



# Geotechnical Investigation Report

## 24 Alfred Street West Thornbury, Ontario

Cambium Reference No.: 13303-001

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Prepared for: Pheasant Run Realty Holdings Inc.



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Cambium Inc.

135 Bayfield Street, Suite 102  
Barrie, Ontario, L4M 3B3

Telephone: (866) 217.7900

Facsimile: (705) 742.7907

[cambium-inc.com](http://cambium-inc.com)

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## **1.0 INTRODUCTION**

Cambium Inc. (Cambium) was retained by Pheasant Run Realty Holdings Inc. (Client) to complete a geotechnical investigation in support of the proposed residential development located at 24 Alfred Street West, Thornbury, Ontario (Site).

The property is approximately 1.1 hectares (ha) in size and currently consists parkland with partial tree coverage. At the time of writing, it is understood that the proposed residential development will subdivide the property with up to 14 residential lots, a SWM facility, access road and associated infrastructure. The geotechnical investigation was required to determine the subsurface conditions at the Site to provide geotechnical design parameters as input into the design and construction of the proposed residential development. A Site Plan, including borehole locations, is included as Figure 1 of this report.

This report presents the methodology and findings of the geotechnical investigation to determine the subsurface soil and groundwater conditions and provide design recommendations. Based on the results of this investigation, the report provides geotechnical engineering recommendations pertaining to the proposed development including soil bearing capacity, excavations, backfill and compaction, and groundwater elevations and dewatering.

It is noted that a Phase II Environmental Site Assessment (ESA) was carried out concurrently with the geotechnical investigation and the results are provided under a separate cover.

## 2.0 METHODOLOGY

### 2.1 BOREHOLE INVESTIGATION

A borehole investigation was conducted on August 27<sup>th</sup>, 2021 to assess subsurface conditions at the Site. A total of four boreholes, designated as BH101-21 through BH104-21, were advanced throughout the Site. All boreholes were terminated at depths ranged between 5.0 m below ground surface (mbgs) and 6.1 mbgs. All of the boreholes were advanced within/close to the footprint of the proposed building structures and BH102-21 was advanced as close to the proposed SWM facility as possible.

The borehole locations and elevations were surveyed using a Sokkia RTK GPS system. The borehole elevations were tied into the ground surface elevation of the rim EX SANMH1, which was assigned an elevation of 197.27 metres above sea level (mASL) as per the concept servicing plan CSP-1 by Tatham Engineering Limited (Tatham). The borehole UTMs and elevations are provided on the borehole logs in Appendix A. Borehole locations are shown on Figure 1.

Drilling and sampling was completed using a track-mounted drill rig, under the supervision of a Cambium Geotechnical Analyst. The boreholes were advanced to the pre-determined depths by means of continuous flight hollow stem augers with 50 mm O.D. split spoon samplers. Standard Penetration Test (SPT) N values were recorded for the sampled intervals as the number of blows required to drive a split spoon (SS) sampler 305 mm into the soil using a 63.5 kg drop hammer falling 750 mm, as per ASTM D1586 procedures. Soil samples were collected at 0.75 m intervals from 0 to 3 m and at 1.5 m intervals after 3 m. The encountered soil units were logged in the field using visual and tactile methods, and samples were placed in labelled plastic bags for transport, future reference, laboratory testing, and storage. Open boreholes were checked for groundwater and general stability prior to backfilling.

Borehole BH102-21 was outfitted with a monitoring well to determine the static groundwater elevation within the proposed SWM facility.

Borehole logs are provided in Appendix A. Site soil and groundwater conditions are described, and geotechnical recommendations are discussed in the following sections of this report.

### 2.2 PHYSICAL LABORATORY TESTING

Physical laboratory testing, including three sieve and hydrometer analyses (LS-702, 705), was completed on selected soil samples to confirm textural classification and to assess geotechnical parameters. Natural moisture content testing (LS-701) was completed on all retrieved soil samples. Results are presented in Appendix B and are discussed in Section 3.0.

### 3.0 SUBSURFACE CONDITIONS

Based on the results of the borehole investigation, the subsurface conditions at the site consist of a surficial layer of topsoil overlying brown silty sand, which overlies a brown to grey silt to clayey silt in all the borehole locations to the termination depths ranged between 5.0 mbgs and 6.1 mbgs. The boreholes were terminated in native soils and bedrock was not encountered within the investigation depths.

The borehole locations are shown on Figure 1 and the individual soil units are described in detail below and provided in detail on the borehole logs in Appendix A.

#### 3.1 TOPSOIL

A layer of black organic rich topsoil was observed at the surface of all boreholes throughout the Site and was  $\pm 100$  mm thick in all borehole locations. This layer was moist at the time of the investigation with a natural moisture content ranging from 14.5% to 25.7% based on laboratory testing.

#### 3.2 SILTY SAND

Beneath the topsoil in all borehole locations, a layer of silty sand was encountered. The soil was brown in colour and contained varying amounts of silt, trace clay and extended to depths of 0.8 mbgs in boreholes BH102-21 and BH103-21 and 1.5 mbgs in boreholes BH101-21 and BH104-21, respectively. Based on the SPT N values between 3 and 11, the relative density of the granular soil is generally considered to be very loose to compact. The natural moisture content of the ranges between 8% and 21.6% based on laboratory testing and was described as moist at the time of the investigation.

Laboratory particle size distribution analyses were completed for two samples of this soil layer to identify the soil texture. The testing results are provided in Appendix B and are summarized in Table 1 based on the Unified Soils Classification System (USCS).

**Table 1 Particle Size Distribution – Silty Sand**

| Borehole     | Depth (mbgs) | Description           | % Gravel | % Sand | % Silt | % Clay | % Moisture content |
|--------------|--------------|-----------------------|----------|--------|--------|--------|--------------------|
| BH101-21 SS2 | 0.8 – 1.2    | Silty Sand trace Clay | 0        | 67     | 26     | 7      | 21.6               |

#### 3.3 SILT TO CLAYEY SILT

Underlying the silty sand, a layer of brown to grey silt soil was encountered in all the boreholes advanced at the site. This soil material extended to the borehole termination depth between 4.6 mbgs and 6.1 mbgs. The layer was found to contain varying amounts of clay, trace sand. The SPT N values ranged between 11 and 50 blows per 125 mm of penetration, indicative of a stiff to very hard consistency. The soil was described as moist during

the investigation and was found to have a natural moisture content between 6.9% and 19.9% based on laboratory testing.

Laboratory particle size distribution analyses were completed for two samples of the silt to identify the soil texture and the testing results are provided in Appendix B and are summarized in Table 2.

**Table 2 Particle Size Distribution – Silt to Clayey Silt**

| Borehole     | Depth (mbgs) | Description               | % Gravel | % Sand | % Silt | % Clay | % Moisture content |
|--------------|--------------|---------------------------|----------|--------|--------|--------|--------------------|
| BH102-21 SS2 | 0.8 – 1.2    | Clayey Silt trace Sand    | 0        | 2      | 78     | 20     | 17.2               |
| BH103-21 SS4 | 2.3 – 2.7    | Silt some Clay trace Sand | 0        | 1      | 80     | 19     | 13.9               |

### 3.4 BEDROCK

Bedrock was not confirmed within the investigation depths, all boreholes were terminated in native soils at the pre-determined depth ranged between 4.6 and 6.1 mbgs. The elevation of each borehole and the respective termination depths are provided in Table 3.

