GEOTECHNICAL INVESTIGATION REPORT

Town of Blind River

Eldorado Road Resurfacing



March 2025

TULLOCH Project # 24-1376

LICENSED PROFESSIONAL ENGINEER
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2025/03/11
PROVINCE OF ONTARIO

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March 11, 2025
24-1376

Town of Blind River
11 Hudson Street
Blind River, ON
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Attention: Chris Zagar | Director of Public Services

RE: Geotechnical Services for the Proposed Road Resurfacing on Eldorado Road, Blind River, Ontario

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Dear Mr. Zagar,

Please find enclosed our Geotechnical Engineering Report for the proposed Road Resurfacing project located on Eldorado Road in Blind River, Ontario.

This report outlines the results of the geotechnical investigation completed for the site and provides geotechnical recommendations for the feasibility of in place processing for Eldorado Road, as well as other relevant geotechnical recommendations for project design.

We trust the enclosed is adequate for your current needs. If there is anything further that we can assist with, please contact us at your convenience.

Sincerely,

Daniel Wheeler, P.Eng.
Geotechnical Engineer

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1. INTRODUCTION AND SCOPE

TULLOCH Engineering Inc. (TULLOCH) was retained by the Town of Blind River (Client) to perform a geotechnical investigation for the proposed road resurfacing at Eldorado Road in Blind River, Ontario. The purpose of the investigation was to evaluate the subsurface conditions within the proposed expansion area and provide geotechnical design inputs as well as discuss the feasibility of road resurfacing for the project site. The scope of work included the advancement and sampling of geotechnical boreholes at nine (9) locations across the Project area, as defined by Eldorado Road between bounded by Highway 17 at the northern project extent and the termination of the road at the Cameco refinery to the South. Borehole locations can be found illustrated in the site plans attached in Appendix A of this report.

This report provides the factual geotechnical investigation data and geotechnical design recommendations to aid in the design and construction of the proposed road rehabilitation. The provided geotechnical design recommendations are based on the data obtained from the site investigation and our understanding of the project scope and engineering experience. Common terminology used in this report is outlined in Appendix B; specific terminology will be stated in table notes and the report body.

2. REGIONAL GEOLOGY AND SITE INFORMATION

The project site consists of Eldorado Rd within the Town of Blind River, Ontario. The road connects Highway 17 to Cameco's Blind River Uranium Refinery. The Huron Pines Golf & Country Club lies immediately west of the road. The surrounding lands generally consist of forested areas of relatively flat topography. A photograph log showing borehole locations and site conditions at the time of the investigation can be found attached in Appendix C.

Based on a review of public geological resources and maps of Northern Ontario as published by the Ontario Geological Survey (OGS), the regional geology of the site contains glaciolacustrine deposits, which are comprised of sand, gravelly sand and gravel associated with nearshore and beach deposits. The bedrock underlying the site consists of siltstone, quartz-feldspar sandstone, argillite and, mafic and related intrusive rocks.

3. SITE INVESTIGATION AND METHODOLOGY

The geotechnical investigation was completed on December 6, 2024, and comprised of a series of nine (9) geotechnical boreholes referred to as BH-24-01 to BH-24-10. Borehole BH-24-07 was not advanced due to time and budgetary restraints; however, representative sampling was noted through the remaining boreholes. All boreholes were advanced using hollow stem auger

techniques to depths ranging from approximately 1.4 to 2.1 metres below ground surface (mbgs). Borehole locations were chosen based on a desktop review of street view mapping of the site. Locations were selected based on noted defects within the road to try and identify any critical subgrade conditions to inform the feasibility of road resurfacing versus full depth reconstruction.

Prior to advancing the boreholes, underground utility locate clearances were completed to determine any conflicts and shift borehole locations accordingly. All boreholes were positioned in field by TULLOCH's geotechnical representative to avoid underground utilities under the roadway. Borehole locations were recorded using a handheld GPS with an accuracy of ±3 m. A summary of the geotechnical investigation is shown below in Table 3-1.

Table 3-1: Summary of Borehole Information

Borehole No.	Northing[1] (m)	Easting[1] (m)	Ground Surface Elevation (masl)[2]	Borehole Depth (mbgs)
BH-24-01	5116511	344246	179.28	1.52
BH-24-02	5116687	344294	179.92	2.13
BH-24-03	5116832	344429	179.91	1.52
BH-24-04	5116903	344584	180.26	1.52
BH-24-05	5116964	344711	180.80	1.37
BH-24-06	5117015	344818	181.06	1.52
BH-24-07	Not Completed			
BH-24-08	5117109	345023	182.64	1.37
BH-24-09	5117290	345194	183.93	1.52
BH-24-10	5117418	345164	184.50	1.52

Note(s):[1] NAD83 CSRS, UTM Zone 17. [2] Meters above sea level.

All boreholes were advanced using a track mounted Massenza MI3 drill rig owned and operated by Lajoie Bros. Contracting Ltd., from Sault Ste. Marie, Ontario. Borehole advancement was conducted with 200 mm outside diameter (OD) continuous flight hollow stem augers. The rig was equipped with standard split spoon soil sampling equipment, including a full-weight automatic hammer.

In the overburden, soil samples were obtained with standard split spoon equipment in conjunction with Standard Penetration Tests (SPT) performed in accordance with ASTM D1586 procedures. SPT "N" blow count values were generally measured at 0.76 m intervals in all boreholes. Bedrock was not encountered or inferred during the drilling investigation, and all boreholes were advanced to target depths.

The soil sampling program was directed by a TULLOCH representative, who logged the drilling operations and identified the soil samples as they were retrieved. The recovered soil samples were transported to TULLOCH's CCIL-Certified Laboratory in Sault Ste. Marie, Ontario, for detailed examination and testing. All samples will be stored at the laboratory for three (3) months and then disposed of unless directed otherwise.

Chemical soil testing for corrosivity was also completed on representative retrieved samples by Testmark Laboratories, based in Garson, Ontario.

Detailed borehole logs and laboratory testing results can be found attached in Appendix D and E, respectively.

4. LABORATORY TESTING PROGRAM

A geotechnical laboratory testing program was undertaken on representative samples taken from the boreholes advanced during the investigation. The laboratory testing was conducted in general accordance with ASTM standards. Table 4-1 provides a list of the testing program. Detailed laboratory reports can be found in Appendix E.

Table 4-1: Summary of Soil Laboratory Testing Program

Test	Number of Tests	Standards
Moisture Content	10	ASTM D2216
Sieve/Hydrometer Analysis	10	ASTM D422/D7928
Soil Corrosivity[1]	2	Various

Note(s): [1]Sub-Contracted Laboratory Tests

5. SUBSURFACE CONDITIONS

5.1 General

Subsurface conditions encountered within the boreholes at the project site are within the following subsections. Generally, similar overburden soil subsurface stratigraphy was encountered across the site. At ground surface, asphalt was encountered overlaying a layer of existing fill consisting of silty sand and gravelly silty sand. Generally, the native soils encountered below the existing fill consisted primarily of sand and silty sand, typically brown in colour, with varying degrees of secondary gravel constituents. Within the native soils, the presence of cobbles was also noted at borehole BH-24-04. Detailed borehole logs and laboratory testing can be seen in Appendix D and E, respectively.

It should be noted that the soil boundaries indicated on the borehole logs are inferred from non-continuous sampling and observations during drilling. These boundaries are intended to reflect approximate transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change. Each soil layer will be discussed as it was encountered from ground surface.

5.1.1 ASPHALT

All boreholes were advanced through the existing asphalt surface of Eldorado Road. The asphalt was found to be approximately 90 to 110 mm in thickness across the borehole locations.

5.1.2 Existing FILL – (SM) SILTY SAND to Gravelly SILTY SAND

Existing fill material, generally consisting of silty sand to gravelly silty sand fill, was observed beneath the asphalt in all boreholes. This fill layer was found to be 0.66 m in thickness in BH-24-01 to BH-24-06, 0.93 m in thickness in BH-24-09, and 1.42 m in thickness in BH-24-08 and BH-24-10. The sandy existing fill was noted to range from poorly to well graded with the gravel content ranging from trace to gravelly and the material exhibiting non-cohesive behaviour. The fill material was generally dark brown to brown in colour. Cobbles were observed within the fill material in BH-24-03. The SPT' N' values ranged between 25 to 54 blows per 30 cm of sampler advancement, indicating a compact to very dense material. It should be noted that frozen material may have inflated blow counts for the fill.

Field moisture observations on the retrieved split spoon and grab/auger samples for the fill material indicated that the material was generally moist. Laboratory testing on select samples obtained from the material during the investigation yielded moisture contents ranging from 3.6% to 10.9%, with an average of 5.8%.

Gradation testing was conducted on seven (7) representative samples of the fill material. The laboratory sieve analysis yielded the grain size distribution shown below in Table 5-1.

Table 5-1: Grain Size Distribution Summary – Existing Fill

Borehole No.	Sample No.	Size Fraction (%)			
		Gravel	Sand	Silt	Clay
BH-24-01	SS01	6	61	33	
BH-24-02	SS01	28	56	16	
BH-24-03	SS01	32	52	15	
BH-24-06	GB02	19	62	19	
BH-24-08	GB01	19	68	13	

Borehole No.	Sample No.	Size Fraction (%)			
		Gravel	Sand	Silt	Clay
BH-24-09	SS02A	17	66	17	
BH-24-10	GB03	23	58	18	

The grain size distribution for the tested samples generally falls within the range for OPSS 1010 Granular B Type I for sand- and gravel-sized particles but exceeds the upper limit for silt-sized fines particles. Grain size distribution plots are attached with the laboratory reports in Appendix E.

5.1.3 (SP) SAND

A layer of native poorly graded sand was encountered below the existing fill material in BH-24-01 through BH-24-04 and in BH-24-08. The sand was encountered at depths ranging from approximately 0.8 to 2.1 mbgs. Where encountered, boreholes were generally terminated within the sand layer. The sand layer was noted to be 0.3 m in thickness in borehole BH-24-03. Generally, the sand was found to be grey to brown in colour and exhibited non-cohesive behaviour. The silt and gravel fraction for the sand varied throughout the site from trace to none observed. The presence of cobbles and boulders was noted within the sand in BH-24-04.

The SPT 'N' values within the sand ranged between 6 and 39 blows per 30 cm of sampler advancement, indicating a material density ranging from loose to dense.

Field moisture observations on retrieved split spoon samples indicated the sand was moist. Laboratory testing on select samples obtained from the sand layer during the investigation yielded a moisture content of 4.8%.

Gradation testing was conducted on one (1) representative sample of the sand material. The laboratory sieve analysis yielded the grain size distribution shown below in Table 5-2. A grain size distribution plot is attached with the laboratory reports in Appendix E.

Table 5-2: Grain Size Distribution Summary - SAND

Borehole No.	Sample No.	Size Fraction (%)			
		Gravel	Sand	Silt	Clay
BH-24-01	SS02	0	96	4	

5.1.4 (SM) SILTY SAND

Silty sand deposits were encountered below the sand layer in BH-24-03 and below the existing fill in BH-24-06 and BH-24-09. The deposits were encountered at depths ranging from

approximately 0.8 to 1.5 mbgs. Where encountered, boreholes were generally terminated within the silty sand. Generally, the silty sand was found to be light brown to brown to grey in colour and exhibited non-cohesive behaviour. The silty sand contained trace to no gravel. The SPT 'N' values ranged between 24 and 37 blows per 30 cm of sampler advancement, indicating a material density ranging from compact to dense.

Field moisture observations on retrieved split spoon samples indicated the material was moist. Laboratory testing on select samples obtained from the material during the investigation yielded a moisture content of 9.6%.

Gradation testing was conducted on one (1) representative sample of the silty sand material. The laboratory sieve analysis yielded the grain size distribution shown below in Table 5-3. A grain size distribution plot is attached with the laboratory reports in Appendix E.

Table 5-3: Grain Size Distribution Summary - SILTY SAND

Borehole No.	Sample No.	Size Fraction (%)			
		Gravel	Sand	Silt	Clay
BH-24-03	SS02B	6	62	32	

5.1.5 (SP/ML) SAND & SILT

A layer of sand and silt was encountered below the existing fill material in BH-24-05 from 0.8 to 1.4 mbgs. Generally, the deposit was found to be greyish-brown in colour, contained trace fine grained gravel and exhibited non-cohesive behaviour. The SPT 'N' value was 26 blows per 30 cm of sampler advancement, indicating a compact material density.

Field moisture observations on retrieved split spoon samples indicated the material was moist. Laboratory testing on select samples obtained from the material during the investigation yielded a moisture content of 14.5%.

Gradation testing was conducted on one (1) representative sample of the sand and silt material. The laboratory sieve analysis yielded the grain size distribution shown below in Table 5-4. A grain size distribution plot is attached with the laboratory reports in Appendix E.

Table 5-4: Grain Size Distribution Summary - SAND & SILT

Borehole No.	Sample No.	Size Fraction (%)			
		Gravel	Sand	Silt	Clay
BH-24-05	SS02	1	44	55	

5.1.6 Groundwater Conditions

Groundwater measurements were taken down open boreholes at the conclusion of drilling at each location. Groundwater was not observed during or at the completion of the drilling investigation at the time of measurement. However, it should be noted that groundwater levels are subject to seasonal fluctuations, with high levels occurring during wet weather conditions in the spring and fall and lower levels during dry weather conditions. As such, additional precautions may be required for groundwater management.

6. GEOTECHNICAL RECOMMENDATIONS

6.1 General

The purpose of the following subsections is to provide recommendations for pavement design and construction to comment on the feasibility of in-place processing/road resurfacing for Eldorado Road. The geotechnical engineering recommendations in this report are based on the findings from the investigation, borehole data, and previous engineering experience.

It is TULLOCH's current understanding that the preferred road resurfacing method will include in-place processing of the existing asphalt pavement surface. In this method, the existing asphalt pavement is to be milled, processed and mixed with the road base fill, replaced and recompacted over the existing roadway granular fill. Upon completion of the recompaction of the mixed material, new base course material is placed and compacted prior to placement of a new pavement surface.

A review of the subsurface conditions generally indicates a relatively compact and competent subgrade; however, the existing road fills appear to have larger fines constituents than would typically be acceptable under current provincial standards. Further, the road experiences a relatively high truck traffic volume for access to the Cameco refinery at the southern extent of the project site. As such, it is likely that the material defects observed in the road are a combination of poor road fill quality that has caused serviceability degradation over time compounded by potential frost movement caused by high fines content and high traffic volumes.

Given the above, while full road reconstruction may prove to be the best solution from a long-term viability, the existing subgrade material appears to be relatively consolidated, and no significant poor soil zones were noted. Therefore, from a cost-benefit perspective, in place process with the addition of a new road base is a cost-effective solution that meets project goals and, if constructed properly, will provide the optimal value proposition to the project.

While the underlying issues with the fill may remain, they will be lessened by adding new road base and re-processed asphalt, which will improve the serviceability of the road previous to the

former design. However, it should be noted that from a design life perspective, this option, while preferred, will not be comparable to full-depth replacement and, increased maintenance may be required, and time to further intervention may be lower compared to full-depth replacement.

The following subsections of the report provide our interpretation of the available geotechnical data and present geotechnical recommendations intended for the guidance of the design engineer. Where comments are made regarding construction, they are provided only to highlight any aspects that could affect the design of the project. Contractors bidding on or undertaking the construction should make their own interpretation of the provided subsurface information with respect to their planned construction methods, equipment selection, scheduling, and the like.

6.2 Existing Site Conditions

The roadway presently connects Highway 17 to Cameco's Blind River Uranium Refinery with the Huron Pines Golf & Country Club immediately west of the road and undeveloped forested lands to the east. A detailed assessment of the existing pavement condition was outside of the scope of the geotechnical investigation. While portions of the roadway were snow-covered at the time of the field program, visible portions of the pavement appeared to be in fair to poor condition.

Due to the variability of the existing fill, the distinguishment between road base and subbase was not possible at the time of investigation. High fines content (>10%) was observed in most fills, indicating potential mixing of materials over time or insufficient quality control at the time of construction. The existing fills may be more frost susceptible than a typical free draining OPSS 1010 Granular B Road sub-base, which could be contributing to seasonal movement and the current surficial condition of the road. Table 6-1 summarizes the current road conditions as identified during the geotechnical investigation, including asphalt, granular road base/subbase and groundwater depth. The existing Granular Road Base Equivalency based on the Routine Empirical Method found in the Ministry of Transportation Ontario Pavement Design Rehabilitation Manual (MTO 2013) has also been calculated to indicate the current design standard for the road.

Table 6-1: Existing Road Condition Summary Based on Borehole Data

Borehole	Asphalt Thickness (mm)	Historic Road Fill Base/Subbase/ (mm)	Existing Granular Base Equivalency (GBE)	Groundwater Depth (mbgs)
BH-24-01	90	670	448	N/E[1]
BH-24-02	100	660	455	N/E[1]
BH-24-03	100	660	455	N/E[1]
BH-24-04	100	660	455	N/E[1]

Borehole	Asphalt Thickness (mm)	Historic Road Fill Base/Subbase/ (mm)	Existing Granular Base Equivalency (GBE)	Groundwater Depth (mbgs)
BH-24-05	100	660	455	N/E[1]
BH-24-06	100	660	455	N/E[1]
BH-24-08	100	1420	835	N/E[1]
BH-24-09	110	960	618	N/E[1]
BH-24-10	100	1270	760	N/E[1]

Note(s):[1] N/E = Not Encountered at time of investigation

6.3 Pavement Design Discussion

TULLOCH understands that there is no available traffic data or any published traffic study of Eldorado Road. As such, pavement design has been conducted in accordance with the Routine (Empirical) Method – Experience-Based Standard Section design method as presented in the Pavement Design and Rehabilitation Manual (MTO 2013). A design traffic value of between 2000 and 3000 AADT has been estimated for this design for Secondary Highways. If a further increase in traffic is expected, TULLOCH should be contacted to provide updated recommendations.

Based on their compactness condition, consistency, and lack of organic content, the existing road fill materials are suitable for reuse beneath newly placed hot-mix asphalt following in-place processing of the existing asphalt layers. It should be noted that the existing road sub-base fill materials contain more fines than a typical OPSS 1010 Granular B material, which may result in a reduced pavement serviceable lifespan when compared to the performance of a reconstructed road structure. However, a full-depth reconstruction would significantly increase construction and material costs, which may negate the potential benefit gained from increased road durability. As such, Table 6-2, shown below, presents pavement recommendations for the resurfacing of Eldorado Road following in-place processing of the existing asphalt. Given the variable subgrade ranging from the loose to dense sand to the non-plastic, compact sand and silt, a conservative design approach was completed based on the compact sand and silt subgrade governing.

Furthermore, based on laboratory results of the existing road fills due to high fines content, it is recommended that the asphalt be processed in place with the existing sub-base and then recompacted, after which new Road base fill is recommended. This will prevent contamination of the road base fill from fines in the existing fills and help mitigate serviceability impacts.

The table presented below represents a minimum road cross-section with a Granular Base Equivalency (GBE) of 594. We have assumed that a minimum of 150 mm of base course materials will be placed over the existing historic road fills following in-place processing of the existing

asphalt material to achieve site grades. Additional OPSS1010 Granular A or approved equivalent placed in maximum 200 mm loose lifts and compacted to 100% Standard Proctor Maximum Dry Density (SPMDD) can be utilized to raise grades further prior to asphalt placement, if required.

Table 6-2: Pavement Resurfacing

Layer	Compaction Requirement	Thickness (mm)
Surface Asphalt HL-3 HS (OPSS 1150)	Min 92% MRD as per OPSS 310	50
Binder Course Asphalt HL-8 (OPPS1150)	Min 92% MRD as per OPSS 310	50
Road Base Course Granular A (OPSS 1010)	100% SPMDD (ASTM-D698)	150
Non-Woven Geotextile[1]	Installed per manufacturer's guidelines	-
Historic Road Base/Sub-Base Course	100% SPMDD (ASTM D698) or approved field compaction methodology as described in **Table 6-3**	660 (assumed)
Total Thickness (mm)		900
Granular Base Equivalency (GBE)		604

Note(s): [1]Geotextile should be a Class 1 non-woven geotextile with a grab tensile strength not less than 800 N and AOS (Apparent Opening Size) not larger than 0.3 mm.

6.4 In Place Processing

The in-place processing of asphalt should conform to OPSS 304. Per OPSS 304, during processing all materials should be appropriately crushed such that 100% of the material passes the 26.5 mm sieve and not more than 75% of material passes the 4.75 mm sieve.

Performance testing on the final blended aggregate shall be conducted prior to acceptance per the OPSS and determined by testing standard LS-621 – Method of Test for Determination of Amount of Asphalt-Coated Particles in Coarse Aggregate. Representative testing is recommended throughout the in-place processing to ensure consistency of quality and blend prior to compaction.

The in-place processed material shall be pulverized and recompacted to 100% of the material's Standard Proctor Maximum Dry Density (SPMDD) prior to placement of road base fills.

The processed material shall be adequately graded, such that a minimum 3% cross-fall is maintained.

