

# Hydrogeological Assessment, 1697 Durham Regional Highway 2, Courtice



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Prepared for:  
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## 1.0 Introduction

Cambium Inc. (Cambium) was retained by Gay Company Ltd. (Client) to complete a hydrogeological assessment in support of the design and construction of the proposed mixed-use development of the property located at 1697 Durham Regional Road, Courtice, Ontario (Site), as shown on the Regional Location Plan (Figure 1).

The purpose of the field work and testing was to obtain information on the general subsurface and groundwater conditions at the Site by means of a limited number of monitoring wells, as well as field and laboratory tests. It should be noted that this report addresses only the hydrogeological aspects of the subsurface conditions at the site. The geo-environmental (chemical) aspects, including the consequences of possible surface and/or subsurface contamination resulting from previous activities or uses of the Site and/or resulting from the introduction onto the Site of materials from off-site sources, are beyond the terms of reference for this report and are not addressed herein. The geotechnical and environmental assessments conducted by Cambium for the Site have been submitted to the Client under separate cover (Cambium Inc., 2023; 2023b).

This report provides the results of the hydrogeological assessment and should be read in conjunction with the “Standard Limitations” in Section 12.0, which forms an integral part of this document. The reader’s attention is specifically drawn to this information, as it is essential for the proper use and interpretation of this report. The data, interpretations and recommendations contained in this report pertain to a specific project as described in the report and are not applicable to any other project or site location. If the project is modified in concept, location, or elevation, or if the project is not initiated within eighteen months of the date of the report, Cambium should be given an opportunity to confirm that the recommendations in this report are still valid.



## 2.0 Site and Project Description

The Site is located at municipal addresses 1697 and 1701 Durham Regional Highway 2 in Courtice, Ontario, as shown on the Regional Location Plan (Figure 1) and Site Location Plan, (Figure 2), attached. The proposed development plan is included in Appendix A.

The total area of the Site is approximately 9349.42 m<sup>2</sup> (2.31 acres) and it is currently zoned as Residential (R). The Site is bordered to the north by Durham Regional Highway 2, and to the south by Avondale Drive. The Site was previously occupied by a residential building only, which was converted to an office for Gay Company. The building was subsequently demolished in 2022. At the time of study, the Site was vacant.

The proposed development will include three mixed development buildings. Based on the plans provided, Cambium understands that the footings and elevator pits for all buildings will extend to 1.5 m below finished grade, and that Buildings 1 and 3 will have partial basement levels extending to approximately 3.0 m below finished grade. The development will also include associated servicing, driveways, and parking lots. The Site will be municipally serviced for water and wastewater.

### 2.1 Site Environmental Features

To assess environmental features, databases and plans maintained by the Ministry of Natural Resources and Forestry (MNR), the Ministry of Environment, Conservation and Parks (MECP), and Central Lake Ontario Conservation Authority (CLOCA) were reviewed (Appendix B).

Black Creek is located approximately 100 meters north of the Site. Black Creek drains into Farewell Creek and is positioned approximately 1.3 km west of the Site. Lake Ontario is located approximately 4.5 km south of the Site. Based on the topographic plan dated August 16, 2018, drawing No. 18-25-534-00 provided by the Client, the Site is generally flat with elevations ranging from approximately 133 to 134 m above sea level (masl). Along the south border of the Site, a raised area is present with elevations up to about 135.5 masl.



The Site is situated within the North Lake Ontario Shoreline tertiary watershed, within the Central Lake Ontario Source Protection Area and under the authority of CLOCA. The Site is not located within a CLOCA Conceptual Regulated Area.

As per the MNR Natural Heritage System database, the Site does not have any Areas of Environmental Significance or Areas of Natural and Scientific Interests (ANSI). There are no mapped woodlands, wetlands, or watercourses on the Site.

According to the Source Protection Information Atlas (SPIA), the Site is not located within a Vulnerable Area as described in the CLOCA Approved Source Protection Plan. The Site does not lie within a highly vulnerable aquifer, significant groundwater recharge area, wellhead protection area, or an intake protection zone. The Site is located within a CLOCA Ecologically Significant Groundwater Recharge Area. Any development within such areas must consider water balance and should follow the guidelines within the CLOCA Hydrogeological Assessment Submission Guidelines.



### 3.0 Borehole Drilling and Monitoring Well Installation

#### 3.1 Borehole Investigation

The drilling investigation as conducted as part of the geotechnical field investigation from November 17 to 24, 2022, during which ten boreholes, designated as BH101-22 to BH111-22, were advanced into the subsurface at predetermined locations throughout the Site. A summary of the geotechnical drilling program is presented below in Embedded Table 1. The approximate borehole locations are shown on the Borehole Location Plan, Figure 4, attached.

**Embedded Table 1 Borehole Drilling Program Details**

Borehole ID	Ground Surface Elevation (masl)	Borehole Depth (m)	Finished Elevation (masl)	Notes
BH101-21	134.0	17.2	116.8	50-millimetre (mm) diameter monitoring well installed
BH102-22	-	-	-	Was not drilled
BH103-22	133.9	14.2	119.7	50-mm diameter monitoring well installed
BH104-22	133.7	20.3	113.4	50-mm diameter monitoring well installed
BH105-22	135.4	18.7	116.7	50-mm diameter monitoring well installed
BH106-22	133.5	3.5	130.0	50-mm diameter monitoring well installed
BH107-22	133.4	3.5	129.9	Geotechnical borehole, no well installed
BH108-22 to BH111-22	-	-	-	Environmental boreholes

*masl: metres above sea level*

Drilling and sampling were completed using a both a truck-mounted and track-mounted drill rigs operating under the supervision of a Cambium technician. The boreholes were advanced to the sampling depths by means of continuous flight solid stem augers and mud rotary drilling using conventional 38-millimetre (mm) internal diameter split spoon sampling equipment driven by an automatic hammer in accordance with the SPT procedures outlined in ASTM International standard D1586: "Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils".

Groundwater conditions were noted in the open boreholes during and upon completion of drilling and monitoring wells were installed in BH101-22, BH103-22, BH104-22, BH105-22 and



BH106-22 following the completion of drilling to allow for subsequent groundwater measurements. One monitoring well (BH103-22) was installed approximately 9 mbgs, in the silty clay identified in all boreholes. The remaining four monitoring wells were installed at a depth of approximately 3 mbgs, in the surficial silty sand present across the Site.

The monitoring wells consisted of a 50-mm diameter PVC riser pipe, with a slotted screen sealed at a selected depth within the borehole. A sand filter pack surrounded the screen, and above the screen the borehole and annulus surrounding the riser pipe were backfilled to the surface with bentonite. All other boreholes were backfilled and sealed in accordance with Ontario Regulation (O.Reg.) 903, as amended, and the property was reinstated to pre-existing conditions. Logs for boreholes completed as monitoring wells are presented in Appendix C.

The ground surface elevations at the borehole locations were measured using a Trimble Catalyst GPS unit using a temporary benchmark. The benchmark used was the top of the manhole near the north curb of Avondale Drive and west of the property at 185 Avondale Drive. The elevation the benchmark at 133.77 metres above seal level (masl) was provided by the Client and all borehole elevations are relative to this elevation. The survey also measured the locations and elevations of three existing monitoring wells installed at the Site prior to Cambium's investigations.

### **3.2 Physical Laboratory Testing**

Physical laboratory testing, including four particle size distribution analysis (LS-702, 705) and six Atterberg Limits tests, were completed on selected soil samples to confirm textural classification and to assess geotechnical parameters. Moisture content testing was completed on all soil samples. Testing results are presented in the geotechnical report prepared by Cambium (2023).



## 4.0 Physical Setting

### 4.1 Topography and Drainage

The Site is located in an area that is relatively flat with an approximate elevation ranging from 133 to 134 meters above sea level (masl). The surrounding topography slopes gently to the north, toward Black Creek and a provincially significant wetland (approximately 130 masl) situated to the north of the Site, across Durham Regional Hwy 2.

There are no mapped water bodies on the Site. The local drainage for the Site is assumed to follow local topography and flow off site to the north into storm sewers located along Durham Regional Highway 2.

### 4.2 Physiography

The Site is located within the physiographic region known as the Iroquois Plain, which extends from the western part of Lake Ontario to the Niagara and Trent Rivers. The Plain is approximately 306 km in length with widths varying from 0.18 km to 12.8 km. The area between Scarborough and Oshawa is characterized by sandy, offshore deposits and as being fairly level and poorly drained (Chapman & Putnam, 1984)

According to *Miscellaneous Release – Data from the Ontario Geological Survey (2010)*, the overburden in the area of the Site is described as being stone-poor, sandy silt to silty sand-textured till on Paleozoic terrain. Bedrock in the area is characterized as Middle Ordovician nodular to black laminated limestone of the Lindsay Formation within the Simcoe Group (Ontario Geological Survey, 2019).

### 4.3 Overburden Geology

Overburden geology observed in boreholes advanced at the Site during the geotechnical investigation is consistent with Iroquois Plains deposits. The detailed soil profiles encountered in the boreholes are shown on the attached borehole logs (Appendix C) and are described in detail in geotechnical report prepared for the Site by Cambium (2023).



Based on the results of the borehole investigation, subsurface conditions at the Site generally consist of topsoil overlying near surface very loose to loose sand to silty sand. The surficial silty sand is underlain by a significant deposit of compact to very dense sandy silt to silt. The sandy silt to silt deposit is interlayered with generally compact to dense deposits of sand to silty sand. Localized deposits of stiff to very stiff silty clay were also encountered in the boreholes except in BH108 22, where the silty clay to clayey silt deposit was more significant.

#### **4.4 Bedrock Geology**

Bedrock was not encountered during subsurface investigations conducted at the Site, which reached a maximum depth of approximately 9 mbgs.

#### **4.5 MECP Well Records Assessment**

Cambium accessed the Ministry of the Environment Conservation and Parks (MECP) Water Well Information System (WWIS) to review water well records within 500 m of the Site (Appendix D).

Forty-seven well records within a 500 m radius were found and can be seen in Figure 3. All the well records were for wells that were installed in overburden, except for 1 abandoned water quality well that was drilled into black shale bedrock. Twenty-three wells were drilled as supply wells, with six of these wells listed as abandoned. Eighteen wells were classified as monitoring, observation, or test wells, with four wells abandoned. There were 5 overburden wells that had information on the well use in the well record. A summary of the well information is provided in Embedded Table 2.

The wells were installed between the years 1957 and 2020 to depths ranging between 3.05 mbgs to 53.64 mbgs, with an average of 15.27 mbgs. Static water levels for the wells ranged between 1 and 9 mbgs, with a geometric mean of 3.75 mbgs. Flow rates for the wells was ranged between 5 and 73 litres per minute (lpm), with a geometric mean of 29.33 lpm.



**Embedded Table 2 Supply Well Information Summary**

		<b>Depth (mbgs)</b>	<b>Static Water Level (mbgs)</b>	<b>Flow Rate (lpm)</b>
Wells Count = 47	Min	3.05	1	5
	Max	53.64	9	73
	Average <sup>(1)</sup>	15.27	3.75	29.33

1. The geometric mean of the recommended flow rate was calculated.

Soils were typically reported as topsoil and/or fill, underlain by native overburden generally classified as clay to medium grained sands. Some well records also had some fine graded and/or gravel components.





## 5.0 Groundwater Investigation

### 5.1 Groundwater Level Monitoring

On November 24, 2022, and on January 24, 2024, Cambium staff measured the depths to groundwater in the three existing monitoring wells and the five new monitoring wells installed in November 2022. A summary of groundwater elevations is provided in Embedded Table 3.

**Embedded Table 3 Groundwater Elevations**

Monitoring Well ID	Depth to Water (mbtoc)	End of Hole (mbtoc)	November 2022		January 2024	
			Groundwater Elevation (masl)	Groundwater Elevation (mbgs)	Groundwater Elevation (masl)	Groundwater Elevation (mbgs)
BH101-22	dry	4.08	< 131.12	>2.89	132.86	1.15
BH103-22	3.21	8.74	131.77	2.08	132.69	1.16
BH104-22	dry	3.93	< 130.79	>2.93	131.82	1.90
BH105-22	dry	4.08	< 132.21	>3.20	132.43	2.98
BH106-22	3.53	4.1	130.88	2.63	132.02	1.49
Existing MW 1	3.72	9.92	131.42	2.71	132.81	1.32
Existing MW 2	3.87	9.74	131.24	2.89	131.93	2.20
Existing MW 3	3.63	9.78	131.03	2.68	131.75	1.96

*mbtoc: metres below top of casing; masl: metres above sea level; mbgs: metres below ground surface*

In the first monitoring event following well installation, three of the four monitoring wells screened in the surficial silty sand (installed at a depth of approximately 3 mbgs) were dry (MW101-22, MW104-22, and MW105-22) while groundwater was measured in the fourth shallow monitoring well (MW106-22) at a depth of 2.63 mbgs. Groundwater was observed in all four monitoring wells installed between 9 and 10 mbgs and screened in the silty clay layer. During the January 2024 monitoring event, groundwater was observed in all monitoring wells.

### 5.2 Groundwater Flow Direction

Inferred groundwater contours for the silty clay layer, based on the November 2022 monitoring results, are presented in the groundwater configuration map (Figure 5).

Groundwater flow at the Site during the January 2024 monitoring event was from northwest to southeast, consistent with regional groundwater and surface water flow patterns toward Lake



Ontario. This differs from the conditions observed at the Site in November 2022, when the groundwater flow direction on the Site appeared to be flowing radially outward from the location of the former home on the property from north to south.

Ongoing monitoring of groundwater levels at the Site started in January 2024 to capture water level fluctuations throughout the winter months and into the spring high water table season. Water levels will be measured manually in every well on the Site each month until June 2024, and a Solinst Levellogger datalogger and barometric logger have been installed in BH103-22 to collect twice-daily water levels in the well for the duration of the monitoring program.

### 5.3 In-Situ Hydraulic Conductivity Tests

A Cambium technologist went to the Site on November 24, 2022, to complete well development and in-situ single well hydraulic tests (SWHT) on the monitoring wells installed in the shallow (< 3 mbgs) silty sand unit during the geotechnical drilling program. The SWHT results were used to estimate the hydraulic conductivity of the soils at the depths proposed for the development at the Site.

Despite the presence of free water in soils samples collected at the bottom of BH101-22, BH104-22, and BH105-22, the monitoring wells were dry to their finished depth during the November 2022 monitoring event and therefore could not undergo a SWHT. BH106-22 was surged and developed then allowed to recover to pre-development levels prior to conducting the SWHT.

**Embedded Table 4 Results of Hydraulic Conductivity Determined via SWHT**

Monitoring Well	Estimated Hydraulic Conductivity (m/sec)	Tested Soil Type
BH106-22	$2.42 \times 10^{-6}$	Silty SAND

The hydraulic conductivity of the geological formation adjacent the BH106-22 was estimated via the Aquifer Test Pro slug test software using the Hvorslev interpretation method. The result of the hydraulic test is presented in Embedded Table 4 and the analytical data can be found in Appendix E. The estimated hydraulic conductivity of the native overburden of  $2.42 \times 10^{-6}$  m/s is



consistent with the expected conductivity of silty sand soils identified in the drilling investigation.



## 6.0 Construction Dewatering

Dewatering estimates within this report are based off the proposed development plan presented in Appendix A. At the time of preparing this report the information pertaining the development of the Site is as follows:

- Building 1: slab-on-grade 6-storey building for commercial and seniors affordable living, with an approximate ground floor area of 862 m<sup>2</sup>, with a 200 m<sup>2</sup> partial basement.
- Building 2: slab-on-grade 4-storey seniors affordable living building with an approximate ground floor area of 603 m<sup>2</sup>.
- Building 3: slab on grade 5-storey seniors affordable living building with an approximate ground floor area of 721 m<sup>2</sup>, with a 200 m<sup>2</sup> partial basement.

### 6.1.1 Construction Dewatering Estimates

Requirements for construction dewatering generally depend on a Site's soil and groundwater conditions including soil type, soil permeability or hydraulic conductivity, local groundwater levels, and the design of the proposed works, such as the foundation and/or basement elevation, as well as the size of proposed structure/excavation.

Dewatering levels for Buildings 1 and 3 were assumed to be 4.0 mbgs, corresponding to an elevation 1 m below the finished floor elevation of the partial basements (3.0 mgbs) to allow for installation of foundation drainage and to maintain dry working conditions in the excavation during construction. The dewatering level for Building 2, which will not have a basement, was assumed to be 2.5 mbgs, corresponding to an elevation 1 m below the footing elevation (1.5 mgbs) to allow for installation of foundation drainage and to maintain dry working conditions in the excavation during construction. A representative area of 15 m x 1 m was assumed for utility trench excavations to provide services to each building, with an assumed depth of 1.5 mbgs and a dewatering depth of 2.5 mbgs.

Groundwater levels measured in the monitoring wells in January 2024 were recorded at depths ranging from 1.15 to 2.98 mbgs, excavations for the buildings will likely extend below the water



table, which will require the use of dewatering to maintain sufficiently dry conditions at the Site during development construction.

The following subsections outline results for the estimated dewatering volumes required for proposed phased construction of each building depicted in the proposed Site Plan (Appendix A).

## 6.2 Estimated Construction Dewatering Rates

An open-cut excavation that extends below the water table will be required for construction of each building. Based on the Site Plan provided by the Client (Appendix A), the rectangular footprint of each building unit was used, with an additional 1 m of clearance added in each lateral direction to accommodate shoring and formwork.

To calculate the estimated dewatering rate required for the open-cut excavation for each building unit, a modified Dupuit-Forchheimer equation for a rectangular excavation was used (Powers, Corwin, Schmall, & Kaeck, 2007):

$$Q = \frac{\pi K(H^2 - h^2)}{\ln(R_0/r_s)} + \frac{2(xK(H^2 - h^2))}{2L}$$

Where:

$Q$  = dewatering rate ( $m^3/s$ )

$K$  = hydraulic conductivity ( $m/s$ )

$H$  = initial hydraulic head in aquifer ( $m$ )

$h$  = target hydraulic head (initial hydraulic head – target drawdown) ( $m$ )

$R_0$  = zone of influence (from excavation center) =  $3000(H - h)\sqrt{K}$  ( $m$ )

$r_s$  = equivalent single well radius

$x$  = unit length of trench ( $m$ )

$L$  = distance to line source =  $R_0/2(m)$

For rectangular excavations, the equivalent radius ( $r_s$ ) is determined as one half the width of the excavation. The radius of influence for each excavation was estimated from soil hydraulic conductivity using the method of Sichardt (1930). In conditions of low hydraulic conductivity,



where  $R_0$  is calculated to be less than  $r_s$ , the denominator of the first right hand term of the above equation is amended to be  $\ln((R_0 + r_s)/r_s)$ .

The hydraulic conductivity measured in the shallow (< 3 mbgs) silty sand formation (BH106-22) on November 24, 2022, was used in the dewatering calculations (Section 5.0). To account for potential water level fluctuations at the Site, a conservative depth to groundwater at the Site of 1.0 mbgs was used, which is higher any measurement at the Site collected to date (Embedded Table 3). Dewatering estimates can be revised as needed following completion of the ongoing monitoring program started in January 2024.

Embedded Table 5 shows the estimated groundwater inflow rate into the construction excavations for each building and the subsurface utility trenches. Detailed construction dewatering estimate calculations are presented in Appendix F.

**Embedded Table 5 Estimated Construction Groundwater Inflow Rates**

	Hydraulic Conductivity (K)	Zone of Influence ( $R_0$ )	Dewatering Rate (Q)	
	(m/s)	(m)	m <sup>3</sup> /day	L/s
Building 1	$2.42 \times 10^{-6}$	14	81.0	0.94
Building 2	$2.42 \times 10^{-6}$	7	12.5	0.14
Building 3	$2.42 \times 10^{-6}$	14	69.5	0.80
Utility Trench (per 15 m section)	$2.42 \times 10^{-6}$	7	4.5	0.08

For construction of the buildings, given an estimated hydraulic conductivity of  $2.42 \times 10^{-6}$  m/s, the estimated radius of influence ( $R_0$ ) for dewatering is between 7 and 14 m (Embedded Table 5) and the estimated construction dewatering rate ranges from 12.5 m<sup>3</sup>/day (12,500 L/day, or 0.14 L/s) to 81.0 m<sup>3</sup>/day (81,000 L/day, or 0.94 L/s).

It is noted that the above equation is designed to represent steady state pumping conditions in an aquifer where no recharge boundaries are encountered. In general, at the beginning of the pumping, the pumping rate required to lower Site water levels to acceptable levels may be greater than the rate estimated for steady state conditions as groundwater is extracted from



storage in the surrounding aquifer. Additionally, the above equation does not account for any precipitation that may occur during the construction process.

For construction dewatering, a safety factor of 2 was employed to account for transient pumping conditions and rainfall during construction. This gives an estimated construction dewatering rate of 162 m<sup>3</sup>/day (162,000 L/day, or 1.88 L/s) for Building 1, 25 m<sup>3</sup>/day (25,000 L/day, or 0.28 L/s) for Building 2, and 139 m<sup>3</sup>/day (139,000 L/day, or 1.60 L/s) for Building 3. Construction of 15 m trenches for installation of underground utilities is anticipated to generate 9 m<sup>3</sup>/day (9,000 L/day or 0.16 L/s) during dewatering.

### 6.3 Estimated Operational Dewatering Rates

Operational dewatering levels for the three buildings are assumed to be 0.3 m below the basement finished floor elevation or footing depth. For Buildings 1 and 3, this corresponds to a depth of 3.3 mbgs, while for Building 2, which will not have a basement, this corresponds to a depth of 1.8 mbgs.

The hydraulic conductivity measured in the shallow (< 3 mbgs) silty sand formation (BH106-22) on November 24, 2022, was used in the dewatering calculations (Section 5.0). To account for potential water level fluctuations at the Site, a conservative depth to groundwater at the Site of 1.0 mbgs was used, which is higher any measurement at the Site collected to date (Embedded Table 3). Dewatering estimates can be revised as needed following completion of the ongoing monitoring program started in January 2024.

Embedded Table 6 shows the estimated operational groundwater inflow rate for each building. Detailed construction dewatering estimate calculations are presented in Appendix F.

**Embedded Table 6 Estimated Operational Groundwater Inflow Rates**

	Hydraulic Conductivity (K)	Zone of Influence (R <sub>0</sub> )	Dewatering Rate (Q)	
	(m/s)	(m)	m <sup>3</sup> /day	L/s
Building 1	2.42 x 10 <sup>-6</sup>	11	48.5	0.56
Building 2	2.42 x 10 <sup>-6</sup>	7	8.4	0.1
Building 3	2.42 x 10 <sup>-6</sup>	11	40.3	0.47



For operational dewatering of the buildings, given an estimated hydraulic conductivity of  $2.42 \times 10^{-6}$  m/s, the estimated radius of influence ( $R_0$ ) for dewatering is between 7 and 11 m (Embedded Table 5) and the estimated construction dewatering rate ranges from 8.5 m<sup>3</sup>/day (8,400 L/day, or 0.10 L/s) to 48.5 m<sup>3</sup>/day (48,500 L/day, or 0.56 L/s).

It is noted that the above equation is designed to represent steady state pumping conditions in an aquifer where no recharge boundaries are encountered. In general, at the beginning of the pumping, the pumping rate required to lower Site water levels to acceptable levels may be greater than the rate estimated for steady state conditions as groundwater is extracted from storage in the surrounding aquifer. Additionally, the above equation does not account for any precipitation that may occur during the construction process.

For operational dewatering, a safety factor of 1.25 was employed to account for eventual steady state conditions and placement of impermeable surfaces. This gives an estimated operational dewatering rate of 60.6 m<sup>3</sup>/day (60,600 L/day, or 0.7 L/s) for Building 1, 10.5 m<sup>3</sup>/day (10,500 L/day, or 0.13 L/s) for Building 2, and 50.4 m<sup>3</sup>/day (50,400 L/day, or 0.59 L/s) for Building 3.

#### **6.4 Impacts to Neighbouring Water Supply Wells**

The maximum estimated radius of influence during either construction or operational dewatering is 14 m. The nearest private water supply wells are greater than 14 m from the outer edge of the foundations of the proposed buildings (Figure 3); therefore, no significant impacts to surrounding water users are expected as a results of dewatering at the Site.

Changes to the Site's water balance (Section 8.0) will be mitigated using Low Impact Development (LID) techniques outlined in a separate report prepared by D. G. Biddle and Associates. Net infiltration at the Site is expected to be maintained following development using LID measures, so no significant impacts to surrounding water users are expected.





## **6.5 Assessment of Required Regulatory Permits or Registration**

Any construction dewatering or other water taking in Ontario is governed by the Ontario Water Resources Act (OWRA; Ontario Regulation 387/04 and/or Ontario Regulation 63/16) and/or the Environmental Protection Act (Registrations under Part II.2).

Where construction dewatering is required in amounts in excess of 400,000 L/day, a Permit to Take Water (PTTW) must be obtained. For temporary construction dewatering greater than 50,000 L/day but less than 400,000 L/day, registration through Environmental Activity and Sector Registry (EASR) is required. For long-term dewatering in excess of 50,000 L/day, a PPTW is necessary.

Assuming the buildings will be constructed in a phased manner, an EASR registration will be necessary for construction dewatering proposed at the Site. Once all buildings are completed, their cumulative foundation drainage is expected to exceed 50,000 L/day. Therefore, a PTTW will be required for operational dewatering.

Cambium notes that the provincial government is proposing changes to O. Regs. 63/16 and 387/04 to further reduce burden related to water takings for foundation drains. If the proposed regulatory amendments come into effect, residential foundation drainage systems would be exempt from requiring a PTTW for water taking of up to 379,000 litres of water per day. In that case, a PTTW would not be required for operational dewatering the Site.



## 7.0 Water Quality

One groundwater sample was collected from BH103-22 on November 24, 2022, by Cambium staff. Prior to sampling, the monitoring well was surged and then a minimum of three well volumes of groundwater were purged from the well. One unfiltered water sample was collected from the well using laboratory-supplied containers.

The groundwater sample was delivered to Bureau Veritas, an accredited laboratory, for analysis for parameters in Regional Municipality of Durham Sewer Use By-Law No. 55-2013. Water quality analysis was completed on unfiltered samples to measure the total concentration of each parameter and to determine the dewatering discharge options to local sewer systems. The Certificates of Analysis are attached in Appendix G and parameters exceeding Sewer Use By-Law criteria are presented in Embedded Table 7.

**Embedded Table 7 Groundwater Quality Exceedances (BH103-22)**

Parameter	Concentration (mg/L)	Sanitary Sewer Criteria (mg/L)	Storm Sewer Criteria (mg/L)
Total Suspended Solids	9,500	350	15
Total Kjeldahl Nitrogen (TKN)	1.1	100	1
Parameter	Concentration (µg/L)	Sanitary Sewer Criteria (µg/L)	Storm Sewer Criteria (µg/L)
Total Arsenic (As)	170,000	50,000	-
Total Chromium (Cr)	31	1,000	20
Total Copper (Cu)	250	2,000	80
Total Manganese (Mn)	240	3,000	50
Total Nickel (Ni)	6,900	5,000	150
Total Phosphorus (P)	210	2,000	80
Total Titanium (Ti)	9,100	10,000	400
Total Zinc (Zn)	9,000	5,000	-

Several parameters exceed the sanitary and sewer use criteria applicable at the Site. Due to the presence of fine-grained sediments, groundwater in BH103-22 remained turbid following well development and purging. This is reflected in the high total suspended solids result for the sample. Elevated concentrations of total Kjeldahl nitrogen and total metals measured in BH103-22 may be associated with the suspended sediment in the sample.



Treatment of groundwater would be required prior to discharge to sewer. However, Cambium anticipates that filtration may significantly reduce suspended solid and total metal concentrations and that water discharged from any construction excavations may be treated via filtration or settling tanks (or similar) as a cost-effective means of reducing TSS and metal concentrations prior to discharge. Potential treatment options could be confirmed once the contribution of suspended sediments to the total metals load is determined, either via collection and analysis of filtered groundwater samples or through the use of low-flow sampling methods.

A water quality sampling and analysis plan should be developed and implemented to ensure construction compliance with the applicable standards and by-laws if dewatering is required.



## 8.0 Water Balance Assessment

A conceptual water balance study was completed for the proposed development using the Thornthwaite-Mather approach and utilizing the climatic data obtained from Environment Canada. Pre- and post-development conditions were compared.

Based on the Thornthwaite and Mather methodology (1957), a water balance is an accounting of water in the hydrologic cycle. Precipitation (P) falls as rain and snow. It can run off towards lakes and streams (R), infiltrate to the groundwater table (I), or evaporate from ground or be transpired by vegetation (ET). When long-term average values of P, R, I, and ET are used, there is minimal or no net change to groundwater storage ( $\Delta S$ ) in a steady-state system.

The annual water budget of a site can be expressed as:

$$P = ET + R + I + \Delta S$$

Where:

P = Precipitation (mm/year)

ET = Evapotranspiration (mm/year)

R = Run-off (mm/year)

I = Infiltration (mm/year)

$\Delta S$  = Change in groundwater storage (taken as zero) (mm/year)

The calculations presented here compare the pre- and post-development water balance changes within the Site boundaries as a result of the proposed development. It is noted that the water balance described herein does not account for catchment areas that extend off-site.

The Site was previously developed with a single residence used for an office for Gay Company Ltd. There is a paved driveway and parking area on the pre-development site, with the remainder of site being grassy lawn.

The single residence was demolished some time in 2022. The development of the three proposed buildings will occupy a total footprint of 2275m<sup>2</sup>. The site plans provided by the client



(Appendix A) indicate that building 1 will have a building area of 885 m<sup>2</sup>, building 2 will have a building area of 695 m<sup>2</sup> and building 3 will have a building area of 695 m<sup>2</sup>. Based on the available design information, the development area of the Site can be characterized into three types: paved area, roofed area, and landscaped area. These areas can be observed in Figure 6 and Figure 7. A description of the pre- and post-development areas are listed in Embedded Table 8. Detailed water balance calculations referenced herein are attached in Appendix H.

**Embedded Table 8 Pre- and Post-Development Statistics**

Type of Land Coverage	Pre-Development Areas (m <sup>2</sup> )	Post-Development Areas (m <sup>2</sup> )
Paved Area	1423.65	4751.74
Building Roofed Area	224.96	2275
Landscaped/Vegetated Area	7700.81	2322.68
Total	9349.42	9349.42

## 8.1 Water Surplus

Water surplus is calculated by determining the difference between precipitation and evapotranspiration at a site over the course of a year (changes in soil water storage were assumed to be negligible). The volume of water surplus is further sub-divided into portions that infiltrate the on-site soils and that are directed off-site as runoff.

The climatic data, including monthly average temperature and precipitation from 1981 to 2010, were obtained from Environment Canada for Oshawa WPCP (Climate ID:6155878), located about 6.34 km from the Site. The average annual precipitation was recorded to be 872 mm/year average and the annual evapotranspiration was estimated to be about 548 mm/year using the USGS Thornthwaite Monthly Water Balance methodology (Appendix H). Accordingly, the water surplus of the Site was calculated to be 324 mm/yr.

Transpiration does not occur from structures, paved areas, or gravel surfaces, but it was assumed that 10% of precipitation falling on these surfaces is lost directly to evaporation. The remaining depth of precipitation (i.e., 90%) in these areas was considered surplus and converted to runoff.



## 8.2 Infiltration Rates

The volume of surplus water that infiltrates through pervious surfaces on-site was determined by applying an infiltration factor to the surplus depth. The surplus water that does not infiltrate into pervious surfaces will leave the Site as surface water runoff. The infiltration factor varies from 0 to 1 and is estimated based on topography, soils, and vegetation cover as per the Stormwater Management Planning and Design Manual (Ministry of the Environment, 2003).

The rate of infiltration at a site is expected to vary, based on a number of factors to be considered in any infiltration model. To partition the available water surpluses into infiltration and surface run-off, the Ministry of Environment, Conservation and Parks (MECP) infiltration factor was used. The MECP Storm Water Management Planning and Design Manual (2003) methodology for calculating total infiltration based on topography, soil type and land cover was used, and a corresponding run-off component was calculated for the soil moisture storage conditions (Embedded Table 9).

The Site was determined to be fall within the flat to gently sloping land (less than 0.6m/km) based on the topographic plan dated August 16, 2018 (drawing No. 18-25-534-00), provided by the Client. Based on the results of the borehole investigation, the subsurface conditions at the Site consisted predominantly of sandy silt to silty sand with some areas having silty or sandy clay strata (Appendix C). An infiltration factor of 0.60 was calculated for pervious areas, such as the pre-development lawns and post-development landscaped areas of the Site. An infiltration factor of 0 was assigned to all impervious areas, such as paved surfaces and roofs.



**Embedded Table 9 Infiltration Factor Parameters and Result**

Infiltration Factor	
Topography	Flat = 0.3
Soil	Sandy Silt to Silty Sand = 0.2
Cover	Historically Cultivated Land = 0.1
<b>Infiltration Factor (I)</b>	<b>0.6</b>

### 8.3 Pre-Development Water Balance

The water balance for the pre-development conditions on site are summarized in Embedded Table 10. The pre-development infiltration rate was calculated to be 1,497 m<sup>3</sup>/yr and the runoff rate was 2,291 m<sup>3</sup>/yr.

**Embedded Table 10 Pre-Development Water Balance**

Land Use		Area (m <sup>2</sup> )	Precipitation (m <sup>3</sup> )	Evapotranspiration (m <sup>3</sup> )	Infiltration (m <sup>3</sup> )	Run-off (m <sup>3</sup> )
Impervious Areas	Paved Area	1,424	1,241	124	-	1,117
	Roof Area	225	196	20	-	177
Pervious Areas	Landscape Area	7,701	6,714	4,220	1,497	998
Totals		9,349	8,152	4,364	1,497	2,291

*Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.*

### 8.4 Post-Development Water Balance

The water balance for the post-development conditions on site are summarized in Embedded Table 11. The post-development infiltration rate was calculated to be 451 m<sup>3</sup>/yr and the runoff rate was 5,815 m<sup>3</sup>/yr.

**Embedded Table 11 Post-Development Water Balance**

Land Use		Area (m <sup>2</sup> )	Precipitation (m <sup>3</sup> )	Evapotranspiration (m <sup>3</sup> )	Infiltration (m <sup>3</sup> )	Run-off (m <sup>3</sup> )
Impervious Areas	Paved Area	4,752	4,143	414	-	3,729
	Roof Area	2,275	1,984	198	-	1,785
Pervious Areas	Landscape Area	2,323	2,025	1,273	451	301
Totals		9,349	8,152	1,885	451	5,815

*Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.*



## 8.5 Water Balance Comparison

The differences between the pre-development and post-development infiltration rates from the preceding water balance scenarios are summarized below in Embedded Table 12.

**Embedded Table 12 Water Balance Comparison**

Scenario	QI (m <sup>3</sup> /yr)	QI Difference from Pre- Development Scenario (m <sup>3</sup> /yr, % change)	QR (m <sup>3</sup> /yr)	QR Difference from Pre- Development Scenario (m <sup>3</sup> /yr, % change)
Pre-Development	1,497	-	2,291	-
Post-Development	451	(-1,046 m <sup>3</sup> /yr, -70%)	5,815	(+3,524 m <sup>3</sup> /yr, +253%)

The infiltration deficit of the post-development water balance was estimated to be 1,046 m<sup>3</sup>/year (a reduction of 70% of pre-development annual infiltration). The runoff rate on development of the Site will increase by 3,524 m<sup>3</sup>/year (an increase of 253%).

## 8.6 Low Impact Development Measures

Low Impact Development measures to address this infiltration deficit have been developed and are presented in a separate report for the Site prepared by D.G. Biddle and Associates. In-situ permeability and groundwater level measurements to be collected in spring, 2024, will be used to confirm the LID measures will be sufficient to maintain pre-development infiltration at the Site.





## 9.0 Conclusions and Recommendations

Richard H. Gay Company Ltd. retained Cambium Inc. to complete a hydrogeological assessment for the proposed development at 1697 Durham Regional Highway 2, in Courtice Ontario.

### 9.1 Groundwater Levels and Flow

The results of the subsurface drilling investigation indicate that the overburden at the Site extends to a depth of at least 9 mbgs. Bedrock was not encountered during the Cambium investigations.