**Table 3 Borehole Termination Depth – Elevations**

| Borehole | Borehole Elevation (mASL) | Borehole Termination Depth (mbgs) | Borehole Termination Elevation (mASL) |
|----------|---------------------------|-----------------------------------|---------------------------------------|
| BH101-21 | 198.41                    | 6.1                               | 192.31                                |
| BH102-21 | 197.26                    | 5.0                               | 192.26                                |
| BH103-21 | 197.42                    | 6.1                               | 191.32                                |
| BH104-21 | 199.07                    | 6.1                               | 192.97                                |

### 3.5 GROUNDWATER

Groundwater (free water) and caving (sloughing) was not noted in any boreholes during the investigation. Borehole BH102-21 was outfitted as a monitoring well and groundwater was recorded on September 7<sup>th</sup>, 2021. The groundwater and caving observations are summarized in Table 4. Grey soils, indicating constant saturation, were observed at depths above than the measured water level during the borehole investigation, indicating that the water table measured in September may be seasonally lower than at other times of the year.

The moisture content of the soils generally ranged from 6.9% to 21.6%.

**Table 4 Groundwater and Caving Observations**

| Date                                              | Borehole ID | Borehole Elevation (m) | Depth to Groundwater (mbgs) | Groundwater Elevation (mASL) | Caving Depth (mbgs) |
|---------------------------------------------------|-------------|------------------------|-----------------------------|------------------------------|---------------------|
| August 27 <sup>th</sup> , 2021 (Date of Drilling) | BH101-21    | 198.41                 | Dry                         | -                            | Open                |
|                                                   | BH102-21    | 197.26                 | Dry                         | -                            | . <sup>1</sup>      |
|                                                   | BH103-21    | 197.42                 | Dry                         | -                            | Open                |
|                                                   | BH104-21    | 199.07                 | Dry                         | -                            | Open                |
| September 7 <sup>th</sup> , 2021                  | BH101-21    | 198.41                 | -                           | -                            | -                   |
|                                                   | BH102-21    | 197.26                 | -                           | 4.00                         | 193.26              |
|                                                   | BH103-21    | 197.42                 | -                           | -                            | -                   |
|                                                   | BH104-21    | 199.07                 | -                           | -                            | -                   |

<sup>1</sup> Borehole outfitted as monitoring well.

It should be noted that soil moisture and groundwater levels at the Site may fluctuate seasonally and in response to climatic events.

## 4.0 GEOTECHNICAL CONSIDERATIONS

The following preliminary discussion and recommendations are based on the factual data obtained from this investigation and are intended for use by the owner and the design engineer. Contractors bidding or providing services on this project should review the factual data and determine their own conclusions regarding the construction methods and scheduling. It is possible that subsurface conditions beyond the borehole locations may vary from those observed. If significant variations are found before or during construction, Cambium should be contacted so that we can reassess our findings, if necessary.

This report has been prepared on the assumption that the design features relevant to the geotechnical analysis will be completed in accordance with applicable codes, standards, and guidelines of practice. If there are changes to the site development features, or there are significant variations in the subsurface conditions that are found before or during construction, Cambium should be retained to review the implications of these changes with respect to the contents of this report.

It is understood the proposed lots may contain basements below grade. The depth of the basements are dependent on the depth of the proposed services and associated grading plan.

### 4.1 SITE PREPARATION

The existing topsoil/organic material and any deleterious material (i.e. construction debris, fibrous material, etc.) encountered should be excavated and removed beneath the proposed development area; additionally this material should be excavated and removed to a minimum distance of 3 m around the building footprints. Given the number of mature trees observed at the property, Cambium recommends contractors make an allowance for encountering potential deep root systems within the native soils during construction which may lead to over-excavation works.

The exposed subgrade should be proof-rolled and inspected by a qualified geotechnical engineer prior to placement of any granular fill or foundations. Any loose/soft soils identified at the time of proof-rolling that are unable to uniformly be compacted should be sub-excavated and removed. The excavations created through the removal of these materials should be backfilled with approved engineered fill consistent with the recommendations provided herein.

The near surface soils can be very unstable if they are wet or saturated. Such conditions are common in the spring and late fall. Under these conditions, temporary use of granular fill, and possible reinforcing geotextiles, may be required to prevent severe rutting on construction access routes.

## **4.2 FROST PENETRATION**

Based on climate data and design charts, the maximum frost penetration depth below the surface at the site is estimated at 1.4 mbgs.

Exterior footings for the proposed structures should be situated at or below this depth for frost penetration or should be appropriately protected.

It is assumed that the pavement structure thickness will be less than 1.4 m, so grading and drainage are important for good pavement performance and life expectancy. Any services should be located below this depth or be appropriately insulated.

## **4.3 EXCAVATIONS AND SHORING**

All excavations must be carried out in accordance with the latest edition of the Occupational Health and Safety Act (OHSA). The generally very loose to compact sand may be classified as Type 3 soils above the groundwater table in accordance with OHSA. Type 3 soils may be excavated with unsupported side slopes no steeper than 1H:1V. If the groundwater table is encountered during construction, below the groundwater table the soils may be classified as Type 4 soils and may be excavated with unsupported side slopes no steeper than 3H:1V or adequately shored.

Excavation side slopes should be protected from exposure to precipitation and associated ground surface runoff and should be inspected regularly for signs of instability. If localized instability is noted during excavation or if wet conditions are encountered, the side slopes should be flattened as required to maintain safe working conditions or the excavation sidewalls must be fully supported (shored).

## **4.4 DEWATERING**

The groundwater table was encountered across the site and appeared to vary in depth. The groundwater measurements from the monitoring well are provided in Table 4 and indicate that the groundwater table was observed at approximately 193.26 mASL on September 7, 2021. It should be noted that the elevation of the groundwater table will vary due to seasonal conditions and in response to heavy precipitation events, further, perched groundwater conditions may exist during seasonal wet periods.

It is anticipated that most of the excavations will be above the groundwater elevation based on the groundwater measurements during our investigation. If some groundwater seepage is encountered, it should be manageable using filtered sumps and pumps within the excavations. A Permit to Take Water (PTTW) or registration on the Environmental Activity and Sector Registry (EASR) through the Ministry of the Environment Conservation and Parks (MOECP) will not be required as pumping rates should not exceed 50,000 L/day.

## 4.5 BACKFILL AND COMPACTION

Excavated topsoil or organic soil from the Site is not appropriate for use as fill below grading areas. Excavated sand soils not containing organics may be appropriate for use as fill below grading areas, provided that the actual or adjusted moisture content at the time of construction is within a range that permits compaction to required densities. Some moisture content adjustments may be required depending upon seasonal conditions.

Foundation wall and any buried utility backfill material should consist of free-draining granular material. existing sand soils at the site can be considered free draining and would be acceptable as foundation wall backfill or a well-graded Granular B Type I material complying with OPSS 1010 could be used. The fill should be placed in maximum 300 mm thick loose lifts and should be compacted to 98% of standard Proctor maximum dry density (SPMDD) within the foundation walls, and 95% of SPMDD on the exterior of the foundation.

The backfill material, if any, in the upper 300 mm below the pavement subgrade elevation should be compacted to 100% of SPMDD in all areas.