The sub-base shall be inspected, proof-rolled and reviewed by a geotechnical engineer. Areas that do not meet conformance or if any soft spots or deleterious materials are detected they shall

be sub-excavated and replaced with clean mill conforming to OPSS 1010 Granular B type I, type II or an approved equivalent.

6.5 Pavement End Treatment

Joints between new and existing asphalt should be stepped and constructed according to the requirements of OPSS.PROV 313.07.09 regarding Longitudinal and Transverse joints. The step should be constructed with a width of 500 mm and height equal to half the existing surface course of asphalt (average step height 50 mm). Tack coating should be applied to any milled surface, including the vertical joint surface.

6.6 Pavement Materials, Placement and Compaction

The asphalt, base, and any additional sub-base granular fill should be placed and compacted as per the requirements in this section.

6.6.1 Asphalt

The asphalt mix design should follow the specifications in OPSS 1150 for Hot Laid (HL) Asphalt. Table 6-3 summarizes the specifications regarding asphalt. The mix designs can use Traffic Category “B” as per the expected traffic volume. The mix design should be submitted and approved by a geotechnical engineer prior to use. Tack coating or an approved equivalent method should be used between the base and surface course asphalt layers of the road.

6.6.2 Granular Base and Sub-base Fill

Table 6-3 summarizes the specifications regarding granular base and sub-base (in place processed) fills.

In the event of poor subgrade conditions, the Road sub-base may be placed at full-depth thickness (600 mm) to prevent disturbance of the subgrade soils. Placement and compaction methodology of engineered fill should be completed in consultation with the geotechnical engineer or their representative for the project.

6.6.3 Inspection and Testing

During construction, sub-base inspection and in-situ density testing shall be conducted at the request of the field geotechnical engineer or their representative to confirm that the exposed sub-base conditions are consistent with those encountered in boreholes and to verify the conformance to the design recommendations in this report. Table 6-3 below lists the recommended requirements for various pavement elements.

Table 6-3: Requirement for Asphalt, Base and Sub-base Materials

Materials	Notes
Asphalt HMA (OPSS 1150)	- PGAC: 58-34 with up to 15% RAP - Performance graded asphalt should conform to OPSS1101 - Asphalt construction and QA/QC as per OPSS 310 - Asphalt course compacted to the specified MRD (Maximum Relative Density) according to the asphalt type as per OPSS 310.
Base Course: Granular "A" (OPSS 1010)	- 100% Standard Proctor Maximum Dry Density (ASTMD698) at ± 2% of Optimum Moist Content (OMC) or a compaction method specification as approved by the engineer in writing - Placement in maximum 200 mm lifts, or as accepted by the geotechnical engineer in writing
Sub-base Course: IN-Placed Processed Material (OPSS 330)	- 100% Standard Proctor Maximum Dry Density (ASTMD698) at ± 2% of Optimum Moist Content (OMC) - Placement in maximum 200 mm lifts, or as accepted by the engineer - Material shall conform to OPSS 330 requirements

6.7 Horizontal Transition

Horizontal transition treatment is required where pavement structure changes occur. The following recommendations should be considered:

- The frost tapers for the transition zone between fine-grained native soil and granular fill should be designed at least 10H:1V in accordance with the OPSD 205.060 and OPSD 803 series to mitigate abrupt differential frost heave. Steeper frost tapers may be used if space is not available but should be reviewed and authorized by a geotechnical engineer.
- Horizontal transition from backfill and native soil should follow OPSD 803.010, OPSD 803.030, and OPSD 803.031.
- To ensure a good tie-in from new to old asphalts, the joints along both longitudinal and transverse directions should be designed as per Section 310.07.11 in OPSS 310.

6.8 Pavement Over Underground Utilities

After the installation of underground services, the pavement should be constructed as per the recommended pavement structure. Appropriate frost tapers should be implemented in the backfill geometry for the underground service utilities, such as culverts, as per the OPSD 803 series (e.g., 803.030 and 803.031).

The backfill should be placed in a maximum 200 mm loose lifts and compacted to minimum 95% SPMDD, except the top 1.0 m of the pavement subgrade, which should be compacted to at least 98%.

6.9 Utility Servicing – Bedding and Backfilling

Bedding and backfilling for service pipes, if encountered, should be compatible with the project standards and pipe design specifications. In the absence of pipe design specification, the design should follow OPSD 0802 series from OPSD 0802.0100 to 0802.0950. It is recommended to place a minimum of 150 mm to 200 mm OPSS Granular “A” at the pipe invert as bedding material. A minimum of 300 mm vertical (above the crown of the pipe) and side cover should be placed.

In areas where a relatively high groundwater table is encountered during construction, 19 mm clear stone pipe bedding may be used as an alternative to Granular A, where compaction of the bedding materials may not be possible. A Class 1 non-woven geotextile such as Terrafix 360R/Layfield LP8 or equivalent should be placed to completely encapsulate the clear stone pipe bedding and act as a filter to prevent fines migration into the bedding material.

Open trench excavation is not anticipated; if required, TULLOCH should be contacted to provide additional recommendations prior to work start-up.

If backfilling against slopes, fills should be benched into native slopes per OPSD 208.010.

6.10 Reuse of Existing Soils

Excavated existing fills may be reused, assuming sufficient testing and inspection have been conducted to confirm their general conformance with OPSS 1010 standards, with the exception of road base and sub-base applications. Caution should be exercised, recognizing the soils may have a low to moderate frost susceptibility due to greater than 10% fines content; however, the existing granular fill will likely still be suitable for in-place processing. All fill should be reviewed by a geotechnical engineer or their representative prior to reuse.

Granular fill for road base and sub-base material should be compacted as described in Section 6.5.

Soil disposal, if applicable, should be completed in accordance with all applicable laws and guidelines. It should be noted that recommendations for soil disposal, including those under O. Reg 406/19 Excess Soils, are considered outside the scope of this report.

6.11 Soil Corrosivity

Testing was completed for soil corrosivity and sulphate concentrations on two (2) recovered samples from the borehole investigation. The results of the testing are shown below in Table 6-4. Samples were tested at Testmark laboratories based in Garson, Ontario. The detailed results can be found in Appendix E.

Table 6-4: Soil Corrosivity Results

Borehole No. / Sample No.	Depth (mbgs)	Resistivity (Ω-cm)	pH	Redox Potential (mV)	Chloride (µg/g)	Sulphide (µg/g)	Sulphate (µg/g)	Severity Ranking
BH-24-02 / SS03	1.3 to 1.9	32800	5.08	331	6.5	<0.3	3	1
BH-24-09 / SS02B	1.0 to 1.4	16800	5.02	337	7.0	<0.3	2	1

Note(s): [1]Result at or below testing detection limit

The results of the chemical testing were assessed in reference to the AWWA C-105 Standard from the ANSI/AWWA Corrosivity Rating System. A score greater than 10 indicates the requirement of corrosion protective measures for buried cast iron alloys. The tested samples were assigned a severity ranking of 1, as shown in Table 6-4, which is below the threshold.

In addition, chloride ions can lead to the corrosion of steel. Typically, soils with chloride concentrations greater than 500 µg/g are considered corrosive. As noted in the table, chloride concentrations are less than 500 µg/g.

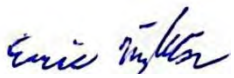
The concentration of sulphate indicates the degree of sulphate attack for concrete buried at the site. As shown in the table, the sulphate concentrations are less than 1000 µg/g, indicating a low degree of sulphate attack. As such, cement general-use GU cement should be suitable for use at this site.

7. CLOSURE

TULLOCH has prepared this geotechnical report for the exclusive use of the Town of Blind River and their authorized agents for the road resurfacing project located on Eldorado Road, Blind River, Ontario. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering for the above-noted location. Classification and identification of soils and geologic units have been based upon commonly accepted methods employed in professional geotechnical practice. No warranty or other conditions, expressed or implied, should be understood. Please refer to Appendix F, Notice to Reader, which should be reviewed, as it forms an integral part of this report.

We trust that the information in this report will be sufficient to allow the Town of Blind River to proceed with the proposed road resurfacing at Eldorado Road. Should further assistance be required for any portion of this project, we would be pleased to assist.

Sincerely,



Prepared By:
Eric Mighton
Geotechnical Engineering Intern

Reviewed By:
Erik Giles P.Eng.
Geotechnical Engineer

Daniel Wheeler, P. Eng.
Geotechnical Engineer

REFERENCES

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APPENDIX A

SITE LOCATION PLAN

BOREHOLE LOCATION PLAN

0 300
METER

PROJECT LOCATION

COORDINATES		
NAME	EASTING	NORTHING
BH-24-01	344 246	5 116 511
BH-24-02	344 294	5 116 687
BH-24-03	344 429	5 116 832
BH-24-04	344 584	5 116 903
BH-24-05	344 711	5 116 964
BH-24-06	344 818	5 117 015
BH-24-08	345 023	5 117 109
BH-24-09	345 194	5 117 290
BH-24-10	345 164	5 117 418

NOTES:

1. COORDINATES ARE IN UTM ZONE 17T (NAD83 CSRS).

LEGEND:

BH-24-01 BOREHOLE LOCATION

No.	DATE	BY	ISSUES / REVISIONS
0	2025-02-13	LM	ISSUED FOR REPORT

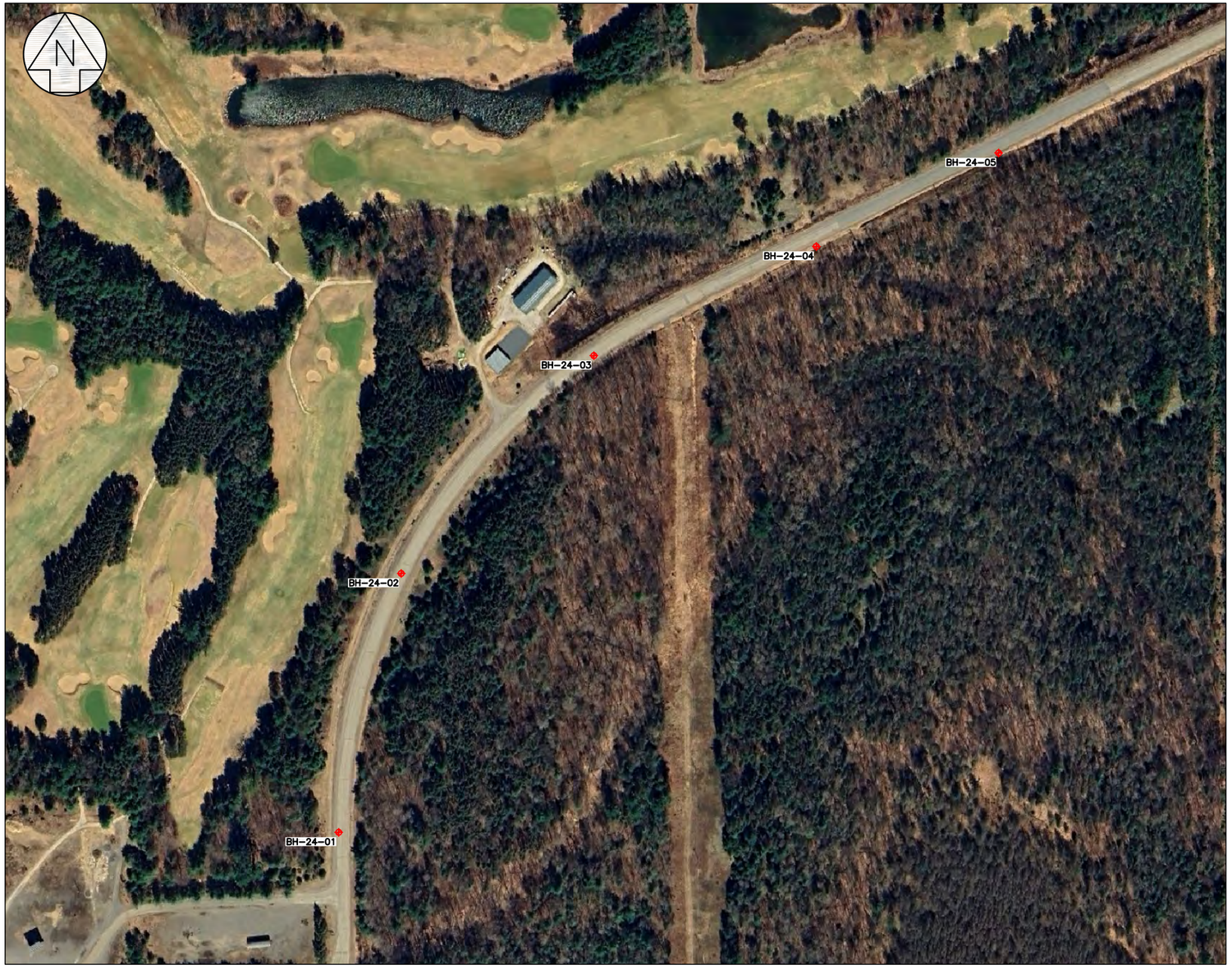
TULLOCH

DRAWING: BOREHOLE LOCATION PLAN

PROJECT: **ELDORADO ROAD RESURFACING GEOTECHNICAL INVESTIGATION**

DRAWN BY: L. MENEGHETTI	CHECKED BY: D. WHEELER	PROJECT No. : 24-1376	
DESIGNED BY:	APPROVED BY: E. GILES	DRAWING No. 24-1376-001	REVISION No. 0
SCALE: AS NOTED	DATE: 2025-02-13		

P:\2024\241376 Town of Blind River - Eldorado Road Resurfacing\Geotechnical\03 Drawings\03.02 Current\Siteplan BH\24-1376-001.dwg



BOREHOLE LOCATION PLAN

0 200
METER

PROJECT LOCATION

COORDINATES		
NAME	EASTING	NORTHING
BH-24-01	344 246	5 116 511
BH-24-02	344 294	5 116 687
BH-24-03	344 429	5 116 832
BH-24-04	344 584	5 116 903
BH-24-05	344 711	5 116 964

NOTES:

1. COORDINATES ARE IN UTM ZONE 17T (NAD83 CSRS).

LEGEND:

BH-24-01 BOREHOLE LOCATION

No.	DATE	BY	ISSUES / REVISIONS
0	2025-02-13	LM	ISSUED FOR REPORT

TULLOCH

DRAWING: BOREHOLE LOCATION PLAN

PROJECT: **ELDORADO ROAD RESURFACING GEOTECHNICAL INVESTIGATION**

DRAWN BY:	CHECKED BY:	PROJECT No. :	
L. MENEGHETTI	D. WHEELER	24-1376	
DESIGNED BY:	APPROVED BY:	DRAWING No.	REVISION No.
	E. GILES	24-1376-002	0
SCALE:	DATE:		
AS NOTED	2025-02-13		

P:\2024\241376 Town of Blind River - Eldorado Road Resurfacing\Geotechnical\03 Drawings\03.02 Current\Siteplan BH\24-1376-001.dwg

BOREHOLE LOCATION PLAN

0 200
METER

PROJECT LOCATION

COORDINATES		
NAME	EASTING	NORTHING
BH-24-06	344 818	5 117 015
BH-24-08	345 023	5 117 109
BH-24-09	345 194	5 117 290
BH-24-10	345 164	5 117 418

NOTES:

1. COORDINATES ARE IN UTM ZONE 17T (NAD83 CSRS).

LEGEND:

BH-24-01 BOREHOLE LOCATION

No.	DATE	BY	ISSUES / REVISIONS
0	2025-02-13	LM	ISSUED FOR REPORT

TULLOCH

DRAWING: BOREHOLE LOCATION PLAN

PROJECT: **ELDORADO ROAD RESURFACING GEOTECHNICAL INVESTIGATION**

DRAWN BY: L. MENEGHETTI	CHECKED BY: D. WHEELER	PROJECT No. : 24-1376	
DESIGNED BY:	APPROVED BY: E. GILES	DRAWING No. 24-1376-003	REVISION No. 0
SCALE: AS NOTED	DATE: 2025-02-13		

P:\2024\241376 Town of Blind River - Eldorado Road Resurfacing\Geotechnical\03 Drawings\03.02 Current\Siteplan BH\24-1376-001.dwg

APPENDIX B

TERMINOLOGY

ABBREVIATIONS, TERMINOLOGY AND PRINCIPAL SYMBOLS USED IN REPORT AND BOREHOLE LOGS

BOREHOLES AND TEST PIT LOGS

Soils

AS	Auger/Grab Sample	w	Water Content
SS	Split Spoon	wP	Plastic Limit
SH	Shelby Tube	wL	Liquid Limit
PISTON	Thin-walled Piston	VANE	Field Vane
WS	Washed Sample	OR	Organic Content
SC	Soil Core	GR	Gravel
BS	Block Sample	SA	Sand
WH	Weight of Rods & Hammer	SI	Silt
WR	Weight of Rods	CL	Clay

Bedrock

TCR	Total Core Recover	VN	Vein
SCR	Solid Core Recovery	CO	Contact
FI	Fracture Frequency Index	KV	Karstic Void
HQ	Rock Core (63.5 mm dia.)	MB	Mechanical Break
NQ	Rock Core (47.6 mm dia.)	PL	Planar
BQ	Rock Core (36.5 mm dia.)	CU	Curved
JN	Joint	UN	Undulating
FLT	Fault	IR	Irregular
SH	Shear	SM	Smooth
SK	Slickensided	SR	Slightly Rough
BD	Bedding	R	Rough
FO	Foliation	VR	Very rough

IN SITU SOIL TESTING

Standard Penetration Test (SPT) "N" value is the number of blows required to drive a 51 mm OD split barrel sampler into the soil a distance of 300 mm with a 63.5kg weight free falling a distance of 760 mm after an initial penetration of 150 mm has been achieved.

Dynamic Cone Penetration Test (DCPT) is the number of blows required to drive a cone with a 60-degree apex attached to "A" size drill rods continuously into the soil for each 300 mm penetration with a 63.5 kg weight free falling a distance of 760 mm.

Cone Penetration Test (CPT) is an electronic cone point with a 10 cm base area with a 60-degree apex pushed through the soil at a penetration rate of 2cm/s.

Field Vane Test (FVT) consists of a vane blade, a set of rods and torque measuring apparatus used to determine the undrained shear strength of cohesive soils.

SOIL DESCRIPTIONS

The soil descriptions and classifications are based on an expanded Unified Soil Classification System (USCS). The USCS classifies soils on the basis of engineering properties. The system divides soils into three major categories: coarse grained, fine grained and highly organic soils. The soil is then subdivided based on either gradation or plasticity characteristics. The classification excludes particles larger than 75 mm. To aid in quantifying material amounts by weight within the respective grain size fractions, the following terms have been included to expand the USCS:

Soil Classification	
Clay	<0.002 mm
Silt	0.002 to 0.06 mm
Sand	0.075 to 4.75 mm
Gravel	4.751 to 75 mm
Cobbles	75 to 300 mm
Boulders	>300 mm

Terminology	Proportion
“trace”, sand, etc.	1% to 10%
"some"	10% to 20%
Sandy, Gravelly, etc.	20% to 35%
“and” SAND, SILT, (non-cohesive)	>35%
“with” SAND, SILT, (cohesive)	>35%

Notes:

1. Soil properties, such as strength, gradation, plasticity, structure, etc., dictate the soils engineering behaviour over the grain size fractions;
2. With the exception of soil samples tested for grain size distribution or plasticity, all soil sample classifications are based on visual and tactile observations and, therefore, constitute an approximate description.

The following table outlines the qualitative terms used to describe the relative density condition of cohesionless soils related to the SPT “N” value:

Cohesionless Soils

Compactness	SPT “N” Value (blows/30cm)
Very Loose	0 to 4
Loose	5 to 10
Compact	11 to 30
Dense	31 to 50
Very Dense	>50

The following table outlines the qualitative terms used to describe the consistency of cohesive soils related to undrained shear strength and SPT “N” value:

Cohesive Soils

Consistency	Undrained Shear Strength (kPa)	SPT “N” Value (blows/30 cm)
Very Soft	<12.5	< 2
Soft	12.5 to 25	2 to 4
Firm	25 to 50	5 to 8
Stiff	50 to 100	9 to 15
Very Stiff	100 to 200	16 to 30
Hard	> 200	>30

Note: Utilizing the SPT “N” value to correlate the consistency and undrained shear strength of cohesive soils is very approximate and needs to be used with caution.

Particle Sizes

Constituent	Description	Size (mm)	Size (in)
BOULDERS	Not Applicable	>300	>12
COBBLES	Not Applicable	75 to 300	3 to 12
GRAVEL	Coarse Fine	19 to 75 4.75 to 19	0.75 to 3 (4) to 0.75
SAND	Coarse Medium Fine	2.00 to 4.75 0.425 to 2.00 0.075 to 0.425	(10) to (4) (40) to (10) (200) to (40)
SILT/CLAY	Classified by Plasticity	< 0.075	< (200)

Note: Brackets () indicate US Standard Sieve Size Number

ROCK CORING

Rock Quality Designation (RQD) is an indirect measure of the number of fractures within a rock mass, Deere et al. (1967). It is the sum of sound pieces of rock core equal to or greater than 100 mm recovered from the core run, divided by the total length of the core run, expressed as a percentage. If the core section is broken during coring or handling, the pieces are fitted together and, if 100 mm or greater included in the total sum.