Groundwater levels in all wells monitored at the Site on November 2022 were more than 2.1 mbgs, while levels measured in January 2024 ranged from 1.15 to 2.98 mbgs. The groundwater flow direction on the Site in November 2022 appeared to be moving from north to south, flowing radially outward from the location of the former home on the property.

Groundwater flow at the Site during the January 2024 monitoring event was from northwest to southeast, consistent with regional groundwater and surface water flow patterns toward Lake Ontario.

Ongoing monitoring of groundwater levels at the Site started in January 2024 to capture water level fluctuations throughout the winter months and into the spring high water table season. Water levels will be measured manually monthly until June 2024, and datalogger has been installed in BH103-22 to collect twice-daily water levels in the well for the duration of the monitoring program.

### 9.2 Dewatering Volume Requirements

Assuming a phased approach to constructing the buildings, the estimated radius of influence for dewatering is between 7 and 14 m and the estimated construction dewatering rate ranges from 25 m<sup>3</sup>/day (25,000 L/day, or 0.28 L/s) for Building 2 to 162 m<sup>3</sup>/day (162,000 L/day, or 1.88 L/s) for Building 1, including a safety factor of 2.



For operational dewatering of the buildings, the estimated radius of influence for dewatering is between 7 and 11 m, and the estimated dewatering rate ranges from 10.5 m<sup>3</sup>/day (10,500 L/day, or 0.13 L/s) for Building 2 to 60.6 m<sup>3</sup>/day (60,600 L/day, or 0.7 L/s) for Building 1, including a safety factor of 1.25.

The maximum estimated radius of influence during either construction or operational dewatering is 14 m. The nearest private water supply wells are greater than 14 m from the outer edge of the foundations of the proposed buildings (Figure 3); therefore, no significant impacts to surrounding water users are expected as a results of dewatering at the Site.

Changes to the Site's water balance (Section 8.0) will be mitigated using Low Impact Development (LID) techniques outlined in a separate report prepared by D. G. Biddle and Associates. Net infiltration at the Site is expected to be maintained following development using LID measures, so no significant impacts to surrounding water users are expected.

Assuming the buildings will be constructed in a phased manner, an EASR registration will be necessary for construction dewatering at the Site. Once all buildings are completed, their cumulative foundation drainage is expected to exceed 50,000 L/day. Therefore, a PTTW will be required for operational dewatering under the current regulatory requirements.

### **9.3 Groundwater Quality**

Several parameters in the groundwater sample collected from BH106-22 exceed the sanitary and sewer use criteria applicable at the Site. Elevated concentrations of total Kjeldahl nitrogen and total metals measured in BH103-22 may be associated with the high suspended sediment in the sample.

Treatment of groundwater would be required prior to discharge to sewer. However, Cambium anticipates that filtration may significantly reduce suspended solid and total metal concentrations and that water discharged from any construction excavations may be treated via filtration or settling tanks (or similar) as a cost-effective means of reducing TSS and metal concentrations prior to discharge.



Cambium recommends that the contribution of suspended sediments to the total metals load be determined via collection and analysis of filtered groundwater samples.

#### **9.4 Conceptual Water Balance**

The conceptual water balance indicates that there will be an infiltration deficit of 1,046 m<sup>3</sup>/year upon development of the Site. Low Impact Development measures to address this infiltration deficit have been developed and are presented in a separate report for the Site prepared by D.G. Biddle and Associates.

#### **9.5 Site Suitability**

Based on the information collected during Cambium's investigations, development at the Site is feasible from a hydrogeological perspective but will require consideration of local groundwater conditions and the development and implementation of various management plans to ensure compliance with local and provincial regulations.

Local groundwater and surface water systems could be influenced by the proposed development, however; appropriate LID and sediment and erosion control measures can be implemented to mitigate impacts. Surrounding monitoring wells should be regularly monitored through construction, and discharge water should be treated as needed during dewatering operations.




## 10.0 Closing


We trust that the information in this submission meets your current requirements. If you have any questions regarding the contents of this report, please contact the undersigned.

Respectfully submitted,


### Cambium Inc.

DocuSigned by:  
  
6C8CA15FD6B4444...

Warren Young  
Groundwater Technologist

DocuSigned by:  
  
A84A949C3B4C4B4...

Kyle Horner, Ph.D., P.Geo.  
Senior Hydrogeologist / Senior Project  
Manager

DocuSigned by:  


2024-01-26

P:\15300 to 15399\15382-002 Gay Company Ltd - HydroG - 1697 Durham Reg Hwy 2\Deliverables\REPORT - Hydrogeological Assessment\Final\2024-01-26 RPT - HydroGeo - 1697 Hwy 2, Courtice.docx



## 11.0 References

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- W. Sichardt, W. K. (1930). *Grundwasserabsenkung bei Fundierungsarbeiten.* Berlin: Springer.



## 12.0 Standard Limitations

### Limited Warranty

In performing work on behalf of a client, Cambium relies on its client to provide instructions on the scope of its retainer and, on that basis, Cambium determines the precise nature of the work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards. Unless required under local laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

### Reliance on Materials and Information

The findings and results presented in reports prepared by Cambium are based on the materials and information provided by the client to Cambium and on the facts, conditions and circumstances encountered by Cambium during the performance of the work requested by the client. In formulating its findings and results into a report, Cambium assumes that the information and materials provided by the client or obtained by Cambium from the client or otherwise are factual, accurate and represent a true depiction of the circumstances that exist. Cambium relies on its client to inform Cambium if there are changes to any such information and materials. Cambium does not review, analyze or attempt to verify the accuracy or completeness of the information or materials provided, or circumstances encountered, other than in accordance with applicable accepted industry practice. Cambium will not be responsible for matters arising from incomplete, incorrect or misleading information or from facts or circumstances that are not fully disclosed to or that are concealed from Cambium during the provision of services, work or reports.

Facts, conditions, information and circumstances may vary with time and locations and Cambium's work is based on a review of such matters as they existed at the particular time and location indicated in its reports. No assurance is made by Cambium that the facts, conditions, information, circumstances or any underlying assumptions made by Cambium in connection with the work performed will not change after the work is completed and a report is submitted. If any such changes occur or additional information is obtained, Cambium should be advised and requested to consider if the changes or additional information affect its findings or results.

When preparing reports, Cambium considers applicable legislation, regulations, governmental guidelines and policies to the extent they are within its knowledge, but Cambium is not qualified to advise with respect to legal matters. The presentation of information regarding applicable legislation, regulations, governmental guidelines and policies is for information only and is not intended to and should not be interpreted as constituting a legal opinion concerning the work completed or conditions outlined in a report. All legal matters should be reviewed and considered by an appropriately qualified legal practitioner.

### Site Assessments

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

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Potential liability to the client arising out of the report is limited to the amount of Cambium's professional liability insurance coverage. Cambium shall only be liable for direct damages to the extent caused by Cambium's negligence and/or breach of contract. Cambium shall not be liable for consequential damages.

### Personal Liability

The client expressly agrees that Cambium employees shall have no personal liability to the client with respect to a claim, whether in contract, tort and/or other cause of action in law. Furthermore, the client agrees that it will bring no proceedings nor take any action in any court of law against Cambium employees in their personal capacity.



Hydrogeological Assessment, 1697 Durham Regional Highway 2, Courtice  
Richard H. Gay Company Limited  
Cambium Reference: 15382-002  
January 26, 2024

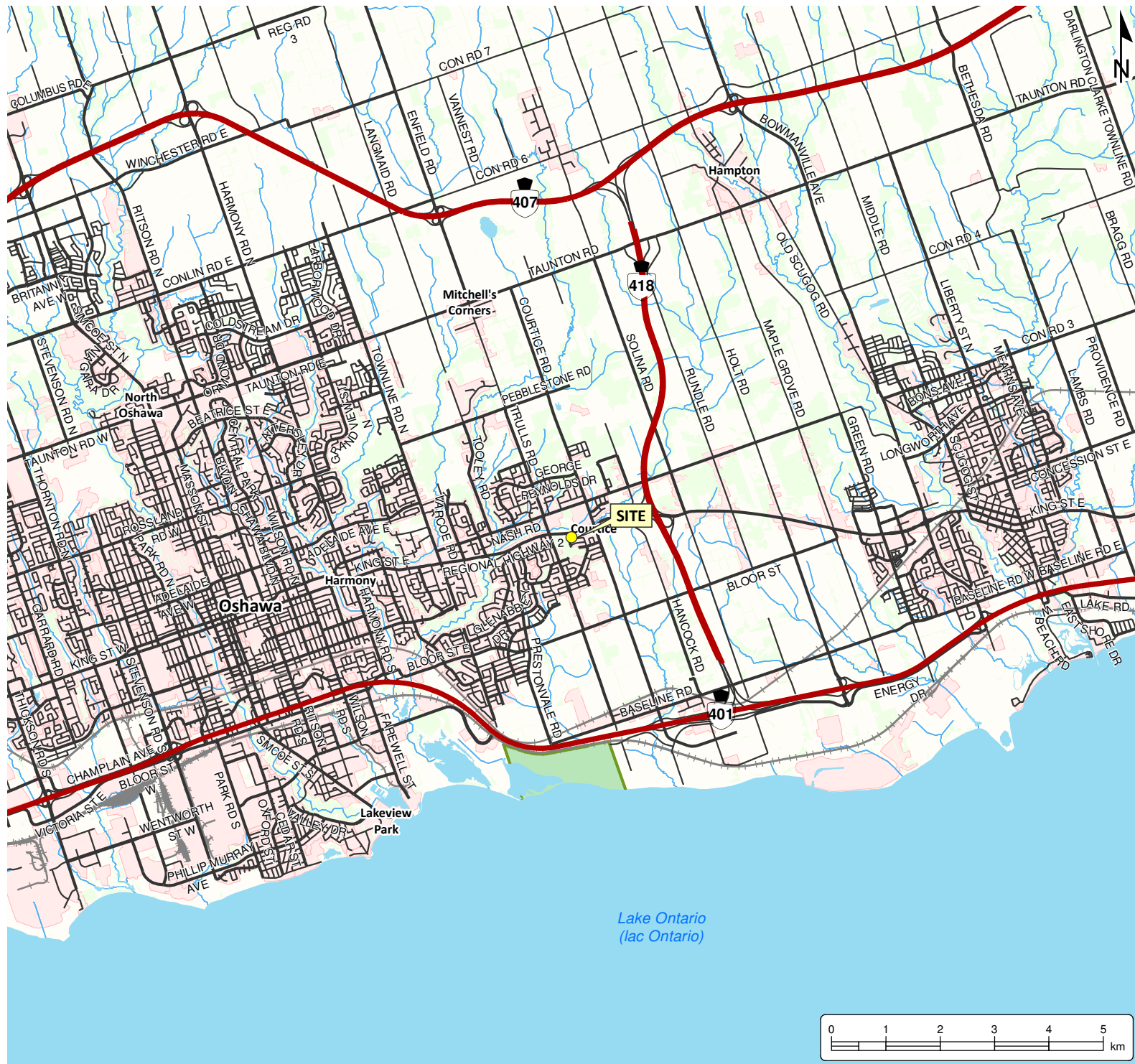
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## Appended Figures

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**HYDROGEOLOGICAL ASSESSMENT**  
**GAY COMPANY LIMITED**  
 1697 Durham Regional Highway 2,  
 Courtice, Ontario

**LEGEND**

- Highway
- Major Road
- Minor Road
- Railroad
- Watercourse
- Water Area
- Provincial Park
- Wooded Area
- Built Up Area

**Notes:**  
 - Site is approximate  
 - Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).  
 - Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.  
 - Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.



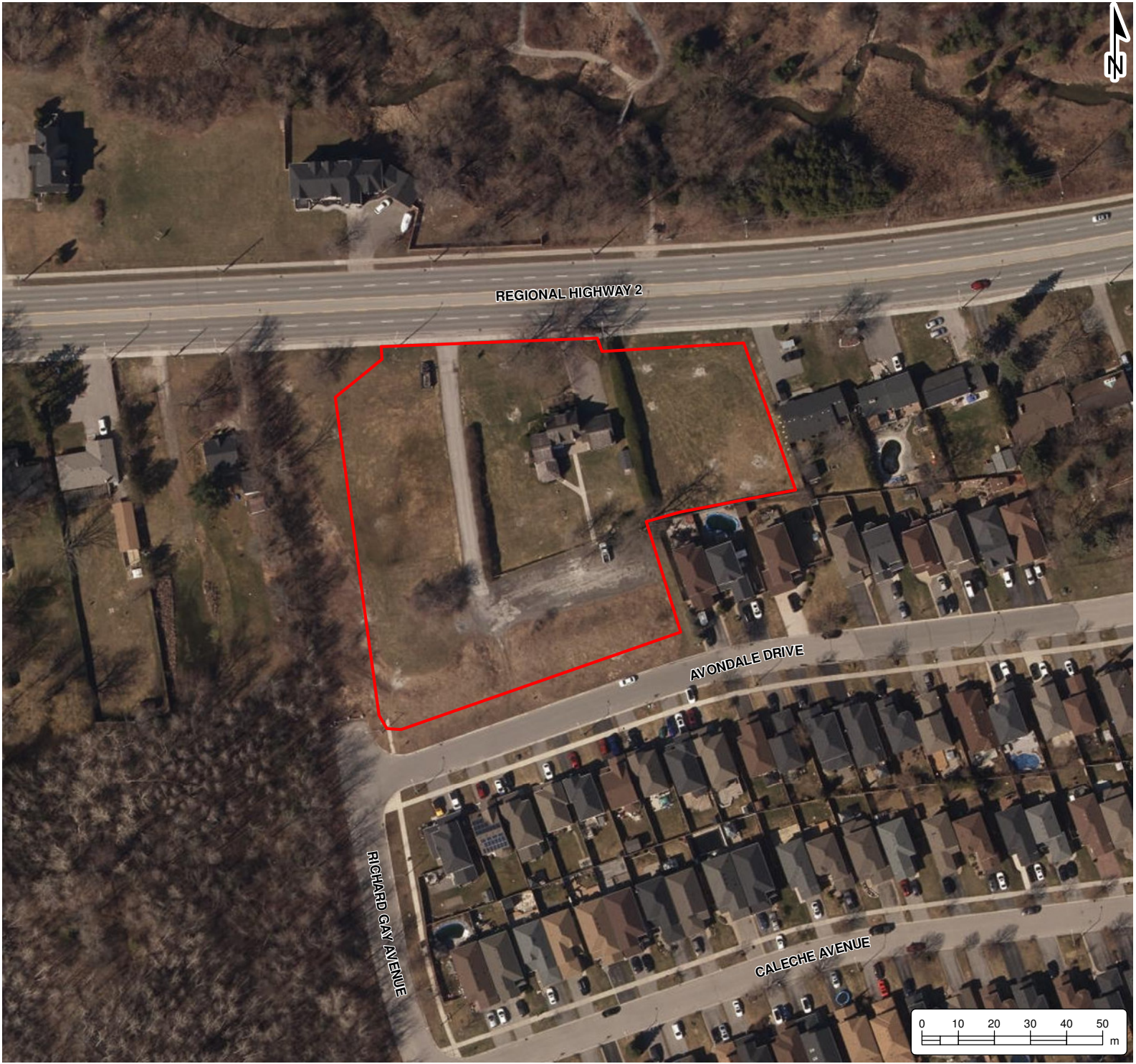
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 Peterborough, Ontario, K9H 1E5  
 Tel: (705) 742.7900 Fax: (705) 742.7907  
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**REGIONAL SITE LOCATION MAP**

Project No.:	15382-002	Date:	December 2022
Scale:	1:100,000	Rev.:	
Created by:	DBB	Projection:	NAD 1983 UTM Zone 17N
Checked by:	KH	Figure:	<b>1</b>







**HYDROGEOLOGICAL  
ASSESSMENT**  
GAY COMPANY LIMITED  
1697 Durham Regional Highway 2,  
Courtice, Ontario

**LEGEND**

Site (0.94ha) (approximate)

**Notes:**  
 - Site is approximate  
 - Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).  
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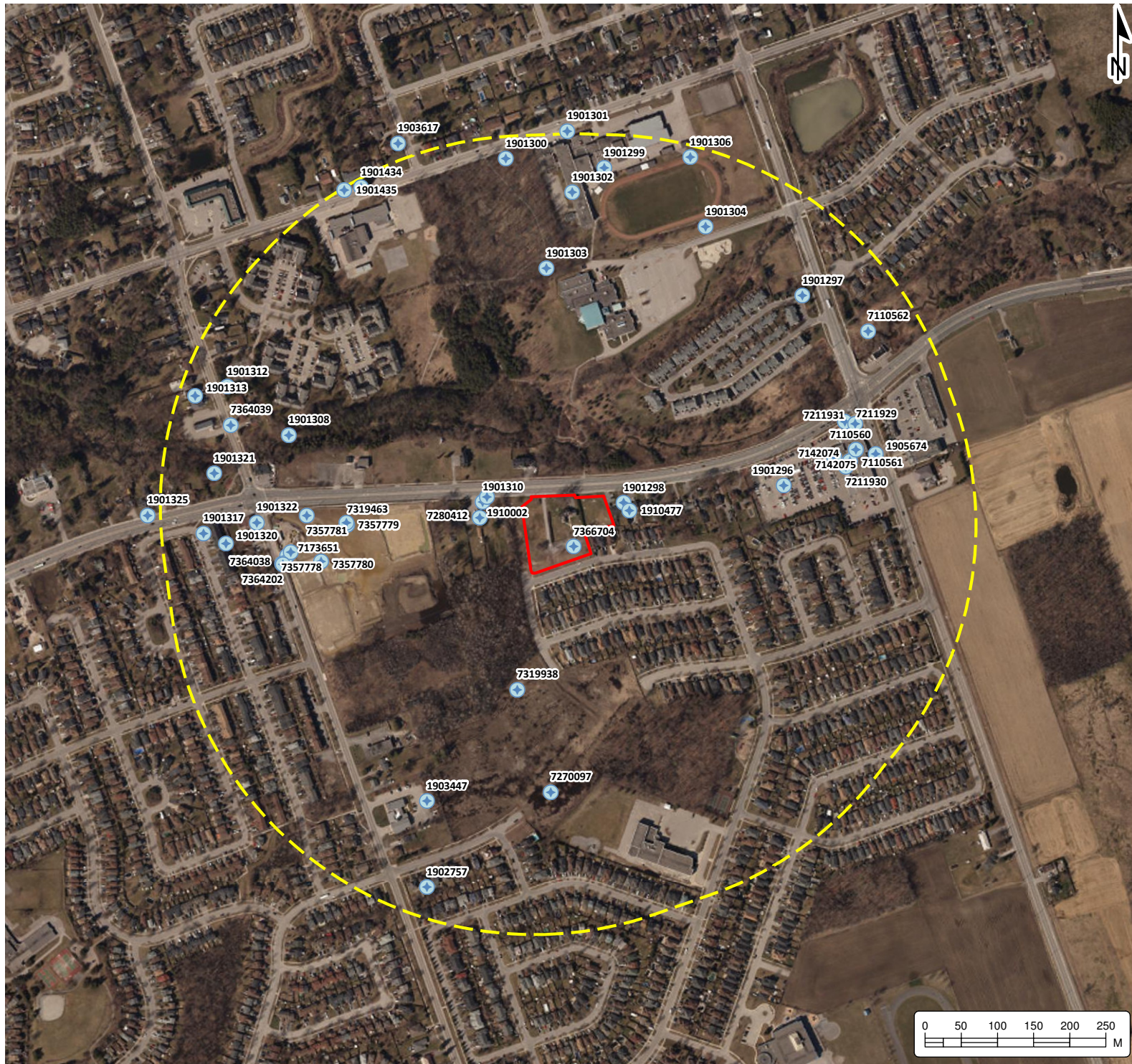


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**SITE PLAN**




Project No.:	15382-002	Date:	December 2022
Scale:	1:1,500	Rev.:	
Created by:	DBB	Checked by:	KH
		Figure:	<b>2</b>





**HYDROGEOLOGICAL ASSESSMENT**  
**GAY COMPANY LIMITED**  
 1697 Durham Regional Highway 2,  
 Courtice, Ontario

**LEGEND**

-  Water Well Records
-  Study Area (500m)
-  Site (0.94ha) (approximate)

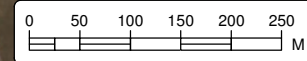
**Notes:**  
 - Site is approximate  
 - Aerial imagery obtained from Durham Region online GIS database  
 - Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).  
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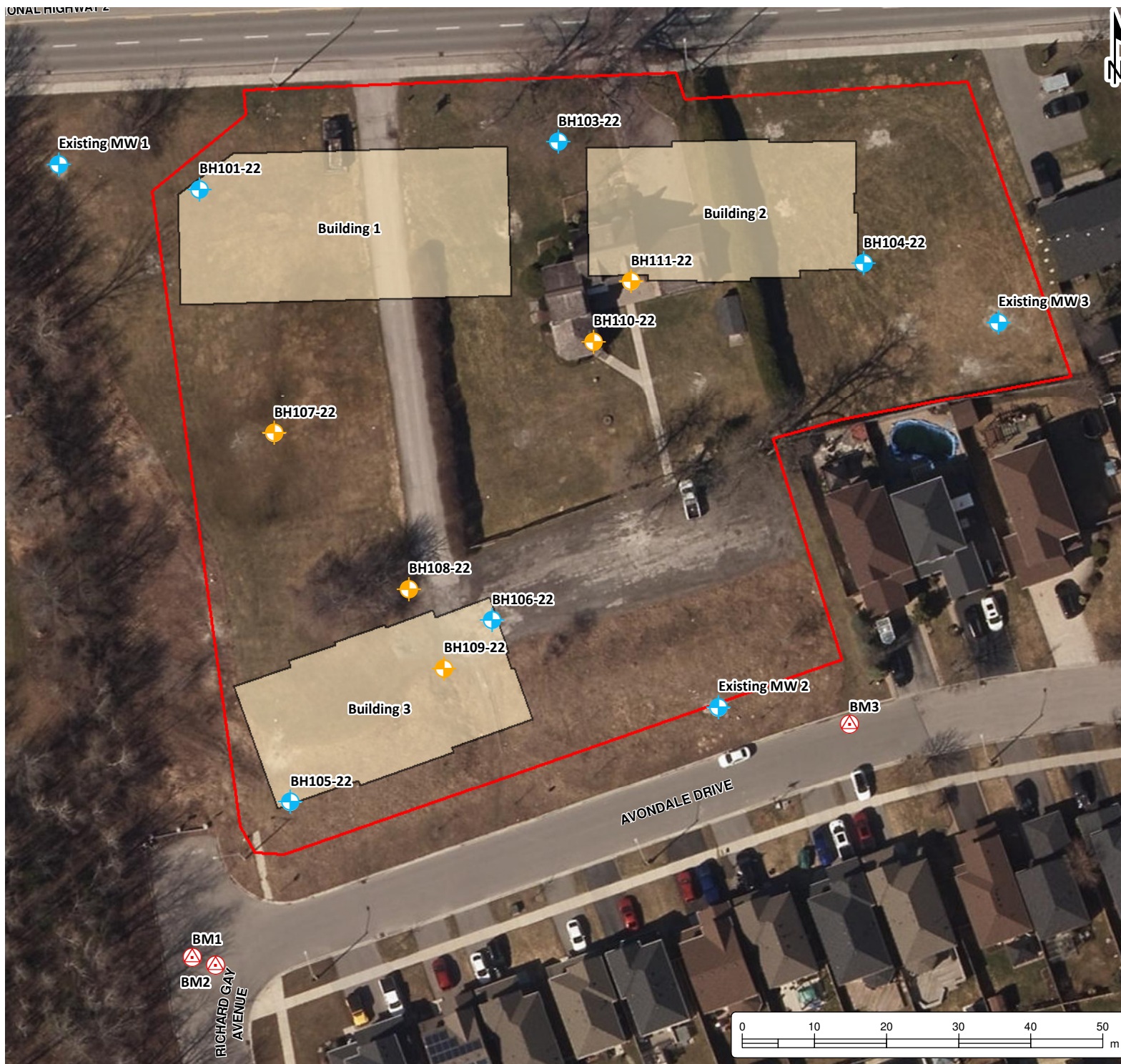
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**MECP WELL RECORDS  
 WITHIN 500m**

Project No.:	15382-002	Date:	November 2022
Scale:	1:7,500	Rev.:	
Created by:	PAS	Projection:	NAD 1983 UTM Zone 17N
Checked by:	KH	Figure:	<b>3</b>












**HYDROGEOLOGICAL ASSESSMENT**  
 RICHARD H. GAY COMPANY LIMITED  
 1697 Durham Regional Highway 2, Courtice, Ontario

**LEGEND**

-  Benchmark
-  Borehole
-  Monitoring Well
-  Proposed Building
-  Site (approximate)

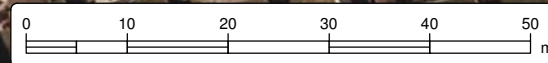
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**BOREHOLE LOCATION PLAN**

Project No.:	15382-002	Date:	December 2022
Scale:	1:750	Rev.:	
Created by:	DBB	Checked by:	KH
Figure:	<b>4</b>		



O:\GIS\MapDocs\153000-15399\15382-002 Gay Company Ltd - GEO - 1697 Durham Reg Hwy, 2-2022-12-01 FIG 4 - Borehole Location Plan.mxd





**HYDROGEOLOGICAL ASSESSMENT**  
 RICHARD H. GAY COMPANY LIMITED  
 1697 Durham Regional Highway 2, Courtice, Ontario

**LEGEND**

- Benchmark
- Borehole
- Monitoring Well
- Groundwater Contour (0.25m intervals)
- Proposed Building
- Site (approximate)

(131.42) Groundwater Elevation (November 24, 2022)

Groundwater Flow Direction (November 24, 2022)

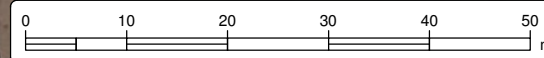
**Notes:**  
 - Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).  
 - Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.  
 - Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.



194 Sophia Street  
 Peterborough, Ontario, K9H 1E5  
 Tel: (705) 742.7900 Fax: (705) 742.7907  
 www.cambium-inc.com

**GROUNDWATER CONFIGURATION MAP**

Project No.:	15382-002	Date:	December 2022
Scale:	1:750	Rev.:	
Created by:	DBB	Checked by:	KH
Figure:	<b>5</b>		







**HYDROGEOLOGICAL  
ASSESSMENT**  
RICHARD H.  
GAY COMPANY LIMITED  
1697 Durham Regional Highway 2,  
Courtice, Ontario

**LEGEND**

- Roofed
- Paved
- Landscaped
- Site (approximate)

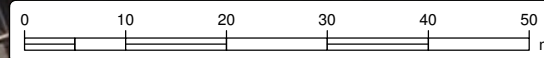
**Notes:**  
 - Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).  
 - Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.  
 - Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.



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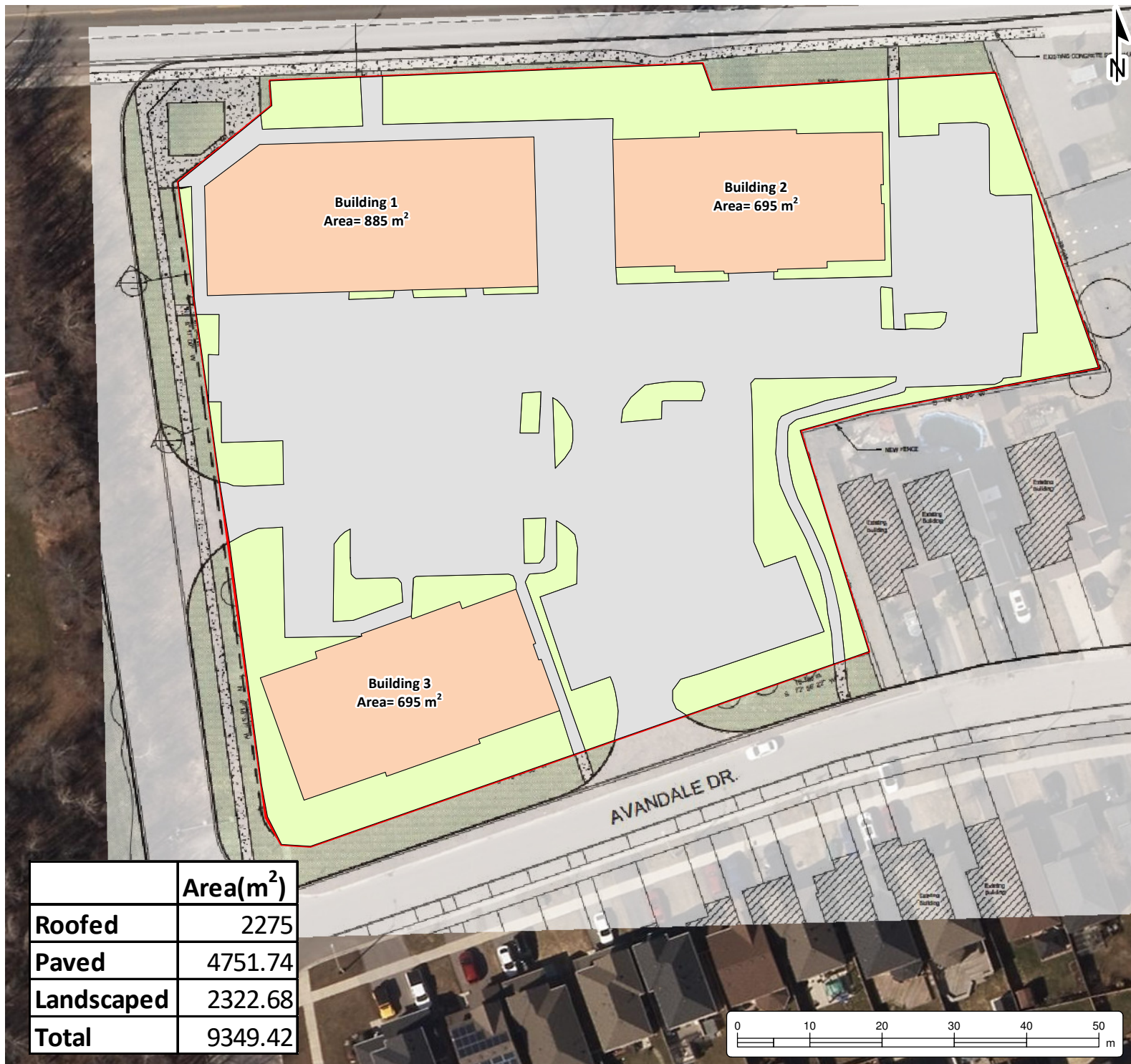
**PRE-DEVELOPMENT PLAN**

	Area(m <sup>2</sup> )
<b>Roofed</b>	224.96
<b>Paved</b>	1423.65
<b>Landscaped</b>	7700.81
<b>Total</b>	9349.42



Project No.: 15382-002	Date: December 2022
Scale: 1:750	Projection: NAD 1983 UTM Zone 17N
Created by: DBB	Checked by: SN
Figure: <b>6</b>	





**HYDROGEOLOGICAL ASSESSMENT**  
 RICHARD H. GAY COMPANY LIMITED  
 1697 Durham Regional Highway 2,  
 Courtice, Ontario

**LEGEND**

- Roofed
- Paved
- Landscaped
- Site (approximate)

**Notes:**  
 - Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).  
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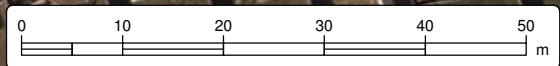


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 www.cambium-inc.com

**POST-DEVELOPMENT PLAN**

Project No.: 15382-002	Date: December 2022
Scale: 1:750	Rev.: Rev.:
Created by: DBB	Checked by: SN
Figure: <b>7</b>	

	Area(m <sup>2</sup> )
<b>Roofed</b>	2275
<b>Paved</b>	4751.74
<b>Landscaped</b>	2322.68
<b>Total</b>	9349.42





Hydrogeological Assessment, 1697 Durham Regional Highway 2, Courtice  
Richard H. Gay Company Limited  
Cambium Reference: 15382-002  
January 26, 2024

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**Appendix A**  
**Proposed Development Plan**

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# Proposed Courtice Mixed-Use Building Development

1697 Durham Regional Hwy 2, Courtice, ON L1E 2R5



KEY MAP



RENDERING

## LIST OF DRAWINGS

### COVER SHEET

A000 COVER SHEET

### CIVIL

- SG-1 SITE GRADING PLAN
- SS-1 SITE SERVICING PLAN
- ES-1 EROSION AND SEDIMENT CTRL PLAN
- SD-1 PRE-DEVELOPMENT STORM DRAINAGE PLAN
- SD-2 POST-DEVELOPMENT STORM DRAINAGE PLAN
- D-3 PHASE 2 STORM DRAINAGE SCHEME
- C-13 STORM OUTFALL EASEMENT
- SE1 SITE ELECTRICAL
- SE2 SITE ELECTRICAL-BLD 1
- SE3 SITE ELECTRICAL-BLD 2
- SE4 SITE ELECTRICAL-BLD 3
- SL-1 SITE LIGHTING - PHOTOMETRIC PLAN
- SL-1\* STREET LIGHTING - PHOTOMETRICS

### LANDSCAPE

- T1.1 TREE INVENTORY AND PRESERVATION PLAN
- L1.1 LANDSCAPE PLAN
- L1.2 LANDSCAPE PLANTING PLAN
- L2.1 LANDSCAPE DETAILS
- L2.2 LANDSCAPE DETAILS

### ARCHITECTURAL

- A200 OBC MATRIX
- A201.a BLDG-1 GROUND & SECOND FLOOR PLAN
- A202.a BLDG-1 TYPICAL FLOOR PLAN (3-4)&(5-6)
- A204.b BLDG-2 GROUND & SECOND FLOOR PLAN
- A205.b BLDG-2 TYPICAL FLOOR (3-4)
- A206.c BLDG-3 GROUND & TYPICAL FLOOR PLAN (2-4)
- A302.a BLDG-1 ELEVATIONS
- A303.b BLDG-2 ELEVATIONS
- A304.c BLDG-3 ELEVATIONS
- A402 BUILDING SECTION II
- A601 3D VIEW AXO NORTH-EAST
- A602 3D VIEW AXO NORTH-WEST
- A603 3D VIEW

NO.	ISSUES	DATE	BY
1	PRE CONSULTATION	APRIL 14 2022	BBA
2	REVISED PRE CONSULTATION	JUNE 22 2022	BBA
3	REVISED PRE CONSULTATION	NOV. 24 2022	BBA
4	INTERNAL REVIEW	NOV. 29 2022	BBA
5	COORDINATION	DEC. 02 2022	BBA
6	SITE PLAN APPLICATION	DEC. 09 2022	BBA

## Proposed Courtice Mixed-Use Building Development

1697 Durham Regional Hwy 2, Courtice, ON L1E 2R5

Project No. 21046

**A000**

Architectural/Structural :

**BARRY BRYAN ASSOCIATES**  
Architects  
Engineers  
Project Managers  
201-250 Water St.  
Whitby Ontario L1N 0G5  
Tel: (905) 666-5252  
Fax: (905) 666-5256  
e-mail: bba@bba-arch.com

PLANNERS:

**AMG GROUP INC.**  
Planning Consultants  
Aaron Gillard  
MCP, RPP  
289-716-1504

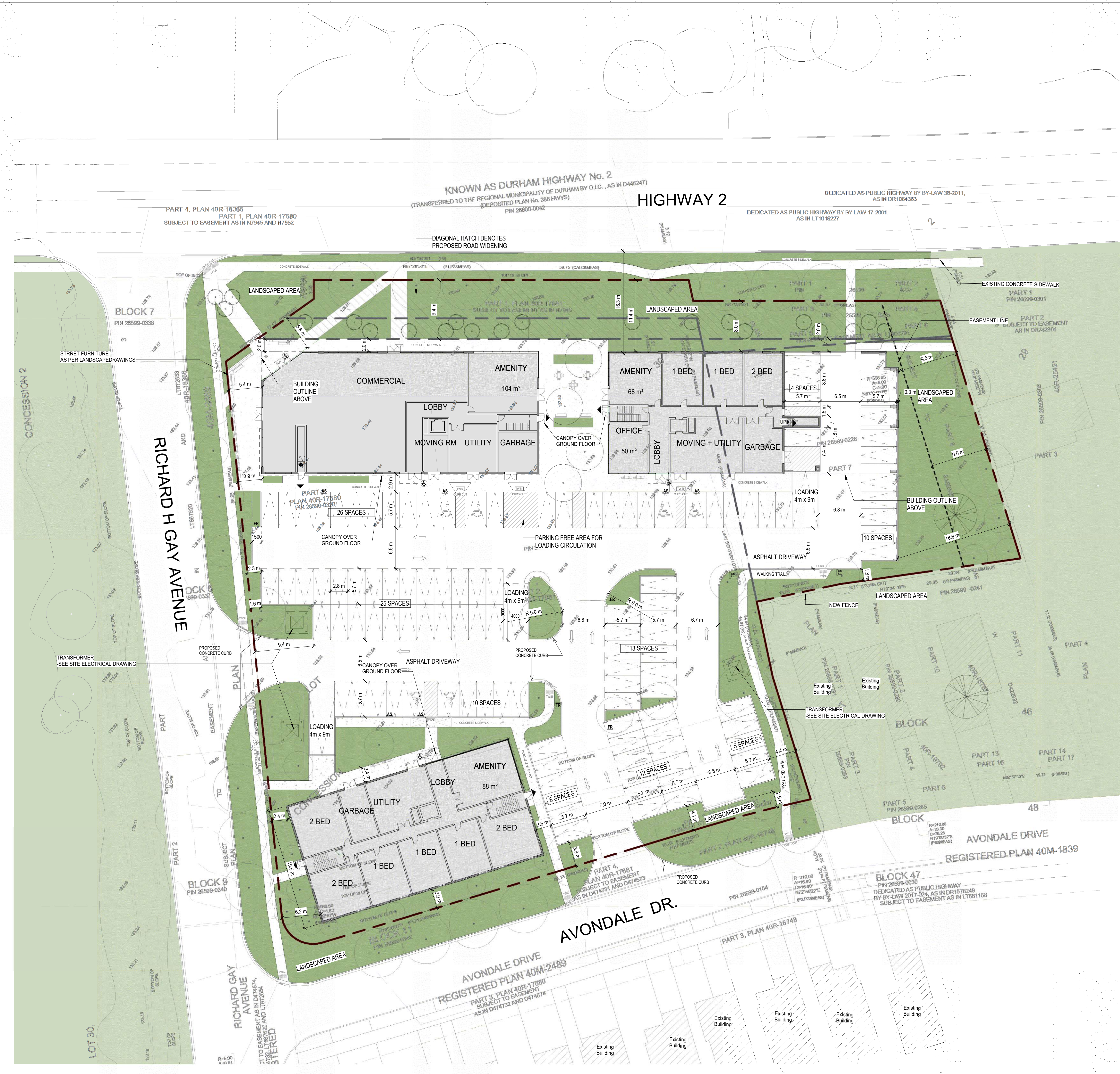
CIVIL / ELECTRICAL:

**D.G. Biddle & Associates Limited**  
Consulting Engineers and Planners  
86 King Street East - Oshawa, ON  
L1H 1B6 p: 905-576-8200

LANDSCAPE:

**TROPIC DESIGN**  
P: 289-251-4396  
www.tropicrodesign.ca





**SITE STATISTICS**

**LEGAL DESCRIPTION:** PART OF LOTS 29 AND 30 CONCESSION 2 MUNICIPALITY OF CLARINGTON REGIONAL MUNICIPALITY OF DURHAM

**ZONING & SITE:** ZONING: R, PROPOSED ZONING: TBD

LOT AREA: 9349.42 m<sup>2</sup>  
 ROAD WIDENING AREA: 839.52 m<sup>2</sup>  
 NET SITE AREA: 8509.9 m<sup>2</sup>

LOT FRONTAGE: 69.965 (North) 89.09 (West)

BUILDING AREA TOTAL: 6133 m<sup>2</sup>  
 BUILDING COVERAGE: 23.17%  
 PAVED AREA: 3889.0 m<sup>2</sup>  
 PAVED AREA COVERAGE: 45%  
 LANDSCAPE AREA: 28%

BLDG-# BUILDING AREA BLDG HEIGHT  
 BLDG-1 861 m<sup>2</sup> 20.5m  
 BLDG-2 699 m<sup>2</sup> 14.1m  
 BLDG-3 722 m<sup>2</sup> 16.3m

**BUILDING SETBACKS (SEE DRAWING)**  
 NORTH (FRONT) FROM BLDG 1 & 2: 11.4 m (2.0 m + 9.4 M Road Widening)  
 EAST (SIDE) FROM BLDG 2: 9.5.0M  
 SOUTH (REAR) FROM BLDG 3: 3.0 m  
 WEST (SIDE) FROM BLDG 3: 2.4 m

**GROSS FLOOR AREA:**

**BUILDING #1:**  
 GROUND FLOOR (COM/RES): 845.9 m<sup>2</sup>  
 SECOND FLOOR (RESIDENTIAL): 862.1 m<sup>2</sup>  
 THIRD FLOOR (RESIDENTIAL): 861.2 m<sup>2</sup>  
 FOURTH FLOOR (RESIDENTIAL): 861.2 m<sup>2</sup>  
 FIFTH FLOOR (RESIDENTIAL): 679.7 m<sup>2</sup>  
 SIXTH FLOOR (RESIDENTIAL): 679.7 m<sup>2</sup>  
**4789.8 m<sup>2</sup>**

**BUILDING #2:**  
 GROUND FLOOR (RESIDENTIAL): 558.7 m<sup>2</sup>  
 SECOND FLOOR (RESIDENTIAL): 902.1 m<sup>2</sup>  
 THIRD FLOOR (RESIDENTIAL): 902.6 m<sup>2</sup>  
 FOURTH FLOOR (RESIDENTIAL): 902.6 m<sup>2</sup>  
**3266.0 m<sup>2</sup>**

**BUILDING #3:**  
 GROUND FLOOR (RESIDENTIAL): 720.7 m<sup>2</sup>  
 SECOND FLOOR (RESIDENTIAL): 720.7 m<sup>2</sup>  
 THIRD FLOOR (RESIDENTIAL): 720.7 m<sup>2</sup>  
 FOURTH FLOOR (RESIDENTIAL): 720.7 m<sup>2</sup>  
 FIFTH FLOOR (RESIDENTIAL): 548.0 m<sup>2</sup>  
**3430.8 m<sup>2</sup>**

**GROSS FLOOR AREA TOTAL: 11,487 m<sup>2</sup>**

**SUITE MIX**

BLDG	1 BED UNIT	2 BED UNIT	TOTAL
BLDG-1	34	20	54
BLDG-2	29	10	39
BLDG-3	29	16	45
BLDG-1+2+3			138

**PARKING**

REQUIRED PARKING: 111 SPACES (SEE CALCULATIONS BELOW)  
 PROVIDED PARKING: 105 + 6 BARRIER FREE SPACES  
 LOADING SPACES REQUIRED: 3 SPACES

**PARKING CALCULATIONS**  
 BLD#1  
 COMMERCIAL 1SP/140m<sup>2</sup> = 67/240 = 17 spaces  
 RESIDENTIAL (0.75SP/54 UNITS) = 38 spaces  
 TOTAL = 55

BLD#2 AFFORDABLE SENIORS  
 RESIDENTIAL (0.75SP/39 UNITS) = 28 spaces  
 TOTAL = 28

BLD#3 AFFORDABLE SENIORS  
 RESIDENTIAL (0.75SP/45 UNITS) = 32 spaces  
 TOTAL = 32

**AMENITY**

INDOOR: REQUIRED = 274m<sup>2</sup> (2.0m<sup>2</sup>/UNIT) PROVIDED: 281.53 m<sup>2</sup>  
 OUTDOOR: REQUIRED = 548m<sup>2</sup> (4.0m<sup>2</sup>/UNIT) PROVIDED: 768.79 m<sup>2</sup>

**LEGEND**

- CONCRETE / STAMPED CONCRETE - SEE LANDSCAPE PLANS
- LANDSCAPED AREA - SEE LANDSCAPE PLAN
- ASPHALT
- PROPOSED BUILDING
- PARKING - PAINT LINES TYP. HATCH WHITE
- TREE PLANTING - SEE LANDSCAPE PLANS
- PROPOSED FIRE EXITS
- PROPOSED ENTRANCE
- PROPERTY LINE
- BARRIER FREE ENTRANCE
- VISITOR PARKING
- BARRIER FREE PARKING
- TACTILE WARNING SURF. INDICATOR
- SITE LIGHTING - SEE ELECTRICAL SITEPLAN

**TRAFFIC SIGNS**

- BY PERMIT ONLY
- FIRE ROUTE

DO NOT SCALE THE DRAWINGS  
 CHECK AND VERIFY ALL DIMENSIONS AT THE SITE.  
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 DRAWINGS ARE NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED AND SEALED BY THE CONSULTANT.

NO.	ISSUES	DATE	BY
1	SPA REVIEW	SEPT 21 2023	JPI/AA
2			
3			
4			
5			
6			

**2023-10-05  
 COORDINATION  
 DRAFT**

	1 BED UNITS	2 BED UNITS	TOTAL
BLDG1			54
BLDG2			39
BLDG3			45
TOTAL			138

NO.	REVISIONS	DATE	BY

**PROJECT:**  
**Proposed Courtye  
 Mixed-Use Building  
 Development**  
 1697 Durham Regional Hwy 2, Courtye,  
 ON L1E 2R5  
 RH Gay Holdings Co.

**DRAWING:**  
**SITE PLAN (Ground  
 Floor)**

**BBA**  
 BARRY BRYAN ASSOCIATES

Architects  
 Engineers  
 Project Managers

201-250 Water Street  
 Whitby Ontario L1N 0G5  
 Tel: (905) 666-5252  
 Fax: (905) 666-5256  
 e-mail: bba@bba-archeng.com

DESIGN BY: [Signature]  
 DRAWN BY: [Signature]  
 AUTHORIZED BY: [Signature]  
 CHECKED BY: [Signature]  
 DATE: 09/21/23  
 SCALE: As indicated  
 FILE: A101

PROJECT NO: 21046  
 DRAWING NO: A101







NAME OF PRACTICE <b>BARRY BRYAN ASSOCIATES</b> 250 WATER STREET WHITBY, ONTARIO, L1N 0G5 www.bba-archeng.com		CERTIFICATE OF PRACTICE No <b>5192</b>								
NAME OF PROJECT <b>COURTICE MIXED-USE BUILDING DEVELOPMENT</b>		LOCATION OF PROJECT <b>1697 DURHAM REGIONAL HWY 2 COURTICE, ONTARIO, L1E 2R5</b>								
ITEM	<b>ONTARIO BUILDING CODE DATA MATRIX - PART 3</b>	O.B.C. REFERENCE References are to Division B unless noted: (A) for Division A or (C) for Division C.								
1.	PROJECT DESCRIPTION: <input checked="" type="checkbox"/> NEW <input type="checkbox"/> ADDITION <input type="checkbox"/> RENOVATION <input type="checkbox"/> CHANGE OF USE <input type="checkbox"/> ADDITION AND RENOVATION DESCRIPTION: 9 STOREY WITH BASEMENT MICRO-UNIT CONDOMINIUM	<input checked="" type="checkbox"/> PART 3	1.1.2 [A]							
2.	MAJOR OCCUPANCY(S) GROUP C	3.1.2.1 (1)								
3.	BUILDING AREA (m <sup>2</sup> ) EXISTING <u>N/A</u> NEW <u>862.1 m<sup>2</sup></u> TOTAL <u>862.1 m<sup>2</sup></u>	1.4.1.2 [A]								
4.	GROSS AREA (m <sup>2</sup> ) EXISTING <u>N/A</u> NEW <u>4,789.8 m<sup>2</sup></u> TOTAL <u>4,789.8 m<sup>2</sup></u>	1.4.1.2 [A]								
5.	NUMBER OF STOREYS ABOVE GRADE <u>8</u> BELOW GRADE <u>0</u>	1.4.1.2 [A] & 3.2.1.1								
6.	NUMBER OF STOREYS / FIRE FIGHTER ACCESS <u>3</u>	3.2.2.10 & 3.2.5								
7.	BUILDING CLASSIFICATION <u>3.2.2.43</u>	3.2.2.20 - 83								
8.	SPRINKLER SYSTEM PROPOSED <input checked="" type="checkbox"/> ENTIRE BUILDING <input type="checkbox"/> SELECTED COMPARTMENTS <input type="checkbox"/> SELECTED FLOOR AREAS <input type="checkbox"/> BASEMENT <input type="checkbox"/> IN LIEU OF RATING <input type="checkbox"/> NOT REQUIRED	3.2.2.20 - 83 3.2.1.5 3.2.2.17 INDEX								
9.	STANDPIPE REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	3.2.9								
10.	FIRE ALARM REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	3.2.4								
11.	WATER SERVICE SUPPLY IS ADEQUATE <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	3.2.5.7								
12.	HIGH BUILDING <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	3.2.6								
13.	CONSTRUCTION RESTRICTIONS <input type="checkbox"/> COMBUSTIBLE PERMITTED <input checked="" type="checkbox"/> NON-COMBUSTIBLE REQUIRED <input type="checkbox"/> BOTH	3.2.2.20 - 83								
ACTUAL CONSTRUCTION <input type="checkbox"/> COMBUSTIBLE <input checked="" type="checkbox"/> NON-COMBUSTIBLE <input type="checkbox"/> BOTH										
14.	IMPORTANCE CATEGORY <input checked="" type="checkbox"/> LOW <input type="checkbox"/> MEDIUM <input type="checkbox"/> HIGH <input type="checkbox"/> POST DISASTER	4.1.2.1 (3) 5.2.2.1 (2)	9.4.1.1, 4.1.2.1 (3) 5.2.2.1 (2)							
SITE CLASS (A,B,C,D,E : FROM GEOTECHNICAL REPORT) TO BE DETERMINED AT PERMIT SUBMISSION		4.1.8.4	4.1.8.4							
EARTHQUAKE IMPORTANCE FACTOR (I <sub>e</sub> ) TO BE DETERMINED AT PERMIT SUBMISSION		T 4.1.8.5	T 4.1.8.5							
ACCELERATION BASED COEFFICIENT (F <sub>a</sub> ) TO BE DETERMINED AT PERMIT SUBMISSION		T 4.1.8.5	T 4.1.8.5							
% SPECTRAL RESPONSE S <sub>a</sub> (0.2) TO BE DETERMINED AT PERMIT SUBMISSION		T 4.1.8.4.1 & (SB-1.1.2)								
SEISMIC HAZARD INDEX: SEISMIC HAZARD INDEX: TO BE DETERMINED AT PERMIT SUBMISSION		4.1.8.18 (1)	4.1.8.18 (1)							
DESIGN FOR SEISMIC REQUIRED CATEGORIES 6 to 21 TABLE 4.1.1.18 EQUAL OR ABOVE 0.35: <input type="checkbox"/> YES <input type="checkbox"/> NO		4.1.8.18 (2)	9.20.1.2, 4.1.8.18 (2) 9.31.6.2 (3)							
15.	MEZZANINE(S) AREA (m <sup>2</sup> ) <u>N/A</u>	3.2.2.1.1 (3)-(8)	3.2.2.1.1 (3)-(8)							
16.	OCCUPANT LOAD BASED ON <input type="checkbox"/> m <sup>2</sup> / PERSON <input checked="" type="checkbox"/> DESIGN OF BUILDING	3.1.17								
<b>1st FLOOR:</b> LOBBY/AMENITY (FOR RESIDENTS ONLY) OCCUPANCY <u>A</u> LOAD # <u>50</u> PERSONS AS PER DESIGN LOADING AND SERVICE AREAS OCCUPANCY <u>F3</u> LOAD # <u>2</u> PERSONS 46m <sup>2</sup> / PERSON AS PER DESIGN COMMERCIAL OCCUPANCY <u>E</u> LOAD # <u>100</u> PERSONS 46m <sup>2</sup> / PERSON <b>2nd FLOOR:</b> 10 UNITS AMENITY LOUNGE (FOR RESIDENTS ONLY) OCCUPANCY <u>A</u> LOAD # <u>30</u> PERSONS 31SLEEPING ROOM AS PER DESIGN 10 UNITS AMENITY LOUNGE (FOR RESIDENTS ONLY) OCCUPANCY <u>A</u> (NON-FIXED SEATS) LOAD # <u>30</u> PERSONS 31SLEEPING ROOM AS PER DESIGN <b>3rd FLOOR:</b> 10 UNITS OCCUPANCY <u>C</u> LOAD # <u>20</u> PERSONS 21SLEEPING ROOM <b>4th FLOOR:</b> 10 UNITS OCCUPANCY <u>C</u> LOAD # <u>20</u> PERSONS 21SLEEPING ROOM <b>5th FLOOR:</b> 10 UNITS OCCUPANCY <u>C</u> LOAD # <u>20</u> PERSONS 21SLEEPING ROOM <b>6th FLOOR:</b> 10 UNITS OCCUPANCY <u>C</u> LOAD # <u>20</u> PERSONS 21SLEEPING ROOM <b>7th FLOOR:</b> 10 UNITS OCCUPANCY <u>C</u> LOAD # <u>20</u> PERSONS 21SLEEPING ROOM <b>8th FLOOR:</b> 10 UNITS OCCUPANCY <u>C</u> LOAD # <u>20</u> PERSONS 21SLEEPING ROOM <b>9th FLOOR:</b> 10 UNITS OCCUPANCY <u>C</u> LOAD # <u>20</u> PERSONS 21SLEEPING ROOM <b>10th FLOOR:</b> 10 UNITS OCCUPANCY <u>C</u> LOAD # <u>20</u> PERSONS 21SLEEPING ROOM <b>MEZZANINE:</b> 10 UNITS OCCUPANCY <u>C</u> LOAD # <u>20</u> PERSONS 21SLEEPING ROOM <b>TOTAL:</b> LOAD # <u>282</u> PERSONS										
17.	BARRIER FREE DESIGN <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO (EXPLAIN)	3.8								
18.	HAZARDOUS SUBSTANCES <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	3.3.1.2 & 3.3.1.19								
19.	REQUIRED FIRE RESISTANCE RATING (F.R.R.)	3.2.2.42								
HORIZONTAL ASSEMBLIES F.R.R. (HOURS)		LISTED DESIGN No. OR DESCRIPTION (SG-2)								
OTHER FLOORS <u>2</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
ROOF <u>1</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
MEZZANINE STORAGE <u>N/A</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
F.R.R. OF SUPPORTING MEMBERS TO BE DETERMINED AT PERMIT SUBMISSION										
FLOORS <u>2</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
ROOF <u>1</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
MEZZANINE <u>N/A</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
20.	SPATIAL SEPERATION: CONSTRUCTION OF EXTERIOR WALLS TO BE DETERMINED AT PERMIT SUBMISSION	3.2.3								
WALL	AREA OF E.S.F. (m <sup>2</sup> )	L.D. (m)	L.H. or H.L.	PERMITTED MAX % OF OPENINGS	PROPOSED % OF OPENINGS	F.R.R. (HOURS)	LISTED DESIGN OR DESCRIPTION	COMB CONST.	COMB CONSTRUCTION NON-COMBUSTIBLE CLADDING	NON-COMBUSTIBLE CONSTRUCTION
NORTH	TBD sqm	TBD m	/	100 %	%	#	TBD	NO	NO	YES
SOUTH	TBD sqm	TBD m	/	100 %	%	#	TBD	NO	NO	YES
EAST	TBD sqm	TBD m	/	100 %	%	#	TBD	NO	NO	YES
WEST	TBD sqm	TBD m	/	100 %	%	#	TBD	NO	NO	YES
21.	PLUMBING FIXTURE REQUIREMENTS	WASHROOMS EXIST IN EVERY RESIDENTIAL UNIT. 5 ADDITIONAL WASHROOMS (1 UNIV + 1BF + 3 UNIS) HAVE BEEN ADDED FOR RESIDENT VISITOR USE ON GROUND FLOOR. ADDITIONAL DETAILS TO BE INCLUDED WITH PERMIT SUBMISSION								
22.	EXIT WIDTH CALCULATION	TO BE DETERMINED AT PERMIT SUBMISSION								

OBC MATRIX BLDG #1  
1 : 125

NAME OF PRACTICE <b>BARRY BRYAN ASSOCIATES</b> 250 WATER STREET WHITBY, ONTARIO, L1N 0G5 www.bba-archeng.com		CERTIFICATE OF PRACTICE No <b>5192</b>								
NAME OF PROJECT <b>COURTICE MIXED-USE BUILDING DEVELOPMENT</b>		LOCATION OF PROJECT <b>1697 DURHAM REGIONAL HWY 2 COURTICE, ONTARIO, L1E 2R5</b>								
ITEM	<b>ONTARIO BUILDING CODE DATA MATRIX - PART 3</b>	O.B.C. REFERENCE References are to Division B unless noted: (A) for Division A or (C) for Division C.								
1.	PROJECT DESCRIPTION: <input checked="" type="checkbox"/> NEW <input type="checkbox"/> ADDITION <input type="checkbox"/> RENOVATION <input type="checkbox"/> CHANGE OF USE <input type="checkbox"/> ADDITION AND RENOVATION DESCRIPTION: 9 STOREY WITH BASEMENT MICRO-UNIT CONDOMINIUM	<input checked="" type="checkbox"/> PART 3	1.1.2 [A]							
2.	MAJOR OCCUPANCY(S) GROUP C	3.1.2.1 (1)								
3.	BUILDING AREA (m <sup>2</sup> ) EXISTING <u>N/A</u> NEW <u>602.6 m<sup>2</sup></u> TOTAL <u>602.6 m<sup>2</sup></u>	1.4.1.2 [A]								
4.	GROSS AREA (m <sup>2</sup> ) EXISTING <u>N/A</u> NEW <u>3,266.0 m<sup>2</sup></u> TOTAL <u>3,266.0 m<sup>2</sup></u>	1.4.1.2 [A]								
5.	NUMBER OF STOREYS ABOVE GRADE <u>4</u> BELOW GRADE <u>0</u>	1.4.1.2 [A] & 3.2.1.1								
6.	NUMBER OF STOREYS / FIRE FIGHTER ACCESS <u>3</u>	3.2.2.10 & 3.2.5								
7.	BUILDING CLASSIFICATION <u>3.2.2.43</u>	3.2.2.20 - 83								
8.	SPRINKLER SYSTEM PROPOSED <input checked="" type="checkbox"/> ENTIRE BUILDING <input type="checkbox"/> SELECTED COMPARTMENTS <input type="checkbox"/> SELECTED FLOOR AREAS <input type="checkbox"/> BASEMENT <input type="checkbox"/> IN LIEU OF RATING <input type="checkbox"/> NOT REQUIRED	3.2.2.20 - 83 3.2.1.5 3.2.2.17 INDEX								
9.	STANDPIPE REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	3.2.9								
10.	FIRE ALARM REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	3.2.4								
11.	WATER SERVICE SUPPLY IS ADEQUATE <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	3.2.5.7								
12.	HIGH BUILDING <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	3.2.6								
13.	CONSTRUCTION RESTRICTIONS <input type="checkbox"/> COMBUSTIBLE PERMITTED <input checked="" type="checkbox"/> NON-COMBUSTIBLE REQUIRED <input type="checkbox"/> BOTH	3.2.2.20 - 83								
ACTUAL CONSTRUCTION <input type="checkbox"/> COMBUSTIBLE <input checked="" type="checkbox"/> NON-COMBUSTIBLE <input type="checkbox"/> BOTH										
14.	IMPORTANCE CATEGORY <input checked="" type="checkbox"/> LOW <input type="checkbox"/> MEDIUM <input type="checkbox"/> HIGH <input type="checkbox"/> POST DISASTER	4.1.2.1 (3) 5.2.2.1 (2)	9.4.1.1, 4.1.2.1 (3) 5.2.2.1 (2)							
SITE CLASS (A,B,C,D,E : FROM GEOTECHNICAL REPORT) TO BE DETERMINED AT PERMIT SUBMISSION		4.1.8.4	4.1.8.4							
EARTHQUAKE IMPORTANCE FACTOR (I <sub>e</sub> ) TO BE DETERMINED AT PERMIT SUBMISSION		T 4.1.8.5	T 4.1.8.5							
ACCELERATION BASED COEFFICIENT (F <sub>a</sub> ) TO BE DETERMINED AT PERMIT SUBMISSION		T 4.1.8.5	T 4.1.8.5							
% SPECTRAL RESPONSE S <sub>a</sub> (0.2) TO BE DETERMINED AT PERMIT SUBMISSION		T 4.1.8.4.1 & (SB-1.1.2)								
SEISMIC HAZARD INDEX: SEISMIC HAZARD INDEX: TO BE DETERMINED AT PERMIT SUBMISSION		4.1.8.18 (1)	4.1.8.18 (1)							
DESIGN FOR SEISMIC REQUIRED CATEGORIES 6 to 21 TABLE 4.1.1.18 EQUAL OR ABOVE 0.35: <input type="checkbox"/> YES <input type="checkbox"/> NO		4.1.8.18 (2)	9.20.1.2, 4.1.8.18 (2) 9.31.6.2 (3)							
15.	MEZZANINE(S) AREA (m <sup>2</sup> ) <u>N/A</u>	3.2.2.1.1 (3)-(8)	3.2.2.1.1 (3)-(8)							
16.	OCCUPANT LOAD BASED ON <input type="checkbox"/> m <sup>2</sup> / PERSON <input checked="" type="checkbox"/> DESIGN OF BUILDING	3.1.17								
<b>BASEMENT:</b> 6 UNITS/AMENITY (FOR RESIDENTS ONLY) OCCUPANCY <u>C</u> LOAD # <u>50</u> PERSONS 46m <sup>2</sup> / PERSON <b>1st FLOOR:</b> 7 UNITS OCCUPANCY <u>C</u> LOAD # <u>14</u> PERSONS AS PER DESIGN LOBBY/AMENITY (FOR RESIDENTS ONLY) OCCUPANCY <u>A</u> LOAD # <u>100</u> PERSONS AS PER DESIGN LOADING AND SERVICE AREAS OCCUPANCY <u>F3</u> LOAD # <u>2</u> PERSONS 46m <sup>2</sup> / PERSON <b>2nd FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM AS PER DESIGN <b>3rd FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>4th FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>5th FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>6th FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>7th FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>8th FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>9th FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>TOTAL:</b> LOAD # <u>214</u> PERSONS										
17.	BARRIER FREE DESIGN <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO (EXPLAIN)	3.8								
18.	HAZARDOUS SUBSTANCES <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	3.3.1.2 & 3.3.1.19								
19.	REQUIRED FIRE RESISTANCE RATING (F.R.R.)	3.2.2.42								
HORIZONTAL ASSEMBLIES F.R.R. (HOURS)		LISTED DESIGN No. OR DESCRIPTION (SG-2)								
OTHER FLOORS <u>2</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
ROOF <u>1</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
MEZZANINE STORAGE <u>N/A</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
F.R.R. OF SUPPORTING MEMBERS TO BE DETERMINED AT PERMIT SUBMISSION										
FLOORS <u>2</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
ROOF <u>1</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
MEZZANINE <u>N/A</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
20.	SPATIAL SEPERATION: CONSTRUCTION OF EXTERIOR WALLS TO BE DETERMINED AT PERMIT SUBMISSION	3.2.3								
WALL	AREA OF E.S.F. (m <sup>2</sup> )	L.D. (m)	L.H. or H.L.	PERMITTED MAX % OF OPENINGS	PROPOSED % OF OPENINGS	F.R.R. (HOURS)	LISTED DESIGN OR DESCRIPTION	COMB CONST.	COMB CONSTRUCTION NON-COMBUSTIBLE CLADDING	NON-COMBUSTIBLE CONSTRUCTION
NORTH	TBD sqm	TBD m	/	100 %	%	#	TBD	NO	NO	YES
SOUTH	TBD sqm	TBD m	/	100 %	%	#	TBD	NO	NO	YES
EAST	TBD sqm	TBD m	/	100 %	%	#	TBD	NO	NO	YES
WEST	TBD sqm	TBD m	/	100 %	%	#	TBD	NO	NO	YES
21.	PLUMBING FIXTURE REQUIREMENTS	WASHROOMS EXIST IN EVERY RESIDENTIAL UNIT. 5 ADDITIONAL WASHROOMS (1 UNIV + 1BF + 3 UNIS) HAVE BEEN ADDED FOR RESIDENT VISITOR USE ON GROUND FLOOR. ADDITIONAL DETAILS TO BE INCLUDED WITH PERMIT SUBMISSION								
22.	EXIT WIDTH CALCULATION	TO BE DETERMINED AT PERMIT SUBMISSION								

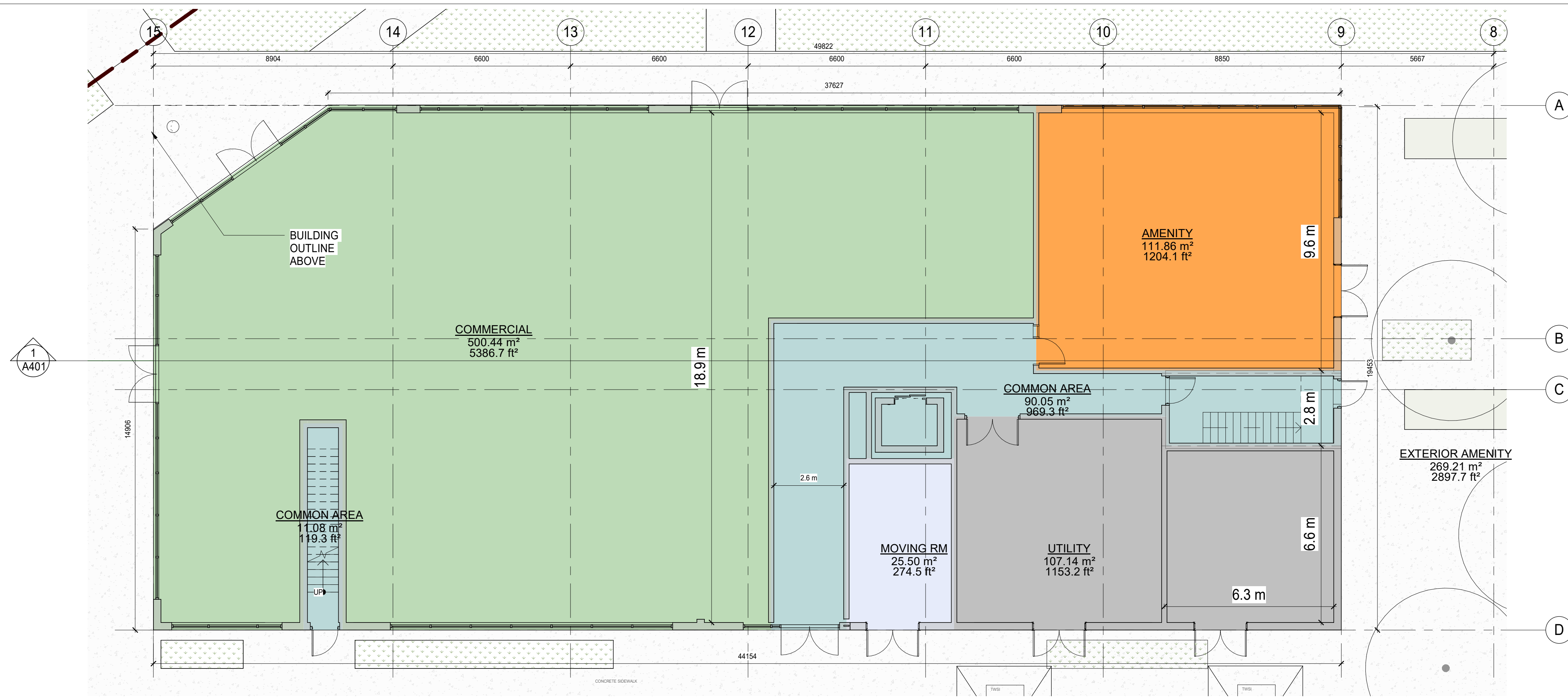
OBC MATRIX BLDG #2  
1 : 125

NAME OF PRACTICE <b>BARRY BRYAN ASSOCIATES</b> 250 WATER STREET WHITBY, ONTARIO, L1N 0G5 www.bba-archeng.com		CERTIFICATE OF PRACTICE No <b>5192</b>								
NAME OF PROJECT <b>COURTICE MIXED-USE BUILDING DEVELOPMENT</b>		LOCATION OF PROJECT <b>1697 DURHAM REGIONAL HWY 2 COURTICE, ONTARIO, L1E 2R5</b>								
ITEM	<b>ONTARIO BUILDING CODE DATA MATRIX - PART 3</b>	O.B.C. REFERENCE References are to Division B unless noted: (A) for Division A or (C) for Division C.								
1.	PROJECT DESCRIPTION: <input checked="" type="checkbox"/> NEW <input type="checkbox"/> ADDITION <input type="checkbox"/> RENOVATION <input type="checkbox"/> CHANGE OF USE <input type="checkbox"/> ADDITION AND RENOVATION DESCRIPTION: 9 STOREY WITH BASEMENT MICRO-UNIT CONDOMINIUM	<input checked="" type="checkbox"/> PART 3	1.1.2 [A]							
2.	MAJOR OCCUPANCY(S) GROUP C	3.1.2.1 (1)								
3.	BUILDING AREA (m <sup>2</sup> ) EXISTING <u>N/A</u> NEW <u>720.7 m<sup>2</sup></u> TOTAL <u>720.7 m<sup>2</sup></u>	1.4.1.2 [A]								
4.	GROSS AREA (m <sup>2</sup> ) EXISTING <u>N/A</u> NEW <u>3,430.8 m<sup>2</sup></u> TOTAL <u>3,430.8 m<sup>2</sup></u>	1.4.1.2 [A]								
5.	NUMBER OF STOREYS ABOVE GRADE <u>5</u> BELOW GRADE <u>0</u>	1.4.1.2 [A] & 3.2.1.1								
6.	NUMBER OF STOREYS / FIRE FIGHTER ACCESS <u>3</u>	3.2.2.10 & 3.2.5								
7.	BUILDING CLASSIFICATION <u>3.2.2.43</u>	3.2.2.20 - 83								
8.	SPRINKLER SYSTEM PROPOSED <input checked="" type="checkbox"/> ENTIRE BUILDING <input type="checkbox"/> SELECTED COMPARTMENTS <input type="checkbox"/> SELECTED FLOOR AREAS <input type="checkbox"/> BASEMENT <input type="checkbox"/> IN LIEU OF RATING <input type="checkbox"/> NOT REQUIRED	3.2.2.20 - 83 3.2.1.5 3.2.2.17 INDEX								
9.	STANDPIPE REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	3.2.9								
10.	FIRE ALARM REQUIRED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	3.2.4								
11.	WATER SERVICE SUPPLY IS ADEQUATE <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	3.2.5.7								
12.	HIGH BUILDING <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	3.2.6								
13.	CONSTRUCTION RESTRICTIONS <input type="checkbox"/> COMBUSTIBLE PERMITTED <input checked="" type="checkbox"/> NON-COMBUSTIBLE REQUIRED <input type="checkbox"/> BOTH	3.2.2.20 - 83								
ACTUAL CONSTRUCTION <input type="checkbox"/> COMBUSTIBLE <input checked="" type="checkbox"/> NON-COMBUSTIBLE <input type="checkbox"/> BOTH										
14.	IMPORTANCE CATEGORY <input checked="" type="checkbox"/> LOW <input type="checkbox"/> MEDIUM <input type="checkbox"/> HIGH <input type="checkbox"/> POST DISASTER	4.1.2.1 (3) 5.2.2.1 (2)	9.4.1.1, 4.1.2.1 (3) 5.2.2.1 (2)							
SITE CLASS (A,B,C,D,E : FROM GEOTECHNICAL REPORT) TO BE DETERMINED AT PERMIT SUBMISSION		4.1.8.4	4.1.8.4							
EARTHQUAKE IMPORTANCE FACTOR (I <sub>e</sub> ) TO BE DETERMINED AT PERMIT SUBMISSION		T 4.1.8.5	T 4.1.8.5							
ACCELERATION BASED COEFFICIENT (F <sub>a</sub> ) TO BE DETERMINED AT PERMIT SUBMISSION		T 4.1.8.5	T 4.1.8.5							
% SPECTRAL RESPONSE S <sub>a</sub> (0.2) TO BE DETERMINED AT PERMIT SUBMISSION		T 4.1.8.4.1 & (SB-1.1.2)								
SEISMIC HAZARD INDEX: SEISMIC HAZARD INDEX: TO BE DETERMINED AT PERMIT SUBMISSION		4.1.8.18 (1)	4.1.8.18 (1)							
DESIGN FOR SEISMIC REQUIRED CATEGORIES 6 to 21 TABLE 4.1.1.18 EQUAL OR ABOVE 0.35: <input type="checkbox"/> YES <input type="checkbox"/> NO		4.1.8.18 (2)	9.20.1.2, 4.1.8.18 (2) 9.31.6.2 (3)							
15.	MEZZANINE(S) AREA (m <sup>2</sup> ) <u>N/A</u>	3.2.2.1.1 (3)-(8)	3.2.2.1.1 (3)-(8)							
16.	OCCUPANT LOAD BASED ON <input type="checkbox"/> m <sup>2</sup> / PERSON <input checked="" type="checkbox"/> DESIGN OF BUILDING	3.1.17								
<b>BASEMENT:</b> 6 UNITS/AMENITY (FOR RESIDENTS ONLY) OCCUPANCY <u>C</u> LOAD # <u>50</u> PERSONS 46m <sup>2</sup> / PERSON <b>1st FLOOR:</b> 7 UNITS OCCUPANCY <u>C</u> LOAD # <u>14</u> PERSONS AS PER DESIGN LOBBY/AMENITY (FOR RESIDENTS ONLY) OCCUPANCY <u>A</u> LOAD # <u>100</u> PERSONS AS PER DESIGN LOADING AND SERVICE AREAS OCCUPANCY <u>F3</u> LOAD # <u>2</u> PERSONS 46m <sup>2</sup> / PERSON <b>2nd FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM AS PER DESIGN <b>3rd FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>4th FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>5th FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>6th FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>7th FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>8th FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>9th FLOOR:</b> 1 UNITS OCCUPANCY <u>C</u> LOAD # <u>16</u> PERSONS 21SLEEPING ROOM <b>TOTAL:</b> LOAD # <u>220</u> PERSONS										
17.	BARRIER FREE DESIGN <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO (EXPLAIN)	3.8								
18.	HAZARDOUS SUBSTANCES <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	3.3.1.2 & 3.3.1.19								
19.	REQUIRED FIRE RESISTANCE RATING (F.R.R.)	3.2.2.42								
HORIZONTAL ASSEMBLIES F.R.R. (HOURS)		LISTED DESIGN No. OR DESCRIPTION (SG-2)								
OTHER FLOORS <u>2</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
ROOF <u>1</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
MEZZANINE STORAGE <u>N/A</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
F.R.R. OF SUPPORTING MEMBERS TO BE DETERMINED AT PERMIT SUBMISSION										
FLOORS <u>2</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
ROOF <u>1</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
MEZZANINE <u>N/A</u> HOURS TO BE DETERMINED AT PERMIT SUBMISSION										
20.	SPATIAL SEPERATION: CONSTRUCTION OF EXTERIOR WALLS TO BE DETERMINED AT PERMIT SUBMISSION	3.2.3								
WALL	AREA OF E.S.F. (m <sup>2</sup> )	L.D. (m)	L.H. or H.L.	PERMITTED MAX % OF OPENINGS	PROPOSED % OF OPENINGS	F.R.R. (HOURS)	LISTED DESIGN OR DESCRIPTION	COMB CONST.	COMB CONSTRUCTION NON-COMBUSTIBLE CLADDING	NON-COMBUSTIBLE CONSTRUCTION
NORTH	TBD sqm	TBD m	/	100 %	%	#	TBD	NO	NO	YES
SOUTH	TBD sqm	TBD m	/	100 %	%	#	TBD	NO	NO	YES
EAST	TBD sqm	TBD m	/	100 %	%	#	TBD	NO	NO	YES
WEST	TBD sqm	TBD m	/	100 %	%	#	TBD	NO	NO	YES
21.	PLUMBING FIXTURE REQUIREMENTS	WASHROOMS EXIST IN EVERY RESIDENTIAL UNIT. 5 ADDITIONAL WASHROOMS (1 UNIV + 1BF + 3 UNIS) HAVE BEEN ADDED FOR RESIDENT VISITOR USE ON GROUND FLOOR. ADDITIONAL DETAILS TO BE INCLUDED WITH PERMIT SUBMISSION								
22.	EXIT WIDTH CALCULATION	TO BE DETERMINED AT PERMIT SUBMISSION								

