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RE: Roadway Materials Report
KN 23028 – Prairie Ave.; Meyer Rd. to SH-41
Post Falls Highway District
Kootenai County, Idaho

Greetings:

STRATA has prepared this Roadway Materials Report for the proposed Prairie Ave.; Meyer Rd. to SH-41 road widening project (KN 23028), located in Post Falls, Idaho. The purpose of our geotechnical engineering evaluation was to explore subsurface soil conditions within the proposed road widening area and provide geotechnical recommendations to support project planning, design, and construction. We accomplished our geotechnical services referencing our authorized agreement between J-U-B Engineers, Inc. and STRATA, executed October 25, 2022.

This report summarizes our field evaluation, laboratory test results, engineering analysis, and presents our geotechnical findings, opinions, and recommendations for the project. Individual portions of this report cannot be relied upon without the supporting text of related sections. A separate report will be issued for the new single-lane roundabout (KN 22435).

We appreciate the opportunity to continue our working relationship with J-U-B and the Post Falls Highway District and we look forward to our continued involvement during the design and construction phases. We strive to provide quality, innovative, and timely geoprofessional services. Please contact us if you have any questions or comments.

Sincerely,
STRATA



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Roadway Materials Report

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PROJECT NO: A023(028)
KEY NO: 23028
PROJECT: PRAIRIE AVE.; MEYER RD. TO SH-41
COUNTY: KOOTENAI

240.00 ROADWAY MATERIALS REPORT

240.01 INTRODUCTION

This Roadway Materials Report was prepared referencing Section 240.00 of the 2020 Idaho Transportation Department (ITD) Materials Manual. This report presents the results of our geotechnical investigation and pavement estimating data for improvements planned on Prairie Avenue between Meyer Road and SH-41 in Post Falls, Idaho.

Prairie Avenue is an east-west traversing primary arterial connecting Post Falls with north Coeur d'Alene, Dalton Gardens, and Hayden. The Post Falls Highway District (District) seeks to widen Prairie Avenue from 2-lanes to 5-lanes between Meyer Road and SH-41, matching previously constructed improvements at each intersection. J-U-B Engineers, Inc. (J-U-B) was selected to perform civil design for the project and STRATA was subcontracted by J-U-B to provide geotechnical services for the project.

The existing 0.95-mile stretch of Prairie Avenue is relatively flat with gentle slopes greater than 150H: 1V approaching a plateau at the center of the alignment. The total paved width is approximately 25 feet with 12-foot-wide lanes. The land both north and south of Prairie Avenue has historically been utilized for agricultural production and contains various farming structures, however, residential land development has begun along the north side and is scheduled to begin along the south side.

Outside the asphalt paved surfacing, the ground surface is covered with moderate vegetation. On the west stretch of the alignment the roadway prism is elevated approximately 0.5 to 1.0 feet higher than the surrounding ground, allowing water collecting on the pavement surface to drain away from the roadway crown on both sides of the roadway. On the east stretch of the alignment (from North Meyer Road to approximately 1800 feet west) the roadway prism is elevated up to approximately 6.0 to 7.0 feet higher than the surrounding ground.

240.02 VICINITY SKETCH

The exploration locations are shown on Plates 1 and 2, *Exploration Location Plan*.

240.03 SOILS PROFILE/PAVEMENT CONDITION SURVEY

A Soil's Profile showing the explorations in relation to the proposed vertical alignment is provided in Appendix B.

A pavement condition survey was not completed since the project does not include rehabilitation of existing pavement. Subsequent report sections summarize existing asphalt and aggregate thickness encountered at the site.

240.04 SOIL REPORT SUMMARY

Cuts beyond those required to remove topsoil are not anticipated for this project. Fill material will originate from approved contractor-furnished sources. As such, a soil report summary was not completed for this project.

240.04.02 BORING LOGS AND TEST PIT LOGS

Our field explorations were performed on March 23 and June 1, 2023, and consisted of advancing 11 borings in the Prairie Avenue Right of Way (ROW) and 11 test pits adjacent to the ROW along the full length of the alignment from west to east.

Borings PB-1 through PB-11 were advanced to 6.5 feet below the ground surface (BGS). Pavement cores were obtained to determine the asphalt thickness, and the borings were advanced to identify and sample the subsurface aggregate and soil. Borings were advanced in both the north and south lanes of Prairie Avenue. Boring locations are shown on Plates 1 and 2, *Exploration Location Plan*. Exploratory borings were advanced using a trailer-mounted G-2400 drill rig equipped with 6-inch outside diameter hollow-stem augers. Soil samples were obtained at approximate 2.5-foot intervals, starting below the asphalt concrete (AC) pavement layer at each boring location, using a 2-inch outside diameter split-spoon sampler. Soil samples obtained in this manner are disturbed but can be used for visual classification and index testing. In addition, bulk samples of select soils were collected from the auger cuttings.

Test pits PTP-1 through PTP-11 were advanced to depths of between 3.5 to 5.5 feet BGS. Exploratory test pits were advanced using a Kubota KX057-4 compact excavator equipped with a 24-inch-wide bucket and general-purpose excavation bucket teeth. The test pits were advanced in the proposed widening areas on both the north and south sides of Prairie Avenue. Test pit locations are also shown on Plates 1 and 2, *Exploration Location Plan*.

The soils encountered in the borings and test pits were logged and visually classified by Mr. Steven J. Litalien, E.I. in accordance with the *Unified Soil Classification System* (USCS). Appendix C provides laboratory test results used to confirm visual classifications in the field.

Field testing consisted of Standard Penetration Tests (SPTs) performed in general accordance with ASTM International (ASTM) D1586. The SPT consists of driving a 2-inch outside-diameter, split-spoon sampler a distance of 18 inches with a 140-pound automatic hammer falling 30 inches. For each test, the sampler is initially driven 6 inches to seat the sample, and then driven two additional 6-inch increments. The number of blows required to drive the sampler the two additional 6-inch intervals is added together and represents the driving resistance, or SPT N-value at the sample location. The SPT N-value gives an indication of the relative density of cohesionless soils and the consistency of cohesive soils. The raw N-values reported on boring logs have not been corrected for hammer efficiency, borehole diameter, rod length, or overburden pressure.

Single ring infiltration testing was performed referencing the Spokane Regional Stormwater Manual at test pits PTP-2 and PTP-11. Infiltration test results are presented in Appendix E.

At the conclusion of our subsurface investigation, the borings were backfilled with a combination of bentonite and aggregate and the pavement was patched with cold-mix asphalt to match the existing thickness. Test pits were backfilled and loosely compacted with the excavated spoils. The exploratory boring and test pit logs are included in Appendix A, along with a USCS summary, which should be used to interpret the soil descriptive terms in this report.

Within the existing roadway, we encountered AC pavement above base course underlain by either embankment fill, remnant topsoil, or native gravel. Embankment fill comprised of either poorly graded gravel with silt and sand (GP-GM) or poorly graded sand with silt (SP-SM) was encountered below the base course in each boring except for PB-1. The embankment fill was underlain by remnant topsoil consisting of clayey sand with gravel (SC) or silty gravel with sand (GM) in each boring with the exception of PB-1 and PB-8. Native gravel classifying as either silty gravel with sand (GM) or poorly graded gravel with silt and sand (GP-GM) was encountered below either the embankment fill, remnant topsoil, and/or the base course in each pavement boring.

In all of the test pits except for PTP-1, PTP-4, and PTP-8 we encountered topsoil classifying as silty gravel with sand (GM) above native gravels. In test pits PTP-1, PTP-4, and PTP-8 undocumented fill associated with water line construction was encountered at the existing ground surface. A general description of each soil unit's stratigraphic location and properties is provided below:

Topsoil (surficial and remnant): We encountered a 1- to 2-foot-thick topsoil layer at the ground surface in all test pits except for PTP-1, PTP-4, and PTP-8. We also encountered a 0.5- to 2.7-foot thick remnant topsoil layer below the embankment fill in each boring except for PB-1 and PB-8. The topsoil classified as either silty gravel with sand (GM) or clayey sand with gravel (SC) and was described as dark brown and moist, with an in-situ moisture contents ranging from 9.5 to 20.7 percent. Within the existing roadway prism, the remnant topsoil had penetration resistance values between 4 and 13, indicating a very loose to medium dense stratum. The topsoil had an organic content between 3.7 and 11.4 percent and a fines content (percent passing the No. 200 sieve) ranging from 27.2 to 49.5 percent. Atterberg limits testing indicated that the topsoil has liquid limits ranging from no-value to 33 percent, and plasticity indices ranging from non-plastic to 18. Laboratory testing indicated that the topsoil has an Idaho T-8 R-value of 58.

Pavement: We encountered 4.5 to 6.0 inches of AC in the borings drilled within the existing Prairie Avenue ROW (PB-1 through PB-11).