Intact Rock Strength

Intact Strength (MPa)	Description
< 1	Extremely low strength
1 to 5	Very low strength
5 to 25	Low strength
25 to 50	Medium strength
50 to 100	High strength
100 to 250	Very high strength
>250	Extremely high strength

Rock Mass Quality

RQD Classification	RQD Value (%)
Very Poor Quality	<25
Poor Quality	25 to 50
Fair Quality	50 to 75
Good Quality	75 to 90
Excellent Quality	90 to 100

Rock Mass Weathering

Term	Description
Unweathered (Fresh)	No visible sign of material weathering and slight discoloration on major discontinuity surfaces.
Slightly Weathered	Discoloration indicates the weathering of rock material and discontinuity of surfaces. All of the rock material may be discoloured by weathering and may be somewhat weaker than its fresh condition.
Moderately Weathered	Less than half the rock material is decomposed and/or disintegrates to soil. Fresh or discoloured rock is present either as a continuous framework of as core stones.
Highly Weathered	More than half the rock material is decomposed and/or disintegrated to soil. Fresh or discoloured rock is present either as a discontinuous framework or as core stones.
Completely Weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is largely intact.
Residual Soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.

Joint and Foliation Spacing

Description	Spacing
Very Wide	Greater than 3 m
Wide	1 m to 3 m
Moderately Close	0.3 m to 1 m
Close	50 mm to 300 mm
Very Close	Less than 50 mm

Bedding Thickness

Description	Spacing
Very thick	Greater than 2 m
Thick	0.6 m to 2 m
Medium	0.2 m to 0.6 m
Thin	60 mm to 0.2 m
Very thin	20 mm to 60 mm
Laminated	6 to 20 mm
Thinly Laminated	Less than 6 mm

SYMBOLS

General

w_N Natural water content within the soil sample
γ Unit weight
γ' Effective unit weight
γ_D Dry unit weight
γ_{SAT} Saturated unit weight
ρ Density
ρ_s Density of solid particles
ρ_w Density of water
ρ_D Dry density
ρ_{SAT} Saturated density
e Void ratio
n Porosity
S Degree of saturation
E_{50} Fifty percent secant modulus

Consistency

w_L Liquid Limit
w_P Plastric Limit
I_P Plasticity Index
w_S Shrinkage Limit
I_L Liquidity Index
I_C Consistency Index
e_{max} Void ratio in loosest state
e_{min} Void ratio in densest state
I_D Density Index (formerly relative density)

Shear Strength

S_u Undrained shear strength parameter (total stress)
c' Effective cohesion intercept
ϕ' Effective friction angle
τ_P Peak shear strength
τ_R Residual shear strength
δ Angle of interface friction
μ Coefficient of friction = tan ϕ'

Consolidation

C_c Compression index (normally consolidated range)
C_r Recompression index (over consolidated range)
m_v Coefficient of volume change
c_v Coefficient of consolidation
T_v Time factor (vertical direction)
U Degree of consolidation
σ'_v Effictive overburden pressure
OCR Overconsolidation ratio

APPENDIX C

SITE PHOTOGRAPH LOG

Photo 1: BH-24-01 Site Conditions. Photo taken facing north.

Photo 2: BH-24-01 Site Conditions. Photo taken facing south

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Investigation Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**1**

Photo 3: BH-24-01 Post Backfill Conditions. Photo taken facing south,

Photo 4: BH-24-01 Post Backfill Conditions. Photo taken facing north.

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Investigation Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**2**

Photo 5: BH-24-02 Site Conditions. Photo taken facing northeast.

Photo 6: BH-24-02 Site Conditions. Photo taken facing southwest.

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Investigation Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**3**

Photo 7: BH-24-02 during advancement.

Photo 8: BH-24-02 Post Backfill Site Conditions. Photo taken face northeast.

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Investigation Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**4**

Photo 9: BH-24-03 Site Conditions. Photo taken face northeast.

Photo 10: BH-24-03 Site Conditions. Photo taken facing west.

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Investigation Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**5**

Photo 11: BH-24-03 during advance.

Photo 12: BH-24-04 Site Conditions. Photo taken facing northeast.

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Investigation Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**6**

Photo 13: BH-24-04 Site Conditions. Photo taken face east.

Photo 14: BH-24-04 during advance. Photo taken facing west.

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Investigation Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**7**

Photo 15: BH-24-05 during advance.

Photo 16: BH-24-06 Site Conditions. Photo taken facing northeast.

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Investigation Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**8**

Photo 17: BH-24-06 during advance.

Photo 18: BH-24-08 Site Conditions. Photo taken facing southwest.

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Investigation Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**9**

Photo 19: BH-24-08 Site Conditions. Photo taken facing northeast.

Photo 20: BH-24-08 During Advance.

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Investigation Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**10**

Photo 21: BH-24-08 Post Backfill Site Conditions.

Photo 22: BH-24-09 During Advance.

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Verification Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**11**

Photo 23: BH-24-09 Post Backfill Site Conditions. Photo taken face north.

Photo 24: BH-24-10 During Advance. Photo taken face south.

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Investigation Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**12**

Photo 25: BH-24-10 Post Backfill Conditions.

CLIENT
Town of Blind River

PROJECT
Eldorado Road Resurfacing

CONSULTANT
TULLOCH ENGINEERING

YYYY-MM-DD	2025-01-08
PREPARED	GW
DESIGNED	GW
REVIEWED	DW
APPROVED	DW

TITLE
Borehole Investigation Site Photographs

PROJECT NO.	Phase/Task	Rev.	FIGURE
241376	**101**	**0**	**13**

APPENDIX D

BOREHOLE LOGS

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-24-01

1 OF 1

METRIC

JOB NUMBER 24-1376 LOCATION Eldorado Road, Blind River, ON ORIGINATED BY RM

CLIENT Corporation of the Town of Blind River DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger COMPILED BY JR

DRILLER Lajoie Bros. Contracting Ltd. DATE 2024.12.06 NORTHING 5116511 EASTING 344246 CHECKED BY

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION (M)	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ POCKET PEN + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	RECOVERY RATIO (%)					GR SA SI CL
179.28											
0.00 / 179.19	ASPHALT, 90 mm THICK										Approximately 150 mm of frost
0.09	FILL - (SM) SILTY SAND, trace fine grained gravel, brown, non-cohesive, frozen, compact		1	SS	25	60		179		○	6 61 (33)
178.52											
0.76	(SP) SAND, fine to coarse grained, trace silt, brown, non-cohesive, moist, compact		2	SS	30	80		178		○	0 96 (4)
177.76											
1.52	END OF BOREHOLE Note(s): - Borehole cave-in at approximately 1.37 mbgs upon completion of drilling. - Groundwater was not encountered upon completion of drilling. - It should be noted that groundwater conditions may not have stabilized at investigation completion.										

200 + : Numbers refer to Field Vane Over Limit +3, ×3: Numbers refer to Sensitivity ○3% STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-24-02

1 OF 1

METRIC

JOB NUMBER 24-1376 LOCATION Eldorado Road, Blind River, ON ORIGINATED BY RM

CLIENT Corporation of the Town of Blind River DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger COMPILED BY JR

DRILLER Lajoie Bros. Contracting Ltd. DATE 2024.12.06 NORTHING 5116687 EASTING 344294 CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	TYPE	"N" VALUES	RECOVERY RATIO (%)	GROUND WATER CONDITIONS	ELEVATION (M)	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ POCKET PEN + FIELD VANE ● QUICK TRIAXIAL × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
179.92											
0.00 / 179.82	ASPHALT, 100 mm THICK										
0.10 / 179.16	FILL - (SM) Gravelly SILTY SAND, brown, non-cohesive, frozen, very dense		1	SS	54	75				○	28 56 (16)
0.76 / 177.79	(SP) SAND, fine to medium grained, trace gravel, trace silt, grey to light brown, non-cohesive, moist, compact to loose		2	SS	27	83		179			
			3	SS	6	75		178			
2.13	END OF BOREHOLE Note(s): - Borehole cave-in at approximately 1.37 mbgs upon completion of drilling. - Groundwater was not encountered upon completion of drilling. - It should be noted that groundwater conditions may not have stabilized at investigation completion.										

200 + : Numbers refer to Field Vane Over Limit +3, ×3: Numbers refer to Sensitivity ○3% STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-24-03

1 OF 1

METRIC

JOB NUMBER 24-1376 LOCATION Eldorado Road, Blind River, ON ORIGINATED BY RM

CLIENT Corporation of the Town of Blind River DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger COMPILED BY JR

DRILLER Lajoie Bros. Contracting Ltd. DATE 2024.12.06 NORTHING 5116832 EASTING 344429 CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	SAMPLES: RECOVERY RATIO (%)	GROUND WATER CONDITIONS	ELEVATION (M)	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ POCKET PEN, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
179.91									20 40 60 80 100	20 40 60	
0.00 179.81	ASPHALT, 100 mm THICK										
0.10 179.15	FILL - (SM) Gravelly SILTY SAND, brown, presence of COBBLES, non-cohesive, frozen, dense		1	SS	46	75				○	32 52 (15) Cobbles inferred at 0.61 mbgs due to audible auger grinding
0.76 178.84	(SP) SAND, brown, non-cohesive, moist, compact		2A/B	SS	24	83		179			
1.07 178.39	(SM) SILTY SAND, trace fine grained gravel, brown, non-cohesive, moist, compact									○	6 62 (32)
1.52	END OF BOREHOLE Note(s): - Borehole cave-in at approximately 1.52 mbgs upon completion of drilling. - Groundwater was not encountered upon completion of drilling. - It should be noted that groundwater conditions may not have stabilized at investigation										

$200+$: Numbers refer to Field Vane Over Limit $+^{3}, \times^{3}$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-24-04

1 OF 1

METRIC

JOB NUMBER 24-1376 LOCATION Eldorado Road, Blind River, ON ORIGINATED BY RM

CLIENT Corporation of the Town of Blind River DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger COMPILED BY JR

DRILLER Lajoie Bros. Contracting Ltd. DATE 2024.12.06 NORTHING 5116903 EASTING 344584 CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	SAMPLES: RECOVERY RATIO (%)	GROUND WATER CONDITIONS	ELEVATION (M)	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ POCKET PEN, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
180.26									20 40 60 80 100	20 40 60	
0.00 / 180.16	ASPHALT, 100 mm THICK										
0.10 / 179.50	FILL - (SM) Gravelly SILTY SAND, dark brown, non-cohesive, moist		1	AS	-	-		180			Auger grinding at approximately 0.61 mbgs.
0.76 / 178.74	(SP) SAND, trace gravel, light brown, presence of COBBLES, non-cohesive, moist		2	AS	-	-		179			
1.52	END OF BOREHOLE Note(s): - Borehole cave-in at approximately 1.37 mbgs upon completion of drilling. - Groundwater was not encountered upon completion of drilling. - It should be noted that groundwater conditions may not have stabilized at investigation										

200 + : Numbers refer to Field Vane Over Limit

+ 3 , × 3 : Numbers refer to Sensitivity

○ 3% STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-24-05

1 OF 1

METRIC

JOB NUMBER 24-1376 LOCATION Eldorado Road, Blind River, ON ORIGINATED BY RM

CLIENT Corporation of the Town of Blind River DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger COMPILED BY JR

DRILLER Lajoie Bros. Contracting Ltd. DATE 2024.12.06 NORTHING 5116964 EASTING 344711 CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	SAMPLES: RECOVERY RATIO (%)	GROUND WATER CONDITIONS	ELEVATION (M)	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ POCKET PEN, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
180.80									20 40 60 80 100	20 40 60	
0.00 180.70	ASPHALT, 100 mm THICK										
0.10	FILL - (SM) Gravelly SILTY SAND, brown, non-cohesive, moist		1	AS	-	-					Difficulty adnvancing beyond 0.46 mbgs due to frost.
180.04											
0.76	(ML-SP) SAND & SILT, trace fine grained gravel, greyish-brown, non-cohesive, moist, compact		2	SS	26	83		180		○	1 44 (55)
179.43											
1.37	END OF BOREHOLE Note(s): - Borehole cave-in at approximately 1.07 mbgs upon completion of drilling. - Groundwater was not encountered upon completion of drilling. - It should be noted that groundwater conditions may not have stabilized at investigation										

$200+$: Numbers refer to Field Vane Over Limit $+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-24-06

1 OF 1

METRIC

JOB NUMBER 24-1376 LOCATION Eldorado Road, Blind River, ON ORIGINATED BY RM

CLIENT Corporation of the Town of Blind River DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger COMPILED BY JR

DRILLER Lajoie Bros. Contracting Ltd. DATE 2024.12.06 NORTHING 5117015 EASTING 344818 CHECKED BY

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION (M)	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ POCKET PEN + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	RECOVERY RATIO (%)					GR SA SI CL
181.06											
0.00 180.96	ASPHALT, 100 mm THICK							181			
0.10	FILL - (SM) SILTY SAND, some gravel, dark brown to brown, non-cohesive, moist		1	AS	-	-					
			2	AS	-	-				○	19 62 (19)
180.30 0.76	(SM) SILTY SAND, trace gravel, greyish-brown, non-cohesive, moist		3	AS	-	-		180			
179.54											
1.52	END OF BOREHOLE Note(s): - Borehole cave-in at approximately 1.52 mbgs upon completion of drilling. - Groundwater was not encountered upon completion of drilling. - It should be noted that groundwater conditions may not have stabilized at investigation										

$200+$: Numbers refer to Field Vane Over Limit $+^{3}, \times^{3}$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-24-08

1 OF 1

METRIC

JOB NUMBER 24-1376 LOCATION Eldorado Road, Blind River, ON ORIGINATED BY RM

CLIENT Corporation of the Town of Blind River DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger COMPILED BY JR

DRILLER Lajoie Bros. Contracting Ltd. DATE 2024.12.06 NORTHING 5117109 EASTING 345023 CHECKED BY

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION (M)	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	RECOVERY RATIO (%)			20 40 60 80 100	w_P w w_L	GR SA SI CL
182.64									SHEAR STRENGTH kPa: ○ POCKET PEN + FIELD VANE; ● QUICK TRIAXIAL × LAB VANE	WATER CONTENT (%) 20 40 60	
0.00	ASPHALT, 100 mm THICK										
182.54											
0.10	FILL - (SM) SILTY SAND, some gravel, brown, non-cohesive, frozen, very dense		1	AS	-	-				○	19 68 (13)
			2	SS	44	83		182			
181.12											
1.52	(SP) SAND, fine to medium grained, trace gravel, trace silt, light brown, non-cohesive, moist, dense		3	SS	39	83		181			
180.51											
2.13	END OF BOREHOLE Note(s): - Borehole cave-in at approximately 1.37 mbgs upon completion of drilling. - Groundwater was not encountered upon completion of drilling. - It should be noted that groundwater conditions may not have stabilized at investigation										

200 + : Numbers refer to Field Vane Over Limit +3, ×3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-24-09

1 OF 1

METRIC

JOB NUMBER 24-1376 LOCATION Eldorado Road, Blind River, ON ORIGINATED BY RM

CLIENT Corporation of the Town of Blind River DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger COMPILED BY JR

DRILLER Lajoie Bros. Contracting Ltd. DATE 2024.12.06 NORTHING 5117290 EASTING 345194 CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	SAMPLES: RECOVERY RATIO (%)	GROUND WATER CONDITIONS	ELEVATION (M)	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ POCKET PEN, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
183.93									20 40 60 80 100	20 40 60	
0.00	ASPHALT, 110 mm THICK										
183.82											
0.11	(SM) SILTY SAND, some gravel, brown, non-cohesive, moist		1	AS	-	-					
			2A/B	SS	37	71		183		○	17 66 (17)
182.86											
1.07	(SM) SILTY SAND, fine to medium grained, light brown, non-cohesive, moist, dense										
182.41											
1.52	END OF BOREHOLE Note(s): - Borehole cave-in at approximately 1.07 mbgs upon completion of drilling. - Groundwater was not encountered upon completion of drilling. - It should be noted that groundwater conditions may not have stabilized at investigation										

$200+$: Numbers refer to Field Vane Over Limit $+^{3}, \times^{3}$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-24-10

1 OF 1

METRIC

JOB NUMBER 24-1376 LOCATION Eldorado Road, Blind River, ON ORIGINATED BY RM

CLIENT Corporation of the Town of Blind River DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger COMPILED BY JR

DRILLER Lajoie Bros. Contracting Ltd. DATE 2024.12.06 NORTHING 5117418 EASTING 345164 CHECKED BY

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION (M)	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT / WATER CONTENT (%)	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	RECOVERY RATIO (%)			20 40 60 80 100	20 40 60	GR SA SI CL
184.50											
0.00 / 184.40	ASPHALT, 100 mm THICK										
0.10	FILL - (SM) Gravelly SILTY SAND, dark brown to brown, non-cohesive, moist		1	AS	-	-					
			2	AS	-	-		184			
			3	AS	-	-				○	23 58 (18)
183.13											
1.37	END OF BOREHOLE Note(s): - Borehole cave-in at approximately 1.22 mbgs upon completion of drilling. - Groundwater was not encountered upon completion of drilling. - It should be noted that groundwater conditions may not have stabilized at investigation										

SHEAR STRENGTH kPa: ○ POCKET PEN + FIELD VANE ● QUICK TRIAXIAL × LAB VANE

200^{+} : Numbers refer to Field Vane Over Limit $+^{3}, \times^{3}$: Numbers refer to Sensitivity $\circ^{3\%}$ STRAIN AT FAILURE

APPENDIX E

LABORATORY TESTING RESULTS

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CCIL Certified Technicians

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 24-1376 **DATE SAMPLED:** 2025-12-06

PROJECT: Eldorado Road Resurfacing **SOURCE:** Boreholes

DATE TESTED: 2025-01-06 **TESTED BY:** T. Linley

			Gross (inc. Tare) (g)				
Tare ID	**Sample ID**	**Depth (m)**	**Wet Weight**	**Dry Weight**	**TARE**	**Mass Lost**	**Water %**
	BH-24-01 SS01	0.2 to 0.6	962.20	884.10	164.90	78.1	10.9%
	BH-24-01 SS02	0.9 to 1.4	790.40	761.40	161.50	29	4.8%

REMARKS:

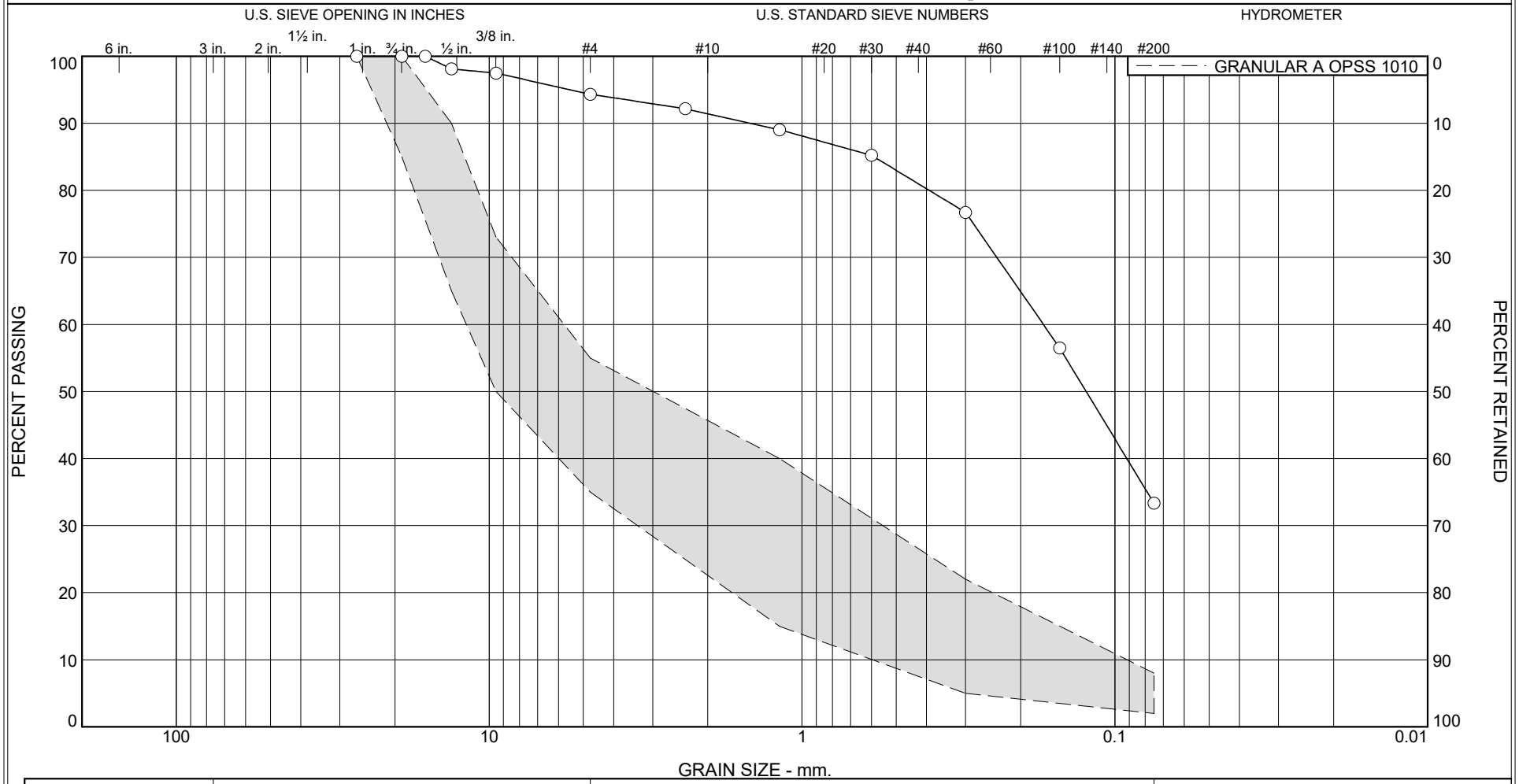
CLIENT: Corporation of the Town of Blind River