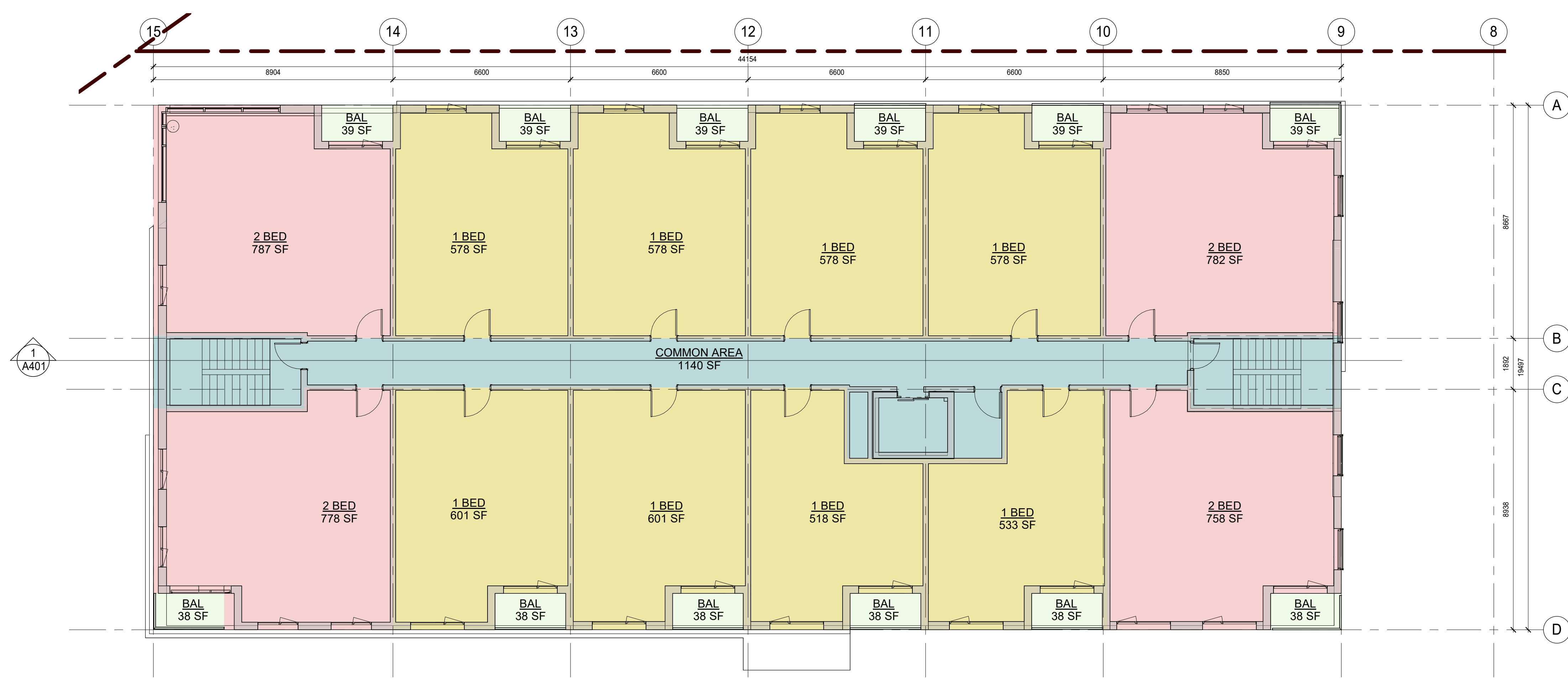
OBC MATRIX BLDG #3  
1 : 125

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CHECK AND VERIFY





01. GROUND FLOOR  
1:100



0.2 2ND FLOOR  
1:100

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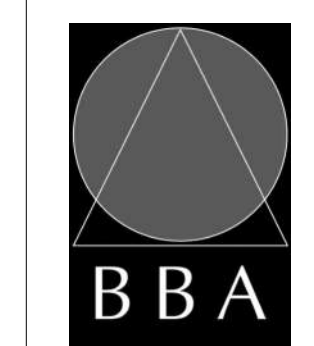
NO.	ISSUES	DATE	BY
1	PRE CONSULTATION	APRIL 14 2022	BBA
2	REVISED PRE CONSULTATION	JUNE 22 2022	BBA
3	INTERNAL REVIEW	NOV. 29 2022	BBA
4	COORDINATION	DEC. 02 2022	BBA
5	SITE PLAN APPLICATION	DEC. 09 2022	BBA

**2023-10-05  
COORDINATION  
DRAFT**

NO.	REVISIONS	DATE	BY

PROJECT:  
**Proposed Courtye  
Mixed-Use Building  
Development**  
  
1697 Durham Regional Hwy 2, Courtye,  
ON L1E 2R5  
RH Gay Holdings Co.

DRAWING:  
**BLDG-1 GROUND &  
SECOND FLOOR PLAN**

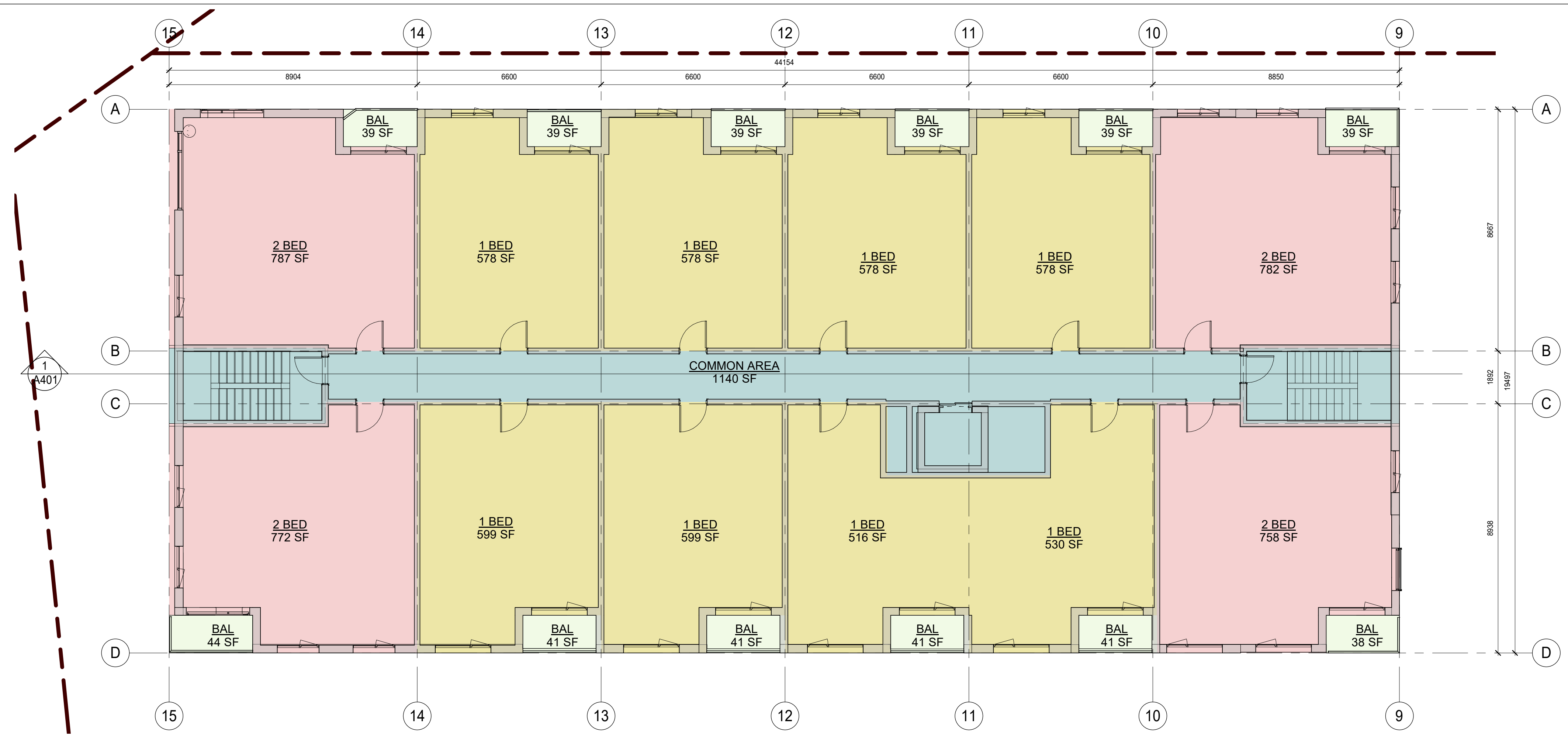


**BARRY BRYAN  
ASSOCIATES**  
  
Architects  
Engineers  
Project Managers

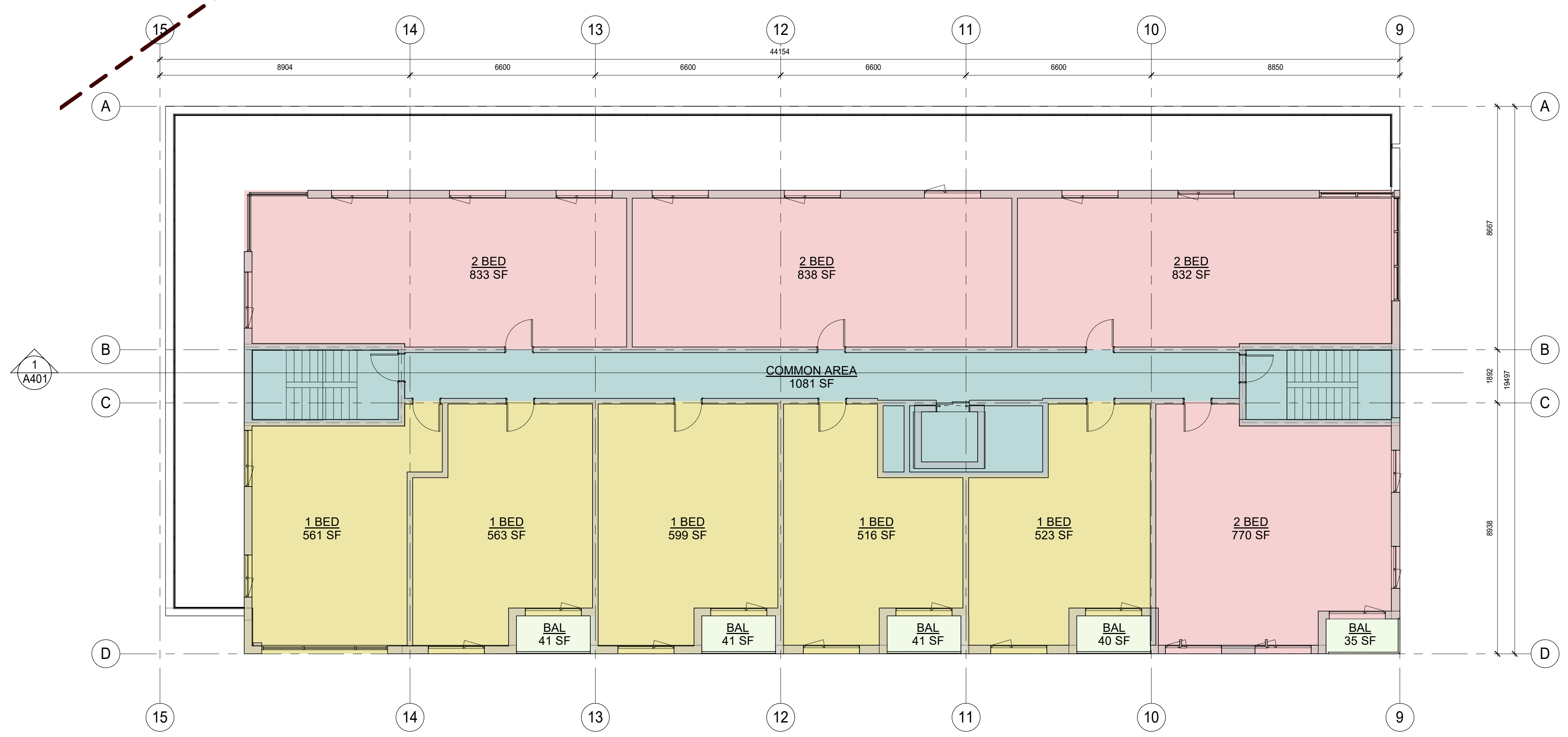
DESIGN BY:	CS
DRAWN BY:	CS
CHECKED BY:	CS
DATE:	06/22/2022
SCALE:	1 : 100
FILE:	

PROJECT NO:  
**21046**

DRAWING NO:  
**A201.a**



1 0.3 FLOORS 3-4  
A202.a 1:100



2 0.5 FLOORS 5-6  
A202.a 1:100



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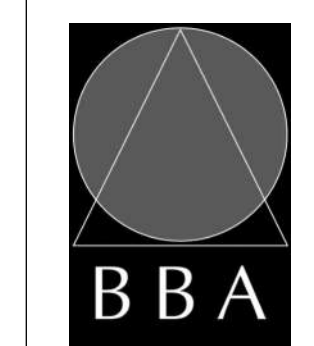
NO.	ISSUES	DATE	BY
1	PRE CONSULTATION	APRIL 14 2022	BBA
2	REVISED PRE CONSULTATION	JUNE 22 2022	BBA
3	INTERNAL REVIEW	NOV 29 2022	BBA
4	COORDINATION	DEC 02 2022	BBA
5	SITE PLAN APPLICATION	DEC 09 2022	BBA

2023-10-05  
COORDINATION  
DRAFT

NO.	REVISIONS	DATE	BY

PROJECT:  
**Proposed Courtye  
Mixed-Use Building  
Development**  
  
1697 Durham Regional Hwy 2, Courtye,  
ON L1E 2R5  
RH Gay Holdings Co.

DRAWING:  
**BLDG-1 TYPICAL FLOOR  
PLAN (3-4)&(5-6)**



BARRY BRYAN  
ASSOCIATES

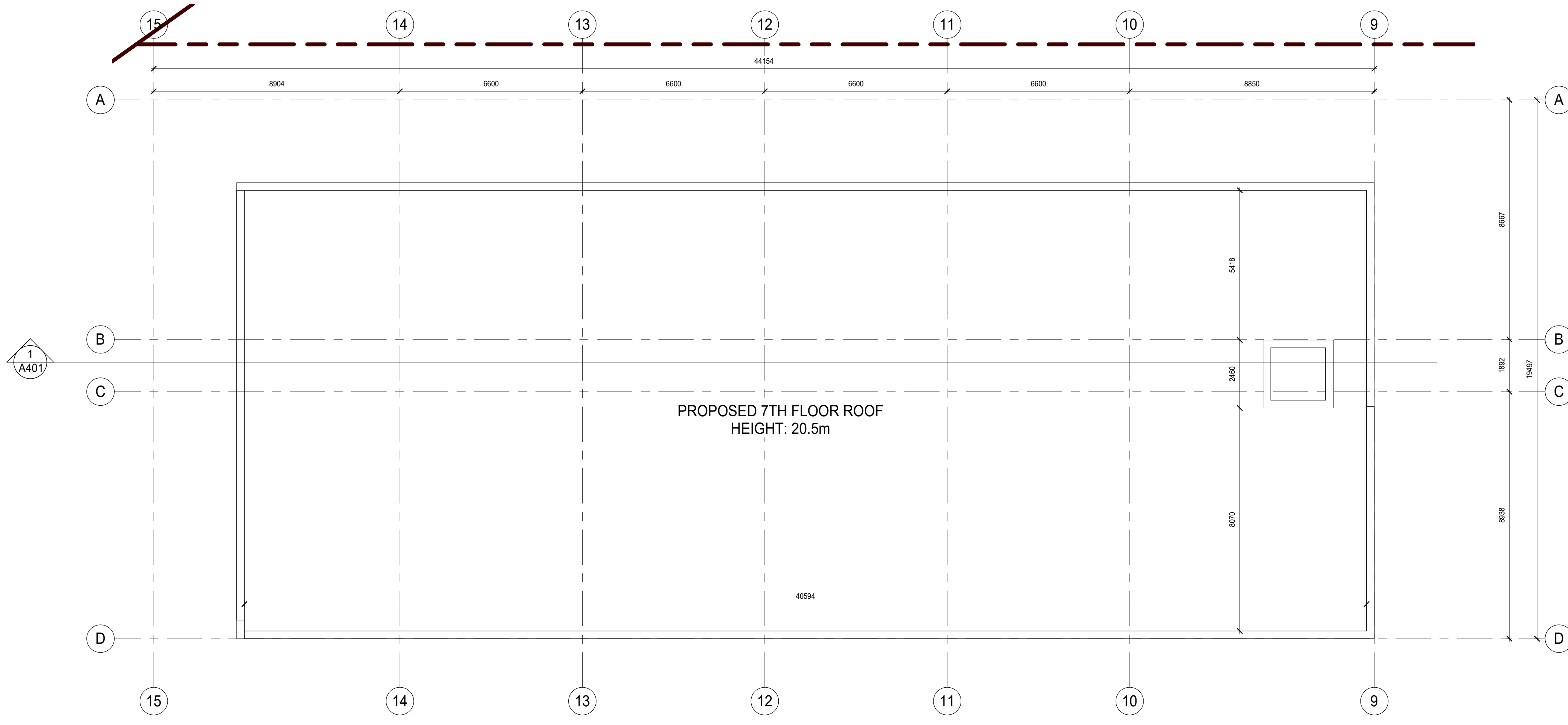
Architects  
Engineers  
Project Managers

201-250 Water Street  
Whitby Ontario L1N 0G8  
Tel: (905) 886-5252  
Fax: (905) 886-5258  
e-mail: bba@bba-arch.com

DESIGN BY:	CS	DATE:	06/22/2022
DRAWN BY:	CS	SCALE:	1 : 100
CHECKED BY:	NS	FILE:	

PROJECT NO:  
**21046**

DRAWING NO:  
**A202.a**



1  
A203.a  
7TH ROOF  
1:100

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NO.	ISSUES	DATE	BY

2023-10-05  
COORDINATION  
DRAFT


NO.	REVISIONS	DATE	BY

PROJECT:  
**Proposed Courtice  
Mixed-Use Building  
Development**  
  
1697 Durham Regional Hwy 2, Courtice,  
ON L1E 2R5  
RH Gay Holdings Co.

DRAWING:  
**BLDG-1 ROOF PLAN**



**BARRY BRYAN  
ASSOCIATES**  
  
*Architects  
Engineers  
Project Managers*

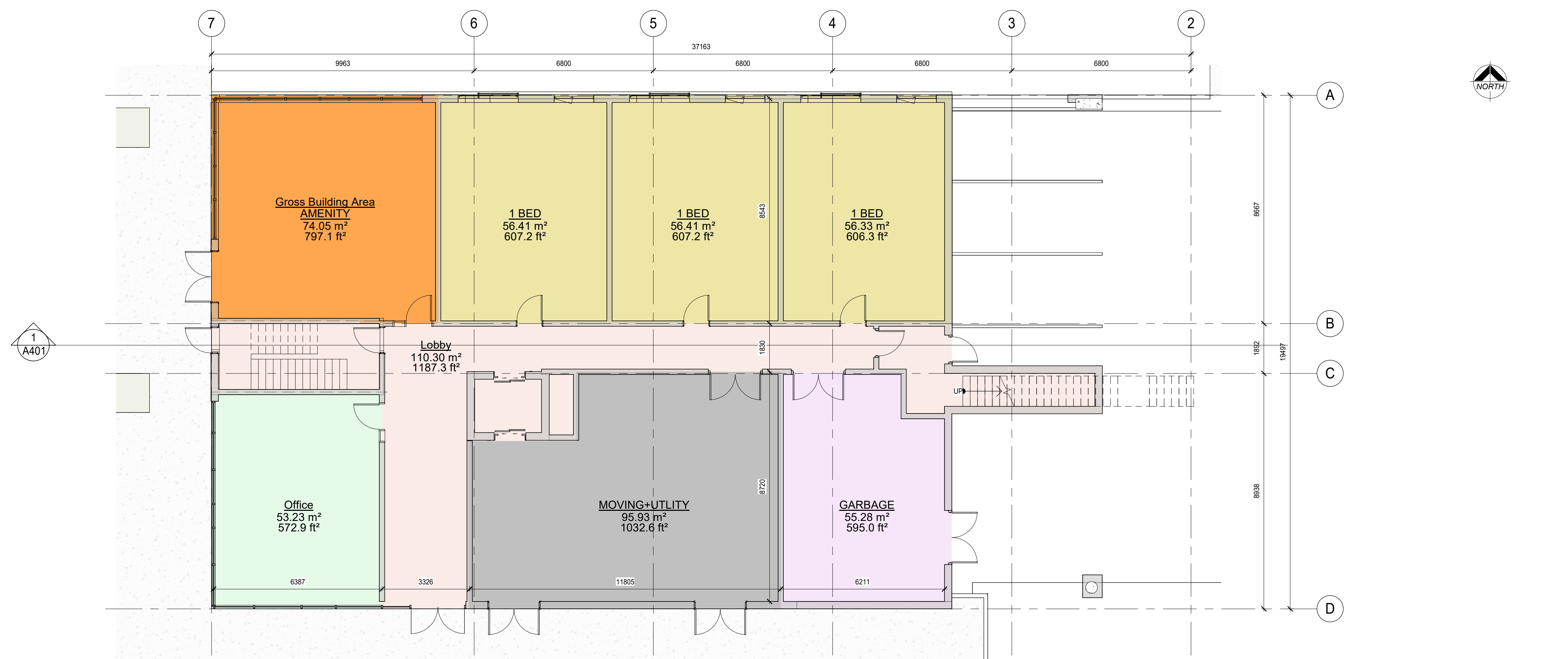
201-250 Water Street  
Whitby Ontario L1N 9G5  
Tel: (905) 666-5252  
Fax: (905) 666-5258  
e-mail: bba@bba-arch.com

DESIGN BY:	
<i>Designer</i>	
DRAWN BY:	
<i>Author</i>	
CHECKED BY:	
<i>Checker</i>	

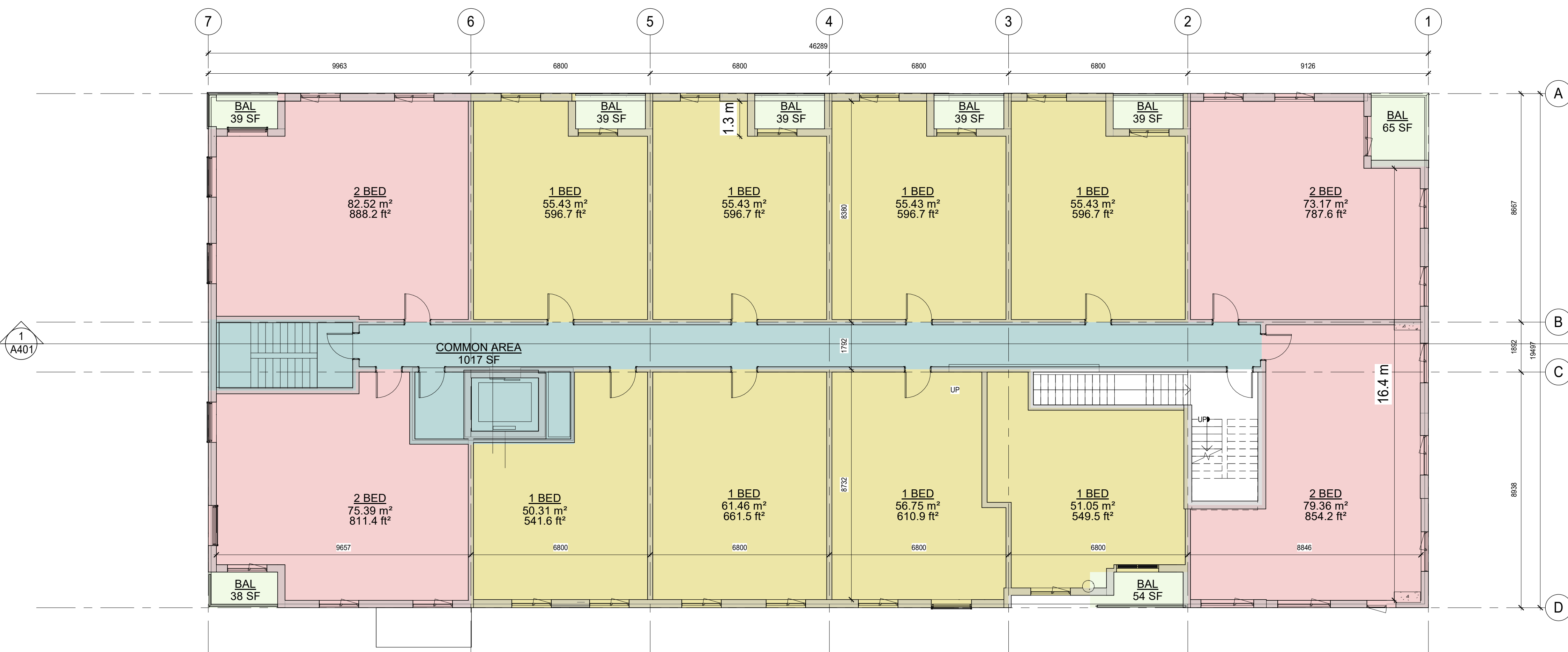
DATE:  
10/04/23  
SCALE:  
1 : 100  
FILE:

PROJECT NO:  
**21046**  
DRAWING NO:  
**A203.a**





0.1 GROUND FLOOR BLDG. 2  
1:100



0.2 2ND FLOOR BLDG. 2  
1:100

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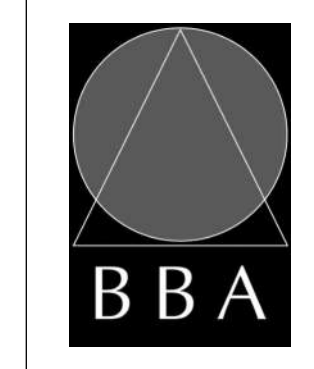
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2	REVISED PRE CONSULTATION	JUNE 22 2022	BBA
3	INTERNAL REVIEW	NOV 29 2022	BBA
4	COORDINATION	DEC 02 2022	BBA
5	SITE PLAN APPLICATION	DEC 09 2022	BBA

**2023-10-05  
COORDINATION  
DRAFT**

NO.	REVISIONS	DATE	BY

**PROJECT:**  
**Proposed Courtye Mixed-Use Building Development**  
1697 Durham Regional Hwy 2, Courtye, ON L1E 2R5  
RH Gay Holdings Co.

**DRAWING:**  
**BLDG-2 GROUND & SECOND FLOOR PLAN**



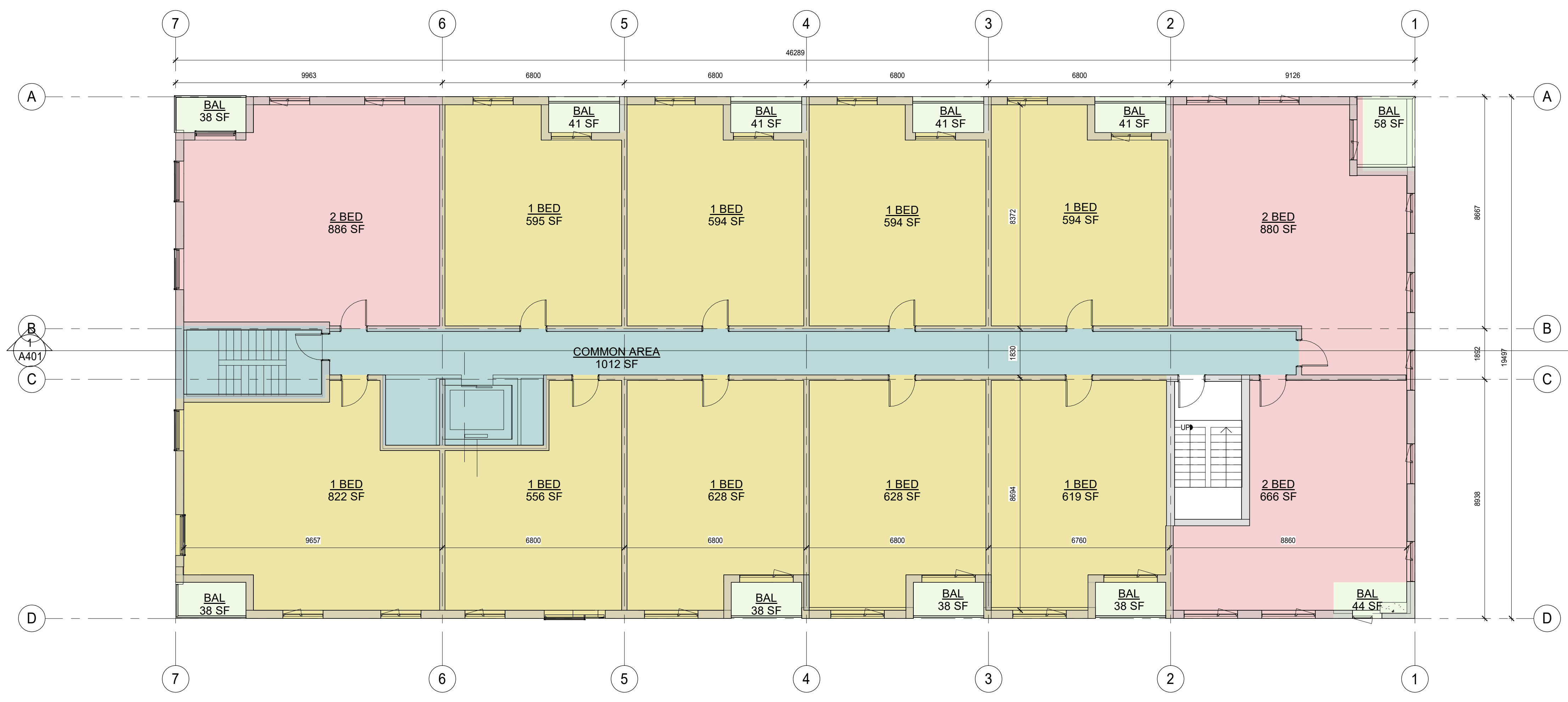
**BARRY BRYAN ASSOCIATES**

Architects  
Engineers  
Project Managers

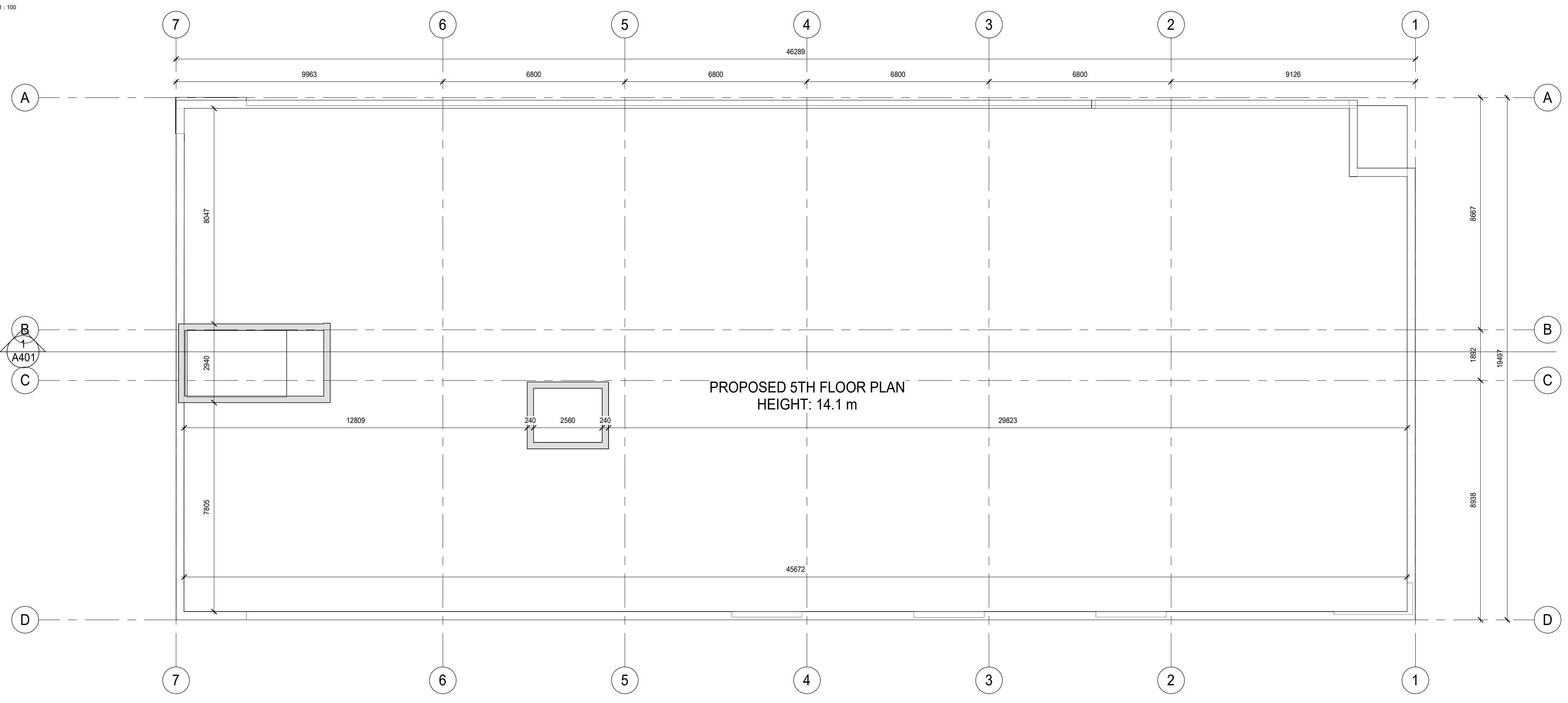
201-250 Water Street  
Whitby Ontario L1N 0G8  
Tel: (905) 666-5252  
Fax: (905) 666-5258  
e-mail: bba@bba-arch.com