Base Course: Base Course comprising well graded gravel with silt and sand (GW-GM) was encountered below the AC in all the borings drilled within the existing pavement. The base course ranged from 5.0 to 8.5 inches in thickness within Prairie Avenue. The base course was described as light brown to brown and moist and

contained subangular to angular gravel. The base course had a fines content (percent passing the No. 200 sieve) of 8.6 percent. The base course had a gravel content (percent retained on the No. 4 sieve) of 51 percent. A fractured face count performed on a sample of the base course resulted in 100 percent of the particles having at least one fractured face.

Embankment Fill: Fill comprised either poorly graded gravel with silt and sand (GP-GM), poorly graded sand with silt and gravel (SP-SM), or silty sand with gravel (SM) was encountered below the base course in each boring with the exception of PB-1. The embankment fill was likely used as a subbase course layer as well as general embankment fill to raise grades below the pavement on the east side of the alignment. The embankment fill extended to depths ranging from 2.0 feet below the top of pavement to the maximum depth explored in PB-8 (6.5 feet). The fill was described as light brown to brown and moist, with an in-situ moisture content ranging from 2.3 to 5.3 percent. Penetration resistance values ranged from 25 to greater than 50 blows per foot, indicating a medium dense to very dense fill layer. A sample of the silty sand with gravel (SM) fill had a fines content of 14.9 percent and an Idaho T-8 R-value of 76.

Undocumented Fill: Undocumented fill associated with the new water line construction visually classifying as either poorly graded gravel with silt and sand (GP-GM), poorly graded sand with silt and gravel (SP-SM), or silty sand with gravel (SM) was encountered at the ground surface in PTP-1, PTP-4, and PTP-8 and extended to 3.0 to 3.5 feet below existing grade. The embankment fill was described as light brown, brown, dark brown, dark gray, or black. The undocumented fill was described as moist, with in-situ moisture contents ranging from 4.5 to 5.1 percent. Some of the fill was likely mixed with topsoil and contained some plastic debris.

Native Gravel: Native gravel was encountered below the base course, topsoil, or embankment fill in each boring and test pit with the exception of PB-8 and PB-9. Where encountered, the native gravel extended to each boring or test pit's termination depth (6.5 feet). The native gravel classified as either poorly graded gravel with silt and sand (GP-GM) according to the ASTM classification system. The native gravel was described as brown and moist, with in-situ moisture contents ranging from 3.8 to 9.6 percent. Penetration resistance values ranged from 8 to 38 blows per foot, indicating a loose to very dense soil stratum. We measured a fines content ranging from 5.8 to 10.1 percent in the native gravel. Atterberg limits testing indicates that the native gravel is non-plastic. The native gravel had an Idaho T-8 R-Value between 77 and 79. Cobbles and/or boulders were observed within the native gravel at all test pit locations.

We did not encounter groundwater to the depths explored at the project site. We anticipate the groundwater table is more than 50 feet below the ground surface. Seasonal groundwater elevation changes due to variations in precipitation, runoff, irrigation, infiltration and other factors are possible. Since extensive sub-excavation is not expected, the potential for encountering groundwater during construction is negligible. Additional details and specific soil descriptions are included on the boring logs in Appendix A.

240.05 TOTAL DESIGN PAVEMENT THICKNESS

Pavement design alternatives are provided in section 240.22.02 Typical Section.

240.06 SUB-SUBGRADING

We encountered a 1- to 2-foot-thick topsoil layer at the ground surface in all test pits except for PTP-1, PTP-4, and PTP-8. We also encountered a 0.5- to 2.7-foot thick remnant topsoil layer below the embankment fill in each boring except for PB-1 and PB-8. The remnant and surficial topsoil has an elevated organic content (greater than 3 percent), a lower R-Value than the native gravel and embankment fill, and is susceptible to frost action.

Sub-subgrading (SSG) is additional excavation below pavement subgrade due to the presence of undesirable subgrade soil. As discussed with J-U-B, without SSG, the alignment will require a thicker pavement section to meet the intended design life if the remnant topsoil is not removed. SSG to depths up to 5.0 feet below the top of existing pavement will be required if the design team elects to remove the remnant topsoil below the embankment fill. If removed, the excavated remnant topsoil should be disposed off site in a location suitable to the District and the excavation backfilled with *Granular Borrow* or *Granular Subbase/Ballast*. We provide pavement design alternatives in this report with and without SSG (i.e. remnant topsoil removal).

240.07 GRADE POINTING

Grade pointing is tapered sub-subgrading to eliminate abrupt transitions from existing pavement sections to the new pavement section. If topsoil is removed below the new pavement for this project, we recommend a 50-foot long transition zone be utilized to taper existing pavement sections constructed over remnant topsoil to new pavement sections that will be constructed where remnant topsoil has been completely removed. No special drainage considerations are necessary for grade pointing at this site.

240.08 SPECIAL PLACEMENT

If removed, the excavated surficial and remnant topsoil should be disposed off site in a location suitable to the District.

240.09 COMPACTION

Class A compaction is specified for this project referencing Sections 205.03.F and 205.03G of the 2023 ITD Standard Specifications for Highway Construction (SSHC). We recommend that construction be undertaken during dry weather conditions. During wet periods of the year, wet or saturated native soil or embankment fill will be susceptible to erosion, pumping, or rutting when subject to heavy loads from rubber-tired equipment or vehicles which exert a point load. Grading and compaction should not be attempted under these conditions. If the subgrade soil becomes soft, wet, or otherwise unsuitable due to earthwork attempted during wet weather conditions, this material should be excavated to undisturbed and firm soil and backfilled with *Granular Subbase*

(also referred to as *Ballast* in the 2019 Highway Standards for the Associated Highway Districts of Kootenai County, Idaho) or *Aggregate Base* as described in Section 301 and 303 of the 2023 ITD SSHC, respectively.

240.10 SLOPE DESIGN SUMMARY

This project includes embankment slopes to achieve grades in the widening areas and for infiltration swales to promote drainage at the site. Slopes greater than 6.5 vertical feet or steeper than 3.0 H: 1.0V (horizontal: vertical) are not planned for this project. As such, this report does not include a slope design summary.

240.11 SLOPE DESIGN

Embankment slopes for this project are planned at a 3.0H: 1.0V or flatter slope. There are no slopes at the site that require a comprehensive slope stability analysis.

240.12 EMBANKMENT FOUNDATION

This project includes minor cuts (less than 2 feet) and fills up to 7 feet high on flat to very gradually sloping ground. Based on the subsurface and geologic conditions encountered at the site and planned improvements, we anticipate new embankment consolidation and settlement will occur during construction and will be negligible (less than 1.0 inches of total settlement) following construction completion. Station to station embankment heights are approximated in Table 1 below. Fill heights on the north end of the existing roadway were not available from Stations 26+00 to 38+00 at the time of this report.

Table 1: Embankment Summary

Station Limits	Widening Area	Fill Height (feet)
15+77 – 19+00	North	Up to 2
15+77 – 19+00	South	Up to 1.5
19+00 – 22+50	North	Up to 5
19+00 – 22+50	South	Up to 3.5
22+50 – 24+00	North	Up to 2
22+50 – 24+00	South	Up to 3.5
24+00 – 26+00	North	Up to 4
24+00 – 26+00	South	Up to 3.5
26+00 – 38+00	North	Data not available
26+00 – 38+00	South	Up to 3
38+00 – 42+00	North	Up to 3

38+00 – 42+00	South	Up to 2.5
42+00 – 45+00	North	Up to 5
42+00 – 45+00	South	Up to 3.5
45+00 – 50+00	North	Up to 2
45+00 – 50+00	South	Up to 2
50+00 – 53+00	North	Up to 7
50+00 – 53+00	South	Up to 6.5
53+00 – 55+50	North	Up to 4.5
53+00 – 55+50	South	Up to 6
55+50 – 61+00	North	Up to 2
55+50 – 61+00	South	Up to 3

To construct embankment fills in cut/widening areas, we recommend constructing an initial “base key” and benching *Granular Borrow* fill into existing embankments per Section 205.03F of the 2023 ITD-SSHC. Figure 1 below outlines our recommendations for embankment widening construction.