COPIES TO:

Tulloch Engineering, Materials Testing Laboratory, 71 Black Road - Unit 3, Sault Ste. Marie, ON. Canada P6B 0A3

Tel: (705) 949-1457 Fax: (705) 945-5092 email: daren.stadnisky@tulloch.ca

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	0.0	5.7	2.9	10.4	47.7	33.3

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-01 Depth: 0.2m - 0.6m Sample Number: SS01	Dec 6, 2024		Jan 7, 2024

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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Daren.Stadnisky@TULLOCH.ca

○ F.M.=1.09

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-01
Depth: 0.2m - 0.6m **Sample Number:** SS01
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 7, 2024
Tested by: T. Linley
Material specification: GRANULAR A OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
884.10	164.90	26.5mm	0.00	0.00	100.0	0.0	100.0	100.0	
		19mm	0.00	0.00	100.0	0.0	85.0	100.0	
		16mm	0.00	0.00	100.0	0.0			
		13.2mm	13.60	0.00	98.1	1.9	65.0	90.0	*+8.1*
		9.5mm	4.60	0.00	97.5	2.5	50.0	73.0	*+24.5*
		#4	22.60	0.00	94.3	5.7	35.0	55.0	*+39.3*
711.00	388.80	#8	7.40	0.00	92.2	7.8			
		#16	10.70	0.00	89.0	11.0	15.0	40.0	*+49.0*
		#30	13.00	0.00	85.2	14.8			
		#50	29.10	0.00	76.7	23.3	5.0	22.0	*+54.7*
		#100	69.10	0.00	56.5	43.5			
		#200	79.00	0.00	33.3	66.7	2.0	8.0	*+25.3*

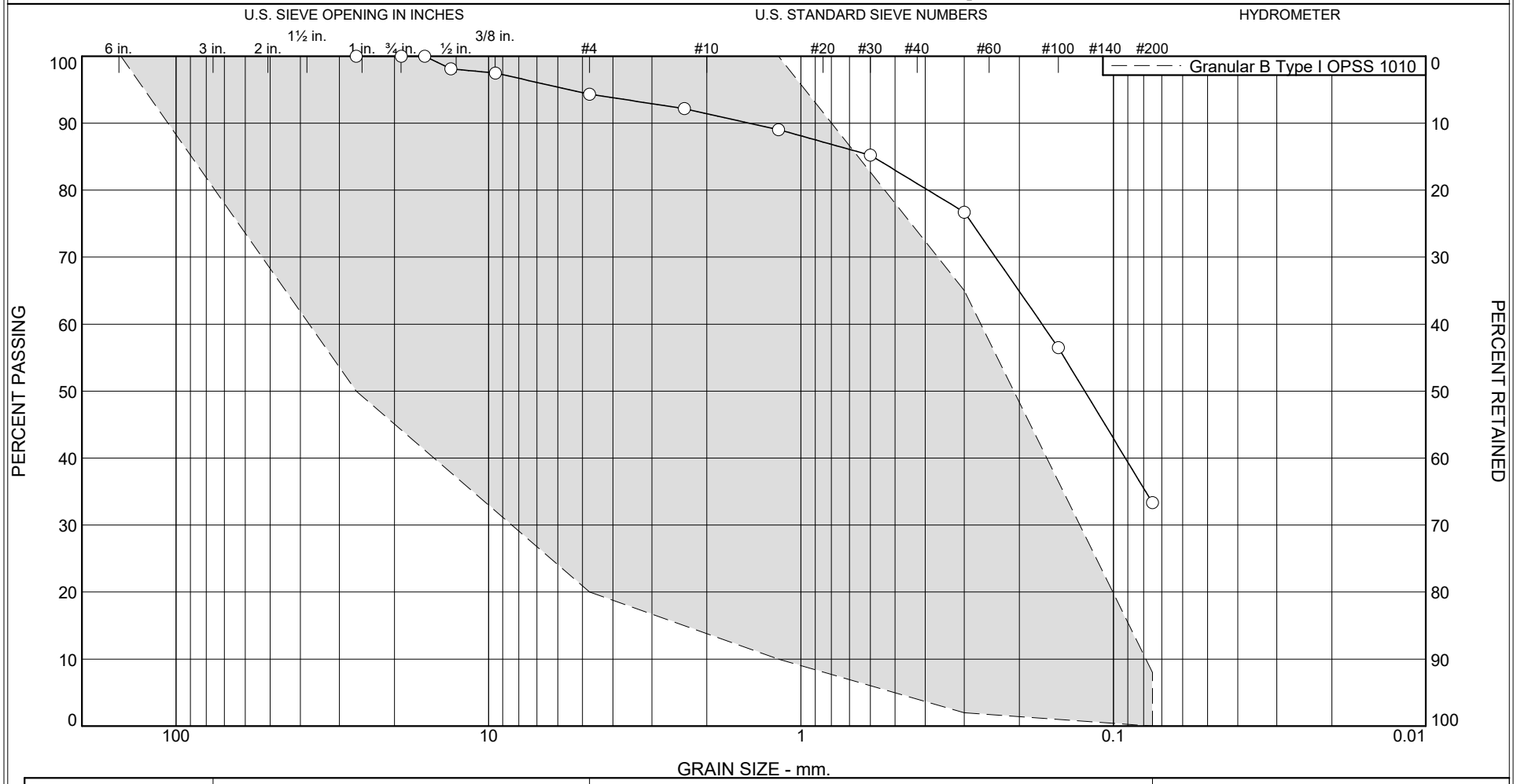
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	5.7	5.7	2.9	10.4	47.7	61.0			33.3

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.0916	0.1235	0.1693	0.3923	0.5892	1.4631	5.5101

Fineness Modulus
1.09

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	0.0	5.7	2.9	10.4	47.7	33.3

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-01 Depth: 0.2m - 0.6m Sample Number: SS01	Dec 6, 2024		Jan 7, 2024

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=1.09

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-01
Depth: 0.2m - 0.6m **Sample Number:** SS01
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 7, 2024
Tested by: T. Linley
Material specification: Granular B Type I OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
884.10	164.90	26.5mm	0.00	0.00	100.0	0.0	50.0	100.0	
		19mm	0.00	0.00	100.0	0.0			
		16mm	0.00	0.00	100.0	0.0			
		13.2mm	13.60	0.00	98.1	1.9			
		9.5mm	4.60	0.00	97.5	2.5			
		#4	22.60	0.00	94.3	5.7	20.0	100.0	
711.00	388.80	#8	7.40	0.00	92.2	7.8			
		#16	10.70	0.00	89.0	11.0	10.0	100.0	
		#30	13.00	0.00	85.2	14.8			
		#50	29.10	0.00	76.7	23.3	2.0	65.0	*+11.7*
		#100	69.10	0.00	56.5	43.5			
		#200	79.00	0.00	33.3	66.7	0.0	8.0	*+25.3*

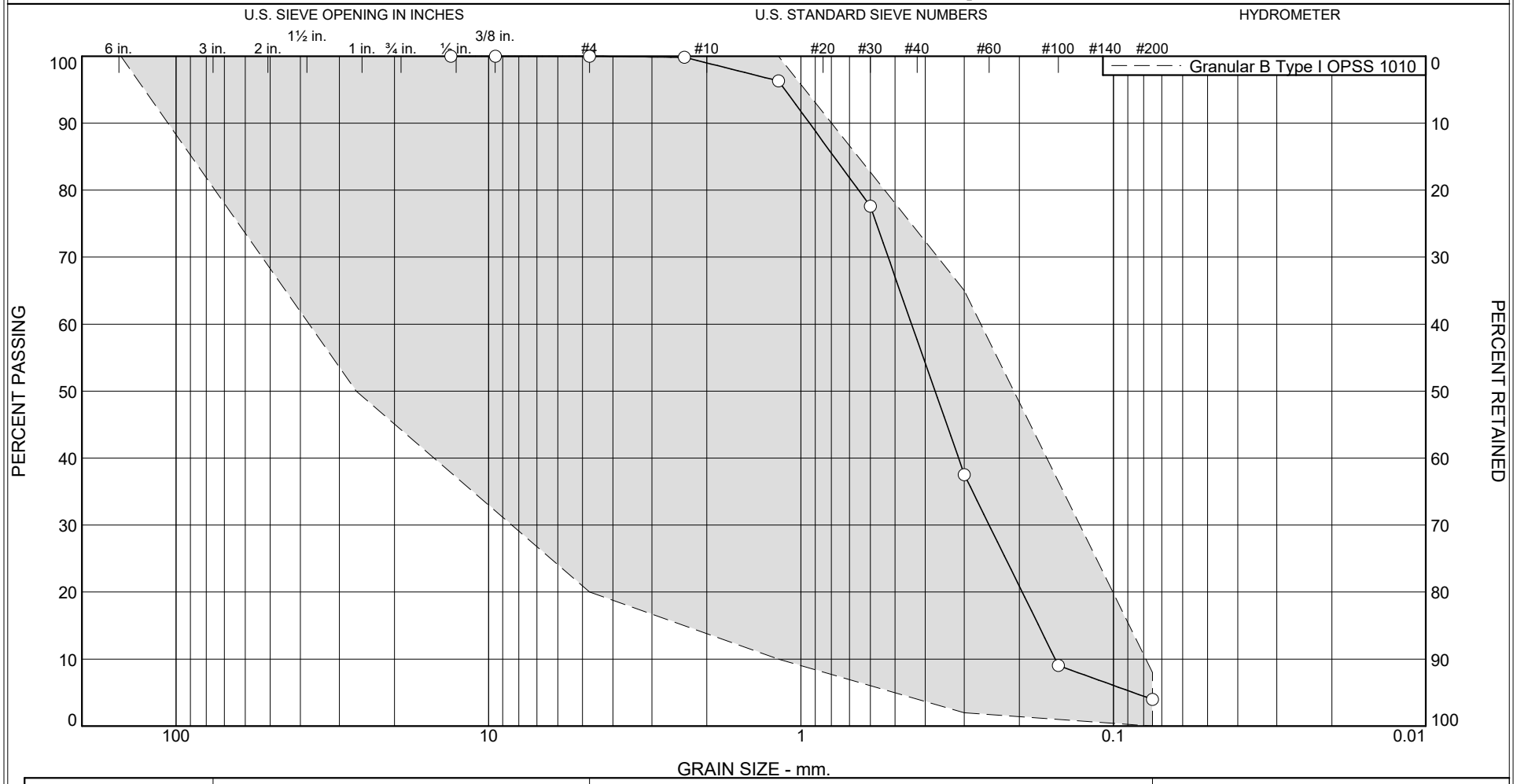
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	5.7	5.7	2.9	10.4	47.7	61.0			33.3

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.0916	0.1235	0.1693	0.3923	0.5892	1.4631	5.5101

Fineness Modulus
1.09

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	0.0	0.0	1.0	41.3	53.7	4.0

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-01 Depth: 0.9m - 1.4m Sample Number: SS02	Dec 6, 2024		Jan 7, 2025

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=1.80

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-01
Depth: 0.9m - 1.4m **Sample Number:** SS02
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 7, 2025
Tested by: T. Linley
Material specification: Granular B Type I OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
761.40	161.50	13.2mm	0.00	0.00	100.0	0.0			
		9.5mm	0.00	0.00	100.0	0.0			
		#4	0.00	0.00	100.0	0.0	20.0	100.0	
521.80	235.10	#8	0.50	0.00	99.8	0.2			
		#16	10.10	0.00	96.3	3.7	10.0	100.0	
		#30	53.60	0.00	77.6	22.4			
		#50	114.90	0.00	37.5	62.5	2.0	65.0	
		#100	81.70	0.00	9.0	91.0			
		#200	14.50	0.00	4.0	96.0	0.0	8.0	

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.0	41.3	53.7	96.0			4.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0863	0.1536	0.1734	0.1959	0.2498	0.3131	0.3722	0.4425	0.6543	0.7840	0.9394	1.1257

Fineness Modulus	C_u	C_c
1.80	2.88	0.92

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CCIL Certified Technicians

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 24-1376 **DATE SAMPLED:** 2025-12-06

PROJECT: Eldorado Road Resurfacing **SOURCE:** Boreholes

DATE TESTED: 2025-01-06 **TESTED BY:** T. Linley

			Gross (inc. Tare) (g)				
Tare ID	**Sample ID**	**Depth (m)**	**Wet Weight**	**Dry Weight**	**TARE**	**Mass Lost**	**Water %**
	BH-24-02 SS01	0.2 to 0.8	1206.00	1157.10	151.20	48.9	4.9%

REMARKS:

CLIENT: Corporation of the Town of Blind River

COPIES TO:

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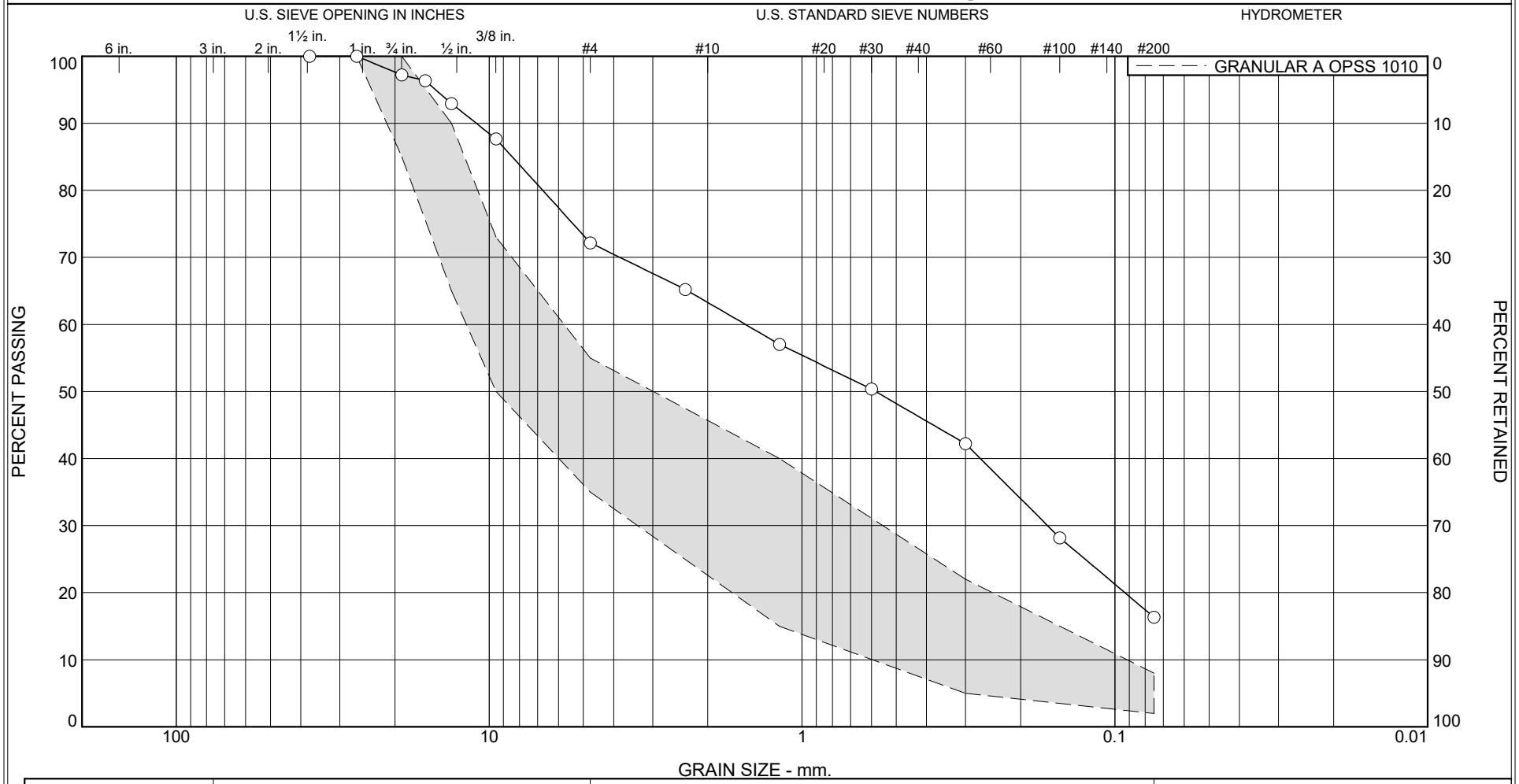
Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	2.8	25.0	8.9	17.0	30.0	16.3

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-02 Depth: 0.2m - 0.8m Sample Number: SS01	Dec 6, 2024		Jan 7, 2025

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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Daren.Stadnisky@TULLOCH.ca

○ F.M.=3.00

Tested By: S. Campbell

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-02
Depth: 0.2m - 0.8m **Sample Number:** SS01
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 7, 2025
Tested by: S. Campbell
Material specification: GRANULAR A OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
1157.10	151.20	37.5mm	0.00	0.00	100.0	0.0			
		26.5mm	0.00	0.00	100.0	0.0	100.0	100.0	
		19mm	28.20	0.00	97.2	2.8	85.0	100.0	
		16mm	8.60	0.00	96.3	3.7			
		13.2mm	34.20	0.00	92.9	7.1	65.0	90.0	*+2.9*
		9.5mm	53.20	0.00	87.7	12.3	50.0	73.0	*+14.7*
		#4	155.80	0.00	72.2	27.8	35.0	55.0	*+17.2*
533.70	241.80	#8	28.10	0.00	65.2	34.8			
		#16	33.10	0.00	57.0	43.0	15.0	40.0	*+17.0*
		#30	27.00	0.00	50.4	49.6			
		#50	33.00	0.00	42.2	57.8	5.0	22.0	*+20.2*
		#100	56.70	0.00	28.2	71.8			
		#200	47.90	0.00	16.3	83.7	2.0	8.0	*+8.3*

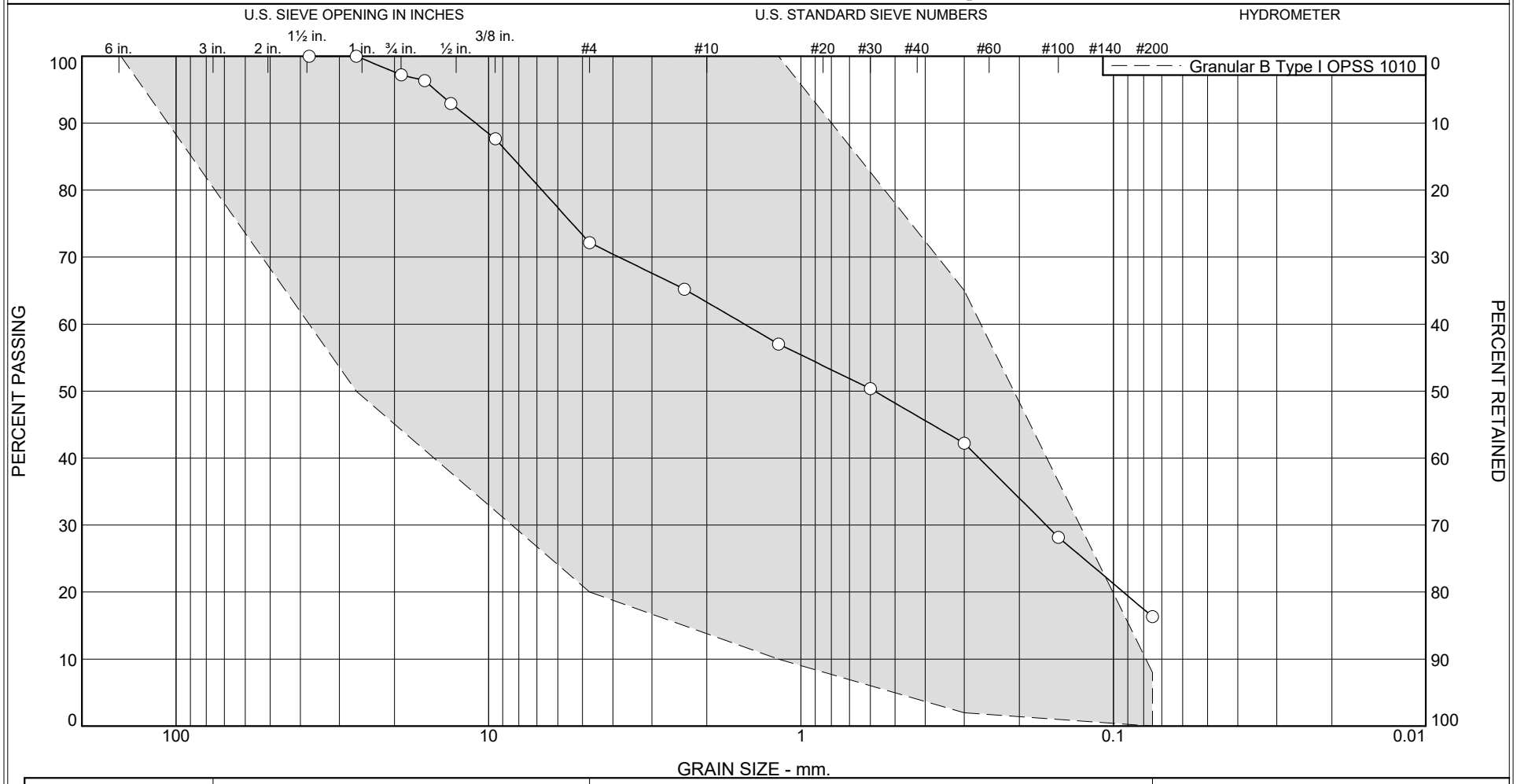
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	2.8	25.0	27.8	8.9	17.0	30.0	55.9			16.3