Geotechnical inspections and testing of engineered fill are required to confirm acceptable quality. Geotechnical inspections and testing of engineered fill are required to confirm acceptable quality.

### 4.5.1 ENGINEERED FILL

Any engineered fill below foundations should be placed in lifts appropriate to the type of compaction equipment used and be compacted to a minimum of 100% of SPMDD, as confirmed by nuclear densometer testing. If native soils from the site are not used as engineered fill, imported material for engineered fill should consist of clean, non-organic soils, free of chemical contamination or deleterious material. The moisture content of the engineered fill will need to be close enough to optimum at the time of placement to allow for adequate compaction. Consideration could be given to using a material meeting the specifications of OPSS 1010 Granular B Type II material near the water table

When the fill is treated as an engineered fill to support structural elements such as foundations and/or floor slabs the following is recommended for the construction of engineered fill:

- I. Remove any and all existing vegetation, surficial topsoil/ organics, organic fills or fills and any loose soils to a competent subgrade for a suitable building footprint;
- II. As a minimum, the area of the engineered fill should extend horizontally 1 m beyond the outside edge of the foundations then extend downward at a 1H:1V slope to the competent native soils;
- III. The subgrade or base of the engineered fill area must be approved by Cambium prior to placement of any new fill, to ensure that suitability of subgrade condition;

- IV. Place approved OPSS 1010.MUNI SSM or Granular B Type I material at a moisture content at or near optimum moisture in suitable maximum 200 mm thick lifts, compacted to 100% of SPMDD. If native soils from the site are not used as engineered fill, imported material for engineered fill should consist of clean, non-organic soils, free of chemical contamination or deleterious material. Any frost penetration into the fill material must be removed prior to placement of subsequent lifts of fill and reviewed by Cambium;
- V. Full time testing and inspection of the engineered fill will be required for it to be used as a founding material, as outlined in Section 4.2.2.2 of the Ontario Building Code.
- VI. To account for varying founding soils, the footings and foundation walls should be suitably reinforced to mitigate potential settlement cracking.

#### 4.6 FOUNDATION DESIGN

Design and construction recommendations for potential foundation systems are outlined below. It is understood that the site may be regraded, and our foundation recommendations may change depending upon the final grades. Cambium should be contacted to review the final grading plan and provide any necessary changes to our foundation recommendations. It is noted that the foundation recommendations have been developed based on the proposed design and construction of residential buildings (with basements).

At the time of investigation, it is understood that all boreholes are within or close to the proposed building footprints. Assuming that the site is prepared as outlined above, the native sub-soils are competent to support the proposed structure on conventional spread footings. Footings should be covered with at least 1.4 m of soil cover to provide protection against frost heave.

For the proposed buildings, continuous perimeter strip and/or spread foundations can be founded on undisturbed, stiff to very hard native silt. Foundations bearing on this material and founded above the groundwater table maybe designed for an allowable bearing capacity of 150 kPa at serviceability limit state (SLS) and 190 kPa at ultimate limit state (ULS). The quality of the subgrade should be inspected by Cambium during construction, prior to placement of the concrete foundation, to confirm bearing capacity estimates.

Given the very loose nature of the overlying sand soils in some locations, if very loose / loose soil is encountered at footing depths it is recommended that trenches for the footings be sub-excavated to the underlying silt soils. The elevation to competent silt based on the boreholes are provided in Table 5.

**Table 5 Elevation of Competent Founding Soil**

| Borehole | Design Bearing Capacity    | Elevation (mASL) |
|----------|----------------------------|------------------|
| BH101-21 | 150 kPa SLS<br>190 kPa ULS | 197.00           |
| BH102-21 |                            | 196.50           |
| BH103-21 |                            | 196.60           |
| BH104-21 |                            | 197.60           |

Any required grade raises to the footing elevations should be accomplished with engineered fill, using OPSS 1010 SSM or Granular B in 200 mm lifts and compacted to a minimum of 100% of SPMDD as per the recommendations in Section 4.5.1. Where OPSS Granular B is utilized as an engineered fill up to underside of proposed footing elevation, the engineered fill may be designed for an allowable bearing capacity of 150 kPa at SLS and 185 kPa at ULS

Settlement potential at the above-noted SLS loadings is less than 25 mm and differential settlement should be less than 10 mm. The quality of the subgrade should be inspected by Cambium during construction, prior to constructing the footings, to confirm bearing capacity estimates.

#### 4.7 LATERAL EARTH PRESSURE

The appropriate values for use in the design of structures subject to unbalanced earth pressures at this site are tabulated in Table 6.

**Table 6 Earth Pressure Design Values**

| Stratum/Parameter | $\gamma$ | $\phi$ | $K_a$ | $K_o$ | $K_p$ |
|-------------------|----------|--------|-------|-------|-------|
| Silty Sand        | 18       | 30     | 0.33  | 0.50  | 3.00  |
| Silt              | 19       | 28     | 0.36  | 0.53  | 2.77  |
| Granular Backfill | 22       | 35     | 0.27  | 0.42  | 3.70  |

Where:

$\gamma$  = bulk unit weight of soil (kN/m<sup>3</sup>)

$\phi$  = internal angle of friction (degrees)

$K_a$  = Rankine active earth pressure coefficient (dimensionless)

$K_o$  = Rankine at-rest earth pressure coefficient (dimensionless)

$K_p$  = Rankine passive earth pressure coefficient (dimensionless)

The above earth pressure parameters pertain to a horizontal grade condition behind a retaining structure. Values of earth pressure parameters for an inclined retained grade condition will vary.

Walls subject to unbalanced earth pressures must be designed to resist a pressure that can be calculated based on the following equation:

$$P = K[\gamma(h - h_w) + \gamma' h_w + q] + \gamma_w h_w$$

|        |           |   |                                                                                      |
|--------|-----------|---|--------------------------------------------------------------------------------------|
| Where: | $P$       | = | the horizontal pressure at depth, h (m)                                              |
|        | $K$       | = | the earth pressure coefficient                                                       |
|        | $h_w$     | = | the depth below the ground water level (m)                                           |
|        | $\gamma$  | = | the bulk unit weight of soil, (kN/m <sup>3</sup> )                                   |
|        | $\gamma'$ | = | the submerged unit weight of the exterior soil, ( $\gamma - 9.8$ kN/m <sup>3</sup> ) |
|        | $q$       | = | the complete surcharge loading (kPa)                                                 |

The wall backfill must be drained effectively to eliminate hydrostatic pressures on the wall that would otherwise act in conjunction with the earth pressure. In this case, the above equation is simplified to:

$$P = K[\gamma h + q]$$

The factored geotechnical resistance to sliding of foundation elements is developed by friction between the base of the footing and the soil. This friction (**R**) depends on the normal load at the soil contact (**N**) and the frictional resistance of the soil (**tan φ**) expressed as  $R_f = N \tan \phi$ , which is the unfactored resistance. The factored geotechnical resistance at ULS is  $R_f = 0.8 N \tan \phi$ .

#### 4.8 FLOOR SLABS AND SUBDRAINAGE

To create a stable working surface, to distribute loadings, and for drainage purposes, an allowance should be made to provide at least 200 mm of OPSS 1010 Granular A compacted to 100% of SPMDD beneath all floor slabs.