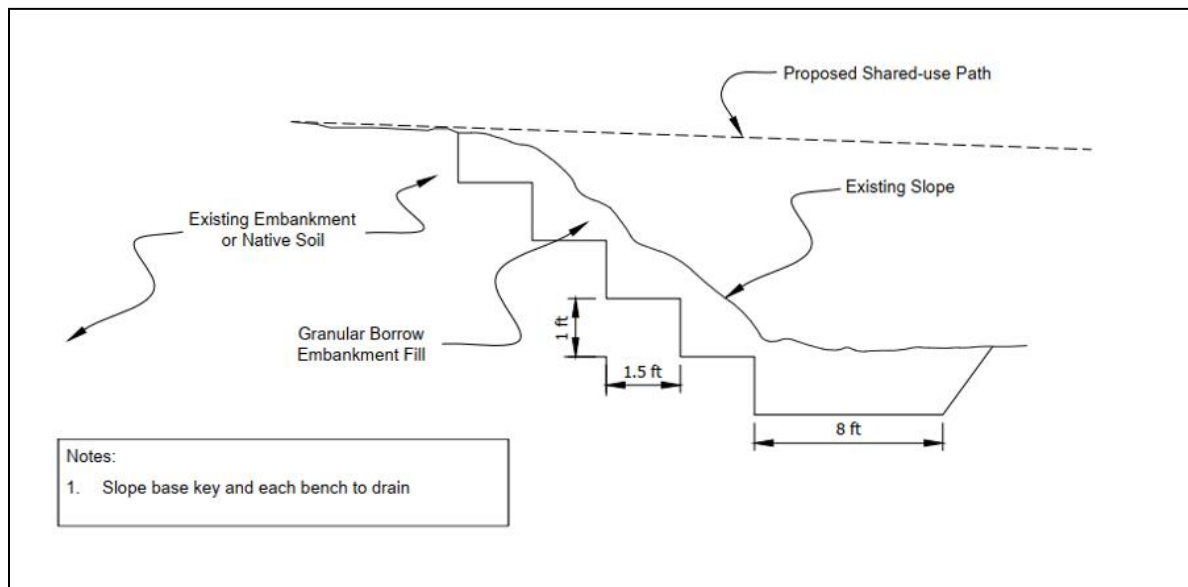


Figure 1: Embankment Widening Construction

240.13 SURFACE AND SUBSURFACE WATER

We did not encounter groundwater during our subsurface investigation within the project boundary. We anticipate the groundwater table is greater than 50 feet below the ground surface in the area. Subsurface water will not require mitigation during construction; however, the contractor could encounter surficial seeps or springs at any time of the year.

Stormwater is currently directed off the Prairie Avenue shoulder and into the soil on the sides of the roadway alignment. The Civil Design team must properly design stormwater conveyance and disposal systems at the site to prevent surface water from collecting on the pavement surface. Surficial water collected on the pavement surface may saturate and weaken subgrade soils and lead to reduced asphalt pavement life.

240.14 DRAINAGE

We understand the proposed drainage system will likely include the construction of 15-foot-wide infiltration swales traversing along the north and south sides of the new alignment. Drywells on both the north and south sides of the road may also be constructed on the west and east sides of the project.

We performed shallow single ring infiltration tests at PTP-2 and PTP-11 to assist stormwater design. The tests were performed in the native gravel just below the existing surficial topsoil. The tests were performed referencing the *Spokane Regional Stormwater Manual*. Our infiltration tests resulted in infiltration rates ranging from 6 to 7.5 inches per hour. A safety factor has not been applied to these field measured rates. Infiltration test results are presented in Appendix E.

240.15 GEOSYNTHETICS

If the existing remnant or surficial topsoil is left in place (pavement design alternative 2), a geotextile separation fabric should be placed between the topsoil and the granular subbase. Nonwoven or woven geotextiles should meet requirements outlined in the subgrade separation geotextile property requirements provided in *Section 718.07* of the 2023 ITD SSHC.

Geotextiles shall be applied directly on approved subgrade, taut, overlapped at least 18 inches or otherwise placed according to manufacturers' recommendations. When used for over-excavation applications, geotextile fabric must completely separate native soil from *Structural Fill*.

240.16 EXISTING ROADWAY MATERIAL

The removal of existing remnant topsoil will require excavation and temporary removal of the existing embankment fill. Existing asphalt pavement, base course, fill, and native gravel excavated during construction may be reused as embankment fill, provided it meets the requirements of Section 205 of the 2023 ITD SSHC and is not classified as Topsoil (defined in Section 240.18). On-site base course may be reused as *Aggregate Base*, provided it meets the requirements of Section 703 of the 2023 ITD SSHC.

240.17 ROCK SUBGRADE

We do not anticipate rock subgrade will be encountered at the project site.

240.18 TOPSOIL

For the purposes of this report, we define "topsoil" as any soil layer containing greater than 3 percent organics and vegetation by weight. As such, there are "topsoil" layers both at the surface and below embankment fill

within the project boundary that are classified as silty gravel with sand (GM) or clayey sand with gravel (SC) according to the USCS classification system. Outside of currently paved areas, we encountered a 1- to 2-foot-thick topsoil layer at the ground surface in all test pits except for PTP-1, PTP-4, and PTP-8. We also encountered a 0.5- to 2.7-foot thick remnant topsoil layer below the embankment fill in each boring except for PB-1 and PB-8. If design alternative 1 (presented in section 240.22.02) is selected, topsoil encountered during construction shall be stripped and removed from the project site or stockpiled in a designated area selected by the Contractor and approved by the District. All subgrade soil shall be cleared of organic material. The requirements for using existing topsoil and contractor furnished topsoil are included in the 2023 ITD SSHC. If sufficient topsoil cannot be generated from the project, contractor furnished sources must be used.

240.19 PIPE

At the time this report was issued, information regarding the location of new pipes and existing pipes that will remain was not specified. Laboratory testing of site soil to determine the pH, resistivity, and soluble sulfates was performed on representative soil samples to determine the potential negative impacts to underground pipes and utilities. Aggressive soil conditions are identified if the soil has a pH of less than 4.5, the sulfate concentration is greater than 200 parts-per-million (PPM), and the resistivity is less than 2000 ohms-cm (FHWA, 2010). Based on this definition, aggressive soil conditions are not present at this site. Laboratory test results are presented in Table 2.

Table 2: pH, Resistivity, and Sulfate Test Results

Sample Location	Soil Classification	pH	Resistivity (ohms-cm)	Sulfate (mg/kg)
PB-7 (2.0'-3.5')	Residual Topsoil – Clayey Sand with Gravel (SC)	7.02	4,180	76.4
PB-9 (1.0'-2.5')	Embankment Fill – Silty Sand with Gravel (SM)	8.51	7,810	19.9
PTP-6 (1.0'-2.0')	Surficial Topsoil – Silty Gravel with Sand (GM)	5.99	16,100	5.04
PTP-11 (1.8'-3.0')	Native Gravel – Poorly Graded Gravel with Silt and Sand (GP-GM)	6.02	24,700	6.27

Based on the above laboratory test results, we anticipate the existing soil below the proposed alignment is mildly to moderately corrosive for underground structures and utilities. Selection of material for metallic utility piping within native soil at the site must account for some possible loss of wall thickness due to corrosion. Corrosion risks include reduced service life for metal pipes, increased maintenance, and possible premature replacement.

The sulfate test results indicate the native soil at the site has a negligible capacity for sulfate attack of concrete, respectively. Therefore, conventional Type I/II cement is appropriate for the project.

A survey of existing culverts and their general condition was not completed as part of this report.

240.20 RIPRAP

Riprap is not required for this project.

240.21 STAGED CONSTRUCTION

Staged construction will not be required on this project other than that required for directing traffic through the improvement area during construction.

240.22 PAVEMENT DATA

240.22.01 PAVEMENT TYPE AND SURFACE SMOOTHNESS

Based on the traffic ESAL value of 1,409,468 projected for Prairie Avenue over a 20-year design life provided by J-U-B and Table 240.25.03.1 of the 2020 ITD Materials Manual, we recommend the use of Superpave HMA Class SP-3 for the site. We recommend asphalt surface smoothness conforms to *Smoothness Schedule I* per Section 405.03T of the 2023 ITD SSHC.

240.22.02 TYPICAL SECTION

We provide the following 2 pavement design alternatives for the new alignment:

Alternative 1:

0.38 feet (4.5 inches) – Superpave HMA Class SP-3 with ½-inch aggregate (Two 2.25-inch-thick lifts per Section 240.25.05)

0.67 feet (8.0 inches) – ¾-inch Aggregate Base “Type B”

Alternative 2:

0.38 feet (4.5 inches) – Superpave HMA Class SP-3 with ½-inch aggregate (Two 2.25-inch-thick lifts per Section 240.25.05)

0.50 feet (6.0 inches) – ¾-inch Aggregate Base “Type B”

1.00 feet (12.0 inches) – Granular Subbase/Ballast

Alternative 1 requires complete removal of the surficial and remnant topsoil beneath the pavement section and replacement with Granular Borrow. No separation fabric is required.

Alternative 2 requires a geotextile separation fabric placed between the topsoil and the Granular Subbase. Refer to Appendix D for flexible pavement design calculations.

Both alternatives are viable, and one will be selected in the design study report.

240.23 BASE

Aggregate Base shall consist of $\frac{3}{4}$ -inch crushed aggregate conforming to one of the following specifications:

- “Type B” requirements in Section 703.04 – *Aggregate for Untreated Base, Treated Base, and Road Mix* of the 2023 ITD SSHC;
- Base requirements in Section 404 of the 2019 Highway Standards for the Associated Highway Districts of Kootenai County, Idaho (Kootenai County Highway Standards).