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0929	0.1641	0.2691	0.5820	1.5170	6.7451	8.4365	10.9931	14.8304

Fineness Modulus
3.00

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	2.8	25.0	8.9	17.0	30.0	16.3

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-02 Depth: 0.2m - 0.8m Sample Number: SS01	Dec 6, 2024		Jan 7, 2025

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=3.00

Tested By: S. Campbell

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-02
Depth: 0.2m - 0.8m **Sample Number:** SS01
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 7, 2025
Tested by: S. Campbell
Material specification: Granular B Type I OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
1157.10	151.20	37.5mm	0.00	0.00	100.0	0.0			
		26.5mm	0.00	0.00	100.0	0.0	50.0	100.0	
		19mm	28.20	0.00	97.2	2.8			
		16mm	8.60	0.00	96.3	3.7			
		13.2mm	34.20	0.00	92.9	7.1			
		9.5mm	53.20	0.00	87.7	12.3			
		#4	155.80	0.00	72.2	27.8	20.0	100.0	
533.70	241.80	#8	28.10	0.00	65.2	34.8			
		#16	33.10	0.00	57.0	43.0	10.0	100.0	
		#30	27.00	0.00	50.4	49.6			
		#50	33.00	0.00	42.2	57.8	2.0	65.0	
		#100	56.70	0.00	28.2	71.8			
		#200	47.90	0.00	16.3	83.7	0.0	8.0	*+8.3*

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	2.8	25.0	27.8	8.9	17.0	30.0	55.9			16.3

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0929	0.1641	0.2691	0.5820	1.5170	6.7451	8.4365	10.9931	14.8304

Fineness Modulus
3.00

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CCIL Certified Technicians

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 24-1376 **DATE SAMPLED:** 2025-12-06

PROJECT: Eldorado Road Resurfacing **SOURCE:** Boreholes

DATE TESTED: 2025-01-06 **TESTED BY:** T. Linley

			Gross (inc. Tare) (g)				
Tare ID	**Sample ID**	**Depth (m)**	**Wet Weight**	**Dry Weight**	**TARE**	**Mass Lost**	**Water %**
	BH-24-03 SS01	0.2 to 0.8	1162.10	1127.70	166.30	34.4	3.6%
	BH-24-03 SS02B	1.1 to 1.4	704.10	657.20	168.50	46.9	9.6%

REMARKS:

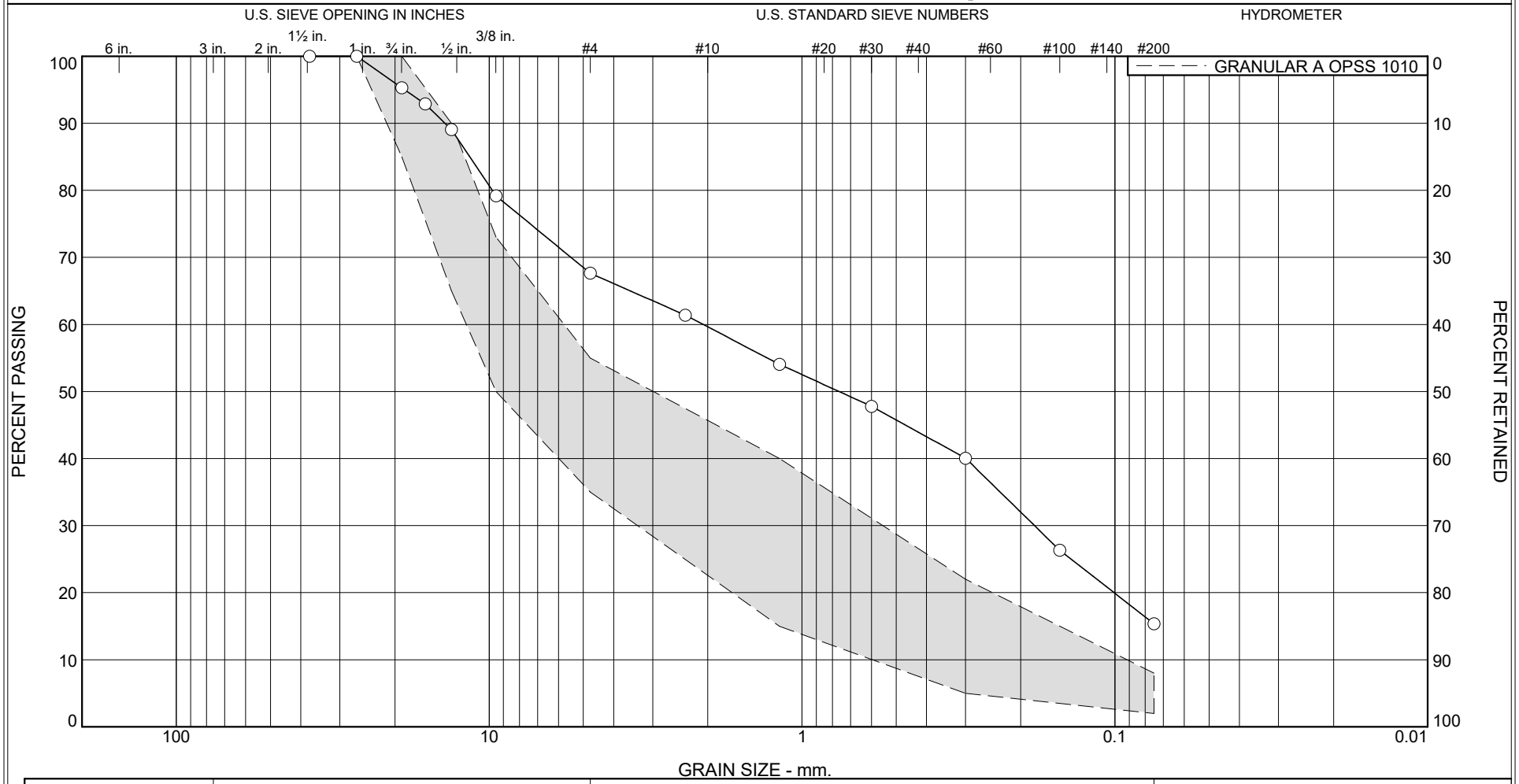
CLIENT: Corporation of the Town of Blind River

COPIES TO:

Tulloch Engineering, Materials Testing Laboratory, 71 Black Road - Unit 3, Sault Ste. Marie, ON. Canada P6B 0A3

Tel: (705) 949-1457 Fax: (705) 945-5092 email: daren.stadnisky@tulloch.ca

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	4.7	27.7	8.0	15.7	28.5	15.4

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-03 Depth: 0.2m - 0.8m Sample Number: SS01	Dec 6, 2024		Jan 8, 2025

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=3.28

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-03
Depth: 0.2m - 0.8m **Sample Number:** SS01
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 8, 2025
Tested by: T. Linley
Material specification: GRANULAR A OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
1122.70	166.30	37.5mm	0.00	0.00	100.0	0.0			
		26.5mm	0.00	0.00	100.0	0.0	100.0	100.0	
		19mm	45.20	0.00	95.3	4.7	85.0	100.0	
		16mm	22.90	0.00	92.9	7.1			
		13.2mm	36.70	0.00	89.0	11.0	65.0	90.0	
		9.5mm	94.40	0.00	79.2	20.8	50.0	73.0	*+6.2*
		#4	110.40	0.00	67.6	32.4	35.0	55.0	*+12.6*
822.10	529.60	#8	27.00	0.00	61.4	38.6			
		#16	31.70	0.00	54.1	45.9	15.0	40.0	*+14.1*
		#30	27.10	0.00	47.8	52.2			
		#50	33.50	0.00	40.0	60.0	5.0	22.0	*+18.0*
		#100	59.40	0.00	26.3	73.7			
		#200	47.30	0.00	15.4	84.6	2.0	8.0	*+7.4*

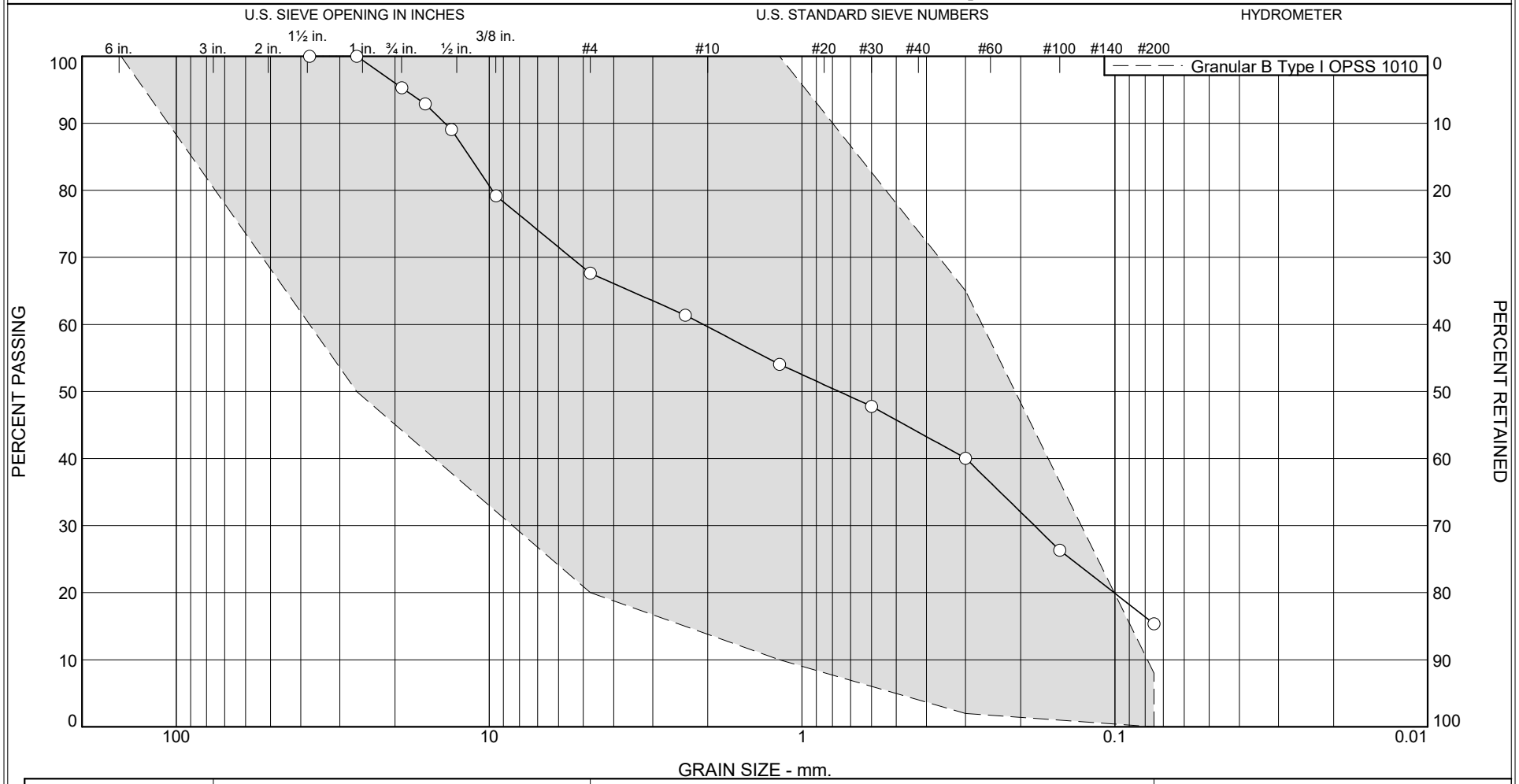
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	4.7	27.7	32.4	8.0	15.7	28.5	52.2			15.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1005	0.1807	0.2993	0.7616	2.0701	9.7658	11.5364	13.8493	18.6301

Fineness Modulus
3.28

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	4.7	27.7	8.0	15.7	28.5	15.4

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-03 Depth: 0.2m - 0.8m Sample Number: SS01	Dec 6, 2024		Jan 8, 2025

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=3.28

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-03
Depth: 0.2m - 0.8m **Sample Number:** SS01
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 8, 2025
Tested by: T. Linley
Material specification: Granular B Type I OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
1122.70	166.30	37.5mm	0.00	0.00	100.0	0.0			
		26.5mm	0.00	0.00	100.0	0.0	50.0	100.0	
		19mm	45.20	0.00	95.3	4.7			
		16mm	22.90	0.00	92.9	7.1			
		13.2mm	36.70	0.00	89.0	11.0			
		9.5mm	94.40	0.00	79.2	20.8			
		#4	110.40	0.00	67.6	32.4	20.0	100.0	
822.10	529.60	#8	27.00	0.00	61.4	38.6			
		#16	31.70	0.00	54.1	45.9	10.0	100.0	
		#30	27.10	0.00	47.8	52.2			
		#50	33.50	0.00	40.0	60.0	2.0	65.0	
		#100	59.40	0.00	26.3	73.7			
		#200	47.30	0.00	15.4	84.6	0.0	8.0	*+7.4*

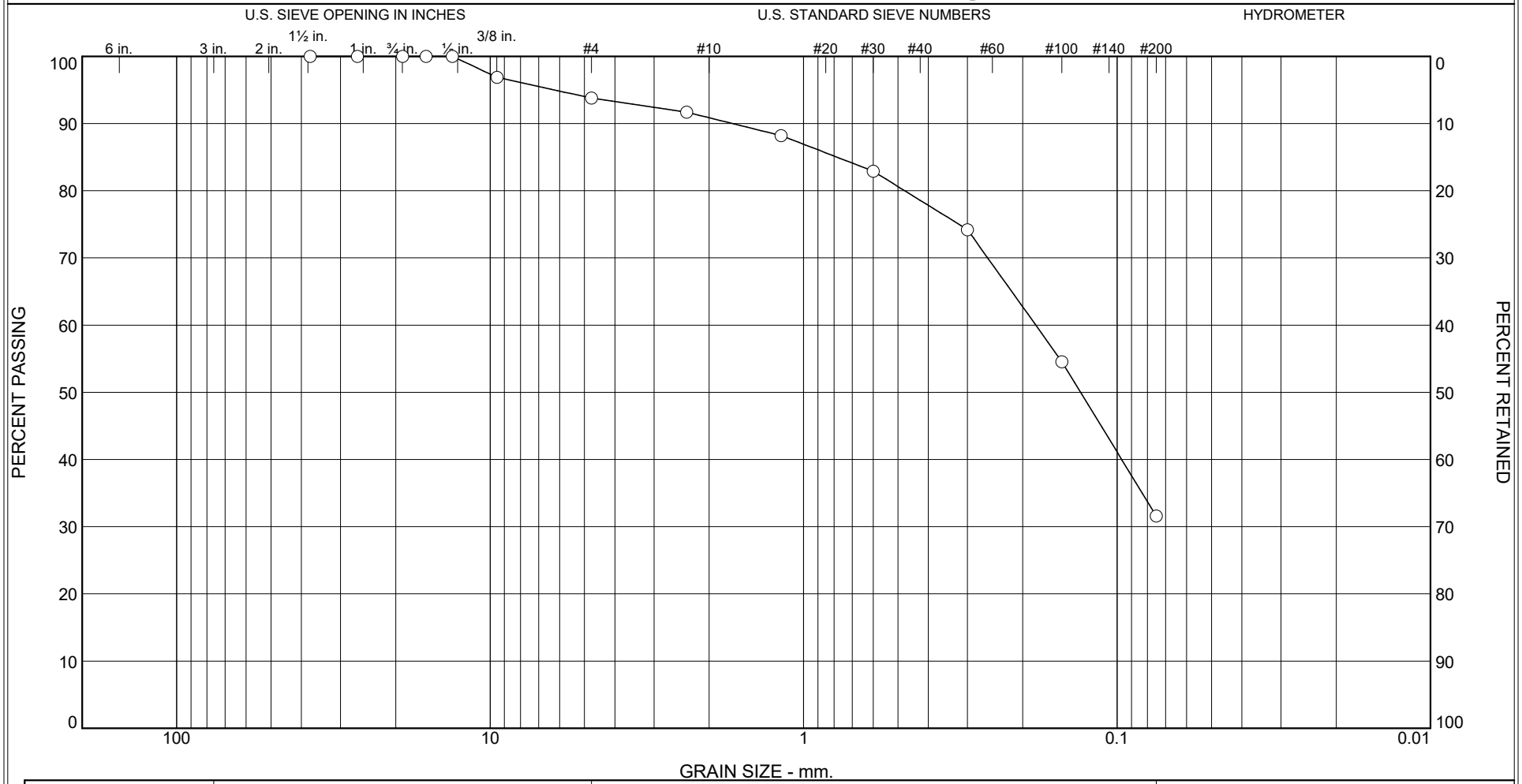
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	4.7	27.7	32.4	8.0	15.7	28.5	52.2			15.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1005	0.1807	0.2993	0.7616	2.0701	9.7658	11.5364	13.8493	18.6301

Fineness Modulus
3.28

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	0.0	6.2	2.9	12.3	47.0	31.6

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-03 Depth: 1.1m - 1.4m Sample Number: SS02B	Dec 6, 2024		Jan 8, 2025

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=1.18

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-03
Depth: 1.1m - 1.4m **Sample Number:** SS02B
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 8, 2025
Tested by: T. Linley

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained
657.20	168.50	37.5mm	0.00	0.00	100.0	0.0
		26.5mm	0.00	0.00	100.0	0.0
		19mm	0.00	0.00	100.0	0.0
		16mm	0.00	0.00	100.0	0.0
		13.2mm	0.00	0.00	100.0	0.0
		9.5mm	15.30	0.00	96.9	3.1
		#4	15.10	0.00	93.8	6.2
555.50	250.90	#8	6.80	0.00	91.7	8.3
		#16	11.30	0.00	88.2	11.8
		#30	17.20	0.00	82.9	17.1
		#50	28.30	0.00	74.2	25.8
		#100	63.80	0.00	54.6	45.4
		#200	74.60	0.00	31.6	68.4

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	6.2	6.2	2.9	12.3	47.0	62.2			31.6

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.0967	0.1307	0.1818	0.4760	0.7834	1.6867	6.2461

Fineness Modulus
1.18

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CCIL Certified Technicians

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 24-1376 **DATE SAMPLED:** 2025-12-06

PROJECT: Eldorado Road Resurfacing **SOURCE:** Boreholes

DATE TESTED: 2025-01-06 **TESTED BY:** T. Linley

			Gross (inc. Tare) (g)				
Tare ID	**Sample ID**	**Depth (m)**	**Wet Weight**	**Dry Weight**	**TARE**	**Mass Lost**	**Water %**
	BH-24-05 SS02	0.8 to 1.5	1367.90	1214.90	162.40	153	14.5%

REMARKS:

CLIENT: Corporation of the Town of Blind River

COPIES TO:

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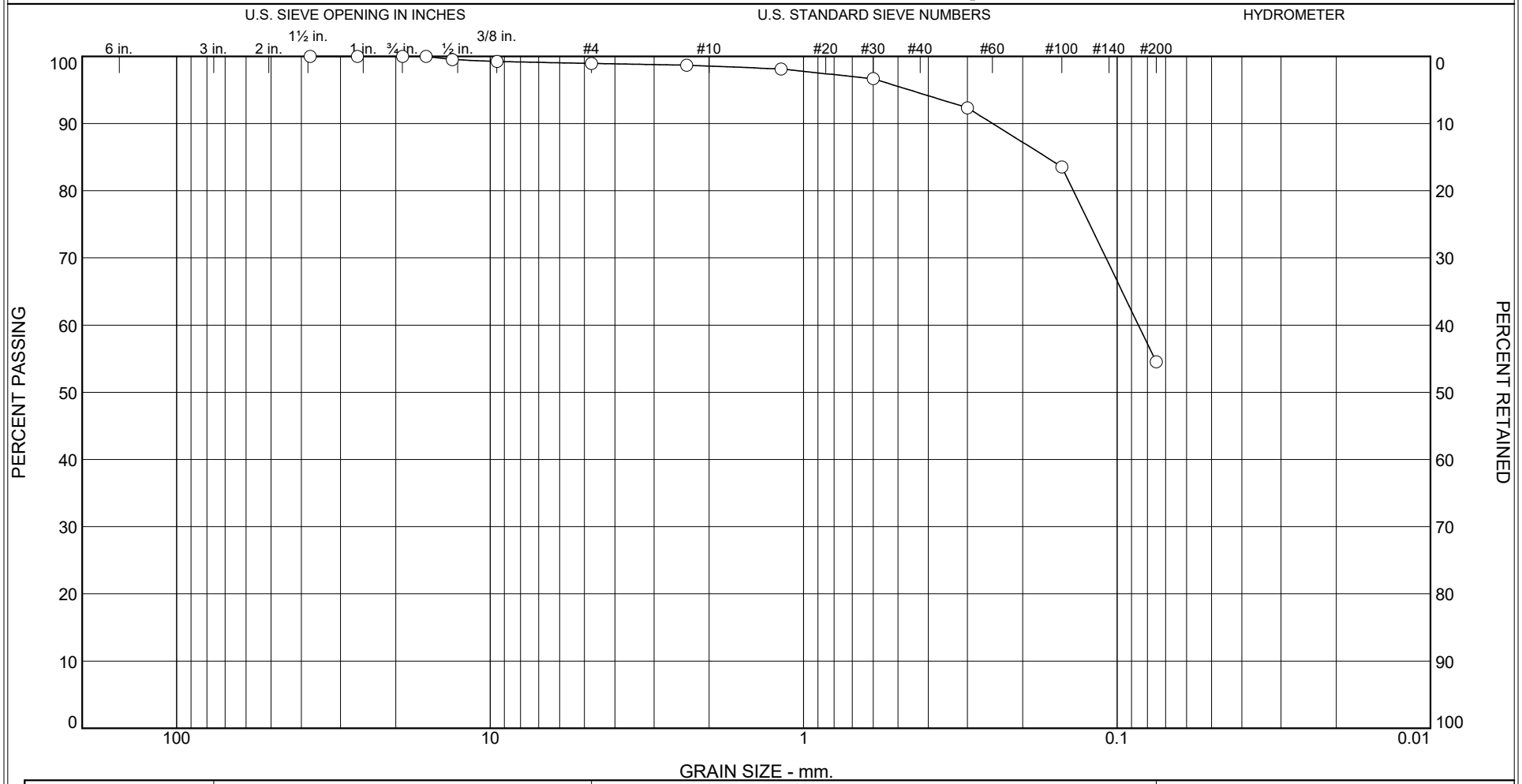
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0.0	0.0	1.1	0.3	4.1	40.0	54.5

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-05 Depth: 0.8m - 1.5m Sample Number: SS02	Dec 6, 2024		Jan 8, 2024

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=0.32

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-05
Depth: 0.8m - 1.5m **Sample Number:** SS02
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 8, 2024
Tested by: T. Linley

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained
1214.90	162.40	37.5mm	0.00	0.00	100.0	0.0
		26.5mm	0.00	0.00	100.0	0.0
		19mm	0.00	0.00	100.0	0.0
		16mm	0.00	0.00	100.0	0.0
		13.2mm	5.10	0.00	99.5	0.5
		9.5mm	3.00	0.00	99.2	0.8
		#4	3.10	0.00	98.9	1.1
761.90	400.60	#8	0.90	0.00	98.7	1.3
		#16	2.10	0.00	98.1	1.9
		#30	5.30	0.00	96.7	3.3
		#50	15.80	0.00	92.3	7.7
		#100	32.10	0.00	83.5	16.5
		#200	106.00	0.00	54.5	45.5

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.1	1.1	0.3	4.1	40.0	44.4			54.5

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
							0.0855	0.1378	0.1682	0.2495	0.4597

Fineness Modulus
0.32

TULLOCH

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CCIL Certified Laboratory for Aggregates and Asphalt Testing
CCIL Certified Technicians

CCIL
Canadian Council of Independent Laboratories
Conseil canadien des laboratoires indépendants

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 24-1376 **DATE SAMPLED:** 2025-12-06

PROJECT: Eldorado Road Resurfacing **SOURCE:** Boreholes

DATE TESTED: 2025-01-06 **TESTED BY:** T. Linley

			Gross (inc. Tare) (g)				
Tare ID	**Sample ID**	**Depth (m)**	**Wet Weight**	**Dry Weight**	**TARE**	**Mass Lost**	**Water %**
	BH-24-06 GB02	0.3 to 0.8	3827.50	3638.70	197.60	188.8	5.5%

REMARKS:

CLIENT: Corporation of the Town of Blind River

COPIES TO:

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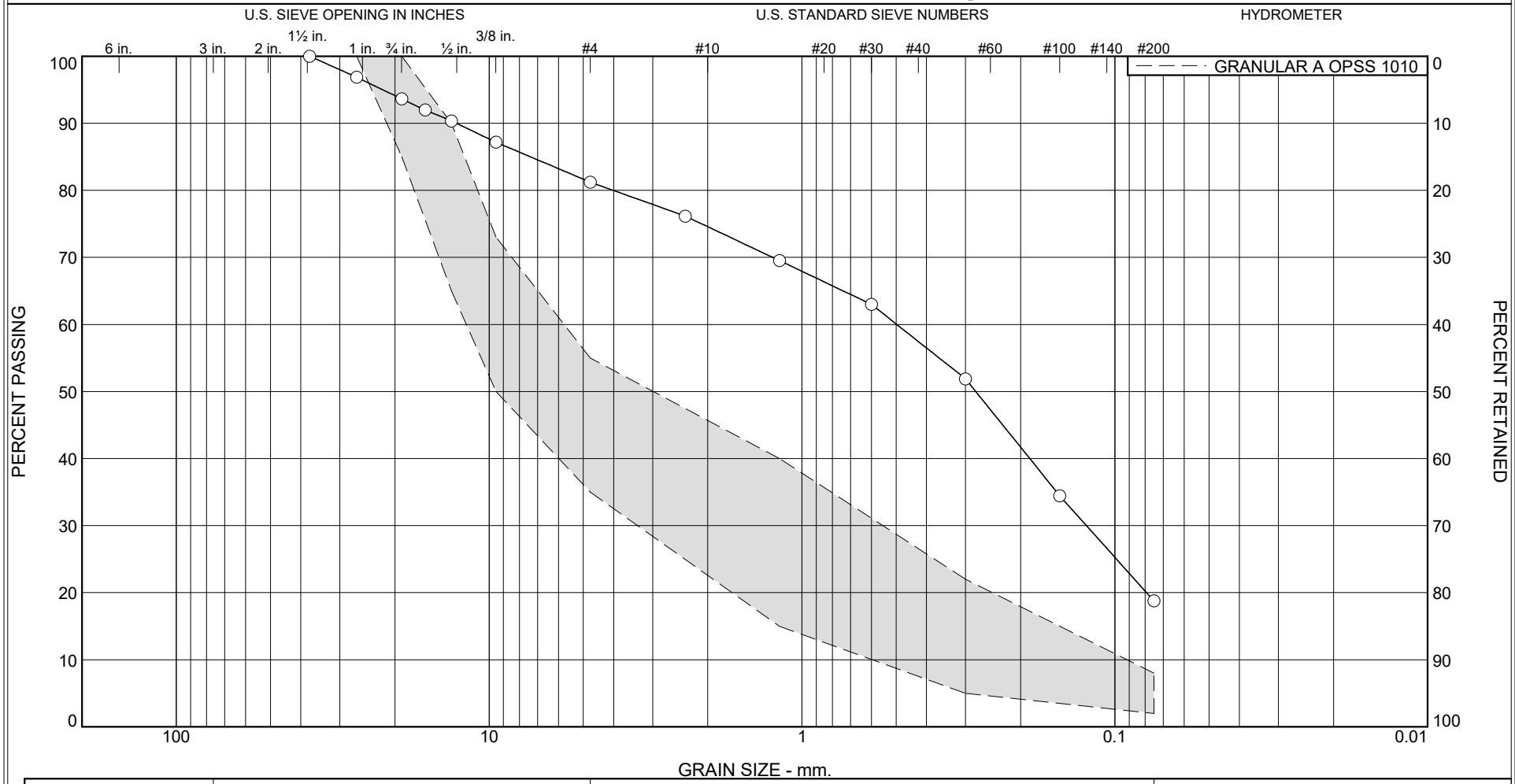
Tel: (705) 949-1457 Fax: (705) 945-5092 email: daren.stadnisky@tulloch.ca

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	6.3	12.5	6.6	17.1	38.7	18.8

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-06 Depth: 0.3m - 0.8m Sample Number: GB02	Dec 6, 2024		Jan 8, 2024

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=2.43

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-06
Depth: 0.3m - 0.8m **Sample Number:** GB02
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 8, 2024
Tested by: T. Linley
Material specification: GRANULAR A OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
3638.70	197.60	37.5mm	0.00	0.00	100.0	0.0			
		26.5mm	108.30	0.00	96.9	3.1	100.0	100.0	*-3.1*
		19mm	110.90	0.00	93.6	6.4	85.0	100.0	
		16mm	57.00	0.00	92.0	8.0			
		13.2mm	56.10	0.00	90.3	9.7	65.0	90.0	*+0.3*
		9.5mm	109.30	0.00	87.2	12.8	50.0	73.0	*+14.2*
		#4	204.70	0.00	81.2	18.8	35.0	55.0	*+26.2*
879.90	520.80	#8	22.40	0.00	76.2	23.8			
		#16	29.30	0.00	69.5	30.5	15.0	40.0	*+29.5*
		#30	28.90	0.00	63.0	37.0			
		#50	49.10	0.00	51.9	48.1	5.0	22.0	*+29.9*
		#100	77.10	0.00	34.4	65.6			
		#200	69.20	0.00	18.8	81.2	2.0	8.0	*+10.8*

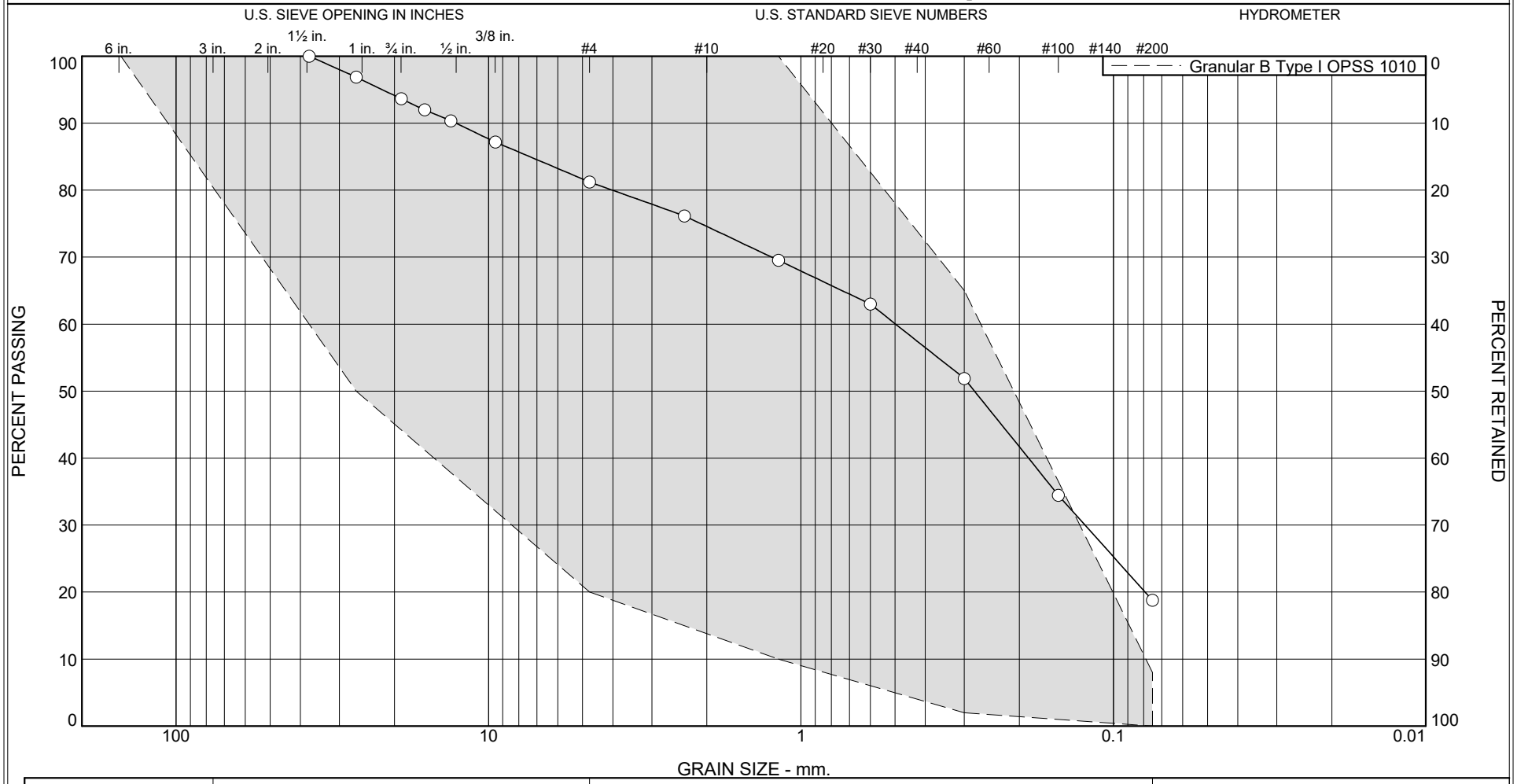
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	6.3	12.5	18.8	6.6	17.1	38.7	62.4			18.8

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0791	0.1232	0.1871	0.2784	0.4979	4.0146	7.3802	12.7391	21.8866

Fineness Modulus
2.43

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	6.3	12.5	6.6	17.1	38.7	18.8

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-06 Depth: 0.3m - 0.8m Sample Number: GB02	Dec 6, 2024		Jan 8, 2024

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=2.43

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-06
Depth: 0.3m - 0.8m **Sample Number:** GB02
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 8, 2024
Tested by: T. Linley
Material specification: Granular B Type I OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
3638.70	197.60	37.5mm	0.00	0.00	100.0	0.0			
		26.5mm	108.30	0.00	96.9	3.1	50.0	100.0	
		19mm	110.90	0.00	93.6	6.4			
		16mm	57.00	0.00	92.0	8.0			
		13.2mm	56.10	0.00	90.3	9.7			
		9.5mm	109.30	0.00	87.2	12.8			
		#4	204.70	0.00	81.2	18.8	20.0	100.0	
879.90	520.80	#8	22.40	0.00	76.2	23.8			
		#16	29.30	0.00	69.5	30.5	10.0	100.0	
		#30	28.90	0.00	63.0	37.0			
		#50	49.10	0.00	51.9	48.1	2.0	65.0	
		#100	77.10	0.00	34.4	65.6			
		#200	69.20	0.00	18.8	81.2	0.0	8.0	*+10.8*

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	6.3	12.5	18.8	6.6	17.1	38.7	62.4			18.8

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0791	0.1232	0.1871	0.2784	0.4979	4.0146	7.3802	12.7391	21.8866

Fineness Modulus
2.43

TULLOCH

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WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 24-1376 **DATE SAMPLED:** 2025-12-06

PROJECT: Eldorado Road Resurfacing **SOURCE:** Boreholes

DATE TESTED: 2025-01-06 **TESTED BY:** T. Linley

			Gross (inc. Tare) (g)				
Tare ID	**Sample ID**	**Depth (m)**	**Wet Weight**	**Dry Weight**	**TARE**	**Mass Lost**	**Water %**
	BH-24-08 GB02	0.3 to 0.8	4337.60	4170.60	236.70	167	4.2%

REMARKS:

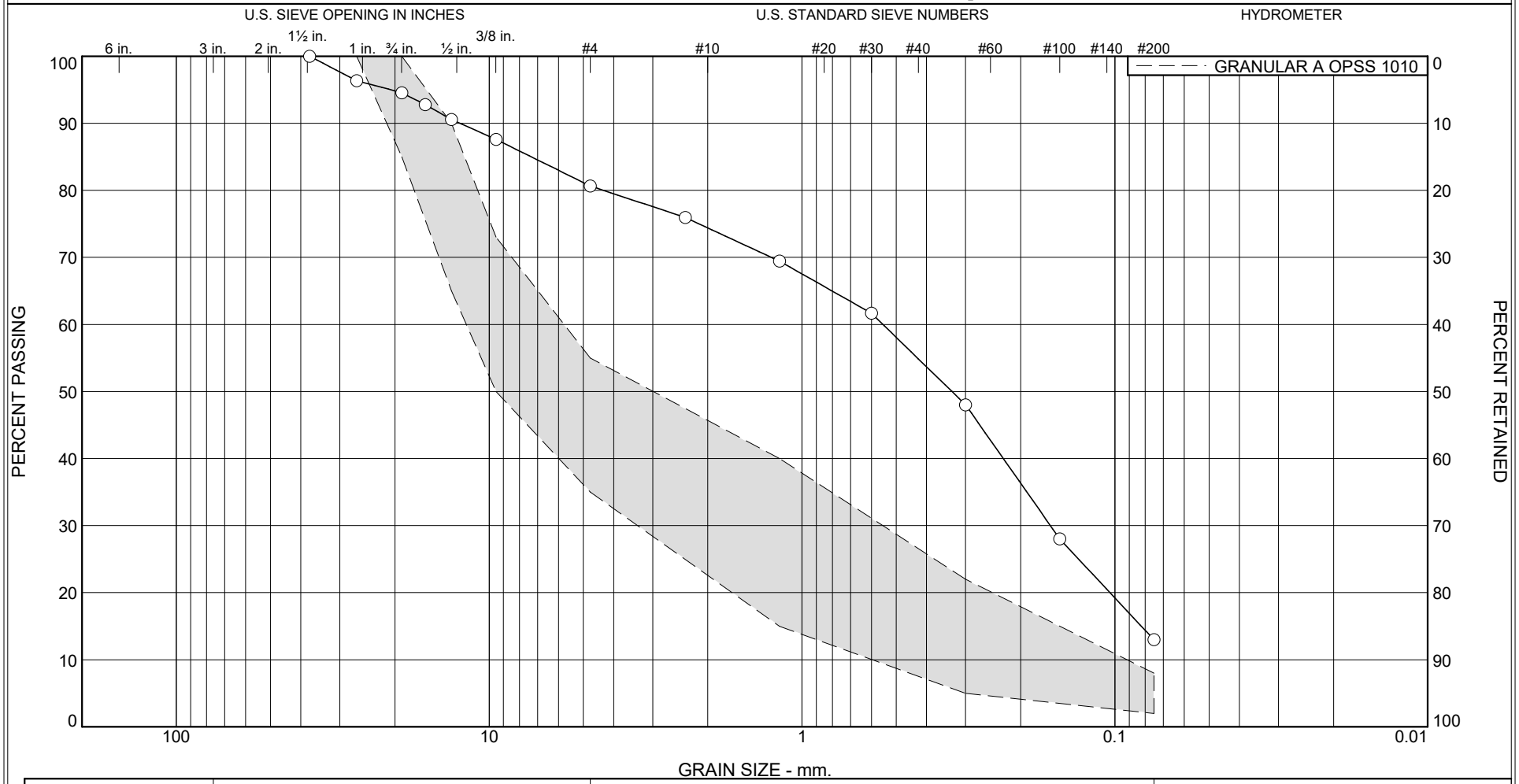
CLIENT: Corporation of the Town of Blind River

COPIES TO:

Tulloch Engineering, Materials Testing Laboratory, 71 Black Road - Unit 3, Sault Ste. Marie, ON. Canada P6B 0A3

Tel: (705) 949-1457 Fax: (705) 945-5092 email: daren.stadnisky@tulloch.ca

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	5.4	14.0	6.2	19.5	41.9	13.0

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-08 Depth: 0.3m - 0.8m Sample Number: GB02	Dec 6, 2024		Jan 8, 2025

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=2.54

Tested By: S. Campbell **Checked By:** T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-08
Depth: 0.3m - 0.8m **Sample Number:** GB02
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 8, 2025
Tested by: S. Campbell **Checked by:** T. Linley
Material specification: GRANULAR A OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
4170.60	236.70	37.5mm	0.00	0.00	100.0	0.0			
		26.5mm	143.40	0.00	96.4	3.6	100.0	100.0	*-3.6*
		19mm	71.00	0.00	94.5	5.5	85.0	100.0	
		16mm	69.60	0.00	92.8	7.2			
		13.2mm	87.80	0.00	90.5	9.5	65.0	90.0	*+0.5*
		9.5mm	116.20	0.00	87.6	12.4	50.0	73.0	*+14.6*
		#4	273.70	0.00	80.6	19.4	35.0	55.0	*+25.6*
900.40	528.40	#8	21.60	0.00	76.0	24.0			
		#16	30.10	0.00	69.4	30.6	15.0	40.0	*+29.4*
		#30	35.80	0.00	61.7	38.3			
		#50	63.00	0.00	48.0	52.0	5.0	22.0	*+26.0*
		#100	92.30	0.00	28.0	72.0			
		#200	69.30	0.00	13.0	87.0	2.0	8.0	*+5.0*