DESIGN BY:	CS	DATE:	06/22/2022
DRAWN BY:	CS	SCALE:	1 : 100
CHECKED BY:	CS	FILE:	

PROJECT NO: **21046**  
DRAWING NO: **A204.b**



1 0.3 FLOORS 3-4 BLDG. 2  
A205.b  
1:100



2 0.5 ROOF BLDG. 2  
A205.b  
1:100



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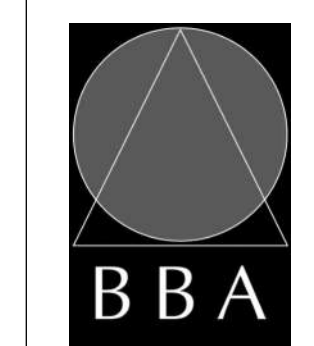
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5	SITE PLAN APPLICATION	DEC 09 2022	BBA

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NO.	REVISIONS	DATE	BY

PROJECT:  
**Proposed Courtye  
Mixed-Use Building  
Development**  
  
1697 Durham Regional Hwy 2, Courtye,  
ON L1E 2R5  
RH Gay Holdings Co.

DRAWING:  
**BLDG-2 TYPICAL FLOOR  
(3-4)**



**BARRY BRYAN  
ASSOCIATES**  
  
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Engineers  
Project Managers

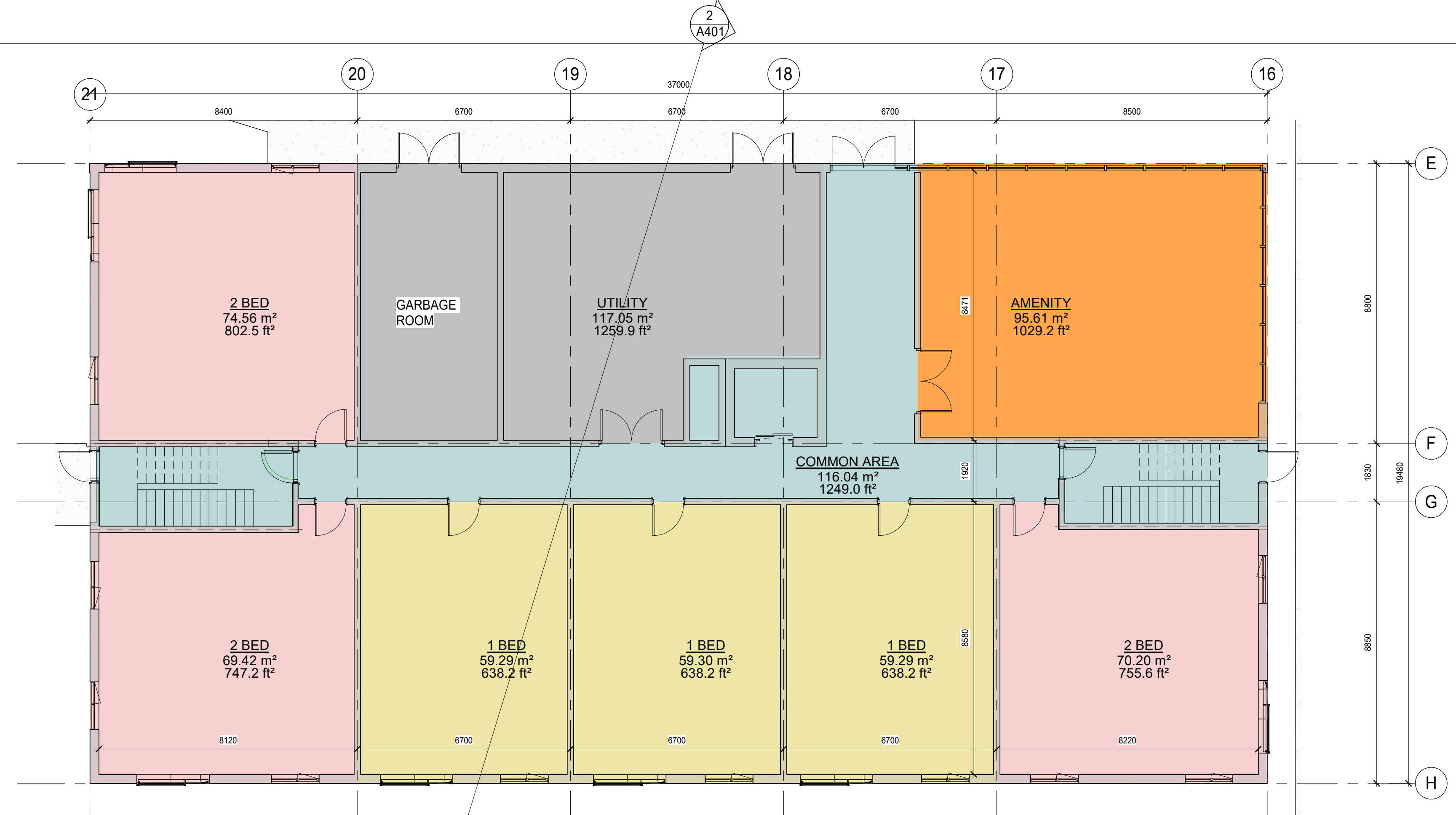
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Whitby Ontario L1N 0G8  
Tel: (905) 666-5252  
Fax: (905) 666-5258  
e-mail: bba@bba-arch.com

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DRAWN BY: CS	SCALE: 1:100
CHECKED BY: CS	FILE:

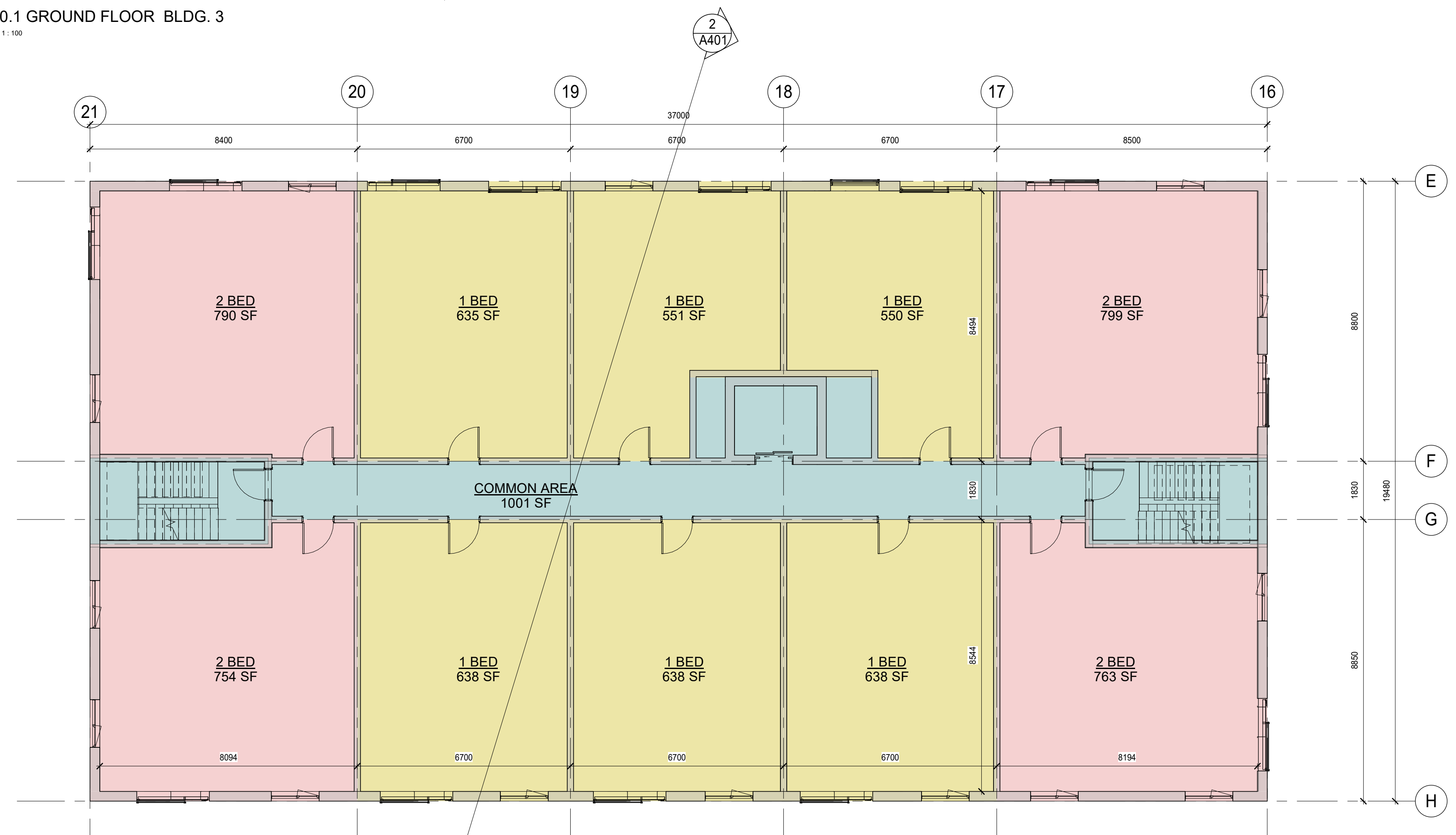
PROJECT NO:  
**21046**

DRAWING NO:  
**A205.b**





1 0.1 GROUND FLOOR BLDG. 3  
A206.c 1:100



2 0.3 FLOORS 2-4 BLDG. 3  
A206.c 1:100

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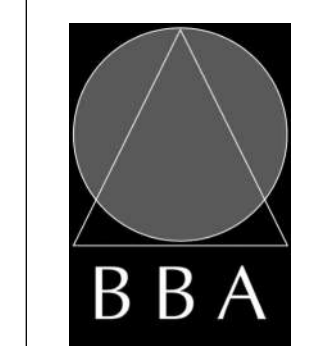
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2	REVISED PRE CONSULTATION	JUNE 22 2022	BBA
3	INTERNAL REVIEW	NOV. 29 2022	BBA
4	COORDINATION	DEC. 02 2022	BBA
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NO.	REVISIONS	DATE	BY

PROJECT:  
**Proposed Courtye  
Mixed-Use Building  
Development**  
  
1697 Durham Regional Hwy 2, Courtye,  
ON L1E 2R5  
RH Gay Holdings Co.

DRAWING:  
**BLDG-3 GROUND &  
TYPICAL FLOOR PLAN  
(2-4)**



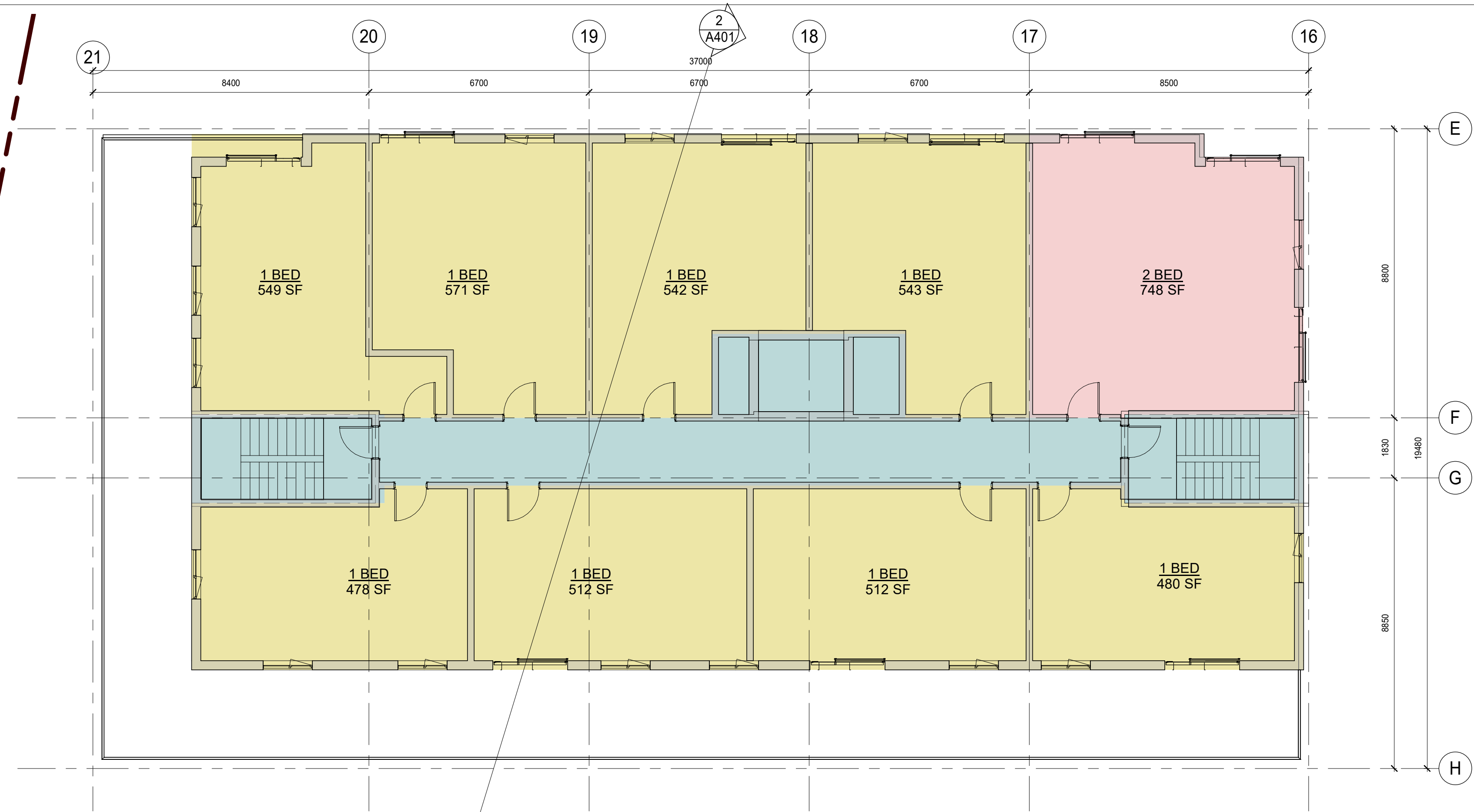
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Engineers  
Project Managers

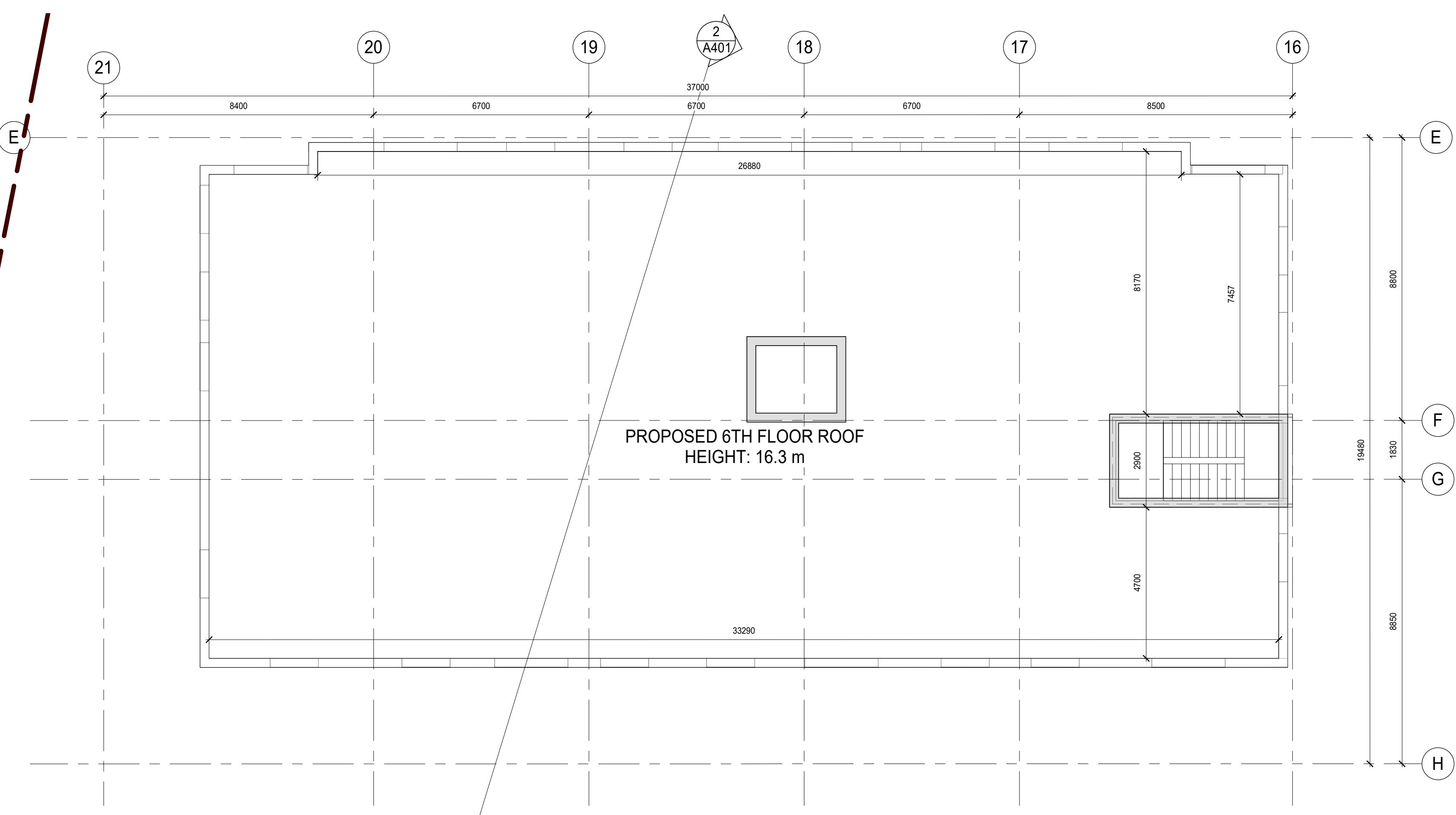
201-250 Water Street  
Whitby Ontario L1N 0G8  
Tel: (905) 666-5252  
Fax: (905) 666-5258  
e-mail: bba@bba-arch.com

DESIGN BY:	CS	DATE:	06/22/2022
DRAWN BY:	CS	SCALE:	1 : 100
CHECKED BY:	NS	FILE:	

PROJECT NO:	21046	DRAWING NO:	A206.c
-------------	-------	-------------	--------



**1**  
A207.c  
0.5 FLOORS 5 BLDG. 3  
1:100



**2**  
A207.c  
6TH FLOOR (BLDG.3)  
1:100

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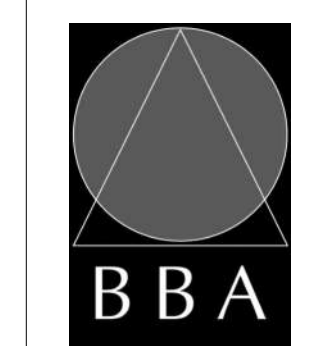
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**2023-10-05**  
**COORDINATION**  
**DRAFT**

NO.	REVISIONS	DATE	BY

PROJECT:  
**Proposed Courtye  
Mixed-Use Building  
Development**  
  
1697 Durham Regional Hwy 2, Courtye,  
ON L1E 2R5  
RH Gay Holdings Co.

DRAWING:  
**BLDG-3 5TH FLOOR &  
ROOF PLAN**



**BARRY BRYAN  
ASSOCIATES**

Architects  
Engineers  
Project Managers

DESIGN BY: <i>Designer</i>	
DRAWN BY:	
AUTHOR	
CHECKED BY: <i>Checker</i>	

DATE:  
**09/18/23**  
SCALE:  
**1 : 100**  
FILE:

PROJECT NO:  
**21046**  
DRAWING NO:  
**A207.c**









4 BLDG #1 SOUTH  
A302.g 1:125



3 BLDG #1 WEST  
A302.g 1:125



1 BLDG #1 NORTH  
A302.g 1:125



2 BLDG #1 EAST  
A302.g 1:125

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3	INTERNAL REVIEW	NOV 29 2022	BBA
4	SITE PLAN APPLICATION	DEC 09 2022	BBA

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NO.	REVISIONS	DATE	BY

PROJECT:  
**Proposed Courtye  
Mixed-Use Building  
Development**  
1697 Durham Regional Hwy 2, Courtye,  
ON L1E 2R5  
RH Gay Holdings Co.

DRAWING:  
**BLDG-1 ELEVATIONS**



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FILE:

PROJECT NO:  
**21046**  
DRAWING NO:  
**A302.a**



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3 BLDG #2 SOUTH  
A303.b 1:125

4 BLDG #2 WEST  
A303.b 1:125

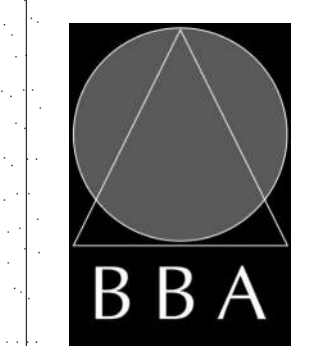
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3	INTERNAL REVIEW	NOV 29 2022	BBA
4	SITE PLAN APPLICATION	DEC 09 2022	BBA

NO.	REVISIONS	DATE	BY

PROJECT:  
**Proposed Courtye  
Mixed-Use Building  
Development**  
  
1697 Durham Regional Hwy 2, Courtye,  
ON L1E 2R5  
RH Gay Holdings Co.

DRAWING:  
**BLDG-2 ELEVATIONS**



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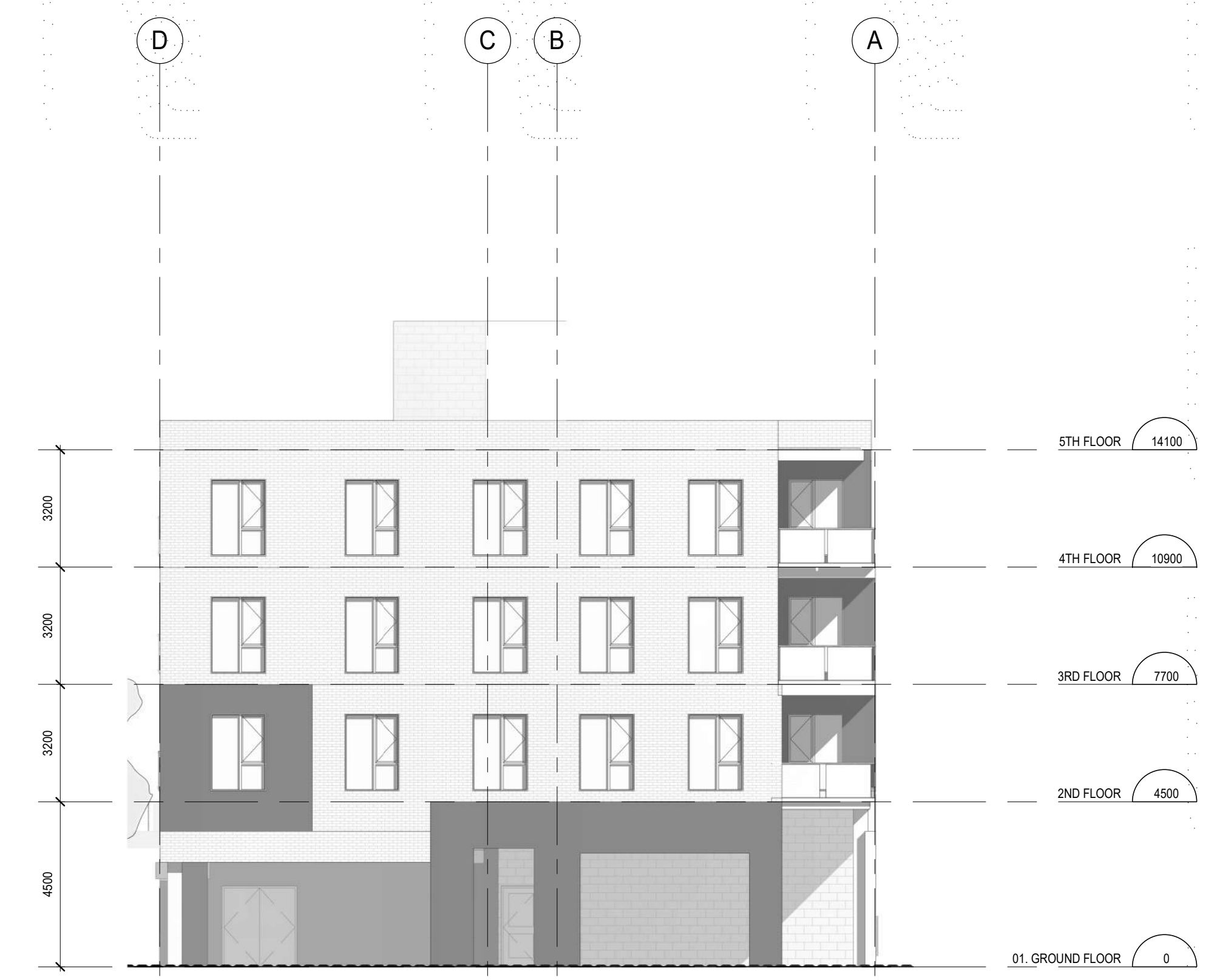
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SCALE:	1 : 125
FILE:	

PROJECT NO:	DRAWING NO:
<b>21046</b>	<b>A303.b</b>



1 BLDG #2 NORTH  
A303.b 1:125



2 BLDG #2 EAST  
A303.b 1:125



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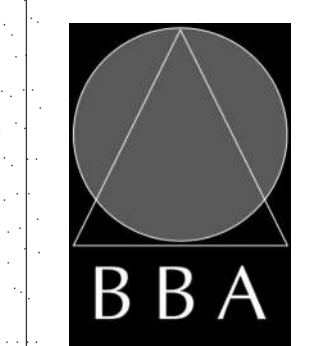
NO.	ISSUES	DATE	BY
1	PRE CONSULTATION	APRIL 14 2022	BBA
2	REVISED PRE CONSULTATION	JUNE 22 2022	BBA
3	INTERNAL REVIEW	NOV 29 2022	BBA
4	SITE PLAN APPLICATION	DEC 09 2022	BBA

**2023-10-05  
COORDINATION  
DRAFT**

NO.	REVISIONS	DATE	BY

PROJECT:  
**Proposed Courtyce  
Mixed-Use Building  
Development**  
1697 Durham Regional Hwy 2, Courtyce,  
ON L1E 2R5  
RH Gay Holdings Co.

DRAWING:  
**BLDG-3 ELEVATIONS**



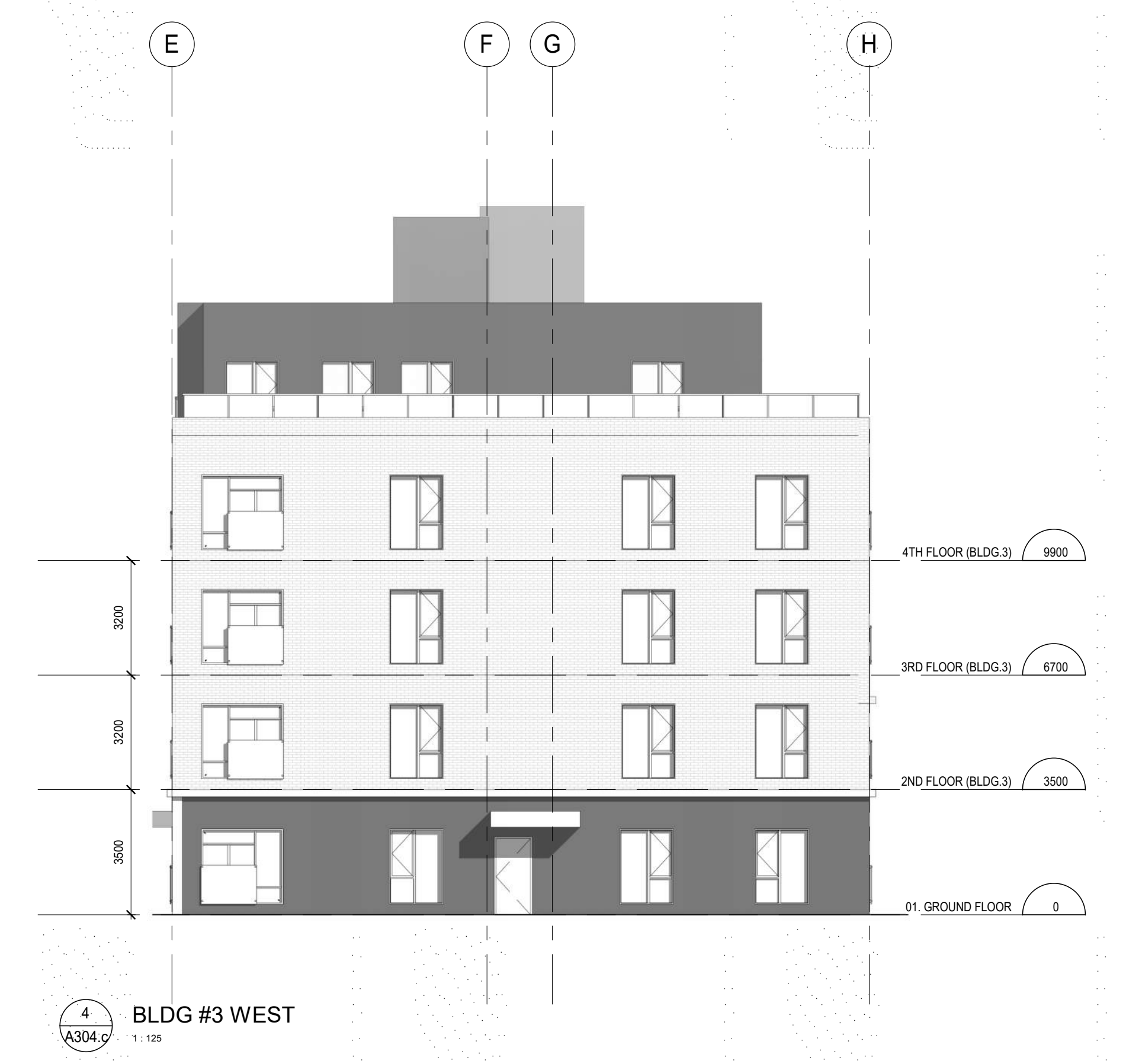
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Engineers  
Project Managers

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DATE: 06/22/2022  
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FILE:

PROJECT NO:  
**21046**

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DATE: 06/22/2022  
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FILE:  
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**A304.c**













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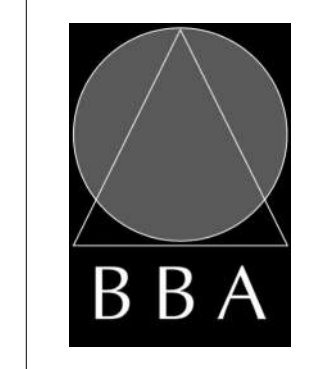
NO.	ISSUES	DATE	BY
1	PRE CONSULTATION	APRIL 14 2022	BBA
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 DRAFT**


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PROJECT:  
**Proposed Courtyards  
 Mixed-Use Building  
 Development**  
 1697 Durham Regional Hwy 2, Courtyards,  
 ON L1E 2R5  
 RH Gay Holdings Co.

DRAWING:  
**3D VIEW AXO  
 NORTH-EAST**



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**A601**









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3	INTERNAL REVIEW	NOV 29 2022	BBA
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PROJECT:  
**Proposed Courtyce  
Mixed-Use Building  
Development**  
  
1697 Durham Regional Hwy 2, Courtyce,  
ON L1E 2R5  
RH Gay Holdings Co.

DRAWING:  
**3D VIEW**



**BARRY BRYAN  
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FILE:	

PROJECT NO:  
**21046**

DRAWING NO:  
**A603**





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**Appendix B**  
**Natural Heritage and Source Protection Features**

---



### Legend

-  Assessment Parcel
-  Ecoregion
- ANSI
-  Earth Science Provincially Significant/sciences de la terre d'importance provinciale
-  Earth Science Regionally Significant/sciences de la terre d'importance régionale
-  Life Science Provincially Significant/sciences de la vie d'importance provinciale
-  Life Science Regionally Significant/sciences de la vie d'importance régionale
- Evaluated Wetland
-  Provincially Significant/considérée d'importance provinciale
-  Non-Provincially Significant/non considérée d'importance provinciale
-  Unevaluated Wetland
-  Woodland

Notes:



Absence of a feature in the map does not mean they do not exist in this area.

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# SPIA Map



## Legend

- Watercourse Direction
- Source Protection Areas
- Quaternary
- Highly Vulnerable Aquifers
- Significant Groundwater Recharge Area
  - 0
  - 2
  - 4
  - 6
- Wellhead Protection Area
  - A
  - B
  - C
  - C1
  - D
  - F
- Intake Protection Zone 1
- Intake Protection Zone 2
- Assessment Parcel with Address

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Hydrogeological Assessment, 1697 Durham Regional Highway 2, Courtice  
Richard H. Gay Company Limited  
Cambium Reference: 15382-002  
January 26, 2024

---

---

## **Appendix C**

# **Borehole Logs and Grain Size Analyses**

---





**Peterborough  
Barrie  
Oshawa  
Kingston**  
T: 866-217-7900  
www.cambium-inc.com

**Log of Borehole:** BH101-22  
Page 1 of 5

**Client:** Gay Company Limited  
**Contractor:** Drilltech Drilling Limited  
**Location:** 1697 Durham Reg Hwy 2, Courtice

**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Method:** Track Mounted Solid Stem Auger  
**UTM:** 17T N: 4864349 E: 677953

**Project No.:** 15382-001  
**Date Completed:** November 18 & 23, 2022  
**Elevation:** 134.01 mASL

SUBSURFACE PROFILE			SAMPLE						Well Installation	Log Notes
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture		
								25 50 75	20 40 60 80	
134.0	0	TOPSOIL: (~175 mm thick)		1A	SS			22.5%		
133.83										
133.5	0.5	FILL: (SM) SILTY SAND, trace gravel; brown, trace rubble; non-cohesive, moist, compact		1B	SS	50	19	9.7%	19	
133.32										
133.0	1	(CL-ML) SILTY CLAY - CLAYEY SILT: trace sand; brown, mottled; cohesive; w<PL, very stiff to hard		2	SS	50	19	15.2%	19	
132.5	1.5									
132.0	2			3	SS	50	30	15%	30	
131.88										
131.5	2.5	(SM) SILTY SAND: light brown; non-cohesive, wet, compact		4	SS	50	28	17.7%	28	
131.11										
131.0	3	(CL) SILTY CLAY: trace sand; grey; cohesive, w>PL, firm to very soft		5	SS	75	8	19.5%	8	
130.01	4									

50 mm Diameter Monitoring Well with a 1.5 m screen.

Groundwater level measured in monitoring well at a depth of about 2.9mbgs (Elevation 131.1masl).