Granular Subbase/Ballast shall consist of crushed aggregate conforming to one of the following specifications:

- Section 703.11 – *Aggregate for Granular Subbase* of the 2023 ITD SSHC;
- “Type 1” or “Type 2” requirements in Section 403 of the 2019 Kootenai County Highway Standards.

We recommend a tack coat consisting of CSS-1 diluted emulsified asphalt be placed above compacted base and between separate asphalt lifts to act as glue and help create a bond between base course and asphalt and the 2 asphalt layers. The emulsion should be diluted by adding an equal amount of warm water, rigorously mixed in the holding tank, and applied at a rate of 0.08 gal/SY. Tack coats should only be applied to an area that can be covered by the same day’s paving and should not be paved over until enough time has passed to allow the tack to “break” and “set”. The tack coat breaking point is defined as the moment when enough water has separated from the asphalt to show a color change from black to brown. Poor bonding of asphalt layers to the base course or underlying lifts can result in slippage and shoving of the pavement.

240.24 SURFACE TREATMENT

Surface treatments (i.e. seal coats) are not required for this project.

240.25 PAVING

Asphalt pavement shall conform to the specifications in Section 405 of the 2023 ITD SSHC. A Superpave Mix Design (Class SP-3) shall be submitted with associated “Job Mix Formula” (JMF) for approval, prior to paving.

240.25.04 PERFORMANCE GRADED BINDER SELECTION

The LTPPBind output for this project (provided in Appendix D) suggests a performance grade (PG) binder of 58-28 at 5.0- to 7.0-percent by weight of mix (estimated) should be used for new asphalt pavement. However, we understand early rutting has been documented by ITD staff along SH-41 near Hayden Avenue, which was paved with a PG 58-28 binder in the Summer and Fall of 2021. ITD’s asphalt paving subject matter expert, Tim Murphy, recommends an increase in PG binder from PG 58-28 to PG 64-28 to improve rutting resistance at higher temperatures and introduce polymer to stiffen the asphalt mix. PG 64-28 is locally available and commonly used in the project area. A minimum $\frac{1}{2}$ -percent anti-strip additive should also be used, unless the mix design indicates anti-strip additive is not required to enhance asphalt-aggregate adhesion.

240.25.05 LIFT THICKNESS AND NOMINAL MAXIMUM AGGREGATE SIZE

We recommend Superpave HMA pavement be placed in two, 2.25-inch-thick lifts referencing guidance provided in *Section 240.05.02* of the 2020 ITD Materials Manual. With a ½-inch nominal maximum aggregate size (NMAS) the ratio of lift thickness to NMAS (t/NMAS) is 4.5 (a minimum t/NMAS of 3 is recommended by ITD). We do not recommend the asphalt be placed as a single, 4.5-inch thick lift unless the contractor can achieve uniform compaction throughout the entire layer without crushing the HMA aggregate.

240.25.06 PORTLAND CEMENT CONCRETE PAVEMENT

Portland cement concrete pavement will not be included in this project.

240.25.07 REDUCED SHOULDER PAVEMENT THICKNESS

We do not recommend a reduced shoulder thickness for this project.

240.26 SEAL

Surface seal or treatments are not anticipated for this project.

240.27 DUST ABATEMENT

An estimated 14,400 MG (1MG = 1,000 gallons) of water will be required for dust abatement, assuming 0.5 gallons of water per square yard of subgrade as outlined in the equation below. Dust palliatives are not anticipated for this project.

$$\left(80,000 \frac{SY}{app}\right) \times \left(3 \frac{apps}{day}\right) \times (120 \text{ days}) \times \left(0.5 \frac{gal}{SY}\right) \times \left(\frac{MG}{1,000 \text{ gal}}\right) = 14,400 \text{ MG}$$

240.28 AGGREGATE ESTIMATING DATA

Aggregate estimating data was determined based on past experience and nearby sources, and include:

½-inch aggregate at 145 pcf for Plant Mix Class SP-3 including asphalt and additives.

¾-inch aggregate at 146 pcf for Base including 7 percent moisture content.

Granular Subbase/Ballast at 145 pcf, including 5 percent moisture content.

240.28.01 DISCLAIMER

The unit weights presented in this report were estimated based on past project experience. This information is used by the designer for developing reasonable project quantities. The actual quantities will vary and were based on contractor-provided source, crushing operation, and mix designs.

The contractor is responsible for determining actual unit weights based on the material produced and providing adequate materials for the project, plus any losses to stockpile operation, out of specification (rejected) materials, or other wastes.

240.29 AGGREGATE SOURCES

All aggregates for the project will originate from on-site crushed base course or approved contractor-furnished sources.

240.30 CURRENT SPECIFICATION AND MINIMUM TESTING REQUIREMENTS

This Roadway Materials Report is based upon the 2020 Idaho Transportation Department Materials Manual, the 2023 Standard Specifications for Highway Construction, the 2019 Quality Assurance Manual, the 2020 Quality Assurance Special Provisions for State Acceptance (10/21/2019), and the 2021 Special Provision for 405 Superpave Hot Mix Asphalt (07/02/2021).

240.31 REFERENCES

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Traffic data provided by J-U-B Engineering on April 24, 2023 via electronic mail.

Path: F:\Spokane\Company\Main\CLIENTS\J\JUB Engineers CDA\2022 Projects\CD22028A - KN 23028 Prairie Ave; Meyer Rd to SH 41; Post Falls HD\CAD & GIS\CD22028A - ELP\CD22028A - ELP.aprx

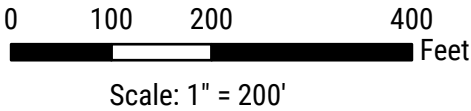


Reference Map



Legend

- PTP-1  Approximate location of test pit observed by STRATA on June 1, 2023
- PB-1  Approximate location of boring observed by STRATA on March 23, 2023



STRATA

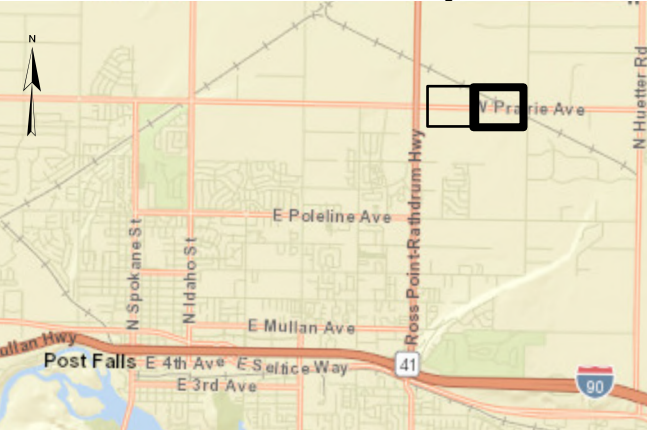
EXPLORATION LOCATION PLAN
(WEST)
Prairie Ave; Meyer Rd to SH-41
Post Falls, Idaho

Client: J-U-B Engineers, Inc.	
Client File No.: N/A	File No.: CD22028A
Drawn By: G. Morlan	Checked By: L. Michels
Date: 7/5/2023	Plate 1

Path: F:\Spokane\Company\Main\CLIENTS\J\JUB Engineers CDA\2022 Projects\CD22028A - KN 23028 Prairie Ave; Meyer Rd to SH 41; Post Falls HD\CAD & GIS\CD22028A - ELP\CD22028A - ELP.aprx

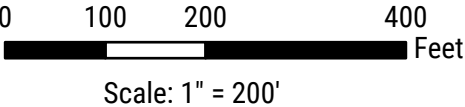


Reference Map



Legend

- PTP-1  Approximate location of test pit observed by STRATA on June 1, 2023
- PB-1  Approximate location of boring observed by STRATA on March 23, 2023



STRATA

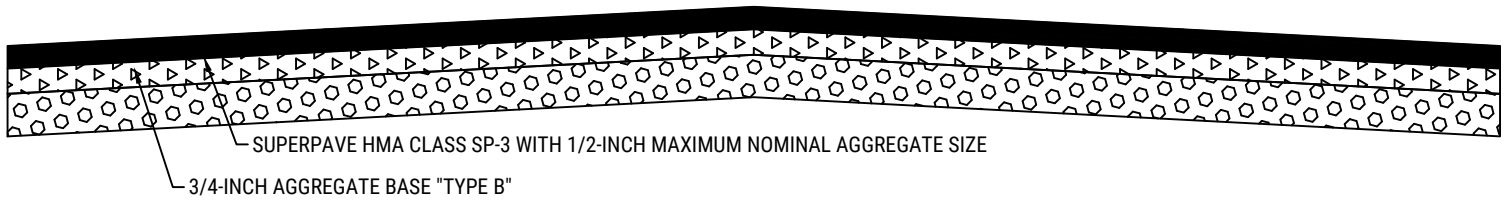
**EXPLORATION LOCATION PLAN
(EAST)**
Prairie Ave; Meyer Rd to SH-41
Post Falls, Idaho

Client: J-U-B Engineers, Inc.	
Client File No.: N/A	File No.: CD22028A
Drawn By: G. Morlan	Checked By: L. Michels
Date: 7/5/2023	Plate 2

TYPICAL PAVEMENT SECTION

ALTERNATIVE 1

N.T.S.