Provisions should be made for draining the basement wall backfill to prevent buildup of hydrostatic pressures; this should consist of geotextile wrapped perforated pipe subdrains set in a trench of clear stone and connected to a sump and pump or other positive, frost-free outlet.

#### 4.9 BURIED UTILITIES

Trench excavations above the groundwater table should generally consider Type 3 soil conditions, which require side slopes no steeper than 1H:1V, otherwise shoring would be required. Any excavations below the water table should generally consider Type 4 soil conditions which require side slopes of 3H:1V or flatter. All utilities should be placed at a minimum depths of 1.4 mbgs to prevent damage due to frost, or be adequately insulated.

Bedding and cover material for any services should consist of OPSS 1010 Granular A or B Type II, placed in accordance with pertinent Ontario Provincial Standard Drawings (OPSD 802.013). The bedding and cover material shall be placed in maximum 200 mm thick lifts and should be compacted to at least 98% of SPMDD. The

cover material shall be a minimum of 300 mm over the top of the pipe and compacted to 98% of SPMDD, taking care not to damage the utility pipes during compaction. If bedding is being placed in wet conditions consideration should be given to using 19 mm crushed clear stone underlain by a geotextile (Terrafix 270R or similar).

#### 4.10 PAVEMENT DESIGN

The performance of the pavement is dependent upon proper subgrade preparation. All topsoil and organic materials should be removed down to native material and backfilled with approved engineered fill or native material, compacted to 98% of SPMDD. The subgrade should be proof rolled and inspected by a Geotechnical Engineer. Any areas where boulders, rutting, or appreciable deflection is noted should be sub-excavated and replaced with suitable fill. The fill should be compacted to at least 98% of SPMDD.

The recommended pavement structure should meet the Ministry standards for parking and driving areas and should, as a minimum, consist of the pavement layers identified in Table 7. The light duty pavement structure is intended for parking areas while the heavy-duty pavement structure is appropriate for areas where heavy traffic or heavy loads are anticipated.

**Table 7 Recommended Minimum Pavement Structure**

| Pavement Layer         | Light Duty                  | Heavy Duty                  |
|------------------------|-----------------------------|-----------------------------|
| Surface Course Asphalt | 40 mm HL3 or HL4            | 40 mm HL3 or HL4            |
| Binder Course Asphalt  | 50 mm HL4 or HL8            | 50 mm HL4 or HL8            |
| Granular Base          | 150 mm OPSS 1010 Granular A | 150 mm OPSS 1010 Granular A |
| Granular Subbase       | 350 mm OPSS 1010 Granular B | 450 mm OPSS 1010 Granular B |

Material and thickness substitutions must be approved by the Design Engineer. The thickness of the subbase layer could be increased at the discretion of the Engineer, to accommodate site conditions at the time of construction, including soft or weak subgrade soil replacement.

Granular layers should be placed in 150 mm thick maximum loose lifts and compacted to at least 98% of SPMDD (ASTM D698) standard. The granular materials specified should conform to OPSS standards, as confirmed by appropriate materials testing.

Subdrains are recommended beneath the pavement structure, connecting to the storm sewer or an alternate frost-free outlet as outlined above, to extend the lifespan of the structure.

The final asphalt surface should be sloped at a minimum of 2% to shed runoff. Abutting pavements should be saw cut to provide clean vertical joints with new pavement areas.



#### **4.11 DESIGN REVIEW AND INSPECTIONS**

Cambium should be retained to complete testing and inspections during construction operations to examine and approve subgrade conditions, placement and compaction of fill materials, granular base courses, and asphaltic concrete.

We should be contacted to review and approve design drawings, prior to tendering or commencing construction, to ensure that all pertinent geotechnical-related factors have been addressed. It is important that onsite geotechnical supervision be provided at this site for excavation and backfill procedures, deleterious soil removal, subgrade inspections and compaction testing.

## 5.0 CLOSING

We trust that the information contained in this report meets your current requirements. If you have questions or comments regarding this document, please do not hesitate to contact the undersigned at (705) 719-0700.

Respectfully submitted,

**CAMBIUM INC.**



Rob Gethin, P.Eng.

Group Manager – Geotechnical Services

SEB/RLG/fj



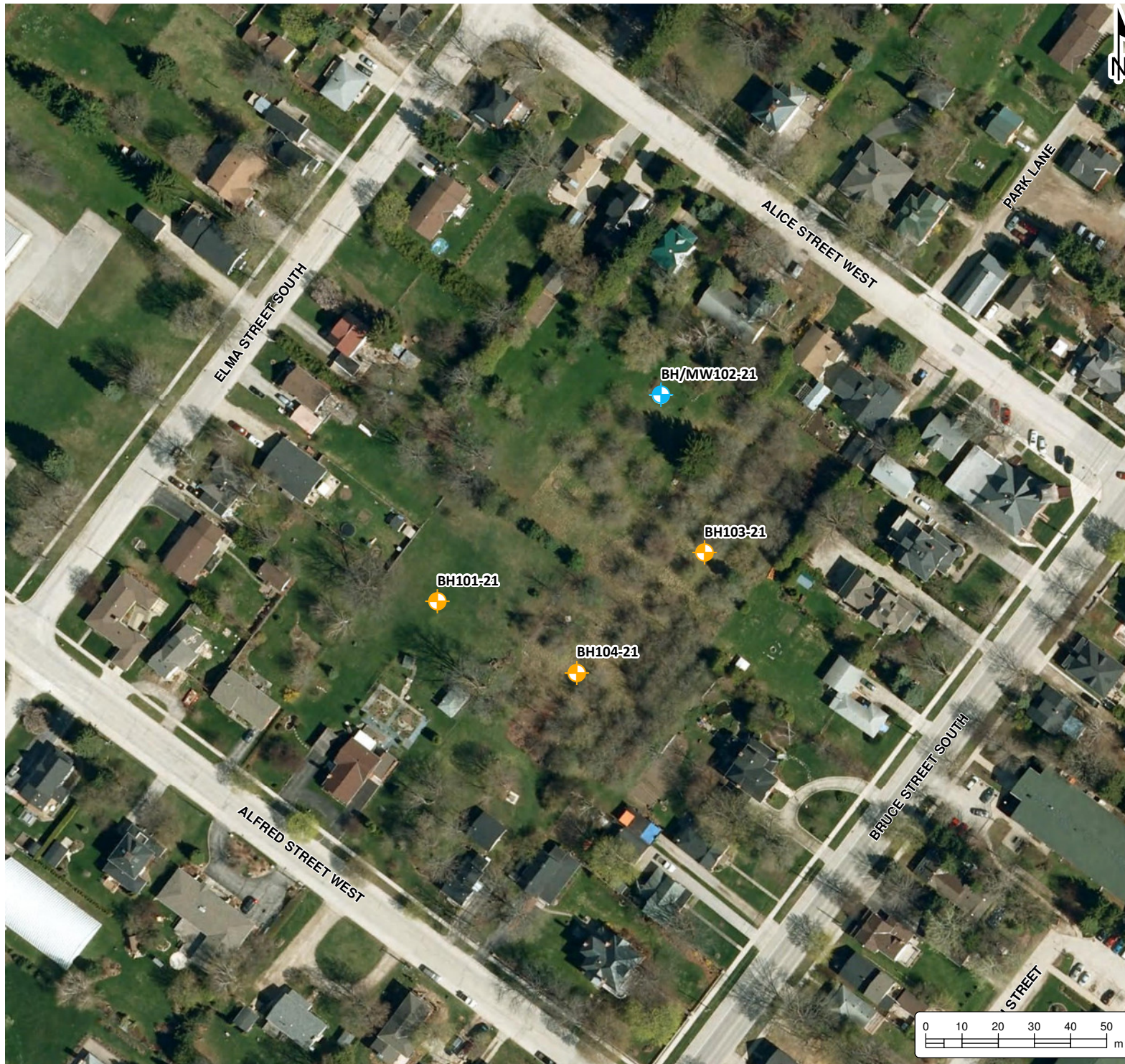


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## **Appended Figures**

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O:\GIS\MXDs\13000-13399\13303-001 Pheasant Run Realty Holdings Inc. GEO PH 1 & I\ESA - 24 Alfred St, Thornbury\2021-08-13 FIG 1 - Borehole Location Plan.mxd