GRAINSIZE DISTRIBUTION	SAMPLE	GRAVEL	SAND	SILT	CLAY
	SS10	5	41	42	12
	SS14	15	37	39	9

1m = 45 units  
Logged By: EC

Input By: CM





**Peterborough  
Barrie  
Oshawa  
Kingston**  
T: 866-217-7900  
www.cambium-inc.com

**Log of Borehole:** BH101-22  
Page 2 of 5

**Client:** Gay Company Limited      **Project Name:** GEO - 1697 Durham Reg Hwy 2      **Project No.:** 15382-001  
**Contractor:** Drilltech Drilling Limited      **Method:** Track Mounted Solid Stem Auger      **Date Completed:** November 18 & 23, 2022  
**Location:** 1697 Durham Reg Hwy 2, Courtice      **UTM:** 17T N: 4864349 E: 677953      **Elevation:** 134.01 mASL

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes					
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture								
								25	50	75	20	40	60	80		
130	4		(CL) SILTY CLAY: trace sand; grey; cohesive, w>PL, firm to very soft													Mud rotary drilling with 90 mm tri-cone from a depth of about 4.5mbgs  Atterberg's Limits LL:37.5%, PL: 18.7%, PI 18.8%
129.5	4.5			6	SS	100	2	38%	2							
129	5															
128.5	5.5															
128	6		(SM) SILTY SAND: grey; non-cohesive, wet, loose													
127.5	6.5			7	SS	20	7	14.8%	7							
127	7															
126.5	7.5		(ML) SILT: and (SP) SAND trace to some gravel; grey; non-cohesive, wet, loose to compact													
126	8			8	SS	80	6	26.4%	6							

GRAINSIZE DISTRIBUTION

SAMPLE	GRAVEL	SAND	SILT	CLAY
SS10	5	41	42	12
SS14	15	37	39	9

1m = 45 units  
Logged By: EC

Input By: CM



**Peterborough  
Barrie  
Oshawa  
Kingston**  
T: 866-217-7900  
www.cambium-inc.com

**Log of Borehole:** BH101-22  
Page 3 of 5

**Client:** Gay Company Limited      **Project Name:** GEO - 1697 Durham Reg Hwy 2      **Project No.:** 15382-001  
**Contractor:** Drilltech Drilling Limited      **Method:** Track Mounted Solid Stem Auger      **Date Completed:** November 18 & 23, 2022  
**Location:** 1697 Durham Reg Hwy 2, Courtice      **UTM:** 17T N: 4864349 E: 677953      **Elevation:** 134.01 mASL

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes				
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture							
								25	50	75	20	40	60	80	
126	8		(ML) SILT: and SAND trace to some gravel; grey; non-cohesive, wet, loose to compact	8	SS	80	6								
125.5	8.5														
125	9														
124.5	9.5				9	SS	50	16	10.1%						
124	10														
123.5	10.5														
123	11			10	SS	45	13	16.7%							
122.5	11.5														
122	12														

GRAINSIZE DISTRIBUTION	SAMPLE	GRAVEL	SAND	SILT	CLAY
	SS10	5	41	42	12
	SS14	15	37	39	9

1m = 45 units  
**Logged By:** EC      **Input By:** CM



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**Log of Borehole:** BH101-22  
Page 4 of 5

**Client:** Gay Company Limited      **Project Name:** GEO - 1697 Durham Reg Hwy 2      **Project No.:** 15382-001  
**Contractor:** Drilltech Drilling Limited      **Method:** Track Mounted Solid Stem Auger      **Date Completed:** November 18 & 23, 2022  
**Location:** 1697 Durham Reg Hwy 2, Courtice      **UTM:** 17T N: 4864349 E: 677953      **Elevation:** 134.01 mASL

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture						
								25	50	75	20	40	60	80
122	12		(ML) SILT: and (SM) SAND trace to some gravel; grey; non-cohesive, wet, loose to compact											
121.5	12.5			11	SS	50	6	21.3%				6		
121	13													
120.5	13.5													
120	14		(ML) sandy SILT: to (SM) SILTY SAND, trace gravel; grey (TILL); non-cohesive, wet, compact											
			120.14											
120	14			12	SS	100	24	10%				24		
119.5	14.5													
119	15													
118.5	15.5			13	SS	85	24	10.4%				24		
118	16		118.01											

GRAINSIZE DISTRIBUTION	SAMPLE	GRAVEL	SAND	SILT	CLAY
	SS10	5	41	42	12
	SS14	15	37	39	9

1m = 45 units  
**Logged By:** EC

**Input By:** CM



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**Log of Borehole:** BH101-22  
Page 5 of 5

**Client:** Gay Company Limited      **Project Name:** GEO - 1697 Durham Reg Hwy 2      **Project No.:** 15382-001  
**Contractor:** Drilltech Drilling Limited      **Method:** Track Mounted Solid Stem Auger      **Date Completed:** November 18 & 23, 2022  
**Location:** 1697 Durham Reg Hwy 2, Courtice      **UTM:** 17T N: 4864349 E: 677953      **Elevation:** 134.01 mASL

SUBSURFACE PROFILE				SAMPLE							Well Installation	Log Notes				
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture					SPT (N)			
								25	50	75	20	40	60	80		
118	16		(ML) sandy SILT: to (SM) SILTY SAND, trace gravel; grey (TILL); non-cohesive, wet, compact													
117.5	16.5															
117	17			14	SS	55	19		10.9%						19	
			116.79													
			Borehole Terminated @ 17.2m Due to target depth achieved.													
116.5	17.5															
116	18															
115.5	18.5															
115	19															
114.5	19.5															
114	20															

GRAINSIZE DISTRIBUTION	SAMPLE	GRAVEL	SAND	SILT	CLAY
	SS10	5	41	42	12
	SS14	15	37	39	9

1m = 45 units

Logged By: EC

Input By: CM





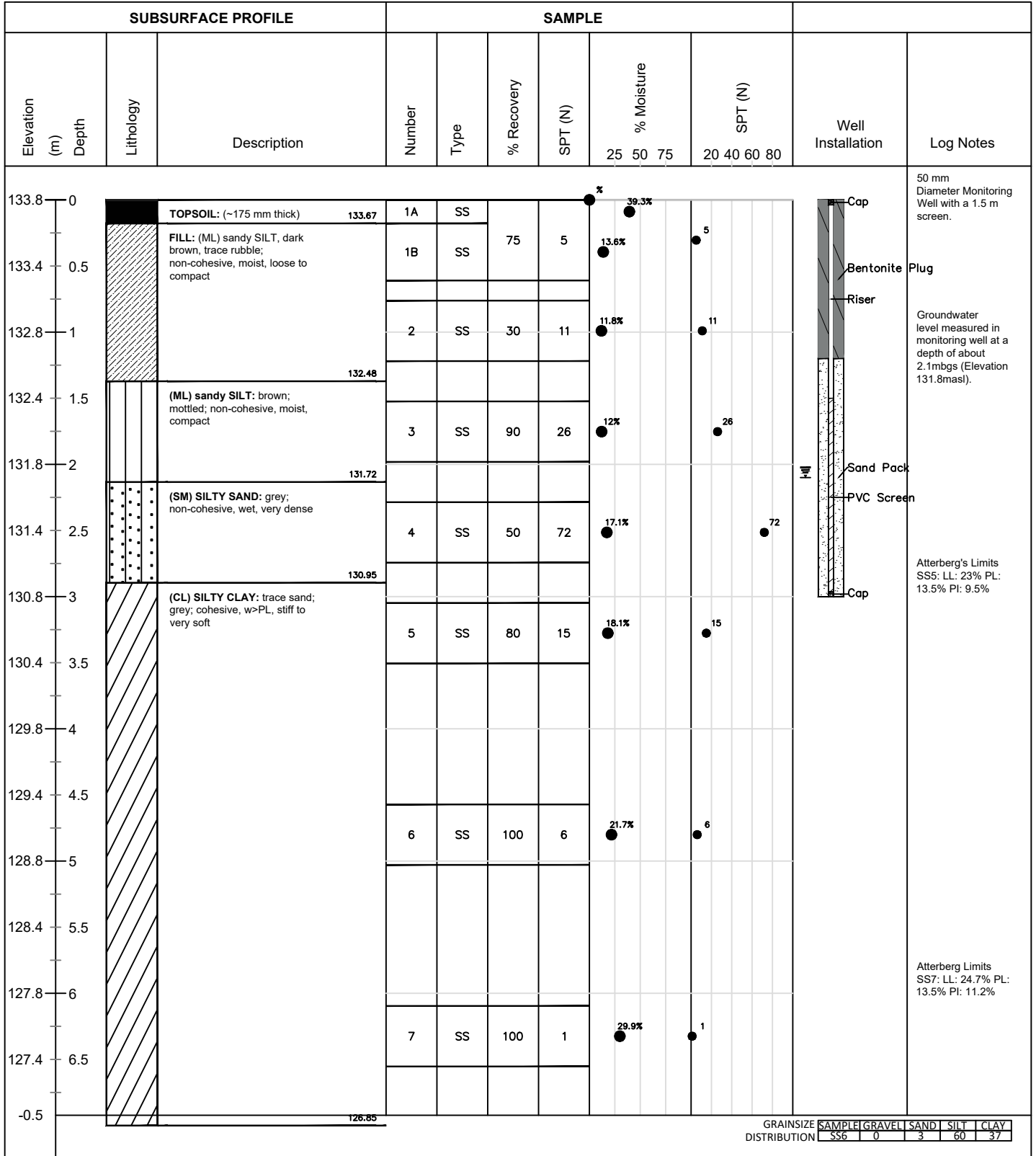
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**Log of Borehole:** BH103-22  
Page 1 of 3

**Client:** Gay Company Limited  
**Contractor:** Drilltech Drilling Limited  
**Location:**

**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Method:** Track Mounted Solid Stem Auger  
**UTM:** 17T N: 4864356 E: 678002

**Project No.:** 15382-001  
**Date Completed:** November 17, 2022  
**Elevation:** 133.85 mASL



1m = 26 units  
Logged By: EC

Input By: CM



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**Log of Borehole:** BH103-22  
Page 2 of 3

**Client:** Gay Company Limited  
**Contractor:** Drilltech Drilling Limited  
**Location:**

**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Method:** Track Mounted Solid Stem Auger  
**UTM:** 17T N: 4864356 E: 678002

**Project No.:** 15382-001  
**Date Completed:** November 17, 2022  
**Elevation:** 133.85 mASL

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture						
								25	50	75	20	40	60	80
126.8	7	(CL) SILTY CLAY: trace sand; grey; cohesive, w>PL, stiff to very soft												
126.4	7.5													
125.8	8			8	SS	100	1	11.2%				1		
125.4	8.5		125.24											
124.8	9	(ML) SILT: and (SP) SAND; trace gravel; grey; non-cohesive, wet, very loose												
124.4	9.5				9	SS	100	1	10.2%				1	
123.8	10													
123.4	10.5													
122.8	11													
122.4	11.5													
121.8	12													
121.4	12.5													
120.8	13													
120.4	13.5		120.13											
6.5		(ML) sandy SILT: trace gravel; grey (FILL); non-cohesive, moist, compact to dense	119.85	10	SS	55	30					30		

GRAINSIZE DISTRIBUTION	SAMPLE	GRAVEL	SAND	SILT	CLAY
	SS6	0	3	60	37

1m = 26 units  
Logged By: EC

Input By: CM



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**Log of Borehole:** BH103-22  
Page 3 of 3

**Client:** Gay Company Limited  
**Contractor:** Drilltech Drilling Limited  
**Location:**

**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Method:** Track Mounted Solid Stem Auger  
**UTM:** 17T N: 4864356 E: 678002

**Project No.:** 15382-001  
**Date Completed:** November 17, 2022  
**Elevation:** 133.85 mASL

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture						
								25	50	75	20	40	60	80
119.8	14		(ML) sandy SILT: trace gravel; grey (TILL); non-cohesive, moist, compact to dense	10	SS	55	30							
119.4	14.5		Borehole Terminated @ 14.2m Due to exploration depth achieved											
118.8	15													
118.4	15.5													
117.8	16													
117.4	16.5													
116.8	17													
116.4	17.5													
115.8	18													
115.4	18.5													
114.8	19													
114.4	19.5													
113.8	20													
113.4	20.5													
13.5														

GRAINSIZE DISTRIBUTION	SAMPLE	GRAVEL	SAND	SILT	CLAY
	SS6	0	3	60	37

1m = 26 units  
**Logged By:** EC

**Input By:** CM





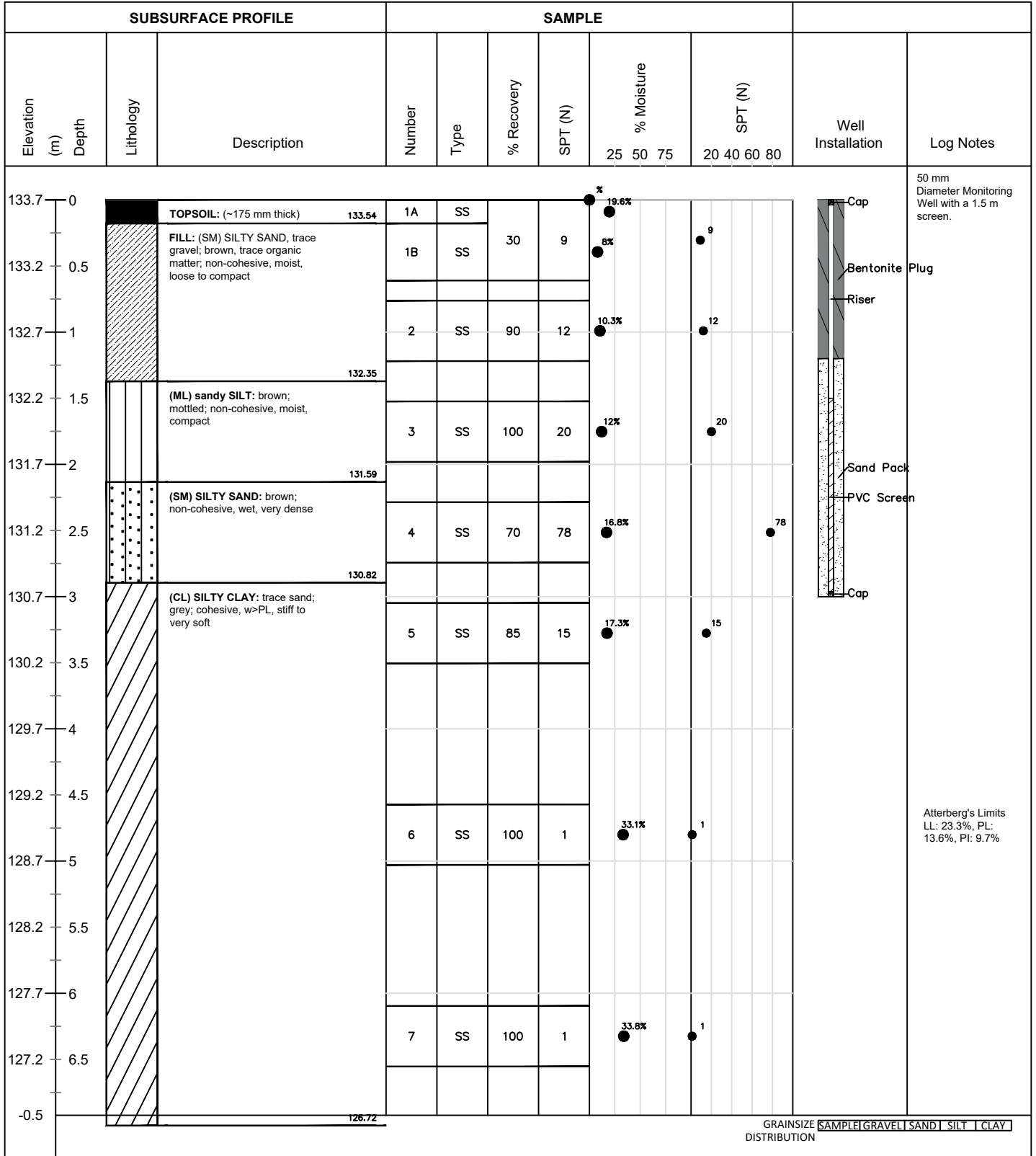
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**Log of Borehole:** BH104-22  
Page 1 of 3

**Client:** Gay Company Limited  
**Contractor:** Drilltech Drilling Limited  
**Location:**

**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Method:** Track Mounted Solid Stem Auger  
**UTM:** 17T N: 4864339 E: 678045

**Project No.:** 15382-001  
**Date Completed:** November 18, 21, 22, 2022  
**Elevation:** 133.72 mASL



1m = 26 units  
Logged By: EC

Input By: CM



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**Log of Borehole:** BH104-22  
Page 2 of 3

**Client:** Gay Company Limited  
**Contractor:** Drilltech Drilling Limited  
**Location:**

**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Method:** Track Mounted Solid Stem Auger  
**UTM:** 17T N: 4864339 E: 678045

**Project No.:** 15382-001  
**Date Completed:** November 18, 21, 22, 2022  
**Elevation:** 133.72 mASL

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture						
								25	50	75	20	40	60	80
126.7	7	[Hatched pattern]	(CL) SILTY CLAY: trace sand; grey; cohesive, w>PL, stiff to very soft											
126.63														
126.2	7.5	[Hatched pattern]	(CL) sandy SILTY CLAY: trace gravel; grey; cohesive, w>PL, firm	8	SS	100	6	11.9%			6			
125.7	8													
125.2	8.5	[Vertical lines]	(ML) SILT and (SP) SAND: trace to some gravel; grey; non-cohesive, wet, loose											
125.11														
124.7	9	[Vertical lines]		9	SS	100	1	10%			1			
124.2	9.5													
123.7	10	[Vertical lines]												
123.2	10.5													
122.7	11	[Vertical lines]		10	SS	100	4	11.2%			4			
122.2	11.5													
121.7	12	[Vertical lines]												
121.2	12.5				11	SS	10	2	10.1%			2		
120.7	13	[Vertical lines]												
120.38														
120.2	13.5	[Dotted pattern]	(SP) SAND and GRAVEL: Coarse, grey; non-cohesive, wet, compact											
119.72														
6.5														

GRAINSIZE [SAMPLE] GRAVEL SAND SILT CLAY DISTRIBUTION

1m = 26 units  
Logged By: EC

Input By: CM



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**Log of Borehole:** BH104-22  
Page 3 of 3

**Client:** Gay Company Limited  
**Contractor:** Drilltech Drilling Limited  
**Location:**

**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Method:** Track Mounted Solid Stem Auger  
**UTM:** 17T N: 4864339 E: 678045

**Project No.:** 15382-001  
**Date Completed:** November 18, 21, 22, 2022  
**Elevation:** 133.72 mASL

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes						
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture				SPT (N)					
								25	50	75	20	40	60	80			
119.7	14	[Dotted pattern]	(SP) SAND and GRAVEL: Coarse, grey; non-cohesive, wet, compact													Mud rotary drilling with 90 mm tri-cone from a depth of about 15mbgs	
119.2	14.5																
118.7	15																
118.2	15.5			12A	SS	100	11				9.3%			11			
				12B	SS						8.6%						
117.7	16	[Vertical lines]	(ML) sandy SILT: to (SM) SILTY SAND, trace to some gravel; grey (TILL); non-cohesive, moist, compact to dense														
117.2	16.5																
116.7	17					13	SS	40	11				8.8%				11
116.2	17.5																
115.7	18																
115.2	18.5			14	SS	45	12				7.9%			12			
114.7	19																
114.2	19.5																
113.7	20			15	SS	50	47				8.1%			47			
113.2	20.5		Borehole Terminated @ 20.3m Due to exploration depth achieved														
13.5																	

GRAINSIZE [SAMPLE] GRAVEL | SAND | SILT | CLAY  
DISTRIBUTION

1m = 26 units  
Logged By: EC

Input By: CM





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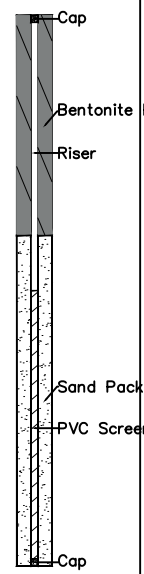
**Log of Borehole:** BH105-22  
Page 1 of 3

**Client:** Gay Company Limited  
**Contractor:** Drilltech Drilling Limited  
**Location:**

**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Method:** Track Mounted Solid Stem Auger  
**UTM:** 17T N: 4864264 E: 677965

**Project No.:** 15382-001  
**Date Completed:** November 18, 23, 24, 2022  
**Elevation:** 135.41 mASL

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture				SPT (N)		
								25	50	75	20	40	60	80
135.4	0	[Diagonal Hatching]	FILL: (ML) sandy SILT, trace gravel; dark brown, trace organic matter, non-cohesive, moist, compact to loose	1	SS	40	20	10.2%				20		
134.9	0.5													
134.4	1			2	SS	50	8	10.1%					8	
133.9	1.5			3	SS	95	8	11.5%				8		
133.4	2													
132.9	2.5	[Dotted Pattern]	(SM) SILTY SAND: brown; non-cohesive, moist, compact	4	SS	75	22	5.8%				22		
132.4	3													
131.9	3.5	[Horizontal Hatching]	(ML) CLAYEY SILT: trace sand; brown; cohesive, w<PL, very stiff	5	SS	60	20	15.8%				20		
131.4	4													
130.9	4.5	[Diagonal Hatching]	(CL) SILTY CLAY: grey; cohesive, w>PL, very soft to soft	6	SS	30	0	37.8%						
130.4	5													
129.9	5.5													
129.4	6													
128.9	6.5			7	SS	100	2	43.4%				2		
-0.5														



50 mm Diameter Monitoring Well with a 1.5 m screen.

Groundwater level measured in monitoring well at a depth of about 3.2mbgs (Elevation 132.2masl)

Atterberg Limits  
SS6: LL: 33.7% PL: 15.7% PI: 18%

Mud rotary drilling with 90 mm tri-cone from a depth of about 4.5mbgs

Shear Vane 1:  
at a depth of about 5.3mbgs:  
Natural 17kPa;  
Remolded 17kPa

Shear Vane 2:  
at a depth of about 6.9mbgs:  
Natural 14kPa;  
Remolded 14kPa

GRAINSIZE DISTRIBUTION	SAMPLE	GRAVEL	SAND	SILT	CLAY
	SS9	13	38	41	8

1m = 26 units  
Logged By: EC Input By: CM



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**Log of Borehole:** BH105-22  
Page 2 of 3

**Client:** Gay Company Limited  
**Contractor:** Drilltech Drilling Limited  
**Location:**

**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Method:** Track Mounted Solid Stem Auger  
**UTM:** 17T N: 4864264 E: 677965

**Project No.:** 15382-001  
**Date Completed:** November 18, 23, 24, 2022  
**Elevation:** 135.41 mASL

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture						
								25	50	75	20	40	60	80
128.4	7		(CL) SILTY CLAY: grey; cohesive, w>PL, very soft to soft											
127.9	7.5		(ML) SILT and (SP) SAND: some gravel to gravelly; grey; non-cohesive, wet, very loose to loose											
127.4	8			8	SS	100	5	10.7%			5			
126.9	8.5													
126.4	9													
125.9	9.5													
125.4	10													
124.9	10.5													
124.4	11			9	SS	85	3	12%			3			
123.9	11.5													
123.4	12													
122.9	12.5													
122.4	13													
121.9	13.5													
6.5				10	SS	100	9	9.9%			9			

GRAINSIZE DISTRIBUTION	SAMPLE	GRAVEL	SAND	SILT	CLAY
	SS9	13	38	41	8

1m = 26 units  
**Logged By:** EC

**Input By:** CM



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**Log of Borehole:** BH105-22  
Page 3 of 3

**Client:** Gay Company Limited  
**Contractor:** Drilltech Drilling Limited  
**Location:**

**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Method:** Track Mounted Solid Stem Auger  
**UTM:** 17T N: 4864264 E: 677965

**Project No.:** 15382-001  
**Date Completed:** November 18, 23, 24, 2022  
**Elevation:** 135.41 mASL

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes					
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture				SPT (N)				
								25	50	75	20	40	60	80		
121.4	14		(ML) SILT and SAND: some gravel to gravelly; grey; non-cohesive, wet, very loose to loose	10	SS	100	9	9.9%			9					
120.9	14.5															
120.4	15															
119.9	15.5		(ML) sandy SILT: to (SM) SILTY SAND; grey (TILL); non-cohesive, wet, compact to very dense	11	SS	25	26	12.5%			26					
119.4	16															
118.9	16.5															
118.4	17			12	SS	80	50	9.2%			50					
117.9	17.5															
117.4	18															
116.9	18.5			13	SS	45	49	8.8%			49					
116.4	19		Borehole Terminated @ 18.7m Due to exploration depth achieved													
115.9	19.5															
115.4	20															
114.9	20.5															
13.5																

GRAINSIZE DISTRIBUTION	SAMPLE	GRAVEL	SAND	SILT	CLAY
	SS9	13	38	41	8

1m = 26 units  
**Logged By:** EC

**Input By:** CM





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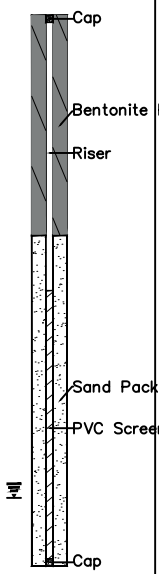
**Log of Borehole:** BH106-22  
Page 1 of 1

**Client:** Gay Company Limited  
**Contractor:** Drilltech Drilling Limited  
**Location:**

**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Method:** Track Mounted Solid Stem Auger  
**UTM:** 17T N: 4864289 E: 677993

**Project No.:** 15382-001  
**Date Completed:** November 18, 2022  
**Elevation:** 133.51 mASL

SUBSURFACE PROFILE			SAMPLE							Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture						
								25	50	75	20	40	60	80
133.5	0		FILL: (SP/GP) SAND and GRAVEL, brown; non-cohesive, moist, compact	1A	SS									
				1B	SS	50	20	8.4%			20			
133	0.5		FILL: (SM) SILTY SAND, brown; non-cohesive, moist, compact											
				2	SS	75	16	10.3%			16			
132.5	1		(ML) sandy SILT: brown, mottled; non-cohesive, moist, compact											
				3	SS	75	19	10.7%			19			
131.5	2		(SM) SILTY SAND: brown; non-cohesive, moist, very dense											
				4	SS	90	70	%			70			
130.5	3		(CL) SILTY CLAY: trace sand, grey; cohesive, w>PL, stiff											
				5	SS	60	9	18.9%			9			
130	3.5		Borehole Terminated @ 3.5m Due to exploration depth achieved											
129.5	4													
129	4.5													
128.5	5													
128	5.5													
127.5	6													
127	6.5													
-0.5														



50 mm Diameter Monitoring Well with a 1.5 m screen.  
  
Groundwater level measured in monitoring well at a depth of about 2.6mbs (Elevation 130.9masl).

GRAINSIZE DISTRIBUTION [SAMPLE] GRAVEL | SAND | SILT | CLAY

1m = 26 units  
Logged By: EC

Input By: CM



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**Log of Borehole:** BH107-22  
Page 1 of 1

**Client:** Gay Company Limited  
**Contractor:** Drilltech Drilling Limited  
**Location:**

**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Method:** Track Mounted Solid Stem Auger  
**UTM:** 17T N: 4864315 E: 677963

**Project No.:** 15382-001  
**Date Completed:** November 17, 2022  
**Elevation:** 133.41 mASL

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes					
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	% Moisture				SPT (N)				
								25	50	75	20	40	60	80		
133.4	0		<b>TOPSOIL:</b> (~ 280 mm thick)	1A	SS											Borehole dry and open upon completion of drilling
			133.13			75	7									
132.9	0.5		<b>FILL:</b> (ML) sandy SILT; brown; non-cohesive, moist, loose	1B	SS											
			132.72													
132.4	1		<b>(CL-ML) SILTY CLAY - CLAYEY SILT:</b> brown, mottled; cohesive, w<PL, stiff to very stiff	2	SS	100	13									
131.9	1.5															
131.4	2															
130.9	2.5		<b>(SM) SILTY SAND:</b> grey; non-cohesive, wet, dense	4	SS	60	36									
			130.51													
130.4	3		<b>(CL) SILTY CLAY:</b> grey; cohesive, w>PL, soft	5	SS	100	3									
			129.9													
129.9	3.5		Borehole Terminated @ 3.5m Due to exploration depth achieved													
129.4	4															
128.9	4.5															
128.4	5															
127.9	5.5															
127.4	6															
126.9	6.5															
-0.5																

GRAINSIZE [SAMPLE] GRAVEL | SAND | SILT | CLAY  
DISTRIBUTION

1m = 26 units  
Logged By: EC

Input By: CM

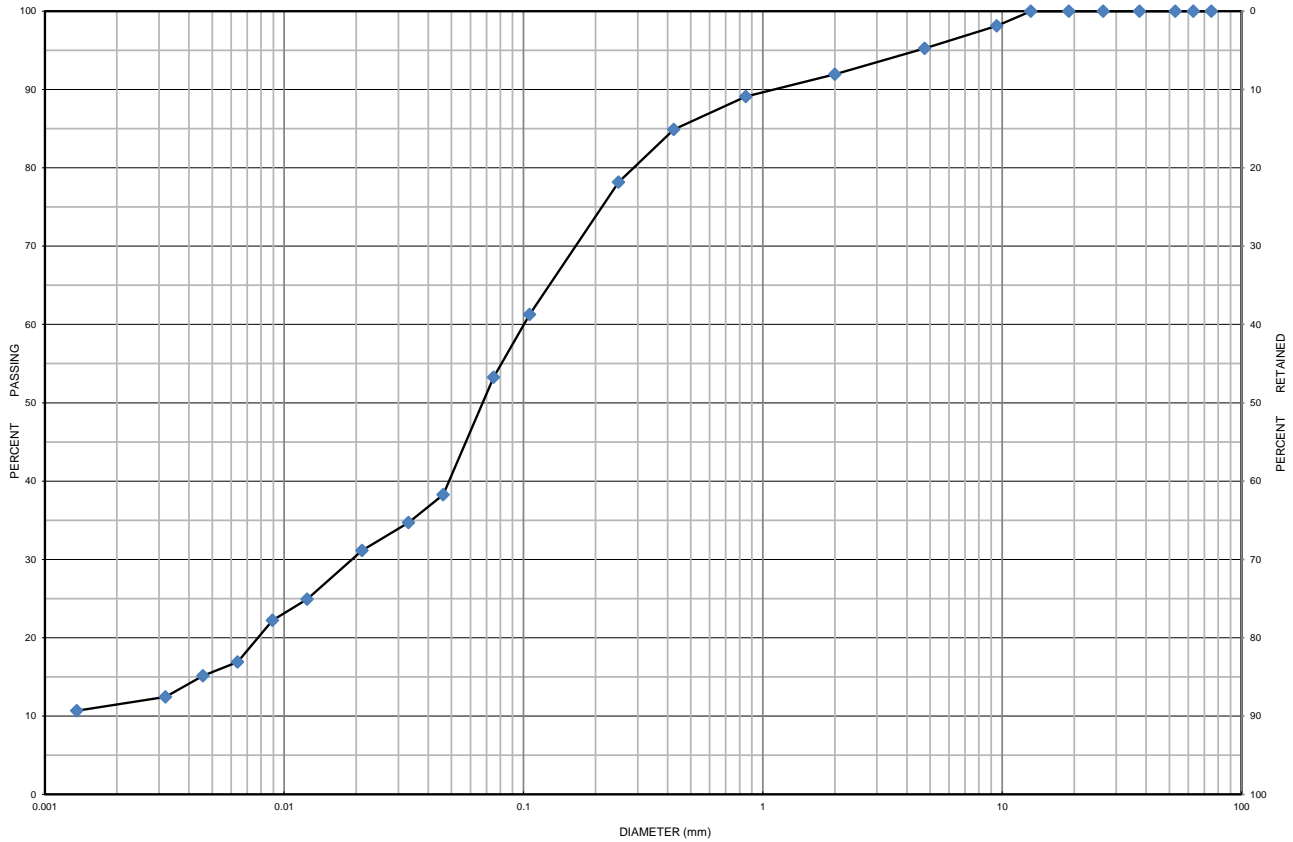




# Grain Size Distribution Chart

**Project Number:** 15382-001      **Client:** Gay Company Limited  
**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Sample Date:** November 17 - 24, 2022      **Sampled By:** Emily Couperthwaite - Cambium Inc.  
**Location:** BH 101-22 SS 10      **Depth:** 10.7 m to 11.1 m      **Lab Sample No:** S-22-130

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
BH 101-22	SS 10	10.7 m to 11.1 m	5	42	41	12	16.7
Description		Classification	D <sub>60</sub>	D <sub>30</sub>	D <sub>10</sub>	C <sub>u</sub>	C <sub>c</sub>
SILT and SAND		ML/SP	0.110	0.019	-	-	-

Additional information available upon request

Issued By: *John Baird*  
 (Senior Project Manager)

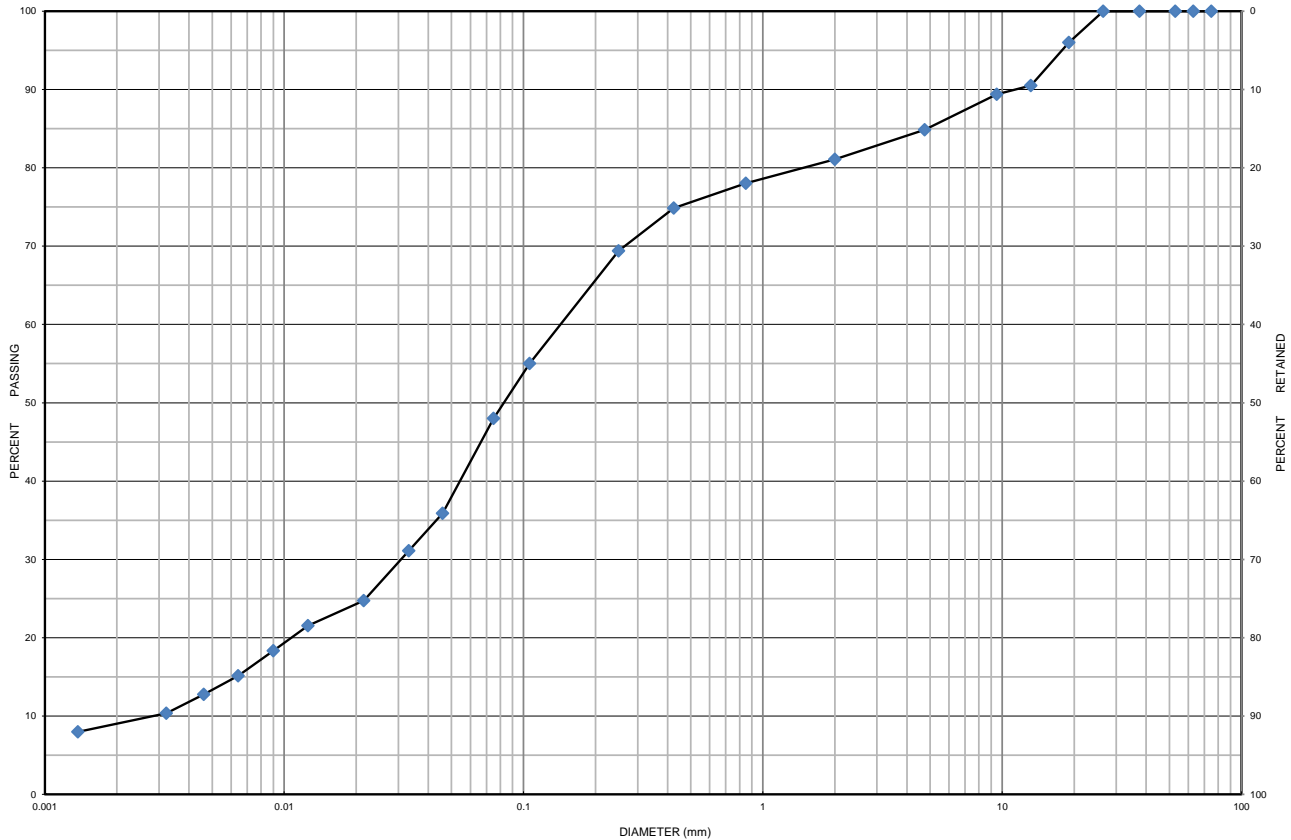
Date Issued: December 1, 2022



# Grain Size Distribution Chart

**Project Number:** 15382-001      **Client:** Gay Company Limited  
**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Sample Date:** November 17 - 24, 2022      **Sampled By:** Emily Couperthwaite - Cambium Inc.  
**Location:** BH 101-22 SS 14      **Depth:** 16.8 m to 17.2 m      **Lab Sample No:** S-22-131