PAVEMENT LAYER THICKNESS

USE	HMA (IN)	AGGREGATE BASE (IN)	SURFACE SMOOTHNESS SCHEDULE
PRAIRIE AVE.; MEYER RD. TO SH-41	4.5	8.0	1

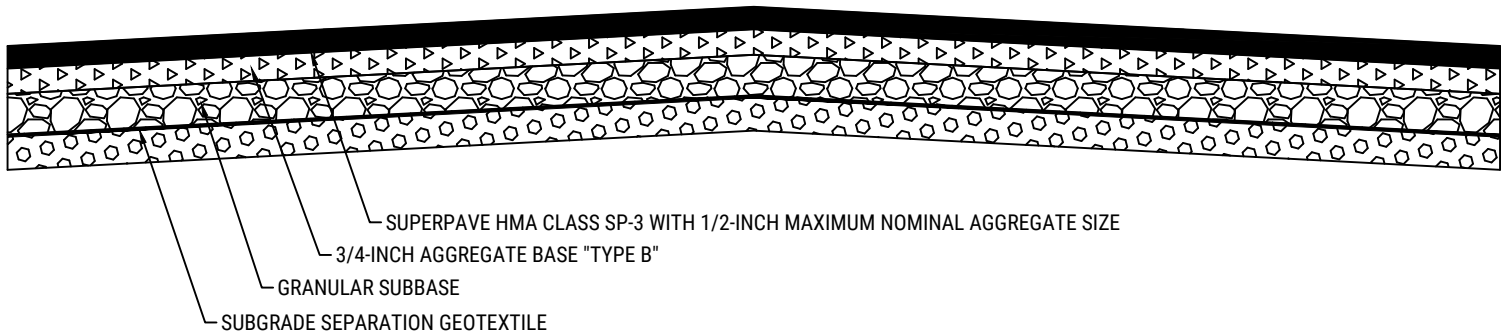
TYPICAL PAVEMENT SECTION
PRAIRIE AVE; MEYER RD TO SH-41

STRATA

Project No.: CD22028AI	Drawing By: G. MORLAN
Client: J-U-B ENGINEERS	Checked By: L. MICHELS
Plate: 3	Date: 7/17/2023

TYPICAL PAVEMENT SECTION

ALTERNATIVE 2
N.T.S.



PAVEMENT LAYER THICKNESS				
USE	HMA (IN)	AGGREGATE BASE (IN)	GRANULAR SUBBASE (IN)	SURFACE SMOOTHNESS SCHEDULE
PRAIRIE AVE.; MEYER RD. TO SH-41	4.5	6.0	12	1

TYPICAL PAVEMENT SECTION
PRAIRIE AVE; MEYER RD TO SH-41

STRATA

Project No.: CD22028AI	Drawing By: G. MORLAN
Client: J-U-B ENGINEERS	Checked By: L. MICHELS
Plate: 4	Date: 7/17/2023

Appendix A

USCS Explanation and
Exploration Logs

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL NAMES	
COARSE GRAINED SOIL MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% COARSE FRACTION RETAINED #4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES	
		GRAVELS WITH >12% FINES		GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES	
				GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	
				GC	CLAYEY GRAVELS, GRAVEL-SAND-SILT MIXTURES	
	SANDS >50% COARSE FRACTION PASSES #4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES		SW	WELL-GRADED SANDS, GRAVELY SANDS	
		SANDS WITH >12% FINES		SP	POORLY GRADED SANDS, GRAVELY SANDS	
				SM	SILTY SANDS, SAND-SILT MIXTURES	
				SC	CLAYEY SANDS, SAND CLAY MIXTURES	
FINE GRAINED SOIL 50% OR MORE PASSING NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	INORGANIC		ML	INORGANIC SILTS, SANDY OR CLAYEY SILTS	
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, SANDY OR SILTY CLAYS	
		ORGANIC		OL	ORGANIC SILTS AND CLAYS OF LOW PLASTICITY	
		SILTS AND CLAYS LIQUID LIMIT 50 OR MORE	INORGANIC		MH	INORGANIC SILTS, MICACEOUS SILTS, PLASTIC SILTS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	ORGANIC			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY	
	HIGHLY ORGANIC SOILS				PT	PEAT, MUCK AND OTHER HIGHLY ORGANIC SOIL

SHORTHAND NOTATION

SPT - STANDARD PENETRATION TEST
 PL - PLASTIC LIMIT
 LL - LIQUID LIMIT
 PI - PLASTICITY INDEX
 MC - MOISTURE CONTENT
 DD - DRY DENSITY
 WD - WET DENSITY
 UC - UNCONFINED COMPRESSION
 OC - ORGANIC CONTENT
 BGS - BELOW GROUND SURFACE
 N.E. - NOT ENCOUNTERED

MATERIAL DESCRIPTION CONTACT

————— DISTINCT SOIL LAYER CONTACT WITHIN SOIL PROFILE
 - - - - - APPROXIMATE SOIL LAYER CONTACT WITHIN SOIL PROFILE

NOTES

- MIXED UNIFIED SOIL CLASSIFICATION SYSTEM SYMBOLS ARE USED TO INDICATE DUAL SOIL CLASSIFICATIONS.
- THE SPT N-VALUE, REPORTED IN BLOWS PER FOOT, IS THE SUM OF THE NUMBER OF BLOWS REQUIRED TO DRIVE THE STANDARD SPLIT SPOON SAMPLER A DISTANCE OF 12-INCHES AFTER AN INITIAL 6-INCHES OF PENETRATION. IF A TOTAL OF 50 BLOWS ARE INSUFFICIENT TO ADVANCE ANY OF THE THREE 6-INCH INTERVALS, THE PENETRATION DEPTH AFTER 50 BLOWS IS ALSO REPORTED.

BORING LOG SYMBOLS

GRAPH SYMBOL	DESCRIPTION
	STANDARD 2-INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER
	MODIFIED CALIFORNIA 3-INCH OUTSIDE DIAMETER SAMPLER
	ROCK CORE
	SHELBY TUBE 3-INCH OUTSIDE DIAMETER SAMPLER

ADDITIONAL MATERIAL SYMBOLS

GRAPH SYMBOL	LETTER SYMBOL	TYPICAL NAMES
	AC	ASPHALT CONCRETE
	CC	PORTLAND CEMENT CONCRETE
	TS	TOPSOIL
	FL	FILL

TEST PIT LOG SYMBOLS

GRAPH SYMBOL	DESCRIPTION
	BAGGIE SAMPLE
	BULK SAMPLE
	RING SAMPLE

GROUNDWATER SYMBOLS

GRAPH SYMBOL	DESCRIPTION
	GROUNDWATER LEVEL AT TIME OF DRILLING
	GROUNDWATER LEVEL AT END OF DRILLING
	GROUNDWATER LEVEL 24 HOURS AFTER DRILLING COMPLETION
04-10-18	DATE OF GROUNDWATER READING

EXPLORATION LOG KEY - SOIL

STRATA

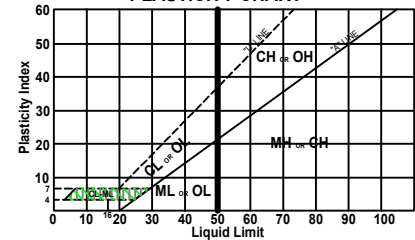
GRAIN SIZE

DESCRIPTION	SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders	>12"	>12"	Larger than basketball-size.
Cobbles	3" - 12"	3" - 12"	Fist-size to basketball-size.
Gravel	coarse	3/4" - 3"	Thumb-sized to fist sized.
	fine	#4 - 3/4"	Pea-sized to thumb-sized.
Sand	coarse	#10 - #4	Rock salt-sized to pea-sized.
	medium	#40 - #10	Sugar-sized to rock salt-sized.
	fine	#200 - #40	Flour-sized to sugar-sized.
Fines	Passing #200	<0.0029"	Flour-sized and smaller.

MODIFIERS

DESCRIPTION	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45

PLASTICITY CHART



STRATIFICATION

DESCRIPTION	THICKNESS
Parting	1/16 - 1/4"
Lense	1/4 - 4"
Layer	4 - 12"

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to touch.
Moist	Slightly damp, some apparent moisture.
Wet	Saturated, visible free water, soil is below water table.

DESCRIPTION	THICKNESS
Occasional	One or less per foot of thickness.
Frequent	More than one per foot of thickness.