**GEOTECHNICAL  
INVESTIGATION**  
PHEASANT RUN REALTY  
HOLDINGS INC.  
24 Alfred Street West  
Thornbury, Ontario

**LEGEND**

-  Borehole  
 Monitoring Well

**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

**BOREHOLE LOCATION PLAN**

|                           |                                |
|---------------------------|--------------------------------|
| Project No.:<br>13303-001 | Date:<br>September 2021        |
| Scale:<br>1:1,500         | Rev.:<br>NAD 1983 UTM Zone 17N |
| Created by:<br>ACS        | Checked by:<br>RG              |
| Figure:<br><b>1</b>       |                                |



---

## **Appendix A**

## **Borehole Logs**

---



**BH101-21**

**Project No.:** 13303-001

**Date Completed:** August 27, 2021

**Elevation:** 198.41 mASL

**Input By:** C. Malliaros



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

# Log of Borehole:

BH102-21

Page 1 of 1

**Client:** Pheasant Run Realty Holdings Inc.  
**Contractor:** Landshark Drilling  
**Location:** 24 Alfred Street West, Thornbury, ON

**Project Name:** Geotechnical Investigation  
**Method:** Solid Stem Auger  
**UTM:** 17T, 4934174 m N, 543105 m E

**Project No.:** 13303-001  
**Date Completed:** August 27, 2021  
**Elevation:** 197.26 mASL

| SUBSURFACE PROFILE |       |           |                                                                                         | SAMPLE |      |            |           |            |    |    |         |    |    |                      |                                                                                                                        |                                                                                                                                                                                     |
|--------------------|-------|-----------|-----------------------------------------------------------------------------------------|--------|------|------------|-----------|------------|----|----|---------|----|----|----------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Elevation<br>(m)   | Depth | Lithology | Description                                                                             | Number | Type | % Recovery | SPT (N)   | % Moisture |    |    | SPT (N) |    |    | Well<br>Installation | Remarks                                                                                                                |                                                                                                                                                                                     |
|                    |       |           |                                                                                         |        |      |            |           | 25         | 50 | 75 | 10      | 20 | 30 | 40                   |                                                                                                                        |                                                                                                                                                                                     |
| 197                | 0     |           | TOPSOIL: Black topsoil, some organics, loose, moist                                     | 1A     |      |            |           |            |    |    |         |    |    |                      | <p>Flush Mount</p> <p>Cap</p> <p>Bentonite Plug</p> <p>PVC Standpipe</p> <p>Sand Pack</p> <p>PVC Screen</p> <p>Cap</p> | Top of Standpipe (TOS) elevation: 198.35 mASL. Groundwater measured at 4.0 mbgs (193.25 mASL.) on September 7, 2021<br><br>GSA SS2:<br>0% Gravel<br>2% Sand<br>78% Silt<br>20% Clay |
|                    |       |           | SAND: Brown sand, some gravel, some silt, trace clay, loose, moist                      | 1B     | SS   | 60         | 6         |            |    |    |         |    |    |                      |                                                                                                                        |                                                                                                                                                                                     |
|                    |       |           | CLAYEY SILT: Brown clayey silt, trace sand, compact, moist                              | 2      | SS   | 100        | 24        |            |    |    |         |    |    |                      |                                                                                                                        |                                                                                                                                                                                     |
| 196                | 1     |           | -dense                                                                                  | 3      | SS   | 95         | 32        |            |    |    |         |    |    |                      |                                                                                                                        |                                                                                                                                                                                     |
|                    |       |           | -grey                                                                                   | 4      | SS   | 100        | 40        |            |    |    |         |    |    |                      |                                                                                                                        |                                                                                                                                                                                     |
| 195                | 2     |           | -very dense, some sand, trace clay                                                      | 5      | SS   | 20         | 50/125 mm |            |    |    |         |    |    |                      |                                                                                                                        |                                                                                                                                                                                     |
| 194                | 3     |           |                                                                                         |        |      |            |           |            |    |    |         |    |    |                      |                                                                                                                        |                                                                                                                                                                                     |
| 193                | 4     |           | -dense                                                                                  | 6      | SS   | 30         | 30        |            |    |    |         |    |    |                      |                                                                                                                        |                                                                                                                                                                                     |
| 192                | 5     |           | Borehole terminated in CLAYEY SILT at 5.0 mbgs due to target exploration depth achieved |        |      |            |           |            |    |    |         |    |    |                      | Borehole open and dry upon completion                                                                                  |                                                                                                                                                                                     |
| 191                | 6     |           |                                                                                         |        |      |            |           |            |    |    |         |    |    |                      |                                                                                                                        |                                                                                                                                                                                     |
| 190                | 7     |           |                                                                                         |        |      |            |           |            |    |    |         |    |    |                      |                                                                                                                        |                                                                                                                                                                                     |

Logged By: C. Malliaros

Input By: C. Malliaros



**BH103-21**

**Project No.:** 13303-001

**Date Completed:** August 27, 2021

**Elevation:** 197.42 mASL

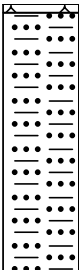
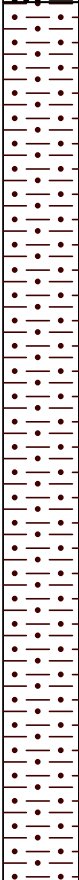
**Input By:** C. Malliaros



**Client:** Pheasant Run Realty Holdings Inc.  
**Contractor:** Landshark Drilling  
**Location:** 24 Alfred Street West, Thornbury, ON