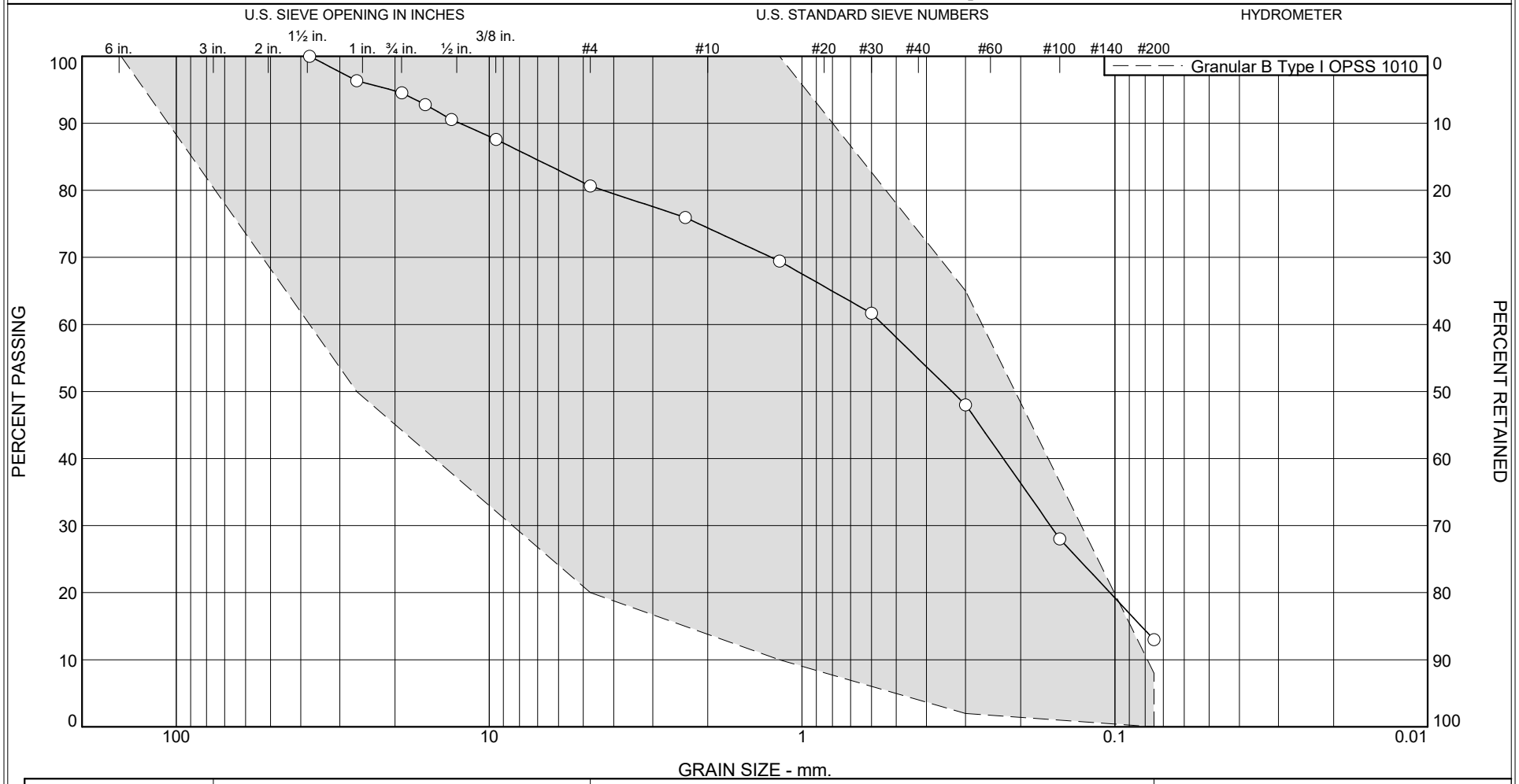
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	5.4	14.0	19.4	6.2	19.5	41.9	67.6			13.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0823	0.1037	0.1607	0.2273	0.3318	0.5512	4.3185	7.3358	12.4174	20.6436

Fineness Modulus
2.54

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	5.4	14.0	6.2	19.5	41.9	13.0

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-08 Depth: 0.3m - 0.8m Sample Number: GB02	Dec 6, 2024		Jan 8, 2025

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=2.54

Tested By: S. Campbell **Checked By:** T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-08
Depth: 0.3m - 0.8m **Sample Number:** GB02
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 8, 2025
Tested by: S. Campbell **Checked by:** T. Linley
Material specification: Granular B Type I OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
4170.60	236.70	37.5mm	0.00	0.00	100.0	0.0			
		26.5mm	143.40	0.00	96.4	3.6	50.0	100.0	
		19mm	71.00	0.00	94.5	5.5			
		16mm	69.60	0.00	92.8	7.2			
		13.2mm	87.80	0.00	90.5	9.5			
		9.5mm	116.20	0.00	87.6	12.4			
		#4	273.70	0.00	80.6	19.4	20.0	100.0	
900.40	528.40	#8	21.60	0.00	76.0	24.0			
		#16	30.10	0.00	69.4	30.6	10.0	100.0	
		#30	35.80	0.00	61.7	38.3			
		#50	63.00	0.00	48.0	52.0	2.0	65.0	
		#100	92.30	0.00	28.0	72.0			
		#200	69.30	0.00	13.0	87.0	0.0	8.0	*+5.0*

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	5.4	14.0	19.4	6.2	19.5	41.9	67.6			13.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0823	0.1037	0.1607	0.2273	0.3318	0.5512	4.3185	7.3358	12.4174	20.6436

Fineness Modulus
2.54

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WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 24-1376 **DATE SAMPLED:** 2025-12-06

PROJECT: Eldorado Road Resurfacing **SOURCE:** Boreholes

DATE TESTED: 2025-01-06 **TESTED BY:** T. Linley

			Gross (inc. Tare) (g)				
Tare ID	**Sample ID**	**Depth (m)**	**Wet Weight**	**Dry Weight**	**TARE**	**Mass Lost**	**Water %**
	BH-24-09 SS02A	0.8 to 1.1	517.30	497.80	173.50	19.5	6.0%

REMARKS:

CLIENT: Corporation of the Town of Blind River

COPIES TO:

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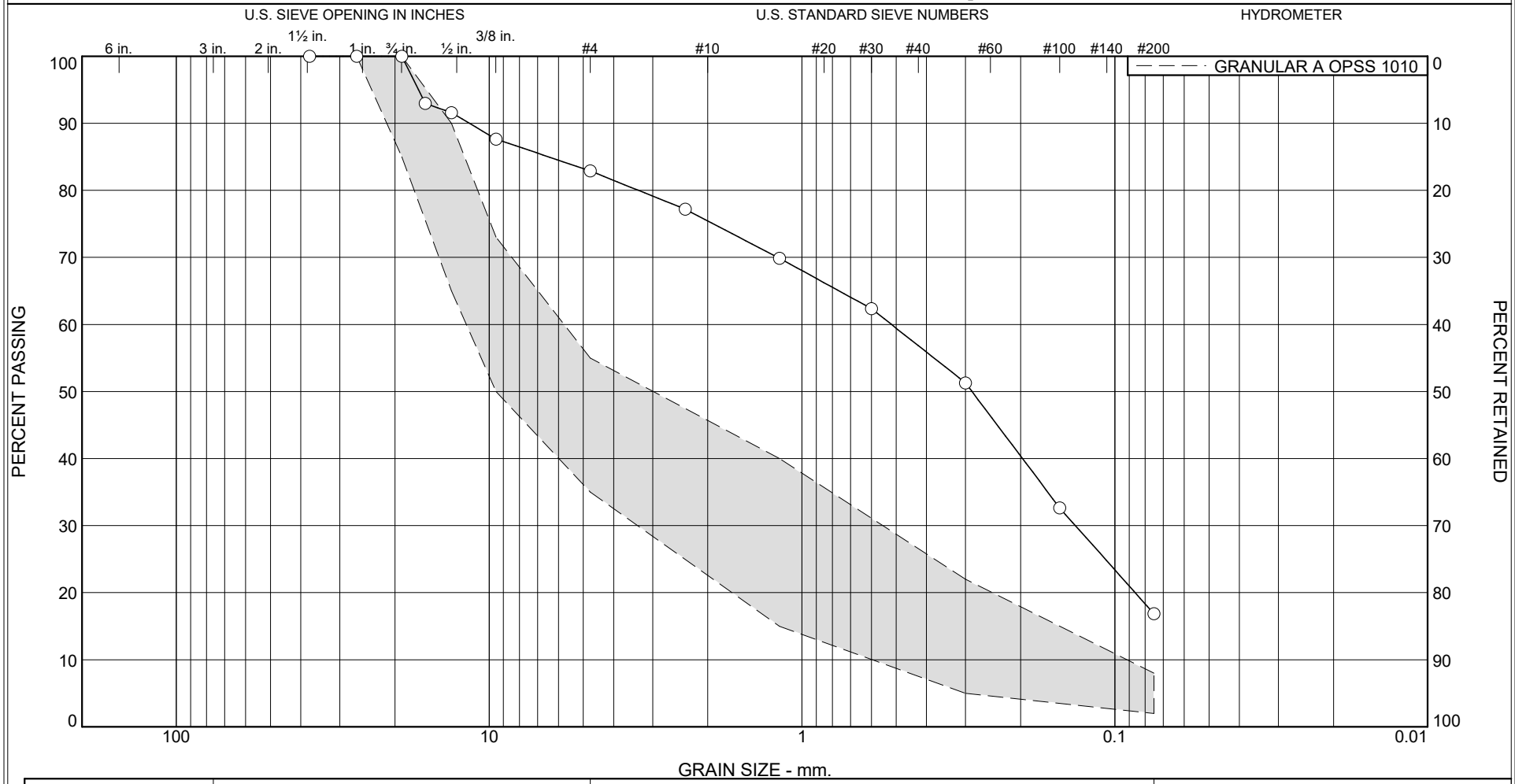
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0.0	0.0	17.1	7.5	18.6	39.9	16.9

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-09 Depth: 0.8m - 1.1m Sample Number: SS02A	Dec 6, 2024		Jan 8, 2025

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=2.36

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-09
Depth: 0.8m - 1.1m **Sample Number:** SS02A
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 8, 2025
Tested by: T. Linley
Material specification: GRANULAR A OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
497.80	173.50	37.5mm	0.00	0.00	100.0	0.0			
		26.5mm	0.00	0.00	100.0	0.0	100.0	100.0	
		19mm	0.00	0.00	100.0	0.0	85.0	100.0	
		16mm	22.80	0.00	93.0	7.0			
		13.2mm	4.50	0.00	91.6	8.4	65.0	90.0	*+1.6*
		9.5mm	12.80	0.00	87.6	12.4	50.0	73.0	*+14.6*
		#4	15.40	0.00	82.9	17.1	35.0	55.0	*+27.9*
		#8	18.50	0.00	77.2	22.8			
		#16	23.70	0.00	69.9	30.1	15.0	40.0	*+29.9*
		#30	24.40	0.00	62.3	37.7			
		#50	35.90	0.00	51.3	48.7	5.0	22.0	*+29.3*
		#100	60.50	0.00	32.6	67.4			
		#200	51.10	0.00	16.9	83.1	2.0	8.0	*+8.9*

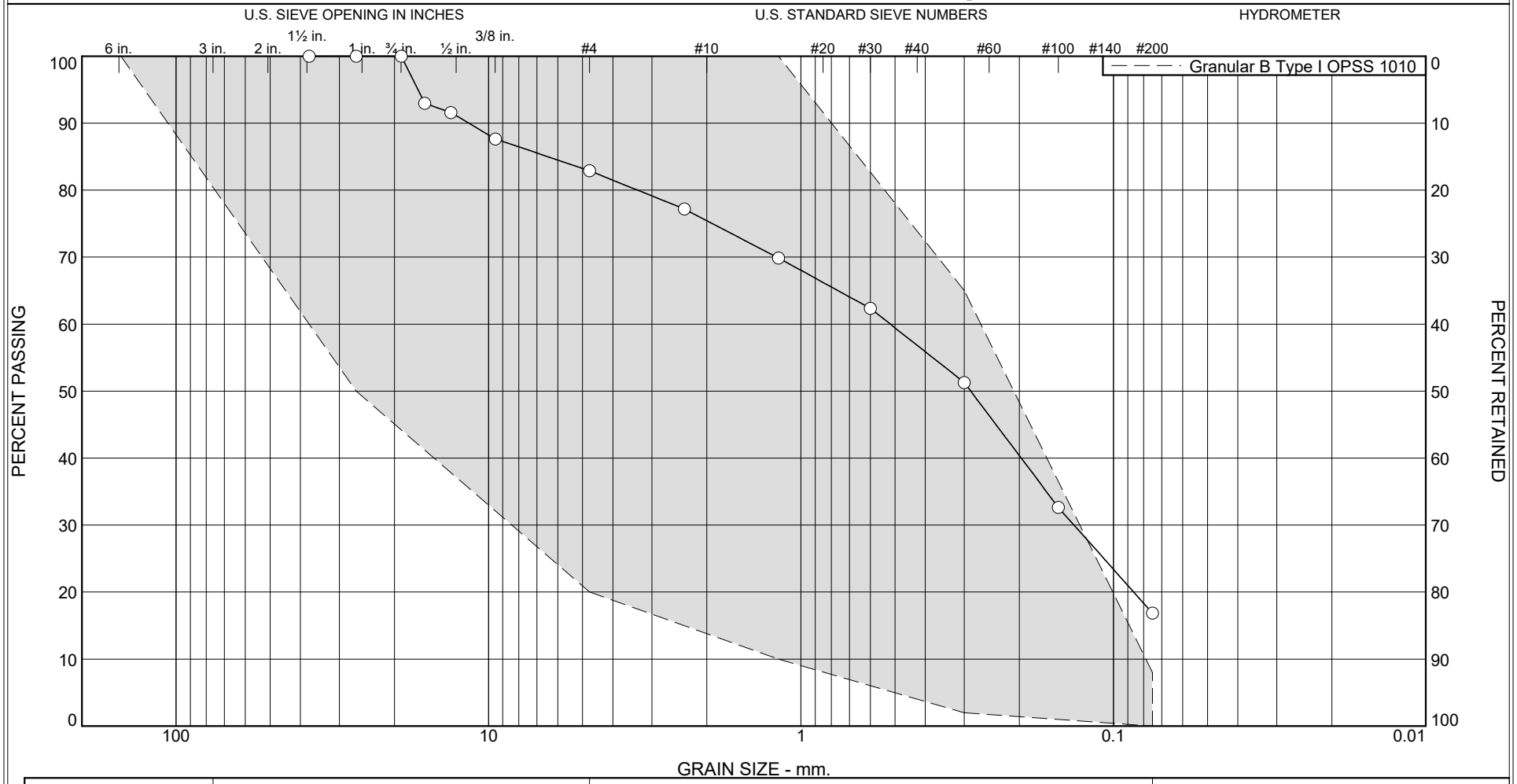
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	17.1	17.1	7.5	18.6	39.9	66.0			16.9

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0861	0.1336	0.1973	0.2861	0.5179	3.3342	6.4668	11.5697	16.8142

Fineness Modulus
2.36

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	0.0	17.1	7.5	18.6	39.9	16.9

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-09 Depth: 0.8m - 1.1m Sample Number: SS02A	Dec 6, 2024		Jan 8, 2025

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=2.36

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-09
Depth: 0.8m - 1.1m **Sample Number:** SS02A
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 8, 2025
Tested by: T. Linley
Material specification: Granular B Type I OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
497.80	173.50	37.5mm	0.00	0.00	100.0	0.0			
		26.5mm	0.00	0.00	100.0	0.0	50.0	100.0	
		19mm	0.00	0.00	100.0	0.0			
		16mm	22.80	0.00	93.0	7.0			
		13.2mm	4.50	0.00	91.6	8.4			
		9.5mm	12.80	0.00	87.6	12.4			
		#4	15.40	0.00	82.9	17.1	20.0	100.0	
		#8	18.50	0.00	77.2	22.8			
		#16	23.70	0.00	69.9	30.1	10.0	100.0	
		#30	24.40	0.00	62.3	37.7			
		#50	35.90	0.00	51.3	48.7	2.0	65.0	
		#100	60.50	0.00	32.6	67.4			
		#200	51.10	0.00	16.9	83.1	0.0	8.0	*+8.9*

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	17.1	17.1	7.5	18.6	39.9	66.0			16.9

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0861	0.1336	0.1973	0.2861	0.5179	3.3342	6.4668	11.5697	16.8142

Fineness Modulus
2.36

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WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 24-1376 **DATE SAMPLED:** 2025-12-06

PROJECT: Eldorado Road Resurfacing **SOURCE:** Boreholes

DATE TESTED: 2025-01-06 **TESTED BY:** T. Linley

			Gross (inc. Tare) (g)				
Tare ID	**Sample ID**	**Depth (m)**	**Wet Weight**	**Dry Weight**	**TARE**	**Mass Lost**	**Water %**
	BH-24-10 GB03	0.8 to 1.5	3432.60	3271.90	203.50	160.7	5.2%

REMARKS:

CLIENT: Corporation of the Town of Blind River

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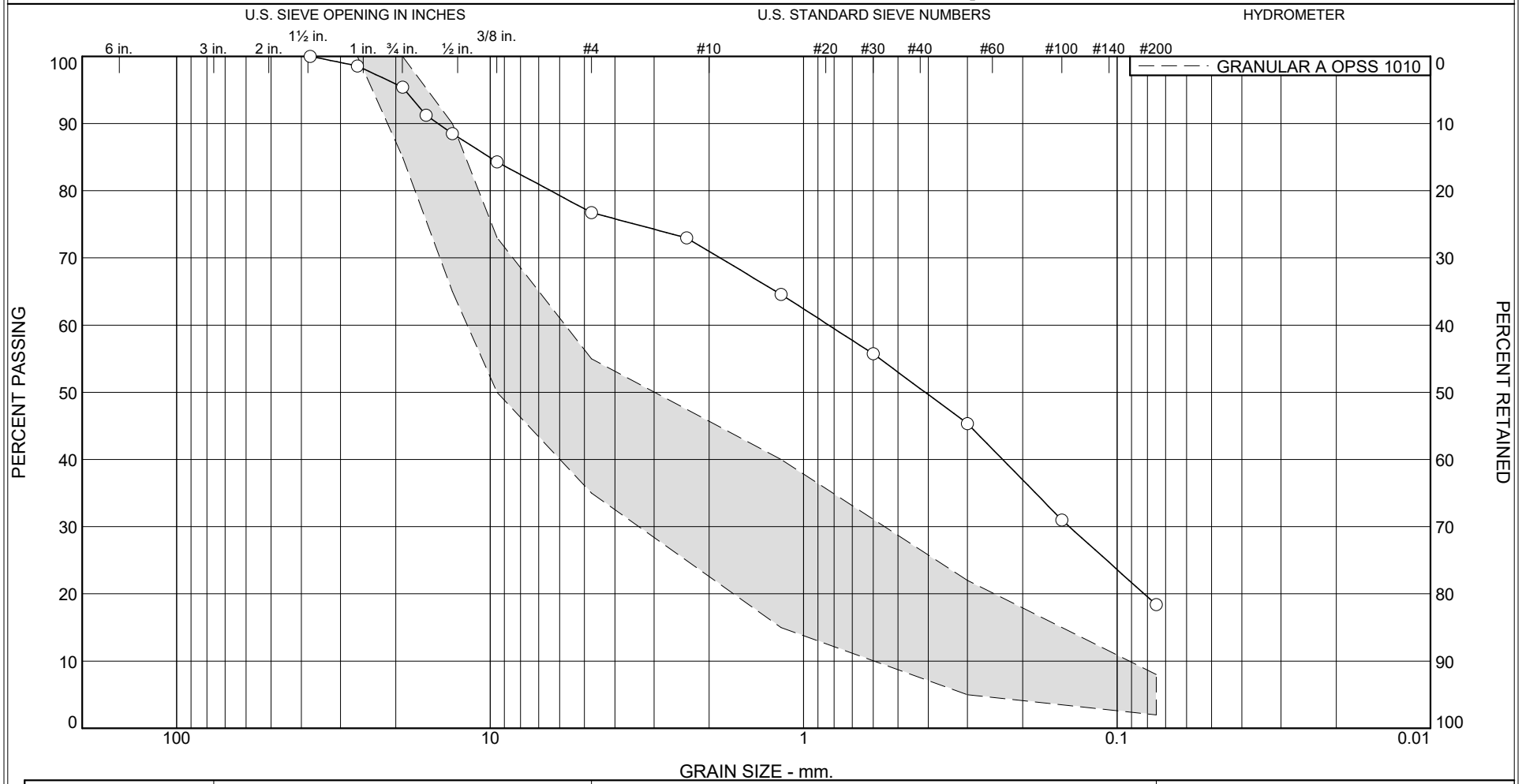
Tel: (705) 949-1457 Fax: (705) 945-5092 email: daren.stadnisky@tulloch.ca