APPARENT RELATIVE DENSITY OF COARSE-GRAINED SOIL

APPARENT DENSITY	SPT blows/ft	CALIFORNIA SAMPLER blows/ft	D & M SAMPLER blows/ft	RELATIVE DENSITY (%)	FIELD TEST
Very Loose	0-4	<4	<5	0-15	Easily penetrated with 1/2" reinforcing rod pushed by hand.
Loose	5-10	5-12	5-15	15-35	Difficult to penetrate with 1/2" reinforcing rod pushed by hand.
Medium Dense	11-30	12-35	15-40	35-65	Easily penetrated a foot with 1/2" reinforcing rod driven with 5-lb hammer.
Dense	31-50	35-60	40-70	65-85	Difficult to penetrate a foot with 1/2" reinforcing rod driven with 5-lb hammer.
Very Dense	>50	>60	>70	85-100	Penetrated only a few inches with 1/2" reinforcing rod driven with 5-lb hammer.

CONSISTENCY FINE-GRAINED SOIL

CONSISTENCY	SPT blows/ft	TORVANE	POCKET PENETROMETER	FIELD TEST
		UNDRAINED SHEAR STRENGTH (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	
Very Soft	<2	<0.125	<0.25	Easily penetrated several inches by thumb. Extrudes between thumb and finger when squeezed in hand.
Soft	2-3	0.125-0.25	0.25-0.5	Penetrated about 1/4 inch by thumb with moderate effort. Molded by strong finger pressure.
Firm	4-7	0.25-0.5	0.5-1.0	Penetrated about 1/4 inch by thumb with moderate effort. Molded by strong finger pressure.
Stiff	8-14	0.5-1.0	1.0-2.0	Indented about 1/2 inch by thumb only with great effort.
Very Stiff	15-30	1.0-2.0	2.0-4.0	Readily indented with difficulty by thumbnail.
Hard	>30	>2.0	>4.0	Indented with difficulty by thumbnail.

REACTION WITH HCl

None	No visible reaction.
Weak	Some reaction, with bubbles forming slowly.
Strong	Violent reaction, with bubbles forming immediately.

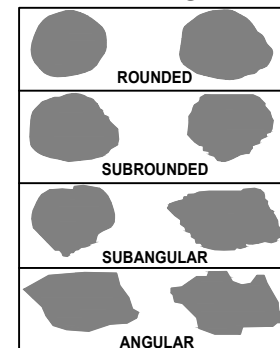
CEMENTATION

Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

STRUCTURE

Stratified	Alternating layers of varying material or color with layers at least 1/4" thick; note thickness.
Laminated	Alternating layers of varying material or color with layers at least 1/2" thick; note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small macular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soil, such as small lenses or sand scattered through a mass of clay; note thickness.
Homogeneous	Same color and thickness throughout.

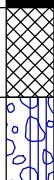
PARTICLE SHAPE



EXPLORATION LOG KEY - SOIL

STRATA

TEST BOREHOLE - STRATA PROJECT.GDT - 7/17/23 18:14 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE, MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028\I LOGS

Project: KN23028 - Prairie Ave; Meyer Rd to SH 41										STRATA		Boring: PB-1		
Client: J-U-B Engineers Inc.					Drill Rig: G-2400									
Date Drilled: 03-23-2023					Borehole Diameter: 6.0"									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	Recovery (in)	Blows Per 6 Inches	SPT N-Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks
														Note: BGS = Below Ground Surface
0.0	2238.2													
	2237.7	Asphalt Concrete Pavement, - (6.0-inches) Recovered core was segregated into a 2-inch thick layer over a 4-inch thick layer.												
	2237.0	Base Course, - (8.5-inches) Well Graded Gravel with Silt and Sand (GW-GM) - Light brown to brown, moist, fine, subangular to angular.			18	16 21 21	42		2.9		6.7	NV	NP	R-Value - 77
		Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, medium dense to very dense, fine to coarse rounded to subangular			2	50/4.0"	50+							
2.5														

TEST BOREHOLE - STRATA PROJECT.GDT - 7/17/23 18:14 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE; MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028\I LOGS

Project: KN23028 - Prairie Ave; Meyer Rd to SH 41												Boring: PB-2		
Client: J-U-B Engineers Inc.					Drill Rig: G-2400									
Date Drilled: 03-23-2023					Borehole Diameter: 6.0"									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	Recovery (in)	Blows Per 6 Inches	SPT N-Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks
	2239.8													Note: BGS = Below Ground Surface
0.0	2239.4	Asphalt Concrete Pavement, - (5-inches).												
	2238.9	Base Course, - (6.0-inches) Well Graded Gravel with Silt and Sand (GW-GM) - Light brown to brown, moist, fine, subangular to angular.												
		Fill - Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, very dense, fine to coarse subrounded to subangular			18	28 32 39	71							
														
2.5	2237.3	Topsoil - Silty Gravel with Sand (GM), Dark brown, moist, loose, fine to coarse rounded to subangular												
					18	7 6 4	10		14.9					
														
5.0	2234.6	Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, medium dense, fine to coarse rounded to subangular												
					10	5 6 10	16		9.2					
	2233.3													
Borehole Terminated at 6.5 Feet.										Latitude: 47.74475 Longitude: -116.8893 Northing: 2217900.9599 Easting: 2344400.2442				

TEST BOREHOLE - STRATA PROJECT.GDT - 7/17/23 18:14 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE; MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028A\ LOGS

Project: KN23028 - Prairie Ave; Meyer Rd to SH 41										STRATA		Boring: PB-3		
Client: J-U-B Engineers Inc.					Drill Rig: G-2400									
Date Drilled: 03-23-2023					Borehole Diameter: 6.0"									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	Recovery (in)	Blows Per 6 Inches	SPT N-Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks
0.0	2242.8													Note: BGS = Below Ground Surface
	2242.4	Asphalt Concrete Pavement, - (4.5-inches).												
	2241.8	Base Course, - (6.5-inches) Well Graded Gravel with Silt and Sand (GW-GM) - Light brown to brown, moist, fine subangular to angular.			18	37 42 39	81		2.9					
	2240.3	Fill - Poorly Graded Gravel with Silt and Sand (GP-GM), Light brown to brown, moist, very dense, fine to coarse rounded to subangular												
2.5		Topsoil - Silty Gravel with Sand (GM), Dark brown, moist, medium dense, fine to coarse rounded to subangular			18	14 7 4	11		12.2					
	2237.8													
5.0		Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, medium dense, fine to coarse rounded to subangular			10	4 6 6	12		9.4					
	2236.3													
Borehole Terminated at 6.5 Feet.										Latitude: 47.74479 Longitude: -116.88769 Northing: 2217901.5163 Easting: 2344927.552				

TEST BOREHOLE - STRATA PROJECT.GDT - 7/17/23 18:14 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE, MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028\I LOGS

Project: KN23028 - Prairie Ave; Meyer Rd to SH 41														Boring: PB-4	
Client: J-U-B Engineers Inc.					Drill Rig: G-2400										
Date Drilled: 03-23-2023					Borehole Diameter: 6.0"										
Depth to Groundwater: N.E.					Logged By: S. Litalien										
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	Recovery (in)	Blows Per 6 Inches	SPT N-Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks	
														Note: BGS = Below Ground Surface	
0.0	2250.3	Asphalt Concrete Pavement, - (5.0-inches) Recovered core was segregated into a 1-inch thick layer over a 4-inch thick layer.			18	34	48								
	2249.9														
	2249.3														
		Base Course, - (6.5-inches) Well Graded Gravel with Silt and Sand (GW-GM) - Light brown to brown, moist, fine subangular to angular.				28									
	2248.3														
		Fill - Poorly Graded Gravel with Silt and Sand (GP-GM) , Brown, moist, dense, fine to coarse rounded to subangular			8	2	13		15.0						
2.5															
		Topsoil - Clayey Sand with Gravel (SC) , Dark brown, moist, medium dense, fine to coarse rounded to subangular				11									
	2246.3														
		Poorly Graded Gravel with Silt and Sand (GP-GM) , Brown, moist, dense, fine to coarse rounded to subangular			6	19	38		3.8						
5.0															
						19									
	2243.8														
Borehole Terminated at 6.5 Feet.										Latitude: 47.74475 Longitude: -116.88554 Northing: 2217870.927 Easting: 2345395.1339					

TEST BOREHOLE - STRATA PROJECT.GDT - 7/17/23 18:14 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE, MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028A\ LOGS

Project: KN23028 - Prairie Ave; Meyer Rd to SH 41										STRATA		Boring: PB-5		
Client: J-U-B Engineers Inc.					Drill Rig: G-2400									
Date Drilled: 03-23-2023					Borehole Diameter: 6.0"									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	Recovery (in)	Blows Per 6 Inches	SPT N-Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks
	2251.9													Note: BGS = Below Ground Surface
0.0	2251.5	Asphalt Concrete Pavement, - (5.5-inches).												
	2251.0	Base Course, - (6.0-inches) Well Graded Gravel with Silt and Sand (GW-GM) - Light brown to brown, moist, fine subangular to angular.												
	2249.9	Fill - Poorly Graded Gravel with Silt and Sand (GP-GM), Light brown to brown, moist, very dense, fine to coarse rounded to subangular												
2.5		Topsoil - Clayey Sand with Gravel (SC), Dark brown, moist, loose, fine to coarse rounded to subangular												
	2247.9													
		Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, medium dense, fine to coarse rounded to subangular												
5.0														
	2245.4													
Borehole Terminated at 6.5 Feet.										Latitude: 47.74476 Longitude: -116.88351 Northing: 2217877.4506 Easting: 2345765.9839				