**Project Name:** Geotechnical Investigation  
**Method:** Solid Stem Auger  
**UTM:** 17T, 4934117 m N, 543043 m E

**Project No.:** 13303-001  
**Date Completed:** August 27, 2021  
**Elevation:** 199.07 mASL

| SUBSURFACE PROFILE |       |                                                                                   |                                                                                                                                             | SAMPLE |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--------------------|-------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------|------|------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------------------|----|----|---------|----|----|----|----------------------|---------------------------------------|---|----|----|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Elevation<br>(m)   | Depth | Lithology                                                                         | Description                                                                                                                                 | Number | Type | % Recovery                                                                         | SPT (N)                                                              | % Moisture                                                                         |    |    | SPT (N) |    |    |    | Well<br>Installation | Remarks                               |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      | 25                                                                                 | 50 | 75 | 10      | 20 | 30 | 40 |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 199                | 0     |  | TOPSOIL: Black topsoil, some organics, very loose, moist<br><br>SILTY SAND: Brown silty sand, trace clay, very loose, moist<br><br>-compact | 1A     | SS   | 65                                                                                 | 3                                                                    |  |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             | 1B     |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             | 2      | SS   | 70                                                                                 | 11                                                                   |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             | 198    | 1    |  | SILT: Brown silt, some clay, trace sand, compact, moist<br><br>-grey |                                                                                    |    |    |         |    |    |    |                      |                                       | 3 | SS | 75 | 15 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       | 4 | SS | 60 | 17 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             | 197    | 2    |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 196                | 3     |                                                                                   |                                                                                                                                             | 5      | SS   | 85                                                                                 | 24                                                                   |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 195                | 4     |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 194                | 5     |                                                                                   |                                                                                                                                             | 6      | SS   | 100                                                                                | 15                                                                   |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 193                | 6     |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 192                | 7     |                                                                                   | Borehole terminated in SILT at 6.6 mbgs due to target exploration depth achieved                                                            |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      | Borehole open and dry upon completion |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    |       |                                                                                   |                                                                                                                                             |        |      |                                                                                    |                                                                      |                                                                                    |    |    |         |    |    |    |                      |                                       |   |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



---

## **Appendix B**

# **Physical Laboratory Testing Results**

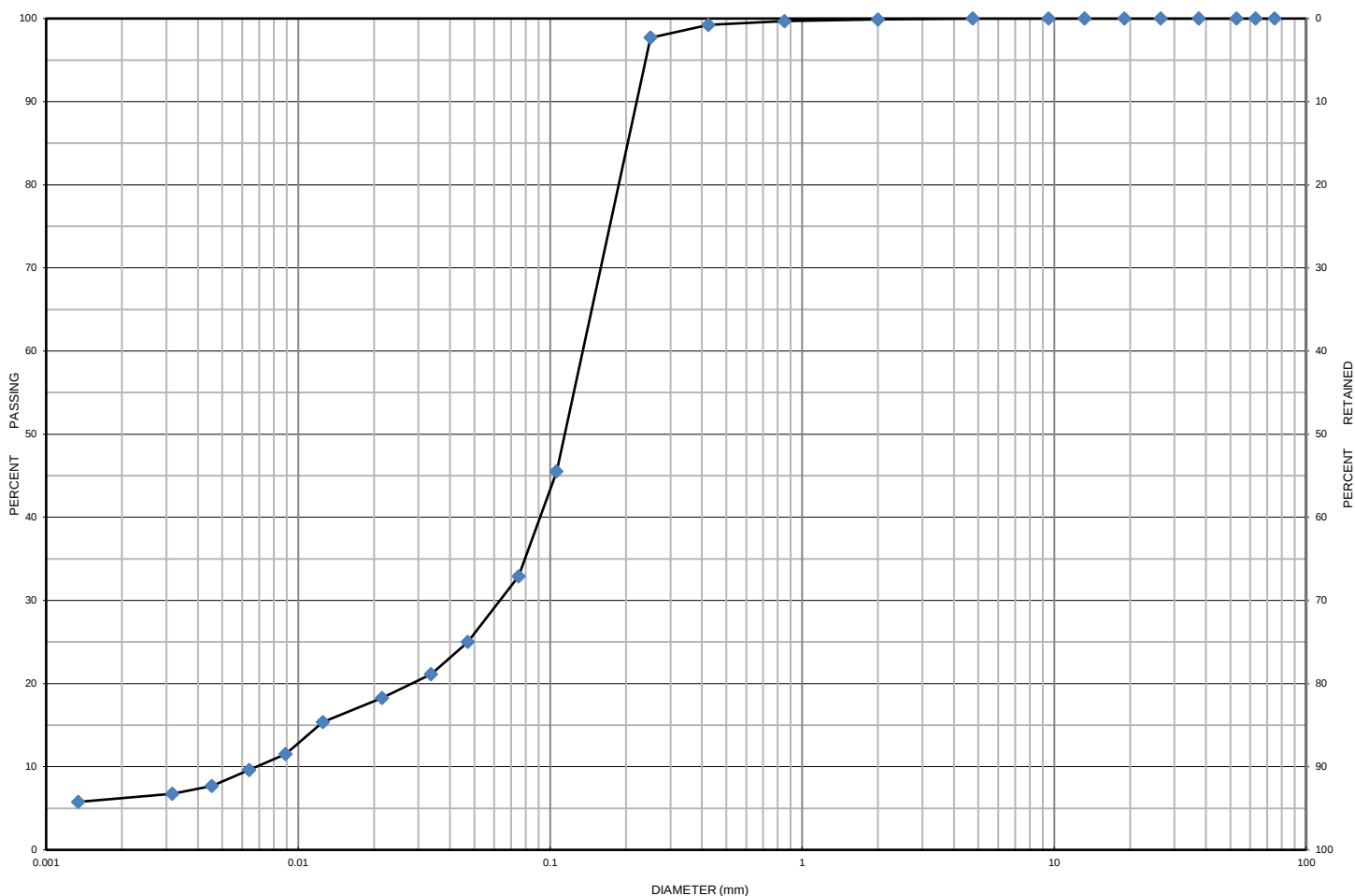
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# Grain Size Distribution Chart

**Project Number:** 13303-001 **Client:** Pheasant Run Realty Holdings Inc  
**Project Name:** Geo & Phase I and II ESA-24 Alfred Street, Thornbury, ON  
**Sample Date:** August 27, 2021 **Sampled By:** Chris Malliaros - Cambium Inc.  
**Location:** BH 101-21 SS 2 **Depth:** 0.8 m to 1.2 m **Lab Sample No:** S-21-1065

| 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 | BOULDER |
|                                |      | SAND |        |        | GRAVEL |        |        |         |

| Borehole No.          | Sample No. | Depth          | Gravel          | Sand            | Silt            | Clay           | Moisture       |
|-----------------------|------------|----------------|-----------------|-----------------|-----------------|----------------|----------------|
| BH 101-21             | SS 2       | 0.8 m to 1.2 m | 0               | 67              | 26              | 7              | 21.6           |
| Description           |            | Classification | D <sub>60</sub> | D <sub>30</sub> | D <sub>10</sub> | C <sub>u</sub> | C <sub>c</sub> |
| Silty Sand trace Clay |            | SM             | 0.1400          | 0.0630          | 0.0068          | 20.59          | 4.17           |

Additional information available upon request

Issued By:

*Chris Malliaros*

(Senior Project Manager)

Date Issued:

September 15, 2021

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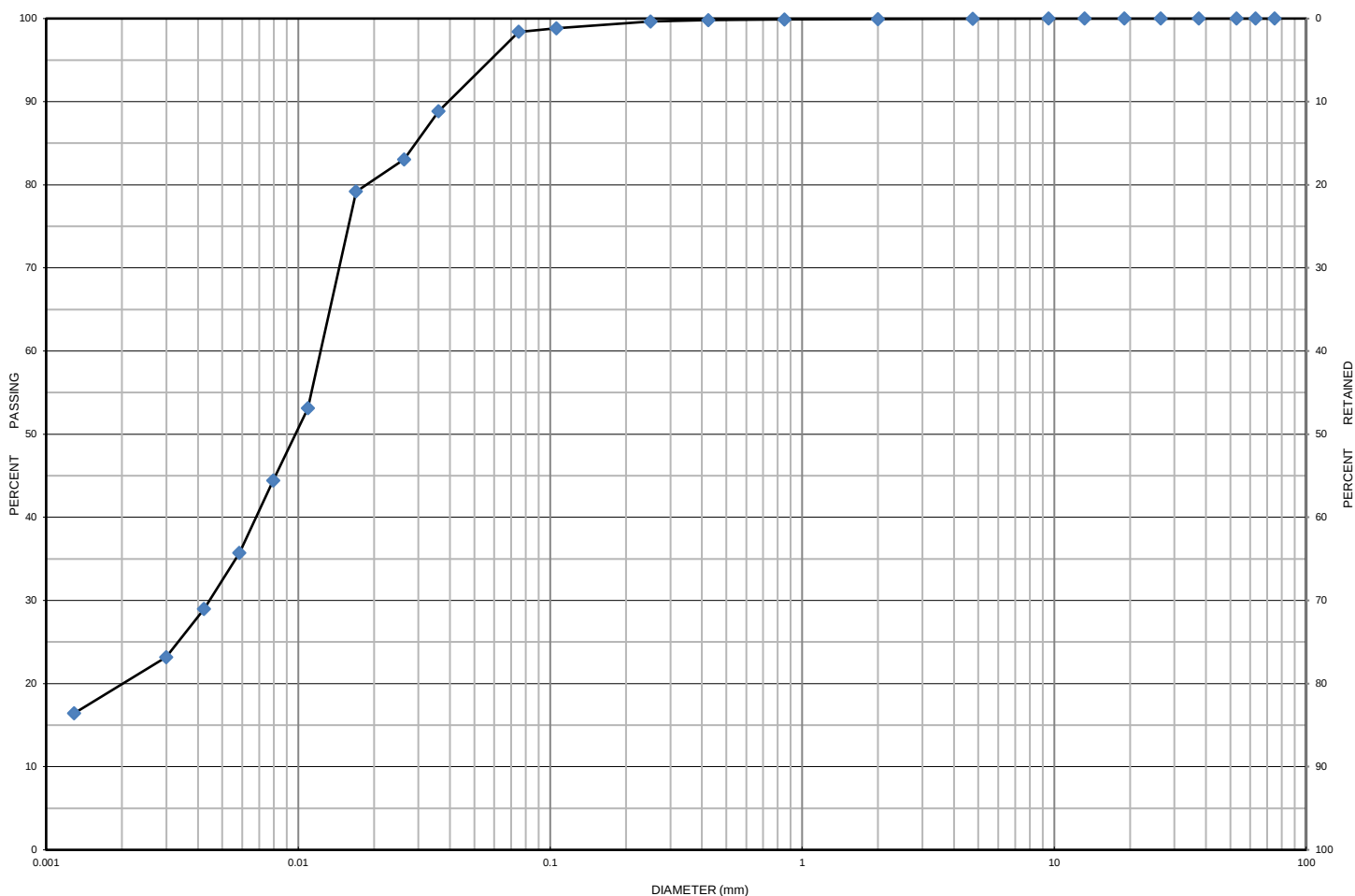
Form: L6V.2 - Grad.Hydo



# Grain Size Distribution Chart

**Project Number:** 13303-001      **Client:** Pheasant Run Realty Holdings Inc  
**Project Name:** Geo & Phase I and II ESA-24 Alfred Street, Thornbury, ON  
**Sample Date:** August 27, 2021      **Sampled By:** Chris Malliaros - Cambium Inc.  
**Location:** BH 102-21 SS 2      **Depth:** 0.8 m to 1.2 m      **Lab Sample No:** S-21-1066

| 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 | BOULDER |
|                                |      | SAND |        |        | GRAVEL |        |        |         |

| Borehole No.           | Sample No. | Depth          | Gravel          | Sand            | Silt            | Clay           | Moisture       |
|------------------------|------------|----------------|-----------------|-----------------|-----------------|----------------|----------------|
| BH 102-21              | SS 2       | 0.8 m to 1.2 m | 0               | 2               | 78              | 20             | 17.2           |
| Description            |            | Classification | D <sub>60</sub> | D <sub>30</sub> | D <sub>10</sub> | C <sub>u</sub> | C <sub>c</sub> |
| Clayey Silt trace Sand |            | ML             | 0.0130          | 0.0045          | -               | -              | -              |

Additional information available upon request

Issued By:   
(Senior Project Manager)

Date Issued: September 15, 2021

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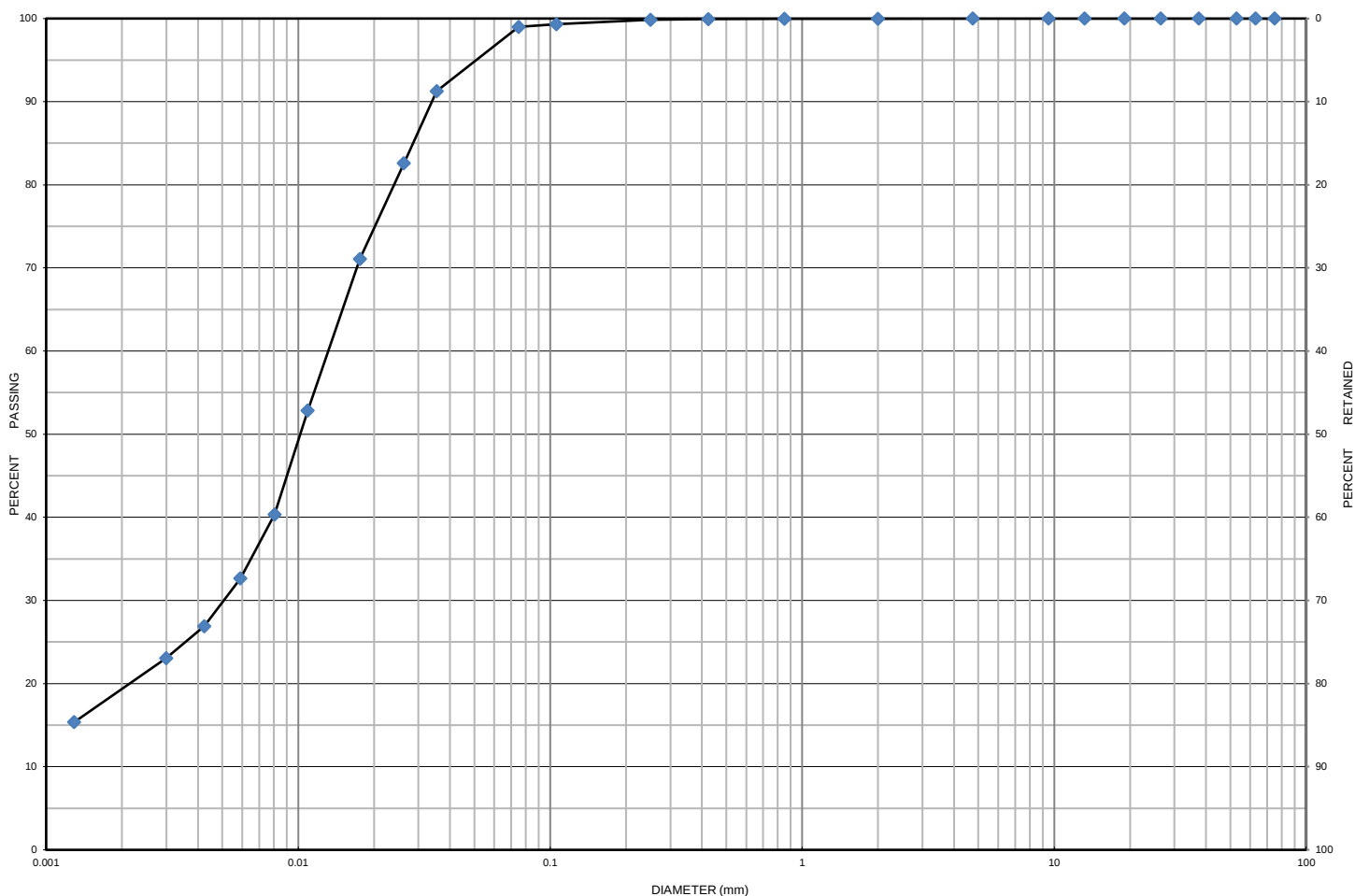
Form: L6V.2 - Grad.Hydo