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
BH 101-22	SS 14	16.8 m to 17.2 m	15	37	40	8	10.9
Description		Classification	D <sub>60</sub>	D <sub>30</sub>	D <sub>10</sub>	C <sub>u</sub>	C <sub>c</sub>
Sandy SILT to SILTY SAND TILL		ML/SM	0.1500	0.0310	0.0026	57.69	2.46

Additional information available upon request

Issued By: *John Baird*  
 (Senior Project Manager)

Date Issued: December 1, 2022



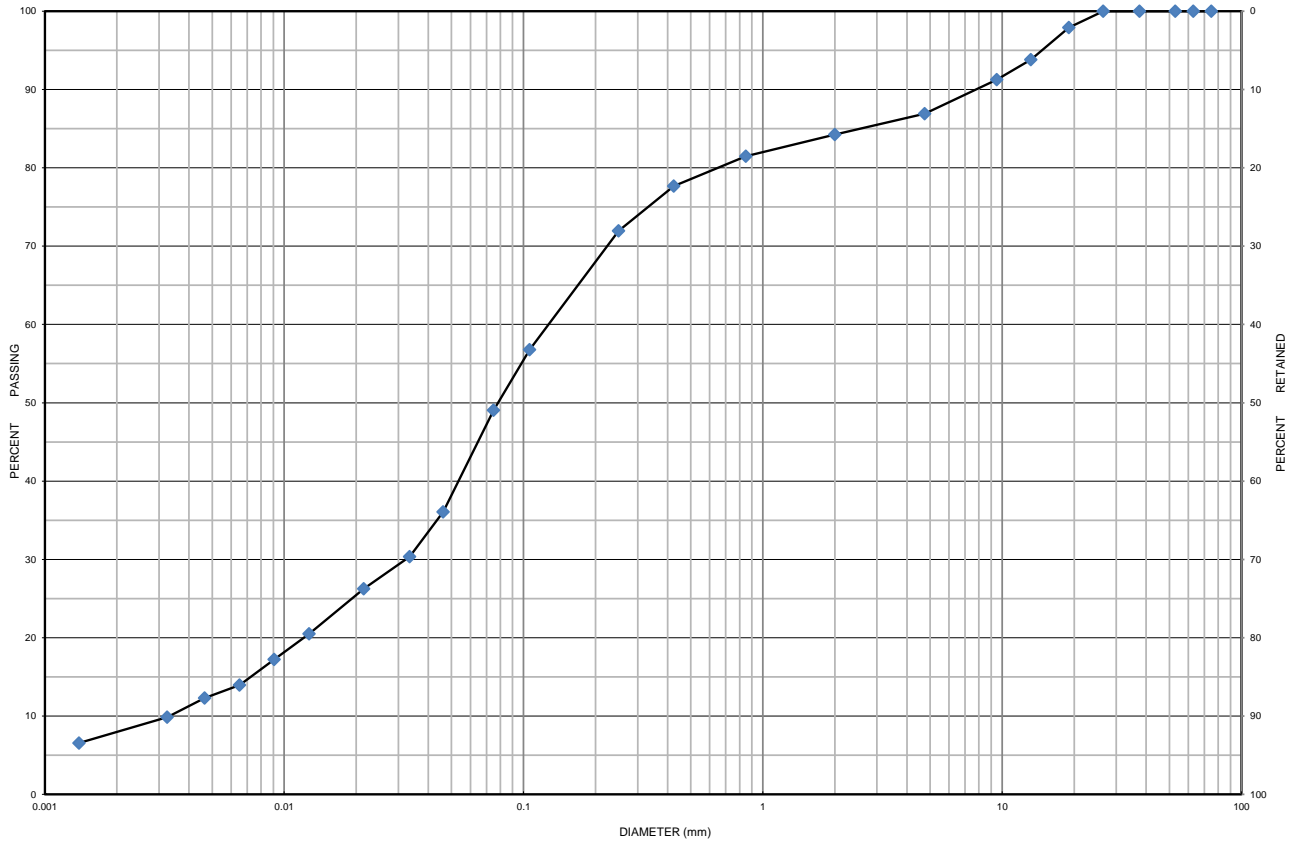




# Grain Size Distribution Chart

**Project Number:** 15382-001      **Client:** Gay Company Limited  
**Project Name:** GEO - 1697 Durham Reg Hwy 2  
**Sample Date:** November 17 - 24, 2022      **Sampled By:** Emily Couperthwaite - Cambium Inc.  
**Location:** BH 105-22 SS 9      **Depth:** 10.7 m to 11.1 m      **Lab Sample No:** S-22-132

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
BH 105-22	SS 9	10.7 m to 11.1 m	13	38	41	8	12.0
Description		Classification	D <sub>60</sub>	D <sub>30</sub>	D <sub>10</sub>	C <sub>u</sub>	C <sub>c</sub>
SILT and SAND		ML/SP	0.1400	0.0320	0.0033	42.42	2.22

Additional information available upon request

Issued By: *John Baird*  
 (Senior Project Manager)

Date Issued: December 1, 2022





Hydrogeological Assessment, 1697 Durham Regional Highway 2, Courtice  
Richard H. Gay Company Limited  
Cambium Reference: 15382-002  
January 26, 2024

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**Appendix D**  
**MECP Well Records**

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# Water Well Records Summary Report

Produced by Cambium Inc. using MOECP Water Well Information System (WWIS)

All units in meters unless otherwise specified



<b>Well ID:</b> 1901296	<b>Easting:</b> 678308	<b>UTM Zone</b> 17	
<b>Construction Date:</b> 1957-11-05	<b>Northing:</b> 4864379	<b>Positional Accuracy:</b> margin of error : 100 m - 300 m	
<b>Well Depth:</b> 6.1	<b>Water Kind</b> FRESH	<b>Pump Rate (LPM):</b>	
<b>Well Diameter (cm):</b> 91.4	<b>Final Status</b> Water Supply	<b>Recommended Pump Rate:</b>	
<b>Water First Found:</b> 3.66	<b>Primary Water Use:</b> Domestic	<b>Pumping Duration (h:m):</b> :	
<b>Static Level:</b> 3			
<b>Layer:</b>	<b>Driller's Description:</b>	<b>Top:</b>	<b>Bottom:</b>
1	TOPSOIL	0	0.61
2	CLAY	0.61	3.66
3	MEDIUM SAND	3.66	4.27
4	CLAY	4.27	5.49
5	MEDIUM SAND	5.49	6.1

<b>Well ID:</b> 1901297	<b>Easting:</b> 678334	<b>UTM Zone</b> 17	
<b>Construction Date:</b> 1959-01-06	<b>Northing:</b> 4864642	<b>Positional Accuracy:</b> margin of error : 100 m - 300 m	
<b>Well Depth:</b> 25.6	<b>Water Kind</b> FRESH	<b>Pump Rate (LPM):</b>	
<b>Well Diameter (cm):</b> 12.7	<b>Final Status</b> Abandoned-Su	<b>Recommended Pump Rate:</b>	
<b>Water First Found:</b> 5.79	<b>Primary Water Use:</b>	<b>Pumping Duration (h:m):</b>	
<b>Static Level:</b>			
<b>Layer:</b>	<b>Driller's Description:</b>	<b>Top:</b>	<b>Bottom:</b>
1	CLAY	0	5.79
1	CLAY	0	5.79
2	CLAY	5.79	9.14
2	CLAY	5.79	9.14
3	CLAY	9.14	25
3	CLAY	9.14	25
4	QUICKSAND	25	25.6
4	QUICKSAND	25	25.6

<b>Well ID:</b> 1901298	<b>Easting:</b> 678087	<b>UTM Zone</b> 17	
<b>Construction Date:</b> 1959-04-06	<b>Northing:</b> 4864355	<b>Positional Accuracy:</b> margin of error : 100 m - 300 m	
<b>Well Depth:</b> 7.62	<b>Water Kind</b> FRESH	<b>Pump Rate (LPM):</b>	
<b>Well Diameter (cm):</b> 91.4	<b>Final Status</b> Water Supply	<b>Recommended Pump Rate:</b>	
<b>Water First Found:</b> 7.01	<b>Primary Water Use:</b> Domestic	<b>Pumping Duration (h:m):</b> :	
<b>Static Level:</b> 5			
<b>Layer:</b>	<b>Driller's Description:</b>	<b>Top:</b>	<b>Bottom:</b>
1	TOPSOIL	0	0.61
2	MEDIUM SAND	0.61	2.13
3	CLAY	2.13	7.01
4	CLAY	7.01	7.62



**Well ID:** 1901299      **Easting:** 678060      **UTM Zone** 17  
**Construction Date:** 1960-02-15      **Northing:** 4864819      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 13.4      **Water Kind** FRESH      **Pump Rate (LPM):** 45  
**Well Diameter (cm):** 20.3      **Final Status** Test Hole      **Recommended Pump Rate:**  
**Water First Found:** 10.4      **Primary Water Use:** Not Used      **Pumping Duration (h:m):** 6 : 0  
**Static Level:** 2

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	MEDIUM SAND	0.30	9.75
3	MEDIUM SAND	9.75	13.4

**Well ID:** 1901300      **Easting:** 677924      **UTM Zone** 17  
**Construction Date:** 1960-02-15      **Northing:** 4864832      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 30.5      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 25.4      **Final Status** Abandoned-Su      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:**      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	MEDIUM SAND	0.30	7.62
3	CLAY	7.62	13.4
4	FINE SAND	13.4	18.3
5	CLAY	18.3	30.5

**Well ID:** 1901302      **Easting:** 678016      **UTM Zone** 17  
**Construction Date:** 1960-02-15      **Northing:** 4864785      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 15.2      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 15.2      **Final Status** Abandoned-Su      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:**      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	FINE SAND	0.30	12.2
3	CLAY	12.2	15.2

**Well ID:** 1901303      **Easting:** 677980      **UTM Zone** 17  
**Construction Date:** 1960-02-15      **Northing:** 4864680      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 18.3      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 15.2      **Final Status** Abandoned-Su      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:**      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	FINE SAND	0.30	4.57
3	CLAY	4.57	18.3

**Well ID:** 1901304      **Easting:** 678200      **UTM Zone** 17  
**Construction Date:** 1960-02-15      **Northing:** 4864738      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 15.2      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 15.2      **Final Status** Abandoned-Su      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:**      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	CLAY	0.30	15.2

**Well ID:** 1901306      **Easting:** 678179      **UTM Zone** 17  
**Construction Date:** 1964-08-05      **Northing:** 4864834      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 26.8      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 15.2      **Final Status** Abandoned-Su      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:**      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	CLAY	0.30	26.8

**Well ID:** 1901308      **Easting:** 677624      **UTM Zone** 17  
**Construction Date:** 1949-04-20      **Northing:** 4864449      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 34.1      **Water Kind** FRESH      **Pump Rate (LPM):** 45  
**Well Diameter (cm):** 15.2      **Final Status** Water Supply      **Recommended Pump Rate:** 45  
**Water First Found:** 6.1      **Primary Water Use:** Public      **Pumping Duration (h:m):** 3 : 0  
**Static Level:** 1

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.91
2	CLAY	0.91	6.1
3	QUICKSAND	6.1	33.5
4	GRAVEL	33.5	34.1

**Well ID:** 1901310      **Easting:** 677892      **UTM Zone** 17  
**Construction Date:** 1963-04-23      **Northing:** 4864356      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 6.1      **Water Kind** FRESH      **Pump Rate (LPM):** 9  
**Well Diameter (cm):** 76.2      **Final Status** Water Supply      **Recommended Pump Rate:** 5  
**Water First Found:** 2.74      **Primary Water Use:** Domestic      **Pumping Duration (h:m):** :  
**Static Level:** 3

Layer:	Driller's Description:	Top:	Bottom:
1	CLAY	0	0.91
2	CLAY	0.91	2.74
3	MEDIUM SAND	2.74	3.66
4	CLAY	3.66	6.1



**Well ID:** 1901312      **Easting:** 677539      **UTM Zone** 17  
**Construction Date:** 1967-12-19      **Northing:** 4864516      **Positional Accuracy:** unknown UTM

**Well Depth:** 5.18      **Water Kind** FRESH      **Pump Rate (LPM):** 23  
**Well Diameter (cm):** 91.4      **Final Status** Water Supply      **Recommended Pump Rate:**  
**Water First Found:** 4.27      **Primary Water Use:** Domestic      **Pumping Duration (h:m):** :  
**Static Level:** 2

Layer:	Driller's Description:	Top:	Bottom:
1	CLAY	0	0.30
2	CLAY	0.30	4.27
3	GRAVEL	4.27	5.18

**Well ID:** 1901313      **Easting:** 677495      **UTM Zone** 17  
**Construction Date:** 1953-12-15      **Northing:** 4864503      **Positional Accuracy:** unknown UTM

**Well Depth:** 6.71      **Water Kind** FRESH      **Pump Rate (LPM):**  
**Well Diameter (cm):** 91.4      **Final Status** Water Supply      **Recommended Pump Rate:**  
**Water First Found:** 6.1      **Primary Water Use:** Domestic      **Pumping Duration (h:m):** :  
**Static Level:** 6

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.61
2	CLAY	0.61	3.05
3	GRAVEL	3.05	3.96
4	CLAY	3.96	6.71

**Well ID:** 1901317      **Easting:** 677506      **UTM Zone** 17  
**Construction Date:** 1960-04-25      **Northing:** 4864313      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 15.5      **Water Kind** FRESH      **Pump Rate (LPM):** 77  
**Well Diameter (cm):** 25.4      **Final Status** Water Supply      **Recommended Pump Rate:**  
**Water First Found:** 12.5      **Primary Water Use:** Public      **Pumping Duration (h:m):** 48 : 0  
**Static Level:** 1

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	CLAY	0.30	7.32
3	STONES	7.32	10.1
4	MEDIUM SAND	10.1	12.5
5	GRAVEL	12.5	12.8
6	MEDIUM SAND	12.8	15.5

**Well ID:** 1901320      **Easting:** 677537      **UTM Zone** 17  
**Construction Date:** 1960-11-14      **Northing:** 4864299      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 7.32      **Water Kind** FRESH      **Pump Rate (LPM):** 100  
**Well Diameter (cm):** 76.2      **Final Status** Water Supply      **Recommended Pump Rate:** 23  
**Water First Found:** 7.32      **Primary Water Use:** Commerical      **Pumping Duration (h:m):** 24 : 0  
**Static Level:** 4

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	CLAY	0.30	3.66
3	CLAY	3.66	7.01
4	GRAVEL	7.01	7.32

**Well ID:** 1901321      **Easting:** 677521      **UTM Zone** 17  
**Construction Date:** 1960-11-14      **Northing:** 4864396      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 6.4      **Water Kind** FRESH      **Pump Rate (LPM):** 5  
**Well Diameter (cm):** 76.2      **Final Status** Water Supply      **Recommended Pump Rate:** 5  
**Water First Found:** 6.1      **Primary Water Use:** Domestic      **Pumping Duration (h:m):** 24 : 0  
**Static Level:** 5

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	CLAY	0.30	6.1
3	GRAVEL	6.1	6.40

**Well ID:** 1901322      **Easting:** 677580      **UTM Zone** 17  
**Construction Date:** 1961-10-23      **Northing:** 4864328      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 9.75      **Water Kind** FRESH      **Pump Rate (LPM):** 23  
**Well Diameter (cm):** 76.2      **Final Status** Water Supply      **Recommended Pump Rate:** 23  
**Water First Found:** 9.14      **Primary Water Use:** Domestic      **Pumping Duration (h:m):** :  
**Static Level:** 2

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
1	TOPSOIL	0	0.30
2	CLAY	0.30	3.05
2	CLAY	0.30	3.05
3	CLAY	3.05	7.32
3	CLAY	3.05	7.32
4	CLAY	7.32	9.14
4	CLAY	7.32	9.14
5	COARSE SAND	9.14	9.45
5	COARSE SAND	9.14	9.45
6	CLAY	9.45	9.75
6	CLAY	9.45	9.75

**Well ID:** 1901434      **Easting:** 677724      **UTM Zone** 17  
**Construction Date:** 1953-09-28      **Northing:** 4864792      **Positional Accuracy:** unknown UTM

**Well Depth:** 22.3      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 10.2      **Final Status** Water Supply      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Domestic      **Pumping Duration (h:m):** :  
**Static Level:** 7

Layer:	Driller's Description:	Top:	Bottom:
1	PREVIOUSLY DUG	0	7.92
2	CLAY	7.92	22.3

**Well ID:** 1901435      **Easting:** 677701      **UTM Zone** 17  
**Construction Date:** 1967-01-17      **Northing:** 4864788      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 11      **Water Kind** FRESH      **Pump Rate (LPM):** 5  
**Well Diameter (cm):** 76.2      **Final Status** Water Supply      **Recommended Pump Rate:**  
**Water First Found:** 9.14      **Primary Water Use:** Domestic      **Pumping Duration (h:m):** :  
**Static Level:** 9

Layer:	Driller's Description:	Top:	Bottom:
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1	TOPSOIL	0	0.30
2	CLAY	0.30	2.74
3	CLAY	2.74	9.14
4	FINE SAND	9.14	10.4
5	CLAY	10.4	11

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<b>Well ID:</b> 1902757	<b>Easting:</b> 677815	<b>UTM Zone</b> 17	
<b>Construction Date:</b> 1969-12-01	<b>Northing:</b> 4863823	<b>Positional Accuracy:</b> margin of error : 30 m - 100 m	
<b>Well Depth:</b> 40.2	<b>Water Kind</b> FRESH	<b>Pump Rate (LPM):</b> 23	
<b>Well Diameter (cm):</b> 12.7	<b>Final Status</b> Water Supply	<b>Recommended Pump Rate:</b> 23	
<b>Water First Found:</b> 40.2	<b>Primary Water Use:</b> Domestic	<b>Pumping Duration (h:m):</b> 3 : 0	
<b>Static Level:</b> 5			
<b>Layer:</b>	<b>Driller's Description:</b>	<b>Top:</b>	<b>Bottom:</b>
1	CLAY	0	39.3
2	GRAVEL	39.3	40.2

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<b>Well ID:</b> 1903447	<b>Easting:</b> 677815	<b>UTM Zone</b> 17	
<b>Construction Date:</b> 1972-12-20	<b>Northing:</b> 4863943	<b>Positional Accuracy:</b> margin of error : 30 m - 100 m	
<b>Well Depth:</b> 13.7	<b>Water Kind</b> FRESH	<b>Pump Rate (LPM):</b> 73	
<b>Well Diameter (cm):</b> 15.2	<b>Final Status</b> Water Supply	<b>Recommended Pump Rate:</b> 73	
<b>Water First Found:</b> 13.7	<b>Primary Water Use:</b> Domestic	<b>Pumping Duration (h:m):</b> 3 : 30	
<b>Static Level:</b> 4			
<b>Layer:</b>	<b>Driller's Description:</b>	<b>Top:</b>	<b>Bottom:</b>
1	FILL	0	1.22
1	FILL	0	1.22
2	CLAY	1.22	10.1
2	CLAY	1.22	10.1
3	FINE SAND	10.1	13.7
3	FINE SAND	10.1	13.7

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<b>Well ID:</b> 1903617	<b>Easting:</b> 677775	<b>UTM Zone</b> 17	
<b>Construction Date:</b> 1973-06-01	<b>Northing:</b> 4864853	<b>Positional Accuracy:</b> margin of error : 30 m - 100 m	
<b>Well Depth:</b> 6.1	<b>Water Kind</b> FRESH	<b>Pump Rate (LPM):</b> 32	
<b>Well Diameter (cm):</b> 76.2	<b>Final Status</b> Water Supply	<b>Recommended Pump Rate:</b> 23	
<b>Water First Found:</b> 3.05	<b>Primary Water Use:</b> Domestic	<b>Pumping Duration (h:m):</b> 0 : 30	
<b>Static Level:</b> 3			
<b>Layer:</b>	<b>Driller's Description:</b>	<b>Top:</b>	<b>Bottom:</b>
1	CLAY	0	3.05
2	CLAY	3.05	6.1

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<b>Well ID:</b> 1905674	<b>Easting:</b> 678435	<b>UTM Zone</b> 17	
<b>Construction Date:</b> 1980-03-03	<b>Northing:</b> 4864423	<b>Positional Accuracy:</b> margin of error : 30 m - 100 m	
<b>Well Depth:</b> 53.6	<b>Water Kind</b> FRESH	<b>Pump Rate (LPM):</b>	
<b>Well Diameter (cm):</b>	<b>Final Status</b> Abandoned-Q	<b>Recommended Pump Rate:</b>	
<b>Water First Found:</b> 48.5	<b>Primary Water Use:</b> Not Used	<b>Pumping Duration (h:m):</b> :	
<b>Static Level:</b>			
<b>Layer:</b>	<b>Driller's Description:</b>	<b>Top:</b>	<b>Bottom:</b>
1	PREVIOUSLY DUG	0	7.92
1	PREVIOUSLY DUG	0	7.92

2	CLAY	7.92	26.2
2	CLAY	7.92	26.2
3	SAND	26.2	27.7
3	SAND	26.2	27.7
4	FINE SAND	27.7	48.5
4	FINE SAND	27.7	48.5
5	CLAY	48.5	49.1
5	CLAY	48.5	49.1
6	SHALE	49.1	50.9
6	SHALE	49.1	50.9
7	SHALE	50.9	53.6
7	SHALE	50.9	53.6

**Well ID:** 1910002  
**Construction Date:** 1989-08-11

**Easting:** 677898  
**Northing:** 4864363

**UTM Zone** 17  
**Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 15.5  
**Well Diameter (cm):** 76.2  
**Water First Found:** 9.14  
**Static Level:** 4

**Water Kind** FRESH  
**Final Status** Water Supply  
**Primary Water Use:** Domestic

**Pump Rate (LPM):** 36  
**Recommended Pump Rate:** 18  
**Pumping Duration (h:m):** 1 : 0

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	CLAY	0.30	3.05
3	SAND	3.05	3.96
4	CLAY	3.96	15.5

**Well ID:** 1910477  
**Construction Date:** 1990-03-22

**Easting:** 678095  
**Northing:** 4864345

**UTM Zone** 17  
**Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:** 9.75  
**Well Diameter (cm):** 76.2  
**Water First Found:** 6.1  
**Static Level:** 3

**Water Kind** FRESH  
**Final Status** Water Supply  
**Primary Water Use:** Domestic

**Pump Rate (LPM):** 36  
**Recommended Pump Rate:** 18  
**Pumping Duration (h:m):** 1 : 0

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	CLAY	0.30	1.83
3	CLAY	1.83	9.75

**Well ID:** 1915820  
**Construction Date:** 2002-05-21

**Easting:** 678416  
**Northing:** 4863854

**UTM Zone** 17  
**Positional Accuracy:** unknown UTM

**Well Depth:** 13.7  
**Well Diameter (cm):** 15.2  
**Water First Found:** 13.7  
**Static Level:** 2

**Water Kind** FRESH  
**Final Status** Water Supply  
**Primary Water Use:** Domestic

**Pump Rate (LPM):** 27  
**Recommended Pump Rate:** 27  
**Pumping Duration (h:m):** 1 : 30

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	1.83
2	CLAY	1.83	3.66
3	GRAVEL	3.66	7.62
4	GRAVEL	7.62	12.5



---

**Well ID:** 1916007      **Easting:** 678415      **UTM Zone** 17  
**Construction Date:** 2002-08-19      **Northing:** 4863853      **Positional Accuracy:** unknown UTM  
  
**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):**      **Final Status** Abandoned-Q      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Not Used      **Pumping Duration (h:m):**  
**Static Level:**  
  
**Layer: Driller's Description: Top: Bottom:**

---

**Well ID:** 1916707      **Easting:** 678415      **UTM Zone** 17  
**Construction Date:** 2003-09-11      **Northing:** 4863853      **Positional Accuracy:** unknown UTM  
  
**Well Depth:**      **Water Kind** FRESH      **Pump Rate (LPM):** 100  
**Well Diameter (cm):** 20.3      **Final Status** Water Supply      **Recommended Pump Rate:** 14  
**Water First Found:** 18.3      **Primary Water Use:** Domestic      **Pumping Duration (h:m):** 1 :  
**Static Level:** 1  
  
**Layer: Driller's Description: Top: Bottom:**

---

**Well ID:** 7110560      **Easting:** 678408      **UTM Zone** 17  
**Construction Date:** 2008-08-28      **Northing:** 4864429      **Positional Accuracy:** margin of error : 10 - 30 m  
  
**Well Depth:** 4.88      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 3.81      **Final Status** Observation W      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring      **Pumping Duration (h:m):**  
**Static Level:**  
  
**Layer: Driller's Description: Top: Bottom:**  
1 SAND 0 3.66  
2 CLAY 3.66 4.88

---

**Well ID:** 7110561      **Easting:** 678400      **UTM Zone** 17  
**Construction Date:** 2008-08-28      **Northing:** 4864413      **Positional Accuracy:** margin of error : 10 - 30 m  
  
**Well Depth:** 4.57      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 3.81      **Final Status**      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring      **Pumping Duration (h:m):**  
**Static Level:**  
  
**Layer: Driller's Description: Top: Bottom:**  
1 SAND 0 3.66  
2 CLAY 3.66 4.57

---

**Well ID:** 7110562      **Easting:** 678425      **UTM Zone** 17  
**Construction Date:** 2008-08-28      **Northing:** 4864593      **Positional Accuracy:** margin of error : 10 - 30 m  
  
**Well Depth:** 4.57      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 3.81      **Final Status** Observation W      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring      **Pumping Duration (h:m):**  
**Static Level:**  
  
**Layer: Driller's Description: Top: Bottom:**  
1 SAND 0 3.66  
2 CLAY 3.66 4.57

**Well ID:** 7142074      **Easting:** 678400      **UTM Zone** 17  
**Construction Date:** 2010-03-24      **Northing:** 4864413      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):**      **Final Status**      Abandoned M      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring an      **Pumping Duration (h:m):**  
**Static Level:**

**Layer: Driller's Description:      Top:      Bottom:**

**Well ID:** 7142075      **Easting:** 678408      **UTM Zone** 17  
**Construction Date:** 2010-03-24      **Northing:** 4864429      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):**      **Final Status**      Abandoned M      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring an      **Pumping Duration (h:m):**  
**Static Level:**

**Layer: Driller's Description:      Top:      Bottom:**

**Well ID:** 7173651      **Easting:** 677622      **UTM Zone** 17  
**Construction Date:** 2011-12-19      **Northing:** 4864282      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):**      **Final Status**      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:**      **Pumping Duration (h:m):**  
**Static Level:**

**Layer: Driller's Description:      Top:      Bottom:**

**Well ID:** 7211928      **Easting:** 678378      **UTM Zone** 17  
**Construction Date:** 2013-11-28      **Northing:** 4864419      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:** 3.05      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 5.08      **Final Status**      Monitoring an      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring an      **Pumping Duration (h:m):**  
**Static Level:**

**Layer: Driller's Description:      Top:      Bottom:**

1	SAND	0	1.83
2	SAND	1.83	3.05

**Well ID:** 7211929      **Easting:** 678393      **UTM Zone** 17  
**Construction Date:** 2013-11-28      **Northing:** 4864467      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:** 4.57      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 5.08      **Final Status**      Monitoring an      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring an      **Pumping Duration (h:m):**  
**Static Level:**

**Layer: Driller's Description:      Top:      Bottom:**

1	FILL	0	2.13
2	SAND	2.13	4.57



**Well ID:** 7211930      **Easting:** 678394      **UTM Zone** 17  
**Construction Date:** 2013-11-28      **Northing:** 4864405      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:** 3.05      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 5.08      **Final Status** Monitoring an      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring an      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
1	FILL	0	1.83
2	SILT	1.83	3.05

**Well ID:** 7211931      **Easting:** 678407      **UTM Zone** 17  
**Construction Date:** 2013-11-28      **Northing:** 4864465      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:** 3.05      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 5.08      **Final Status** Monitoring an      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring an      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
1	SAND	0	1.83
2	SILT	1.83	3.05

**Well ID:** 7270097      **Easting:** 677986      **UTM Zone** 17  
**Construction Date:** 2016-08-29      **Northing:** 4863955      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):**      **Final Status**      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:**      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
1			
2			

**Well ID:** 7280412      **Easting:** 677888      **UTM Zone** 17  
**Construction Date:** 2017-02-02      **Northing:** 4864334      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):**      **Final Status** Abandoned-Ot      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:**      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
1			
2			

**Well ID:** 7319463      **Easting:** 677705      **UTM Zone** 17  
**Construction Date:** 2018-10-04      **Northing:** 4864325      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:** 10.7      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 5.08      **Final Status** Observation W      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Test Hole      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	10.7
2	TILL	10.7	10.7

**Well ID:** 7319938      **Easting:** 677940      **UTM Zone** 17  
**Construction Date:** 2018-09-18      **Northing:** 4864097      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:** 15.2      **Water Kind** Untested      **Pump Rate (LPM):**  
**Well Diameter (cm):** 5.08      **Final Status** Observation W      **Recommended Pump Rate:**  
**Water First Found:** 2.29      **Primary Water Use:** Test Hole      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	SILT	0.30	3.05
3	CLAY	3.05	12.2
4	TILL	12.2	15.2

**Well ID:** 7357778      **Easting:** 677627      **UTM Zone** 17  
**Construction Date:** 2020-05-06      **Northing:** 4864287      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 2      **Final Status** Observation W      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
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**Well ID:** 7357779      **Easting:** 677704      **UTM Zone** 17  
**Construction Date:** 2020-05-06      **Northing:** 4864328      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 2      **Final Status** Observation W      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
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**Well ID:** 7357780      **Easting:** 677669      **UTM Zone** 17  
**Construction Date:** 2020-05-06      **Northing:** 4864274      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 5.08      **Final Status** Observation W      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
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**Well ID:** 7357781      **Easting:** 677649      **UTM Zone** 17  
**Construction Date:** 2020-05-06      **Northing:** 4864338      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):** 2      **Final Status** Observation W      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:** Monitoring      **Pumping Duration (h:m):**  
**Static Level:**

Layer:	Driller's Description:	Top:	Bottom:
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**Well ID:** 7364038      **Easting:** 677615      **UTM Zone** 17  
**Construction Date:** 2020-08-06      **Northing:** 4864271      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):**      **Final Status**      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:**      **Pumping Duration (h:m):**  
**Static Level:**

**Layer:**    **Driller's Description:**    **Top:**    **Bottom:**

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**Well ID:** 7364039      **Easting:** 677544      **UTM Zone** 17  
**Construction Date:** 2020-08-06      **Northing:** 4864463      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):**      **Final Status**      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:**      **Pumping Duration (h:m):**  
**Static Level:**

**Layer:**    **Driller's Description:**    **Top:**    **Bottom:**

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**Well ID:** 7364202      **Easting:** 677616      **UTM Zone** 17  
**Construction Date:** 2020-08-06      **Northing:** 4864270      **Positional Accuracy:** margin of error : 30 m - 100 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):**      **Final Status**      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:**      **Pumping Duration (h:m):**  
**Static Level:**

**Layer:**    **Driller's Description:**    **Top:**    **Bottom:**

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**Well ID:** 7366704      **Easting:** 678018      **UTM Zone** 17  
**Construction Date:** 2020-09-01      **Northing:** 4864295      **Positional Accuracy:** margin of error : 100 m - 300 m

**Well Depth:**      **Water Kind**      **Pump Rate (LPM):**  
**Well Diameter (cm):**      **Final Status**      **Recommended Pump Rate:**  
**Water First Found:**      **Primary Water Use:**      **Pumping Duration (h:m):**  
**Static Level:**

**Layer:**    **Driller's Description:**    **Top:**    **Bottom:**

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Hydrogeological Assessment, 1697 Durham Regional Highway 2, Courtice  
Richard H. Gay Company Limited  
Cambium Reference: 15382-002  
January 26, 2024

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## **Appendix E**

### **AquiferTest Pro Results**

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Cambium Inc.  
194 Sophia St.  
Peterborough, Ontario  
K9H 1E5

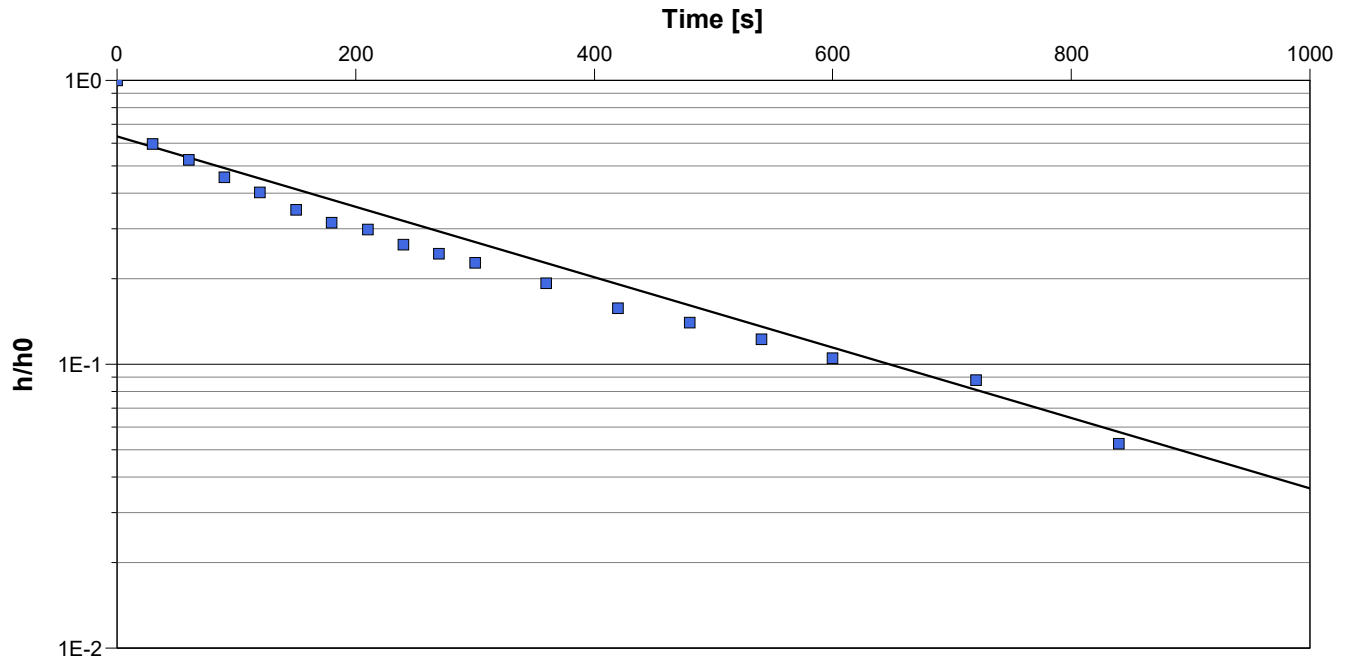
**Slug Test Analysis Report**

Project: Hydrogeological Assessment

Number: 15382-002

Client: Gay Company Ltd

Location: 1697 Durham Reg. Hwy 2	Slug Test: BH106	Test Well: BH106
Test Conducted by: W. Young		Test Date: 11/24/2022
Analysis Performed by: W. Young	Slug Test Analysis - Hvorslev	Analysis Date: 11/30/2022
Aquifer Thickness: 0.57 m		



Calculation using Hvorslev		
Observation Well	Hydraulic Conductivity [m/s]	
BH106	$2.42 \times 10^{-6}$	



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## **Appendix F**

### **Dewatering Calculations**

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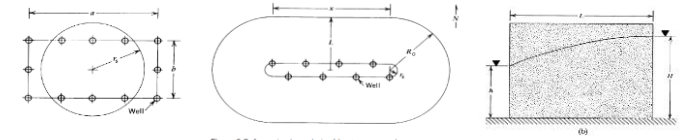


**CONSTRUCTION DEWATERING CALCULATIONS**

Modified Dupuit-Forchheimer Equation: unconfined flow into a linear excavation.  
 Calculations assume no flow boundary at aquifer base