TEST BOREHOLE - STRATA PROJECT.GDT - 7/17/23 18:14 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE, MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028A\ LOGS

Project: KN23028 - Prairie Ave; Meyer Rd to SH 41										STRATA		Boring: PB-6		
Client: J-U-B Engineers Inc.					Drill Rig: G-2400									
Date Drilled: 03-23-2023					Borehole Diameter: 6.0"									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	Recovery (in)	Blows Per 6 Inches	SPT N-Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks
														Note: BGS = Below Ground Surface
0.0	2254.1	Asphalt Concrete Pavement, - (5-inches).												
	2253.7	Base Course, - (6.0-inches) Well Graded Gravel with Silt and Sand (GW-GM) - Light brown to brown, moist, fine subangular to angular.												
	2253.2	Fill - Poorly Graded Sand with Silt and Gravel (SP-SM), Brown, moist, dense, fine to coarse rounded to subangular	SP-SM		14	24 31 13	44							
	2252.5	Topsoil - Clayey Sand with Gravel (SC), Dark brown, moist, fine to coarse rounded to subangular	SC											
2.5	2251.4	Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, loose to medium dense, fine to coarse rounded to subangular	GP-GM		14	6 8 9	17		7.9					
5.0														
	2247.6				11	6 2 6	8		3.8					
Borehole Terminated at 6.5 Feet.										Latitude: 47.74473 Longitude: -116.88163 Northing: 2217851.2762 Easting: 2346265.66				

TEST BOREHOLE - STRATA PROJECT.GDT - 7/17/23 18:14 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE, MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028A\ LOGS

Project: KN23028 - Prairie Ave; Meyer Rd to SH 41										STRATA		Boring: PB-7		
Client: J-U-B Engineers Inc.					Drill Rig: G-2400									
Date Drilled: 03-23-2023					Borehole Diameter: 6.0"									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	Recovery (in)	Blows Per 6 Inches	SPT N-Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks
	2253.0													Note: BGS = Below Ground Surface
0.0	2252.6	Asphalt Concrete Pavement, - (4.5-inches).												
	2252.2	Base Course, - (5.0-inches) Well Graded Gravel with Silt and Sand (GW-GM) - Light brown to brown, moist, fine subangular to angular.		BG							8.6	NV	NP	
	2251.0	Fill - Poorly Graded Sand with Silt and Gravel (SP-SM), Brown, moist, very dense, fine to coarse rounded to subangular	SP-SM		14	27 36 31	67		3.9					
2.5		Topsoil - Clayey Sand with Gravel (SC), Dark brown, moist, very loose, fine to coarse rounded to subangular	SC								27.2	33	18	pH - 7.02 Resistivity - 4,180 ohms-cm Sulfate - 76.4 mg/kg dry Organic Content - 3.7%
	2249.5	Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, medium dense, fine to coarse rounded to subangular	GP-GM		12	1 2 2	4		10.4					
5.0														
	2246.5				8	5 7 8	15							
Borehole Terminated at 6.5 Feet.										Latitude: 47.74474 Longitude: -116.87975 Northing: 2217864.8647 Easting: 2346735.1572				

TEST BOREHOLE - STRATA PROJECT.GDT - 7/17/23 18:14 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE; MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028\I LOGS

Project: KN23028 - Prairie Ave; Meyer Rd to SH 41										STRATA		Boring: PB-8		
Client: J-U-B Engineers Inc.					Drill Rig: G-2400									
Date Drilled: 03-23-2023					Borehole Diameter: 6.0"									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	Recovery (in)	Blows Per 6 Inches	SPT N-Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks
0.0	2249.3													Note: BGS = Below Ground Surface
	2248.9	Asphalt Concrete Pavement, - (4.5-inches).												
	2248.4	Base Course, - (5.0-inches) Well Graded Gravel with Silt and Sand (GW-GM) - Light brown to brown, moist, fine subangular to angular.												
	2247.5	Fill - Silty Sand with Gravel (SM), Brown, moist, very dense, fine to coarse rounded to subangular	SM		18	34 32 44	76							
2.5		Fill - Poorly Graded Sand with Silt and Gravel (SP-SM), Brown, moist, medium dense to dense, fine to coarse rounded to subangular	SP-SM		14	16 21 21	42		3.7					
5.0														
	2242.8					14 15 14	29		4.5					
Borehole Terminated at 6.5 Feet.										Latitude: 47.74476 Longitude: -116.87763 Northing: 2217846.2275 Easting: 2347223.864				

TEST BOREHOLE - STRATA PROJECT.GDT - 7/17/23 18:14 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE, MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028\I LOGS

Project: KN23028 - Prairie Ave; Meyer Rd to SH 41										STRATA				Boring: PB-9	
Client: J-U-B Engineers Inc.					Drill Rig: G-2400										
Date Drilled: 03-23-2023					Borehole Diameter: 6.0"										
Depth to Groundwater: N.E.					Logged By: S. Litalien										
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	Recovery (in)	Blows Per 6 Inches	SPT N-Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks	
0.0	2246.2													Note: BGS = Below Ground Surface	
	2245.8	Asphalt Concrete Pavement, - (5-inches).												pH - 8.51 Resistivity - 7,810 ohms-cm Sulfate - 19.9 mg/kg dry R-Value - 76	
	2245.3	Base Course, - (6.0-inches) Well Graded Gravel with Silt and Sand (GW-GM) - Light brown to brown, moist, fine subangular to angular.			15	32 31 27	58		2.3		14.4	NV	NP		
		Fill - Silty Sand with Gravel (SM), Brown, moist, very dense, fine to coarse rounded to subangular													
2.5	2243.7	Fill - Poorly Graded Sand with Silt and Gravel (SP-SM), Brown, moist, medium dense, fine to coarse rounded to subangular			18	16 14 11	25		5.3						
5.0															
	2240.2				16	9 10 6	16								
	2239.7	Topsoil - Silty Gravel with Sand (GM), Dark brown, moist, fine to coarse rounded to subangular													
Borehole Terminated at 6.5 Feet.														Latitude: 47.74477 Longitude: -116.87653 Northing: 2217848.927 Easting: 2347524.6529	

TEST BOREHOLE - STRATA PROJECT.GDT - 7/17/23 18:14 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE; MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028A\ LOGS

Project: KN23028 - Prairie Ave; Meyer Rd to SH 41										STRATA		Boring: PB-10		
Client: J-U-B Engineers Inc.					Drill Rig: G-2400									
Date Drilled: 03-23-2023					Borehole Diameter: 6.0"									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	Recovery (in)	Blows Per 6 Inches	SPT N-Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks
0.0	2245.9													Note: BGS = Below Ground Surface
	2245.5	Asphalt Concrete Pavement, - (4.5-inches).												
	2245.1	Base Course, - (5.5-inches) Well Graded Gravel with Silt and Sand (GW-GM) - Light brown to brown, moist, fine subangular to angular.												
		Fill - Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, dense, fine to coarse rounded to subangular			18	16 20 18	38							
2.5														
	2242.5	Topsoil - Silty Gravel with Sand (GM), Dark brown, moist, fine to coarse rounded to subangular			14	10 8 4	12		12.3					
	2241.4	Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, medium dense, fine to coarse rounded to subangular												
5.0														
	2239.4				6	5 7 9	16		7.8					
Borehole Terminated at 6.5 Feet.										Latitude: 47.74475 Longitude: -116.87553 Northing: 2217844.3972 Easting: 2347816.5021				

TEST PIT - STRATA PROJECT.GDT - 7/17/23 18:22 - F:\HAYDEN\2022\CDP\2028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE: MEYER RD TO SH-41\CDP\2028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CD2028A\TEST PIT LOC

Project: KN23028 Prairie Ave; Meyer Rd to SH-41										STRATA			Test Pit: PTP-1	
Client: J-U-B					Equipment: Kubota KX057-4									
Date Excavated: 06-01-2023					Bucket Width: 24.0									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	DCP Blows	DCP Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks	
0.0	2237.5												Note: BGS = Below Ground Surface	
	2236.8	Base Coarse - Well-Graded Gravel with Silt and Sand (GW-GM) , Light brown to brown, moist, fine subangular to angular												
	2236.3	Fill - Poorly Graded Sand with Silt and Gravel (SP-SM) , Dark brown, moist, fine to coarse subrounded to subangular, Sub base course		BG										
		Fill - Poorly Graded Gravel with Silt and Sand (GP-GM) , Dark gray to black, moist, fine to coarse subrounded to angular, Embankment fill						4.5						
2.5														
	2234.0	Poorly Graded Gravel with Silt and Sand (GP-GM) , Brown, moist, fine to coarse rounded to subrounded, Cobbles throughout.												
	2232.5													
5.0														