# Grain Size Distribution Chart

**Project Number:** 13303-001 **Client:** Pheasant Run Realty Holdings Inc  
**Project Name:** Geo & Phase I and II ESA-24 Alfred Street, Thornbury, ON  
**Sample Date:** August 27, 2021 **Sampled By:** Chris Malliaros - Cambium Inc.  
**Location:** BH 103-21 SS 4 **Depth:** 2.3 m to 2.7 m **Lab Sample No:** S-21-1067

| 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 | BOULDER |
|                                |      | SAND |        |        | GRAVEL |        |        |         |

| Borehole No.              | Sample No. | Depth          | Gravel          | Sand            | Silt            | Clay           | Moisture       |
|---------------------------|------------|----------------|-----------------|-----------------|-----------------|----------------|----------------|
| BH 103-21                 | SS 4       | 2.3 m to 2.7 m | 0               | 1               | 80              | 19             | 13.9           |
| Description               |            | Classification | D <sub>60</sub> | D <sub>30</sub> | D <sub>10</sub> | C <sub>u</sub> | C <sub>c</sub> |
| Silt some Clay trace Sand |            | ML             | 0.014           | 0.005           | -               | -              | -              |

Additional information available upon request

Issued By:   
(Senior Project Manager)

Date Issued: September 15, 2021

**Cambium Inc. (Laboratory)**  
866.217.7900 | cambium-inc.com  
194 Sophia St. | Peterborough | ON | K9H 1E5

Form: L6V.2 - Grad.Hydo



## Moisture Content



**Project Number:** 13303-001  
**Project Name:** Geo & Phase I and II ESA-24 Alfred Street, Thornbury, ON  
**Client:** Pheasant Run Realty Holdings Inc  
**Date Taken:** 2021-08-27

**Lab Number:** S-21-1064  
**Date Tested:** 2021-09-09  
**Tested By:** D. Rock

| Borehole Number | Sample Number | Sample Depth (m) | Water Weight (g) | Water Content (%) | Additional Observations |
|-----------------|---------------|------------------|------------------|-------------------|-------------------------|
| 101             | 1             | 0.00-0.61        | 20.7             | 23.4              | NR,1                    |
| 101             | 2             | 0.76-1.22        | 134.0            | 21.6              | NR                      |
| 101             | 3             | 1.52-1.98        | 57.6             | 18.5              |                         |
| 101             | 4             | 2.29-2.83        | 47.1             | 18.8              |                         |
| 101             | 5             | 3.05-3.51        | 43.2             | 14.9              |                         |
| 101             | 6             | 4.57-5.03        | 32.3             | 18.9              |                         |
| 101             | 7             | 6.10-6.55        | 15.7             | 7.4               |                         |
| 102             | 1A            | 0.00-0.06        | 20.2             | 15.9              | NR,1                    |
| 102             | 1B            | 0.06-0.61        | 43.0             | 16.9              | NR,1                    |
| 102             | 2             | 0.76-1.22        | 159.6            | 17.2              | NR                      |
| 102             | 3             | 1.52-1.98        | 34.5             | 16.1              |                         |
| 102             | 4             | 2.29-2.74        | 34.8             | 15.9              | 1                       |
| 102             | 5             | 3.05-3.51        | 17.9             | 6.1               | NR,1                    |
| 102             | 6             | 4.57-5.03        | 27.3             | 8.8               | NR                      |
| 103             | 1A            | 0.00-0.06        | 28.4             | 25.7              | NR,1                    |
| 103             | 1B            | 0.06-0.61        | 37.3             | 16.4              | 1                       |
| 103             | 2             | 0.76-1.22        | 40.5             | 18.2              |                         |
| 103             | 3             | 1.52-1.98        | 38.2             | 16.6              |                         |
| 103             | 4             | 2.29-2.74        | 86.2             | 13.9              | NR                      |
| 103             | 5             | 3.05-3.51        | 43.4             | 18.5              |                         |
| 103             | 6             | 4.57-5.03        | 13.0             | 8.7               | NR                      |
| 103             | 7             | 6.10-6.55        | 17.5             | 6.9               | NR                      |
| 104             | 1A            | 0.00-0.06        | 20.3             | 14.5              | NR,1                    |
| 104             | 1B            | 0.06-0.61        | 13.3             | 8.0               | 1                       |
| 104             | 2             | 0.76-1.22        | 17.5             | 10.2              |                         |
| 104             | 3             | 1.52-1.98        | 49.1             | 13.4              |                         |
| 104             | 4             | 2.29-2.74        | 50.4             | 16.8              |                         |

1 – Contains organics  
2 – Contains rubble  
3 – Hydrocarbon Odour  
4 – Unknown Chemical Odour  
5 – Saturated – free water visible

6 – Very moist – near optimum moisture content  
7 – Moist – below optimum moisture  
8 – Dry – dry texture – powdery  
9 – Very small – caution may not be representative  
10 – Hold sample for gradation analysis



## Moisture Content



**Project Number:** 13303-001  
**Project Name:** Geo & Phase I and II ESA-24 Alfred Street, Thornbury, ON  
**Client:** Pheasant Run Realty Holdings Inc  
**Date Taken:** 2021-08-27

**Lab Number:** S-21-1064  
**Date Tested:** 2021-09-09  
**Tested By:** D. Rock

| Borehole Number | Sample Number | Sample Depth (m) | Water Weight (g) | Water Content (%) | Additional Observations |
|-----------------|---------------|------------------|------------------|-------------------|-------------------------|
| 104             | 5             | 3.05-3.51        | 54.2             | 16.6              |                         |
| 104             | 6             | 4.57-5.03        | 48.3             | 19.9              |                         |
| 104             | 7             | 6.10-6.55        | 30.2             | 9.4               |                         |

- |                                    |                                                    |
|------------------------------------|----------------------------------------------------|
| 1 – Contains organics              | 6 – Very moist – near optimum moisture content     |
| 2 – Contains rubble                | 7 – Moist – below optimum moisture                 |
| 3 – Hydrocarbon Odour              | 8 – Dry – dry texture – powdery                    |
| 4 – Unknown Chemical Odour         | 9 – Very small – caution may not be representative |
| 5 – Saturated – free water visible | 10 – Hold sample for gradation analysis            |