Excavation Area		Initial depth to groundwater	Target Depth to groundwater	Depth to Base of Aquifer	Unit length of trench (a)	Width of Trench (b)	Hydraulic Conductivity (K)	s	R <sub>o</sub>	L = R <sub>o</sub> /2	r <sub>s</sub> = b/2	ln(R <sub>o</sub> /r <sub>s</sub> ) [if r <sub>s</sub> < R <sub>o</sub> ] or ln((R <sub>o</sub> +r <sub>s</sub> )/r <sub>s</sub> ) [if r <sub>s</sub> >= R <sub>o</sub> ]	H	h = H-s	Q <sub>ends</sub>	Q <sub>trench</sub>	Q <sub>total</sub>		
																	m <sup>3</sup> /s	L/s	L/d
		mbgs	mbgs	mbgs	m	m	m/s	m	m	m	m	-	m	m	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	L/s	L/d
	<b>Building 1</b>	1	4.0	6.0	46	21.5	2.42E-06	3.00	14.00	7.00	10.75	0.26	5.00	2.00	0.000604	0.000334	<b>0.000938</b>	<b>0.94</b>	<b>81,064</b>
	<b>Building 2</b>	1	2.5	3.0	33	21.5	2.42E-06	1.50	7.00	3.50	10.75	0.50	2.00	0.50	0.000057	0.000086	<b>0.000142</b>	<b>0.14</b>	<b>12,304</b>
	<b>Building 3</b>	1	4.0	6.0	34	21	2.42E-06	3.00	14.00	7.00	10.50	0.29	5.00	2.00	0.000555	0.000247	<b>0.000802</b>	<b>0.80</b>	<b>69,267</b>
	<b>Service Trench</b>	1	2.5	3.0	15	1	2.42E-06	1.50	7.00	3.50	0.50	2.64	2.00	0.50	0.000011	0.000039	<b>0.000050</b>	<b>0.05</b>	<b>4,294</b>

- s = target drawdown (initial - target depth to groundwater) (m)
- R<sub>o</sub> = radius of influence of construction dewatering/pumping (m)
- L = distance to line source (m)
- r<sub>s</sub> = equivalent single well radius (m)
- H = Initial hydraulic head in aquifer (m)
- h = hydraulic head at radius of well (m)
- Q = construction dewatering rate (m<sup>3</sup>/s)



$$Q = \frac{\pi K(H^2 - h^2)}{\ln R_o/r_s} + 2 \left[ \frac{xK(H^2 - h^2)}{2L} \right] \quad (6.10b) \quad x = \text{unit length of trench}$$

R<sub>o</sub> = 3000\*s\*sqrt(K)

Source: Kyrielleis, W. and Sichardt, W.  
 "Grundwasserabsenkung bei Fundierungsarbeiten"  
 Springer, Berlin, 1930

Source: Powers, J. Patrick, et al. "Construction dewatering and groundwater control." (2007)



**OPERATIONAL DEWATERING CALCULATIONS**

Modified Dupuit-Forchheimer Equation: unconfined flow into a linear excavation.  
 Calculations assume no flow boundary at aquifer base

Excavation Area		Initial depth to groundwater	Target Depth to groundwater	Depth to Base of Aquifer	Unit length of trench (a)	Width of Trench (b)	Hydraulic Conductivity (K)	s	R <sub>o</sub>	L = R <sub>o</sub> /2	r <sub>s</sub> = b/2	ln(R <sub>o</sub> /r <sub>s</sub> ) [if r <sub>s</sub> < R <sub>o</sub> ] or ln((R <sub>o</sub> +r <sub>s</sub> )/r <sub>s</sub> ) [if r <sub>s</sub> >= R <sub>o</sub> ]	H	h = H-s	Q <sub>ends</sub>	Q <sub>trench</sub>	Q <sub>total</sub>		
																	m <sup>3</sup> /s	L/s	L/d
		mbgs	mbgs	mbgs	m	m	m/s	m	m	m	m	-	m	m	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s	L/s	L/d
	<b>Building 1</b>	1	3.3	6.0	46	21.5	2.42E-06	2.30	10.73	5.37	10.75	0.69	5.00	2.70	0.000194	0.000367	<b>0.000562</b>	<b>0.56</b>	<b>48,539</b>
	<b>Building 2</b>	1	1.8	3.0	33	21.5	2.42E-06	0.80	7.00	3.50	10.75	0.50	2.00	1.20	0.000039	0.000058	<b>0.000097</b>	<b>0.10</b>	<b>8,400</b>
	<b>Building 3</b>	1	3.3	6.0	34	21.5	2.42E-06	2.30	10.73	5.37	10.75	0.69	5.00	2.70	0.000194	0.000272	<b>0.000466</b>	<b>0.47</b>	<b>40,260</b>

- s = target drawdown (initial - target depth to groundwater) (m)
- R<sub>o</sub> = radius of influence of construction dewatering/pumping (m)
- L = distance to line source (m)
- r<sub>s</sub> = equivalent single well radius (m)
- H = Initial hydraulic head in aquifer (m)
- h = hydraulic head at radius of well (m)
- Q = construction dewatering rate (m<sup>3</sup>/s)

Figure 6.8 Approximate analysis of long, narrow systems.

$$Q = \frac{\pi K(H^2 - h^2)}{\ln R_o/r_s} + 2 \left[ \frac{xK(H^2 - h^2)}{2L} \right] \quad (6.10b) \quad x = \text{unit length of trench}$$

$R_o = 3000 \cdot s \cdot \sqrt{K}$

Source: Kyrielleis, W. and Sichardt, W.  
 "Grundwasserabsenkung bei Fundierungsarbeiten"  
 Springer, Berlin, 1930

Source: Powers, J. Patrick, et al. "Construction dewatering and groundwater control." (2007)



Hydrogeological Assessment, 1697 Durham Regional Highway 2, Courtice  
Richard H. Gay Company Limited  
Cambium Reference: 15382-002  
January 26, 2024

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**Appendix G**  
**Water Quality Laboratory Analysis**

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Your Project #: 15382-001  
 Site Location: Courtice Seniors Apartment  
 Your C.O.C. #: 907944-01-01

**Attention: Kyle Horner**

Cambium Environmental Inc  
 194 Sophia Street  
 PO Box 325  
 Peterborough, ON  
 CANADA K9H 1E5

**Report Date: 2022/12/05**  
 Report #: R7416898  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C2Y6590**

**Received: 2022/11/24, 16:45**

Sample Matrix: Water  
 # Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
ABN Compounds in Water by GC/MS	1	2022/12/01	2022/12/02	CAM SOP-00301	EPA 8270 m
Biochemical Oxygen Demand (BOD)	1	2022/11/26	2022/12/01	CAM SOP-00427	SM 23 5210B m
Total Cyanide	1	2022/11/25	2022/11/28	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	2022/11/26	2022/11/29	CAM SOP-00449	SM 23 4500-F C m
Mercury in Water by CVA	1	2022/11/30	2022/11/30	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	1	N/A	2022/11/29	CAM SOP-00447	EPA 6020B m
E.coli, (CFU/100mL)	1	N/A	2022/11/25	CAM SOP-00552	
Total Nonylphenol in Liquids by HPLC	1	2022/11/30	2022/12/01	CAM SOP-00313	In-house Method
Nonylphenol Ethoxylates in Liquids: HPLC	1	2022/11/30	2022/12/02	CAM SOP-00313	Bureau Veritas
Animal and Vegetable Oil and Grease	1	N/A	2022/12/01	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2022/12/01	2022/12/01	CAM SOP-00326	EPA1664B m,SM5520B m
Polychlorinated Biphenyl in Water	1	2022/11/30	2022/12/01	CAM SOP-00309	EPA 8082A m
pH	1	2022/11/26	2022/11/29	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2022/11/28	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	1	N/A	2022/11/28	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	1	2022/11/28	2022/12/01	CAM SOP-00938	OMOE E3516 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2022/12/01	2022/12/01	CAM SOP-00326	EPA1664B m,SM5520F m
Total Suspended Solids	1	2022/11/29	2022/12/01	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2022/11/29	CAM SOP-00228	EPA 8260C m

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or



Your Project #: 15382-001  
Site Location: Courtice Seniors Apartment  
Your C.O.C. #: 907944-01-01

**Attention: Kyle Horner**

Cambium Environmental Inc  
194 Sophia Street  
PO Box 325  
Peterborough, ON  
CANADA K9H 1E5

**Report Date: 2022/12/05**  
Report #: R7416898  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C2Y6590**

**Received: 2022/11/24, 16:45**

implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to:

Gemarie Balatico, Project Manager  
Email: Gemarie.Balatico@bureauveritas.com  
Phone# (905)817-5787

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

BUREAU  
VERITAS

Bureau Veritas Job #: C2Y6590

Report Date: 2022/12/05

Cambium Environmental Inc

Client Project #: 15382-001

Site Location: Courtice Seniors Apartment

Sampler Initials: WY

**DURHAM SANITARY & STORM BYLAW (55-2013)**

Bureau Veritas ID				UKG169		
Sampling Date				2022/11/24 13:55		
COC Number				907944-01-01		
	UNITS	Criteria	Criteria-2	MW103-22	RDL	QC Batch
<b>Calculated Parameters</b>						
Total Animal/Vegetable Oil and Grease	mg/L	150	-	1.3	0.50	8367894
<b>Inorganics</b>						
Total BOD	mg/L	300	15	3	2	8369329
Fluoride (F-)	mg/L	10	-	0.55	0.10	8369495
Total Kjeldahl Nitrogen (TKN)	mg/L	100	1	<b>1.1</b>	0.50	8371798
pH	pH	6.0:10.5	6.0:9.0	8.30		8369496
Phenols-4AAP	mg/L	1	0.008	<0.0010	0.0010	8371770
Total Suspended Solids	mg/L	350	15	<b>9500</b>	200	8373708
Dissolved Sulphate (SO4)	mg/L	1500	-	5.2	1.0	8369664
Total Cyanide (CN)	mg/L	2	0.02	<0.0050	0.0050	8368198
<b>Petroleum Hydrocarbons</b>						
Total Oil & Grease	mg/L	-	-	1.9	0.50	8379181
Total Oil & Grease Mineral/Synthetic	mg/L	15	-	0.60	0.50	8379189
<b>Miscellaneous Parameters</b>						
Nonylphenol Ethoxylate (Total)	mg/L	0.2	-	<0.05	0.05	8375047
Nonylphenol (Total)	mg/L	0.02	-	<0.001	0.001	8375044
<b>Metals</b>						
Mercury (Hg)	mg/L	0.01	0.0004	<0.00010	0.00010	8375818
Total Aluminum (Al)	ug/L	50000	-	<b>170000</b>	250	8372587
Total Antimony (Sb)	ug/L	5000	-	<5.0	5.0	8372587
Total Arsenic (As)	ug/L	1000	20	<b>31</b>	10	8372587
Total Cadmium (Cd)	ug/L	700	8	1.7	0.90	8372587
Total Chromium (Cr)	ug/L	2000	80	<b>250</b>	50	8372587
Total Cobalt (Co)	ug/L	5000	-	100	5.0	8372587
Total Copper (Cu)	ug/L	3000	50	<b>240</b>	9.0	8372587
Total Lead (Pb)	ug/L	1000	120	110	5.0	8372587
Total Manganese (Mn)	ug/L	5000	150	<b>6900</b>	20	8372587
Total Molybdenum (Mo)	ug/L	5000	-	8.1	5.0	8372587
Total Nickel (Ni)	ug/L	2000	80	<b>210</b>	10	8372587
No Fill	No Exceedance					
Grey	Exceeds 1 criteria policy/level					
Black	Exceeds both criteria/levels					
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
Criteria: Durham Municipality Sanitary Sewer Discharge. BY-LAW No.55-2013						
Criteria-2: Durham Municipality Storm Sewer Discharge. By-Law No. 55-2013						



BUREAU  
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Bureau Veritas Job #: C2Y6590

Report Date: 2022/12/05

Cambium Environmental Inc

Client Project #: 15382-001

Site Location: Courtice Seniors Apartment

Sampler Initials: WY

**DURHAM SANITARY & STORM BYLAW (55-2013)**

Bureau Veritas ID				UKG169		
Sampling Date				2022/11/24 13:55		
COC Number				907944-01-01		
	UNITS	Criteria	Criteria-2	MW103-22	RDL	QC Batch
Total Phosphorus (P)	ug/L	10000	400	<b>9100</b>	1000	8372587
Total Selenium (Se)	ug/L	1000	20	<20	20	8372587
Total Silver (Ag)	ug/L	5000	120	0.97	0.90	8372587
Total Tin (Sn)	ug/L	5000	-	<10	10	8372587
Total Titanium (Ti)	ug/L	5000	-	<b>9000</b>	250	8372587
Total Zinc (Zn)	ug/L	2000	40	<b>680</b>	50	8372587
<b>Semivolatile Organics</b>						
Bis(2-ethylhexyl)phthalate	ug/L	12	8.8	<8.0	8.0	8379433
Di-N-butyl phthalate	ug/L	80	15	<8.0	8.0	8379433
<b>Volatile Organics</b>						
Benzene	ug/L	10	2	<0.40	0.40	8370166
Chloroform	ug/L	40	2	<0.40	0.40	8370166
1,2-Dichlorobenzene	ug/L	50	5.6	<0.80	0.80	8370166
1,4-Dichlorobenzene	ug/L	80	6.8	<0.80	0.80	8370166
cis-1,2-Dichloroethylene	ug/L	4000	5.6	<1.0	1.0	8370166
trans-1,3-Dichloropropene	ug/L	140	5.6	<0.80	0.80	8370166
Ethylbenzene	ug/L	160	2	<0.40	0.40	8370166
Methylene Chloride(Dichloromethane)	ug/L	2000	5.2	<4.0	4.0	8370166
Methyl Ethyl Ketone (2-Butanone)	ug/L	8000	-	<20	20	8370166
Styrene	ug/L	200	-	<0.80	0.80	8370166
1,1,1,2-Tetrachloroethane	ug/L	1400	17	<0.80	0.80	8370166
Tetrachloroethylene	ug/L	1000	4.4	<0.40	0.40	8370166
Toluene	ug/L	270	2	<0.40	0.40	8370166
Trichloroethylene	ug/L	400	8	<0.40	0.40	8370166
p+m-Xylene	ug/L	-	-	<0.40	0.40	8370166
o-Xylene	ug/L	-	-	<0.40	0.40	8370166
Total Xylenes	ug/L	1400	4.4	<0.40	0.40	8370166
<b>PCBs</b>						
Total PCB	ug/L	1	0.4	<0.2	0.2	8375636
No Fill	No Exceedance					
Grey	Exceeds 1 criteria policy/level					
Black	Exceeds both criteria/levels					
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
Criteria: Durham Municipality Sanitary Sewer Discharge. BY-LAW No.55-2013						
Criteria-2: Durham Municipality Storm Sewer Discharge. By-Law No. 55-2013						



**BUREAU  
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Bureau Veritas Job #: C2Y6590

Report Date: 2022/12/05

Cambium Environmental Inc

Client Project #: 15382-001

Site Location: Courtice Seniors Apartment

Sampler Initials: WY

### DURHAM SANITARY & STORM BYLAW (55-2013)

Bureau Veritas ID				UKG169		
Sampling Date				2022/11/24 13:55		
COC Number				907944-01-01		
	UNITS	Criteria	Criteria-2	MW103-22	RDL	QC Batch
<b>Microbiological</b>						
Escherichia coli	CFU/100mL	-	200	<10	10	8369063
<b>Surrogate Recovery (%)</b>						
2,4,6-Tribromophenol	%	-	-	1.9 (1)		8379433
2-Fluorobiphenyl	%	-	-	64		8379433
2-Fluorophenol	%	-	-	3.3 (1)		8379433
D14-Terphenyl	%	-	-	81		8379433
D5-Nitrobenzene	%	-	-	78		8379433
D5-Phenol	%	-	-	0.00 (1)		8379433
Decachlorobiphenyl	%	-	-	60		8375636
4-Bromofluorobenzene	%	-	-	92		8370166
D4-1,2-Dichloroethane	%	-	-	111		8370166
D8-Toluene	%	-	-	100		8370166
No Fill	No Exceedance					
Grey	Exceeds 1 criteria policy/level					
Black	Exceeds both criteria/levels					
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
Criteria: Durham Municipality Sanitary Sewer Discharge. BY-LAW No.55-2013						
Criteria-2: Durham Municipality Storm Sewer Discharge. By-Law No. 55-2013						
(1) Surrogate recovery was below our acceptance limit. Since the surrogate standard is not relevant to the analysis of the required phthalate esters, it has been evaluated as having no significant effect on the data reported.						



**BUREAU  
VERITAS**

Bureau Veritas Job #: C2Y6590

Report Date: 2022/12/05

Cambium Environmental Inc

Client Project #: 15382-001

Site Location: Courtice Seniors Apartment

Sampler Initials: WY

## TEST SUMMARY

**Bureau Veritas ID:** UKG169  
**Sample ID:** MW103-22  
**Matrix:** Water

**Collected:** 2022/11/24  
**Shipped:**  
**Received:** 2022/11/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
ABN Compounds in Water by GC/MS	GC/MS	8379433	2022/12/01	2022/12/02	Anh Lieu
Biochemical Oxygen Demand (BOD)	DO	8369329	2022/11/26	2022/12/01	Nusrat Naz
Total Cyanide	SKAL/CN	8368198	2022/11/25	2022/11/28	Chloe Pollock
Fluoride	ISE	8369495	2022/11/26	2022/11/29	Kien Tran
Mercury in Water by CVAA	CV/AA	8375818	2022/11/30	2022/11/30	Japneet Gill
Total Metals Analysis by ICPMS	ICP/MS	8372587	N/A	2022/11/29	Arefa Dabhad
E.coli, (CFU/100mL)	PL	8369063	N/A	2022/11/25	Farhana Rahman
Total Nonylphenol in Liquids by HPLC	LC/FLU	8375044	2022/11/30	2022/12/01	Dennis Boodram
Nonylphenol Ethoxylates in Liquids: HPLC	LC/FLU	8375047	2022/11/30	2022/12/02	Dennis Boodram
Animal and Vegetable Oil and Grease	BAL	8367894	N/A	2022/12/01	Automated Statchk
Total Oil and Grease	BAL	8379181	2022/12/01	2022/12/01	Navneet Singh
Polychlorinated Biphenyl in Water	GC/ECD	8375636	2022/11/30	2022/12/01	Svitlana Shaula
pH	AT	8369496	2022/11/26	2022/11/29	Kien Tran
Phenols (4AAP)	TECH/PHEN	8371770	N/A	2022/11/28	Mandeep Kaur
Sulphate by Automated Colourimetry	KONE	8369664	N/A	2022/11/28	Samuel Law
Total Kjeldahl Nitrogen in Water	SKAL	8371798	2022/11/28	2022/12/01	Jency Sara Johnson
Mineral/Synthetic O & G (TPH Heavy Oil)	BAL	8379189	2022/12/01	2022/12/01	Navneet Singh
Total Suspended Solids	BAL	8373708	2022/11/29	2022/12/01	Masood Siddiqui
Volatile Organic Compounds in Water	GC/MS	8370166	N/A	2022/11/29	Manpreet Sarao





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VERITAS

Bureau Veritas Job #: C2Y6590  
Report Date: 2022/12/05

Cambium Environmental Inc  
Client Project #: 15382-001  
Site Location: Courtice Seniors Apartment  
Sampler Initials: WY

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.7°C
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Sample UKG169 [MW103-22] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

PCB analysis: Due to the nature of the sample matrix, a smaller portion of the sample was extracted. DLs were adjusted accordingly.

Nonylphenol and Nonylphenol Ethoxylates Analysis:

Due to background interference, sample required dilution. The Detection limit was adjusted accordingly.

ABN analysis: Due to the nature of the sample matrix, a smaller than usual portion of the sample was used for extraction. Detection limits were adjusted accordingly.

**Results relate only to the items tested.**

BUREAU  
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Bureau Veritas Job #: C2Y6590

Report Date: 2022/12/05

## QUALITY ASSURANCE REPORT

Cambium Environmental Inc

Client Project #: 15382-001

Site Location: Courtice Seniors Apartment

Sampler Initials: WY

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8370166	4-Bromofluorobenzene	2022/11/28	95	70 - 130	92	70 - 130	92	%				
8370166	D4-1,2-Dichloroethane	2022/11/28	115	70 - 130	112	70 - 130	110	%				
8370166	D8-Toluene	2022/11/28	102	70 - 130	103	70 - 130	102	%				
8375636	Decachlorobiphenyl	2022/12/01	70	60 - 130	77	60 - 130	79	%				
8379433	2,4,6-Tribromophenol	2022/12/02	93	10 - 130	91	10 - 130	31	%				
8379433	2-Fluorobiphenyl	2022/12/02	44	30 - 130	67	30 - 130	65	%				
8379433	2-Fluorophenol	2022/12/02	28	10 - 130	45	10 - 130	14	%				
8379433	D14-Terphenyl	2022/12/02	88	30 - 130	86	30 - 130	91	%				
8379433	D5-Nitrobenzene	2022/12/02	49	30 - 130	73	30 - 130	72	%				
8379433	D5-Phenol	2022/12/02	22	10 - 130	30	10 - 130	16	%				
8368198	Total Cyanide (CN)	2022/11/28	102	80 - 120	97	80 - 120	<0.0050	mg/L	NC	20		
8369329	Total BOD	2022/12/01					<2	mg/L	8.3	30	92	80 - 120
8369495	Fluoride (F-)	2022/11/29	84	80 - 120	102	80 - 120	<0.10	mg/L	0	20		
8369496	pH	2022/11/29			102	98 - 103			0.48	N/A		
8369664	Dissolved Sulphate (SO4)	2022/11/28	122	75 - 125	95	80 - 120	<1.0	mg/L	0.13	20		
8370166	1,1,2,2-Tetrachloroethane	2022/11/29	103	70 - 130	100	70 - 130	<0.40	ug/L	NC	30		
8370166	1,2-Dichlorobenzene	2022/11/29	95	70 - 130	100	70 - 130	<0.40	ug/L	NC	30		
8370166	1,4-Dichlorobenzene	2022/11/29	106	70 - 130	113	70 - 130	<0.40	ug/L	NC	30		
8370166	Benzene	2022/11/29	89	70 - 130	91	70 - 130	<0.20	ug/L	NC	30		
8370166	Chloroform	2022/11/29	95	70 - 130	98	70 - 130	<0.20	ug/L	NC	30		
8370166	cis-1,2-Dichloroethylene	2022/11/29	99	70 - 130	101	70 - 130	<0.50	ug/L	NC	30		
8370166	Ethylbenzene	2022/11/29	87	70 - 130	91	70 - 130	<0.20	ug/L	NC	30		
8370166	Methyl Ethyl Ketone (2-Butanone)	2022/11/29	115	60 - 140	111	60 - 140	<10	ug/L	NC	30		
8370166	Methylene Chloride(Dichloromethane)	2022/11/29	99	70 - 130	99	70 - 130	<2.0	ug/L	NC	30		
8370166	o-Xylene	2022/11/29	89	70 - 130	91	70 - 130	<0.20	ug/L	NC	30		
8370166	p+m-Xylene	2022/11/29	89	70 - 130	93	70 - 130	<0.20	ug/L	NC	30		
8370166	Styrene	2022/11/29	95	70 - 130	98	70 - 130	<0.40	ug/L	NC	30		
8370166	Tetrachloroethylene	2022/11/29	82	70 - 130	86	70 - 130	<0.20	ug/L	NC	30		
8370166	Toluene	2022/11/29	88	70 - 130	92	70 - 130	<0.20	ug/L	NC	30		
8370166	Total Xylenes	2022/11/29					<0.20	ug/L	NC	30		
8370166	trans-1,3-Dichloropropene	2022/11/29	88	70 - 130	99	70 - 130	<0.40	ug/L	NC	30		

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Bureau Veritas Job #: C2Y6590

Report Date: 2022/12/05

## QUALITY ASSURANCE REPORT(CONT'D)

Cambium Environmental Inc

Client Project #: 15382-001

Site Location: Courtice Seniors Apartment

Sampler Initials: WY

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8370166	Trichloroethylene	2022/11/29	90	70 - 130	94	70 - 130	<0.20	ug/L	NC	30		
8371770	Phenols-4AAP	2022/11/28	99	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20		
8371798	Total Kjeldahl Nitrogen (TKN)	2022/11/30	101	80 - 120	104	80 - 120	<0.10	mg/L	NC	20	108	80 - 120
8372587	Total Aluminum (Al)	2022/11/29	107	80 - 120	100	80 - 120	<4.9	ug/L	7.1	20		
8372587	Total Antimony (Sb)	2022/11/29	107	80 - 120	103	80 - 120	<0.50	ug/L	NC	20		
8372587	Total Arsenic (As)	2022/11/29	101	80 - 120	102	80 - 120	<1.0	ug/L	NC	20		
8372587	Total Cadmium (Cd)	2022/11/29	99	80 - 120	100	80 - 120	<0.090	ug/L	NC	20		
8372587	Total Chromium (Cr)	2022/11/29	96	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
8372587	Total Cobalt (Co)	2022/11/29	98	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
8372587	Total Copper (Cu)	2022/11/29	101	80 - 120	102	80 - 120	<0.90	ug/L	13	20		
8372587	Total Lead (Pb)	2022/11/29	94	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
8372587	Total Manganese (Mn)	2022/11/29	97	80 - 120	99	80 - 120	<2.0	ug/L	0.62	20		
8372587	Total Molybdenum (Mo)	2022/11/29	100	80 - 120	95	80 - 120	<0.50	ug/L	2.8	20		
8372587	Total Nickel (Ni)	2022/11/29	95	80 - 120	101	80 - 120	<1.0	ug/L	2.6	20		
8372587	Total Phosphorus (P)	2022/11/29	100	80 - 120	100	80 - 120	<100	ug/L				
8372587	Total Selenium (Se)	2022/11/29	99	80 - 120	104	80 - 120	<2.0	ug/L	NC	20		
8372587	Total Silver (Ag)	2022/11/29	94	80 - 120	98	80 - 120	<0.090	ug/L	NC	20		
8372587	Total Tin (Sn)	2022/11/29	105	80 - 120	101	80 - 120	<1.0	ug/L				
8372587	Total Titanium (Ti)	2022/11/29	104	80 - 120	98	80 - 120	<5.0	ug/L	4.3	20		
8372587	Total Zinc (Zn)	2022/11/29	96	80 - 120	103	80 - 120	<5.0	ug/L	0.43	20		
8373708	Total Suspended Solids	2022/12/01					<10	mg/L	NC	20	97	85 - 115
8375044	Nonylphenol (Total)	2022/11/30	94	50 - 130	94	50 - 130	<0.001	mg/L	NC	40		
8375047	Nonylphenol Ethoxylate (Total)	2022/11/30	93	50 - 130	99	50 - 130	<0.025	mg/L	NC	40		
8375636	Total PCB	2022/12/01	73	60 - 130	79	60 - 130	<0.05	ug/L	NC	40		
8375818	Mercury (Hg)	2022/11/30	106	75 - 125	106	80 - 120	<0.00010	mg/L	NC	20		
8379181	Total Oil & Grease	2022/12/01			99	85 - 115	<0.50	mg/L	0.51	25		
8379189	Total Oil & Grease Mineral/Synthetic	2022/12/01			97	85 - 115	<0.50	mg/L	0.52	25		
8379433	Bis(2-ethylhexyl)phthalate	2022/12/02	95	30 - 130	108	30 - 130	<2.0	ug/L	NC	40		



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Bureau Veritas Job #: C2Y6590

Report Date: 2022/12/05

## QUALITY ASSURANCE REPORT(CONT'D)

Cambium Environmental Inc

Client Project #: 15382-001

Site Location: Courtice Seniors Apartment

Sampler Initials: WY

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8379433	Di-N-butyl phthalate	2022/12/02	85	30 - 130	102	30 - 130	<2.0	ug/L	NC	40		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference  $\leq 2x$  RDL).



BUREAU  
VERITAS

Bureau Veritas Job #: C2Y6590

Report Date: 2022/12/05

Cambium Environmental Inc

Client Project #: 15382-001

Site Location: Courtice Seniors Apartment

Sampler Initials: WY

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Anastassia Hamanov, Scientific Specialist



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Farhana Rahman, Senior Analyst

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by {0}, {1} responsible for {2} {3} laboratory operations.



Bureau Veritas  
 6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: (905) 817-5700 Toll-free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

REC'D IN PORT HOPE

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name: #17950 Cambium Environmental Inc		Company Name: Kyle Horner		Quotation #: C21984		Bureau Veritas Job #:	
Attention: ACCOUNTS PAYABLE		Attention: Kyle Horner		P.O. #:		Bottle Order #:	
Address: 194 Sophia Street PO Box 325		Address:		Project: 15382-001		COC #:	
Peterborough ON K9H 1E5				Project Name:		Project Manager:	
Tel: (705) 742-7900 Fax: (705) 742-7907		Tel: (613) 876-4516 Fax:		Site #:		Gemarie Balatico	
Email: accounting@cambium-inc.com		Email: kyle.horner@cambium-inc.com		Sampled By: Warren Young		C#907944-01-01	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY					ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required: Please provide advance notice for rush projects					
Regulation 153 (2011)			Other Regulations			Special Instructions	Field Filtered (please circle): Metals / Hg / Cr / V	Durham Sanitary & Storm Bylaw (S-2013)											Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.	
<input type="checkbox"/> Table 1	<input type="checkbox"/> Res/Park	<input type="checkbox"/> Medium/Fine	<input type="checkbox"/> CCME	<input type="checkbox"/> Sanitary Sewer Bylaw																<input checked="" type="checkbox"/>
<input type="checkbox"/> Table 2	<input type="checkbox"/> Ind/Comm	<input type="checkbox"/> Coarse	<input type="checkbox"/> Reg 555	<input type="checkbox"/> Storm Sewer Bylaw																
<input type="checkbox"/> Table 3	<input type="checkbox"/> Agri/Other	<input type="checkbox"/> For RSC	<input type="checkbox"/> MISA	Municipality _____																
<input type="checkbox"/> Table _____			<input type="checkbox"/> PWQO	<input type="checkbox"/> Reg 405 Table _____																
Include Criteria on Certificate of Analysis (Y/N)?															Job Specific Rush TAT (if applies to entire submission) Date Required: _____ Time Required: _____ Rush Confirmation Number: _____ (call lab for #)					
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix											# of Bottles	Comments				
	MW 103-22	Nov 24/22	1:55	W	N	X														
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

24-Nov-22 16:45  
 Gemarie Balatico  
  
 C2Y6590  
 KTN ENV-1111

* RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
<i>Warren Young</i>		22/11/24	16:30	<i>Kyle Horner</i>		22/11/24	16:45		Time Sensitive	Temperature (°C) on Recept	Custody Seal Present	Yes	No
				<i>Z V T RINTA</i>		22/11/25	09:00			6, 8, 9 on ice	Intact	<input checked="" type="checkbox"/>	<input type="checkbox"/>

\* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.  
 \* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.  
 \*\* SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

White: Bureau Veritas Yellow: Client  
 3/2/2



BUREAU  
VERITAS

Bureau Veritas Job #: C2Y6590

Report Date: 2022/12/05

Cambium Environmental Inc

Client Project #: 15382-001

Site Location: Courtice Seniors Apartment

Sampler Initials: WY

### Exceedance Summary Table – Durham Sanitary Sewer

#### Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
MW103-22	UKG169-07	Total Aluminum (Al)	50000	170000	250	ug/L
MW103-22	UKG169-07	Total Manganese (Mn)	5000	6900	20	ug/L
MW103-22	UKG169-06	Total Suspended Solids	350	9500	200	mg/L
MW103-22	UKG169-07	Total Titanium (Ti)	5000	9000	250	ug/L

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

### Exceedance Summary Table – Durham Storm Sewer

#### Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
MW103-22	UKG169-07	Total Arsenic (As)	20	31	10	ug/L
MW103-22	UKG169-07	Total Chromium (Cr)	80	250	50	ug/L
MW103-22	UKG169-07	Total Copper (Cu)	50	240	9.0	ug/L
MW103-22	UKG169-10	Total Kjeldahl Nitrogen (TKN)	1	1.1	0.50	mg/L
MW103-22	UKG169-07	Total Manganese (Mn)	150	6900	20	ug/L
MW103-22	UKG169-07	Total Nickel (Ni)	80	210	10	ug/L
MW103-22	UKG169-07	Total Phosphorus (P)	400	9100	1000	ug/L
MW103-22	UKG169-06	Total Suspended Solids	15	9500	200	mg/L
MW103-22	UKG169-07	Total Zinc (Zn)	40	680	50	ug/L

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.



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## Appendix H

# Water Balance Calculations

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# Pre- and Post-Development Water Balance Calculations

## 1697 Durham Regional Highway 2, Courtice, ON

### 1 Climate Information

Precipitation	872 mm/yr
Actual Evapotranspiration	548 mm/yr
Water Surplus	324 mm/yr

### 2 Infiltration Rates

Table 2 Approach - Infiltration factors

Topography: Flat to Gently Sloping Land	0.3
Soil Type: medium combinations of clay and loam	0.2
Cover: Cultivated land	0.1
<b>Total Infiltration Factor</b>	<b>0.6</b>

Infiltration (Water Surplus * Infiltration Factor)	<b>194 mm/yr</b>
Run-off (Water Surplus - Infiltration)	<b>130 mm/yr</b>

Table 3 Approach - Typical Recharge Rates

Coarse Sand and Gravel	>250	mm/yr
Fine to medium sand	200-250	mm/yr
Silty sand to sandy silt	150-200	mm/yr
Silt	125-150	mm/yr
Clayey Silt	100- 125	mm/yr
Clay	<100	mm/yr

Site development area is underlain predominantly by sand and silty sand with gravel and trace clay.

Based on the above, the recharge rate is typically 150-200 mm/yr

### 3 Pre-Development Property Statistics

	ha	m <sup>2</sup>
Total Paved Area	0.14	1,424
Total Roof Area	0.02	225
Total Landscape Area	0.77	7,701
<b>Total</b>	<b>0.93</b>	<b>9,349</b>

### 4 Post-Development Property Statistics

	ha	m <sup>2</sup>
Total Paved Area	0.48	4,752
Total Roof Area	0.23	2,275
Total Landscape Area	0.23	2,323
<b>Total</b>	<b>0.93</b>	<b>9,349</b>





# Pre- and Post-Development Water Balance Calculations

1697 Durham Regional Highway 2, Courtice, ON

## 5 Pre-Development Water Balance

Land Use		Area (m <sup>2</sup> )	Precipitation (m <sup>3</sup> )	Evapotranspiration (m <sup>3</sup> )	Infiltration (m <sup>3</sup> )	Run-off (m <sup>3</sup> )
Impervious Areas	Paved Area	1,424	1,241	124	-	1,117
	Roof Area	225	196	20	-	177
Pervious Areas	Landscape Area	7,701	6,714	4,220	1,497	998
<b>Totals</b>		<b>9,349</b>	<b>8,152</b>	<b>4,364</b>	<b>1,497</b>	<b>2,291</b>

Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.

## 6 Post-Development Water Balance

Land Use		Area (m <sup>2</sup> )	Precipitation (m <sup>3</sup> )	Evapotranspiration (m <sup>3</sup> )	Infiltration (m <sup>3</sup> )	Run-off (m <sup>3</sup> )
Impervious Areas	Paved Area	4,752	4,143	414	-	3,729
	Roof Area	2,275	1,984	198	-	1,785
Pervious Areas	Landscape Area	2,323	2,025	1,273	451	301
<b>Totals</b>		<b>9,349</b>	<b>8,152</b>	<b>1,885</b>	<b>451</b>	<b>5,815</b>

Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.

## 7 Comparison of Pre- and Post -Development

	Precipitation (m <sup>3</sup> )	Evapotranspiration (m <sup>3</sup> )	Infiltration (m <sup>3</sup> )	Run-off (m <sup>3</sup> )
Pre-Development	8,152	4,364	1,497	2,291
Post-Development	8,152	1,885	451	5,815
Change in Volume	-	-	2,478	3,523
Change in %	-	-	57	154

## 8 Requirement for Infiltration of Roof Run-off

Volume of Pre-Development Infiltration (m <sup>3</sup> /yr)	1,497
Volume of Post-Development Infiltration (m <sup>3</sup> /yr)	451
Deficit from Pre to Post Development Infiltration (m <sup>3</sup> /yr)	1,045
Percentage of Roof Runoff required to match the pre-development infiltration (%)	59