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0.0	4.6	18.7	5.7	20.4	32.2	18.4

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-10 Depth: 0.8m - 1.5m Sample Number: GB03	Dec 6, 2024		Jan 8, 2025

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

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○ F.M.=2.74

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-10
Depth: 0.8m - 1.5m **Sample Number:** GB03
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 8, 2025
Tested by: T. Linley
Material specification: GRANULAR A OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
3272.90	203.50	37.5mm	0.00	0.00	100.0	0.0			
		26.5mm	44.20	0.00	98.6	1.4	100.0	100.0	*-1.4*
		19mm	97.30	0.00	95.4	4.6	85.0	100.0	
		16mm	127.50	0.00	91.2	8.8			
		13.2mm	84.50	0.00	88.5	11.5	65.0	90.0	
		9.5mm	129.20	0.00	84.3	15.7	50.0	73.0	*+11.3*
		#4	231.10	0.00	76.7	23.3	35.0	55.0	*+21.7*
513.20	230.20	#8	13.90	0.00	73.0	27.0			
		#16	31.00	0.00	64.6	35.4	15.0	40.0	*+24.6*
		#30	32.60	0.00	55.7	44.3			
		#50	38.30	0.00	45.3	54.7	5.0	22.0	*+23.3*
		#100	52.90	0.00	31.0	69.0			
		#200	46.50	0.00	18.4	81.6	2.0	8.0	*+10.4*

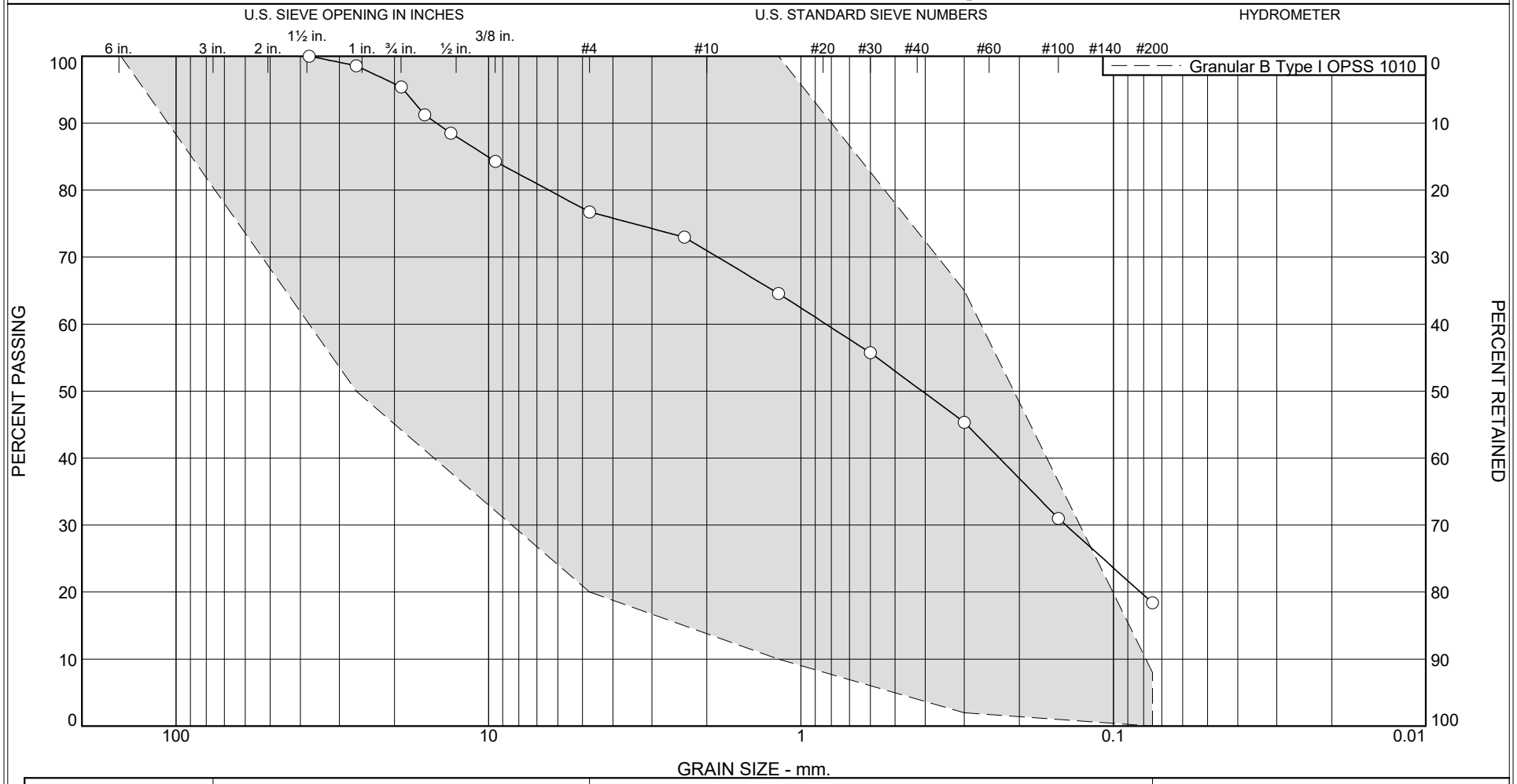
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	4.6	18.7	23.3	5.7	20.4	32.2	58.3			18.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0820	0.1420	0.2318	0.4094	0.8319	6.4099	10.0547	14.6760	18.6959

Fineness Modulus
2.74

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt
○	0.0	4.6	18.7	5.7	20.4	32.2	18.4

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-24-10 Depth: 0.8m - 1.5m Sample Number: GB03	Dec 6, 2024		Jan 8, 2025

Client Corporation of Town of Blind River

Project Eldorado Road Resurfacing

Project No. 24-1376 Figure

TULLOCH ENGINEERING
71 Black Road
Unit 8
Sault Ste. Marie, ON
P6B 0A3
T. 705 949.1457
F. 705 949.9606
TF. 866 806.6602
Daren.Stadnisky@TULLOCH.ca

○ F.M.=2.74

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

2025-01-09

Client: Corporation of Town of Blind River
Project: Eldorado Road Resurfacing
Project Number: 24-1376
Location: BH-24-10
Depth: 0.8m - 1.5m **Sample Number:** GB03
Date Sampled: Dec 6, 2024 **Date Tested:** Jan 8, 2025
Tested by: T. Linley
Material specification: Granular B Type I OPSS 1010

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer	Percent Retained	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
3272.90	203.50	37.5mm	0.00	0.00	100.0	0.0			
		26.5mm	44.20	0.00	98.6	1.4	50.0	100.0	
		19mm	97.30	0.00	95.4	4.6			
		16mm	127.50	0.00	91.2	8.8			
		13.2mm	84.50	0.00	88.5	11.5			
		9.5mm	129.20	0.00	84.3	15.7			
		#4	231.10	0.00	76.7	23.3	20.0	100.0	
513.20	230.20	#8	13.90	0.00	73.0	27.0			
		#16	31.00	0.00	64.6	35.4	10.0	100.0	
		#30	32.60	0.00	55.7	44.3			
		#50	38.30	0.00	45.3	54.7	2.0	65.0	
		#100	52.90	0.00	31.0	69.0			
		#200	46.50	0.00	18.4	81.6	0.0	8.0	*+10.4*

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	4.6	18.7	23.3	5.7	20.4	32.2	58.3			18.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0820	0.1420	0.2318	0.4094	0.8319	6.4099	10.0547	14.6760	18.6959

Fineness Modulus
2.74

TESTMARK Laboratories Ltd.
Committed to Quality and Service

CERTIFICATE OF ANALYSIS

Client:	Jackson Mercer	Work Order Number:	563296
Company:	Tulloch Engineering - Sault Ste. Marie	PO #:	
Address:	71 Black Road Unit 8 Sault Ste. Marie, ON, P6B 0A3	Regulation: Project #:	Information not provided 24-1376
Phone/Fax:	(705) 949-1457 / (705) 949-9606	DWS #:	
Email:	jackson.mercer@tulloch.ca	Sampled By:	Tulloch
Date Order Received:	1/9/2025	Analysis Started:	1/9/2025
Arrival Temperature:	3 C	Analysis Completed:	1/15/2025

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
BH-24-02 SS03	2098448	Soil	None		12/6/2024	
BH-24-09 SS02B	2098449	Soil	None		12/6/2024	

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
Anions Soil (A5)	Garson	Determination of Anions in Soil	Modified from SW846-9056A
Cond Soil (A12)	Garson	Determination of conductivity in soil (1:2)	Modified from EPA SW846-9050A
Moisture (A99)	Garson	Determination of Percent Moisture	In-House
pH Soil (A2.0)	Garson	Determination of soil pH by Ion Selective Electrode	Modified from EPA SW-846 9045D
RedOx - Soil (T06)	Mississauga	Determination of RedOx Potential of Soil	Modified from APHA-2580B
Resistivity Soil (R12)	Garson	Determination of Resistivity in Soil (1:2)	Modified from Carter 18.3
Sulphide/S (R98)	Garson	Determination of Sulphide in Soil	In-House

REPORT COMMENTS

RedOx - Soil (A6): Hold time exceeded for methods BEFORE receipt at lab

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CERTIFICATE OF ANALYSIS

Tulloch Engineering - Sault Ste. Marie

Work Order Number: 563296

This report has been approved by:

Aline de Chevigny
Production Coordinator

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CERTIFICATE OF ANALYSIS

Tulloch Engineering - Sault Ste. Marie

Work Order Number: 563296

WORK ORDER RESULTS

Sample Description	BH - 24 - 02 SS03		BH - 24 - 09 SS02B		
Sample Date	12/6/2024 12:00 AM		12/6/2024 12:00 AM		
Lab ID	2098448		2098449		
Anions (Soil)	Result	MDL	Result	MDL	Units
Bromide	<0.2	0.2	<0.2 [<0.2]	0.2	µg/g
Chloride	6.5	0.4	7.0 [7.0]	0.4	µg/g
Fluoride	<0.2	0.2	<0.2 [<0.2]	0.2	µg/g
Nitrate (as N)	<0.2	0.2	<0.2 [<0.2]	0.2	µg/g
Nitrite (as N)	<0.1	0.1	<0.1 [<0.1]	0.1	µg/g
Sulphate	3	2	18 [19]	2	µg/g

Sample Description	BH - 24 - 02 SS03		BH - 24 - 09 SS02B		
Sample Date	12/6/2024 12:00 AM		12/6/2024 12:00 AM		
Lab ID	2098448		2098449		
General Chemistry	Result	MDL	Result	MDL	Units
% Moisture	4.3	0.1	8.8	0.1	%
Conductivity	31 [30]	1	60	1	µS/cm
pH	5.08 [5.19]	N/A	5.02	N/A	pH
RedOx (vs. S.H.E.)	331 [332]	N/A	337	N/A	mV
Resistivity (Calc.)	32800	N/A	16800	N/A	ohm-cm
Sulphide	<0.3	0.3	<0.3	0.3	µg/g

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CERTIFICATE OF ANALYSIS

Tulloch Engineering - Sault Ste. Marie

Work Order Number: 563296

LEGEND

Dates: Dates are formatted as mm/dd/year throughout this report.

MDL: Method detection limit or minimum reporting limit.

[ ]: Results for laboratory replicates are shown in square brackets immediately below the associated sample result for ease of comparison.

Organic Soil Analysis: Data reported for organic analysis in soils samples are corrected for moisture content.

Quality Control: All associated Quality Control data is available on request.

LCL: Lower Control Limit.

UCL: Upper Control Limit.

QAQCID: This is a unique reference to the quality control data set used to generate the reported value. Contact our lab for this information, as it is traceable through our LIMS.

Field Data: Reports containing Field Parameters represent data that has been collected and provided by the client. Testmark is not responsible for the validity of this data which may be used in subsequent calculations.

Sample Condition Deviations: A noted sample condition deviation may affect the validity of the result. Results apply to the sample(s) as received.

ICPMS Dustfall Insoluble: The ICPMS Dustfall Insoluble Portion method analyzes only the particulate matter from the Dustfall Sampler which is retained on the analysis filter during the Dustfall method.

Regulation Comparisons: Disclaimer: Please note that regulation criteria are provided for comparative purposes, however the onus on ensuring the validity of this comparison rests with the client.

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CERTIFICATE OF ANALYSIS

Tulloch Engineering - Sault Ste. Marie

Work Order Number: 563296

QUALITY CONTROL DATA

THIS SECTION REPORTS QC RESULTS ASSOCIATED WITH THE TEST BATCH; THESE ARE NOT YOUR SAMPLE RESULTS.
QAQC details include only values where sufficient sample data allowed measurement.

Anions (Soil)

Blank: LRB-6 (Blank) (6)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Bromide	0.2	µg/g	0	<0.2	0.6	20250113.A5C
Chloride	0.4	µg/g	0	<0.4	1.2	20250113.A5C
Fluoride	0.02	µg/g	0	<0.02	0.6	20250113.A5C
Nitrate (as N)	0.2	µg/g	0	<0.2	0.6	20250113.A5C
Nitrite (as N)	0.1	µg/g	0	<0.1	0.18	20250113.A5C
Sulphate	0.4	µg/g	0	<0.4	6	20250113.A5C

Positive Control: LFB-5 (0.1/0.02/0.002 mg/g equiv) (5)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Bromide	N/A	%	80	97.3	120	20250113.A5C
Chloride	N/A	%	80	108	120	20250113.A5C
Fluoride	N/A	%	80	106	120	20250113.A5C
Nitrate (as N)	N/A	%	80	112	120	20250113.A5C
Nitrite (as N)	N/A	%	80	104	120	20250113.A5C
Sulphate	N/A	%	80	102	120	20250113.A5C

Positive Control: LFB-7 (0.2/0.1/0.02 mg/g equiv) (7)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Bromide	N/A	%	80	105	120	20250113.A5C
Chloride	N/A	%	80	108	120	20250113.A5C
Fluoride	N/A	%	80	106	120	20250113.A5C
Nitrate (as N)	N/A	%	80	106	120	20250113.A5C
Nitrite (as N)	N/A	%	80	102	120	20250113.A5C
Sulphate	N/A	%	80	104	120	20250113.A5C

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Sample Replicate: % RPD (8)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Chloride	N/A	%	0	0	35	20250113.A5C

Sample Spike: MFS-9 (Sample Spike) (9)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Bromide	N/A	% Rec	75	Not Analyzed	125	20250113.A5C
Chloride	N/A	% Rec	75	Not Analyzed	125	20250113.A5C
Fluoride	N/A	% Rec	75	Not Analyzed	125	20250113.A5C
Nitrate (as N)	N/A	% Rec	75	Not Analyzed	125	20250113.A5C
Nitrite (as N)	N/A	% Rec	75	Not Analyzed	125	20250113.A5C
Sulphate	N/A	% Rec	75	Not Analyzed	125	20250113.A5C

General Chemistry

Calibration Check: Lab Control Sample (2)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Conductivity	N/A	%	475	503	525	20250110.TM-G.A12B

Method Blank: Method Blank (1)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Conductivity	1	µS/cm	0	<1	5	20250110.TM-G.A12B

Positive Control: Lab Control - 200 (7)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
RedOx (vs. S.H.E.)	N/A	mV	175	205	225	20250114.TM-M.A6B

Positive Control: LCS (pH 8) (2)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
pH	N/A	pH	7.8	8.05	8.2	20250110.TM-G.R2C

Positive Control: LFB-7 (7)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Sulphide	0.05	µg/g	0.24	0.339	0.36	20250115.R98B

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CERTIFICATE OF ANALYSIS

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Work Order Number: 563296

Positive Control: LRB-6 (Blank) (6)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Sulphide	0.02	µg/g	0	<0.02	0.06	20250115.R98B

Positive Control: ORP - Soil Control 90 (8)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
RedOx (vs. S.H.E.)	N/A	mV	75	96.5	105	20250114.TM-M.A6B

Sample Replicate: % RPD (3)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
pH	N/A	pH	0	0.11	0.3	20250110.TM-G.R2C

Sample Replicate: % RPD (8)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Conductivity	N/A	%	0	3.3	10	20250110.TM-G.A12B

Sample Replicate: % RPD (9)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
RedOx (vs. S.H.E.)	N/A	%	0	0.3	10	20250114.TM-M.A6B

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CERTIFICATE OF ANALYSIS

Tulloch Engineering - Sault Ste. Marie

Work Order Number: 563296

THIS INDEX SHOWS HOW YOUR SAMPLES ARE ASSOCIATED TO THE CONTROLS INCLUDED IN THE IDENTIFIED BATCHES.

Sample Description	Lab ID	Method	QAQCID	Prep QAQCID
BH - 24 - 02 SS03	2098448	Anions Soil (A5)	20250113.A5C	
BH - 24 - 02 SS03	2098448	Cond Soil (A12)	20250110.TM-G.A12B	
BH - 24 - 02 SS03	2098448	Moisture (A99)	20250109.TM-G.A99B	
BH - 24 - 02 SS03	2098448	pH Soil (A2.0)	20250110.TM-G.R2C	
BH - 24 - 02 SS03	2098448	RedOx - Soil (T06)	20250114.TM-M.A6B	
BH - 24 - 02 SS03	2098448	Resistivity Soil (R12)	20250110.TM-G.R12B	
BH - 24 - 02 SS03	2098448	Sulphide/S (R98)	20250115.R98B	
BH - 24 - 02 SS03	2098448r	Cond Soil (A12)	20250110.TM-G.A12B	
BH - 24 - 02 SS03	2098448r	pH Soil (A2.0)	20250110.TM-G.R2C	
BH - 24 - 02 SS03	2098448r	RedOx - Soil (T06)	20250114.TM-M.A6B	
BH - 24 - 09 SS02B	2098449	Anions Soil (A5)	20250113.A5C	
BH - 24 - 09 SS02B	2098449	Cond Soil (A12)	20250110.TM-G.A12B	
BH - 24 - 09 SS02B	2098449	Moisture (A99)	20250109.TM-G.A99B	
BH - 24 - 09 SS02B	2098449	pH Soil (A2.0)	20250110.TM-G.R2C	
BH - 24 - 09 SS02B	2098449	RedOx - Soil (T06)	20250114.TM-M.A6B	
BH - 24 - 09 SS02B	2098449	Resistivity Soil (R12)	20250110.TM-G.R12B	
BH - 24 - 09 SS02B	2098449	Sulphide/S (R98)	20250115.R98B	
BH - 24 - 09 SS02B	2098449r	Anions Soil (A5)	20250113.A5C	

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APPENDIX F

NOTICE TO READER

NOTICE TO READER

This Report has been prepared by TULLOCH Engineering Inc. ('TULLOCH') for the sole and exclusive use of The Town of Blind River (the 'Client') to support design for the proposed rehabilitation of Eldorado Road(the 'Development') located in Blind River, Ontario (the 'Site'). The Report shall not be used for any other purpose, or provided to, relied upon or used by any third party without the express written consent of TULLOCH.

A limited number of boreholes were advanced at the Site; and as such, the information collected and presented herein applies to the borehole locations only. The subsurface conditions between boreholes can change and accordingly any use of the data contained in this Report should take into consideration the nature of the materials and potential variation between boreholes.

This Report contains opinions, conclusions and recommendations made by TULLOCH using professional judgment and reasonable care for the purpose of foundation design for the Development. Use of or reliance on this report by the Client is subject to the following conditions:

a) the report being read in the context of and subject to the terms of the Engineering Services Agreement for the Work, including any methodologies, procedures, techniques, assumptions and other relevant terms or conditions specified or agreed therein;
b) the report being read in its entirety. TULLOCH is not responsible for the use of portions of the report without reference to the entire report;
c) the conditions of the site may change over time or may have already changed due to natural forces or human intervention, and TULLOCH takes no responsibility for the impact that such changes may have on the accuracy or validity of the observations, conclusions and recommendations set out in this report;
d) the classification of soils and rocks in this report is based on commonly accepted methods. However, the classification of geologic materials and the boundaries between subsurface layers involves judgement. Boundaries between different soils layers may also be transitional rather than abrupt. TULLOCH does not warrant or guarantee the exactness of these descriptions and boundaries.
e) the subsurface conditions must be verified by a qualified geotechnical engineer during construction to ensure that the borehole data presented herein is representative of the actual site conditions so that the design recommendations contained herein remain valid; and
f) the report is based on information made available to TULLOCH by the Client or by certain third parties; and unless stated otherwise in the Agreement, TULLOCH has not verified the accuracy, completeness or validity of such information, makes no representation regarding its accuracy and hereby disclaims any liability in connection therewith.

This Report has been prepared with the degree of care, skill and diligence normally provided by engineers in the performance of comparable services for projects of similar nature. The scope of this report includes foundation engineering design only and it specifically excludes investigation, detection, prevention and assessment of the presence of subsurface contaminants. No conclusions or inferences should be drawn regarding contamination at the site including but not limited to molds, fungi, spores, bacteria, viruses, soil gases such as Radon, PCBs, petroleum hydrocarbons, inorganic and volatile organic compounds, polycyclic aromatic hydrocarbons and or any by products thereof.