Latitude: 47.7447
Longitude: -116.8985
Northing: 2217886.8908
Easting: 2344077.8225

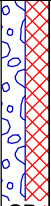
TEST PIT - STRATA PROJECT.GDT - 7/17/23 18:22 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE: MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028A\TEST PIT LOG

Project: KN23028 Prairie Ave; Meyer Rd to SH-41													Test Pit: PTP-2	
Client: J-U-B					Equipment: Kubota KX057-4									
Date Excavated: 06-01-2023					Bucket Width: 24.0									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	DCP Blows	DCP Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks	
0.0	2237.7												Note: BGS = Below Ground Surface	
	2236.7	Topsoil - Silty Gravel with Sand (GM), Dark brown, moist, fine to coarse rounded to subangular	GM					20.7		49.5	NV	NP	Organic Content - 11.4%	
2.5		Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, fine to coarse rounded to subrounded, Cobbles encountered from 4' down, fines content decreased depth increased.	GP-GM					3.9		5.8	NV	NP		
5.0	2232.5	Terminated at 5.2 Feet.												
										Latitude: 47.74486 Longitude: -116.88809 Northing: 2217920.9622 Easting: 2344662.9884				

TEST PIT - STRATA PROJECT.GDT - 7/17/23 18:22 - F:\HAYDEN\2022\CDP\22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE: MEYER RD TO SH-41\CDP\22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP\22028A\TEST PIT LOG

Project: KN23028 Prairie Ave; Meyer Rd to SH-41														Test Pit: PTP-3	
Client: J-U-B					Equipment: Kubota KX057-4										
Date Excavated: 06-01-2023					Bucket Width: 24.0										
Depth to Groundwater: N.E.					Logged By: S. Litalien										
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	DCP Blows	DCP Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks		
0.0	2245.0												Note: BGS = Below Ground Surface		
		Topsoil - Silty Gravel with Sand (GM), Dark brown, moist, fine to coarse rounded to subangular													
	2243.5														
		Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, fine to coarse rounded to subrounded, Cobbles encountered from 4' down, fines content decreased depth increased.													
2.5															
5.0	2239.9														
Terminated at 5.1 Feet.										Latitude: 47.74464 Longitude: -116.88614 Northing: 2217860.3537 Easting: 2345162.852					

TEST PIT - STRATA PROJECT.GDT - 7/17/23 18:22 - F:\HAYDEN\2022\CDP\22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE: MEYER RD TO SH-41\CDP\22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP\22028\TEST PIT LOC

Project: KN23028 Prairie Ave; Meyer Rd to SH-41										Test Pit: PTP-4			
Client: J-U-B			Equipment: Kubota KX057-4										
Date Excavated: 06-01-2023			Bucket Width: 24.0										
Depth to Groundwater: N.E.			Logged By: S. Litalien										
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	DCP Blows	DCP Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks
0.0	2250.5												Note: BGS = Below Ground Surface
		Fill - Poorly Graded Gravel with Silt and Sand (GP-GM), Light brown to brown, moist, fine to coarse rounded to subangular, Fill placed for temporary construction road.		BG				5.1					
2.5													
	2247.0	Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, fine to coarse rounded to subrounded, Cobbles encountered from 4' down, fines content decreased depth increased.											
	2245.5												
5.0		Terminated at 5.0 Feet.											
													Latitude: 47.7448 Longitude: -116.8844 Northing: 2217886.729 Easting: 2345578.3601

TEST PIT - STRATA PROJECT.GDT - 7/17/23 18:22 - F:\HAYDEN\2022\CDP\22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE: MEYER RD TO SH-41\CDP\22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP\22028\TEST PIT LOG

Project: KN23028 Prairie Ave; Meyer Rd to SH-41														Test Pit: PTP-5	
Client: J-U-B					Equipment: Kubota KX057-4										
Date Excavated: 06-01-2023					Bucket Width: 24.0										
Depth to Groundwater: N.E.					Logged By: S. Litalien										
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	DCP Blows	DCP Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks		
0.0	2252.9												Note: BGS = Below Ground Surface		
		Topsoil - Silty Gravel with Sand (GM), Dark brown, moist, fine to coarse rounded to subangular													
	2251.6														
		Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, fine to coarse rounded to subrounded, Cobbles encountered from 4' down, fines content decreased depth increased.													
2.5															
5.0	2247.8														
Terminated at 5.1 Feet.										Latitude: 47.74462 Longitude: -116.88263 Northing: 2217839.4316 Easting: 2346017.8878					

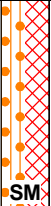
TEST PIT - STRATA PROJECT.GDT - 7/17/23 18:22 - F:\HAYDEN\2022\CDP\2028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE: MEYER RD TO SH-41\CDP\2028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP\2028A\TEST PIT LOG

Project: KN23028 Prairie Ave; Meyer Rd to SH-41										STRATA			Test Pit: PTP-6	
Client: J-U-B					Equipment: Kubota KX057-4									
Date Excavated: 06-01-2023					Bucket Width: 24.0									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	DCP Blows	DCP Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks	
0.0	2253.0												Note: BGS = Below Ground Surface	
		Topsoil - Silty Gravel with Sand (GM), Dark brown, moist, fine to coarse rounded to subangular						15.5		35.1	38	1	R-Value - 58 Organic Content - 7.2% pH - 5.99 Resistivity - 16,100 ohms-cm Sulfate - 5.04 mg/kg dry	
	2251.0	Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, fine to coarse rounded to subrounded												
2.5														
5.0	2247.8													
Terminated at 5.2 Feet.												Latitude: 47.7448 Longitude: -116.88065 Northing: 2217870.6947 Easting: 2346499.6588		

TEST PIT - STRATA PROJECT.GDT - 7/17/23 18:22 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE: MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028A\TEST PIT LOG

Project: KN23028 Prairie Ave; Meyer Rd to SH-41													Test Pit: PTP-7	
Client: J-U-B					Equipment: Kubota KX057-4									
Date Excavated: 06-01-2023					Bucket Width: 24.0									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	DCP Blows	DCP Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks	
0.0	2250.6												Note: BGS = Below Ground Surface	
	2249.3	Topsoil - Silty Gravel with Sand (GM), Dark brown to black, moist, fine to coarse rounded to subangular						9.5						
	2.5	Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, fine to coarse rounded to subrounded, Cobbles encountered approximately 3' BGS.												
	2247.1													
Terminated at 3.5 Feet.										Latitude: 47.74454 Longitude: -116.87871 Northing: 2217827.9079 Easting: 2346981.5782				

TEST PIT - STRATA PROJECT.GDT - 7/17/23 18:22 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE: MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028A\TEST PIT LOG

Project: KN23028 Prairie Ave; Meyer Rd to SH-41														Test Pit: PTP-8	
Client: J-U-B					Equipment: Kubota KX057-4										
Date Excavated: 06-01-2023					Bucket Width: 24.0										
Depth to Groundwater: N.E.					Logged By: S. Litalien										
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	DCP Blows	DCP Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks		
0.0	2244.7												Note: BGS = Below Ground Surface		
		Fill - Silty Sand with Gravel (SM), Dark brown to black, moist, fine to coarse rounded to subangular, Probable stockpiled topsoil mixed in fill. Plastic debris found throughout.													
2.5															
	2241.7	Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, fine to coarse rounded to subrounded, Cobbles encountered approximately 3' BGS.													
5.0															
	2239.2														
Terminated at 5.5 Feet.															
Latitude: 47.74484 Longitude: -116.87711 Northing: 2217867.054 Easting: 2347374.6304															

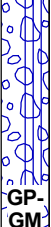
TEST PIT - STRATA PROJECT.GDT - 7/17/23 18:22 - F:\HAYDEN\2022\CDP\22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE: MEYER RD TO SH-41\CDP\22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP\22028A\TEST PIT LOG

Project: KN23028 Prairie Ave; Meyer Rd to SH-41													Test Pit: PTP-9	
Client: J-U-B					Equipment: Kubota KX057-4									
Date Excavated: 06-01-2023					Bucket Width: 24.0									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	DCP Blows	DCP Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks	
0.0	2243.2												Note: BGS = Below Ground Surface	
		Topsoil - Silty Gravel with Sand (GM), Dark brown, moist, fine to coarse rounded to subangular												
	2241.4													
2.5		Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, fine to coarse rounded to subrounded, Cobbles encountered approximately 4' BGS												
5.0	2238.1													
Terminated at 5.1 Feet.												Latitude: 47.74484 Longitude: -116.87585 Northing: 2217866.9124 Easting: 2347685.1683		

TEST PIT - STRATA PROJECT.GDT - 7/17/23 18:22 - F:\HAYDEN\2022\CDP\22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE: MEYER RD TO SH-41\CDP\22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP\22028\TEST PIT LOG

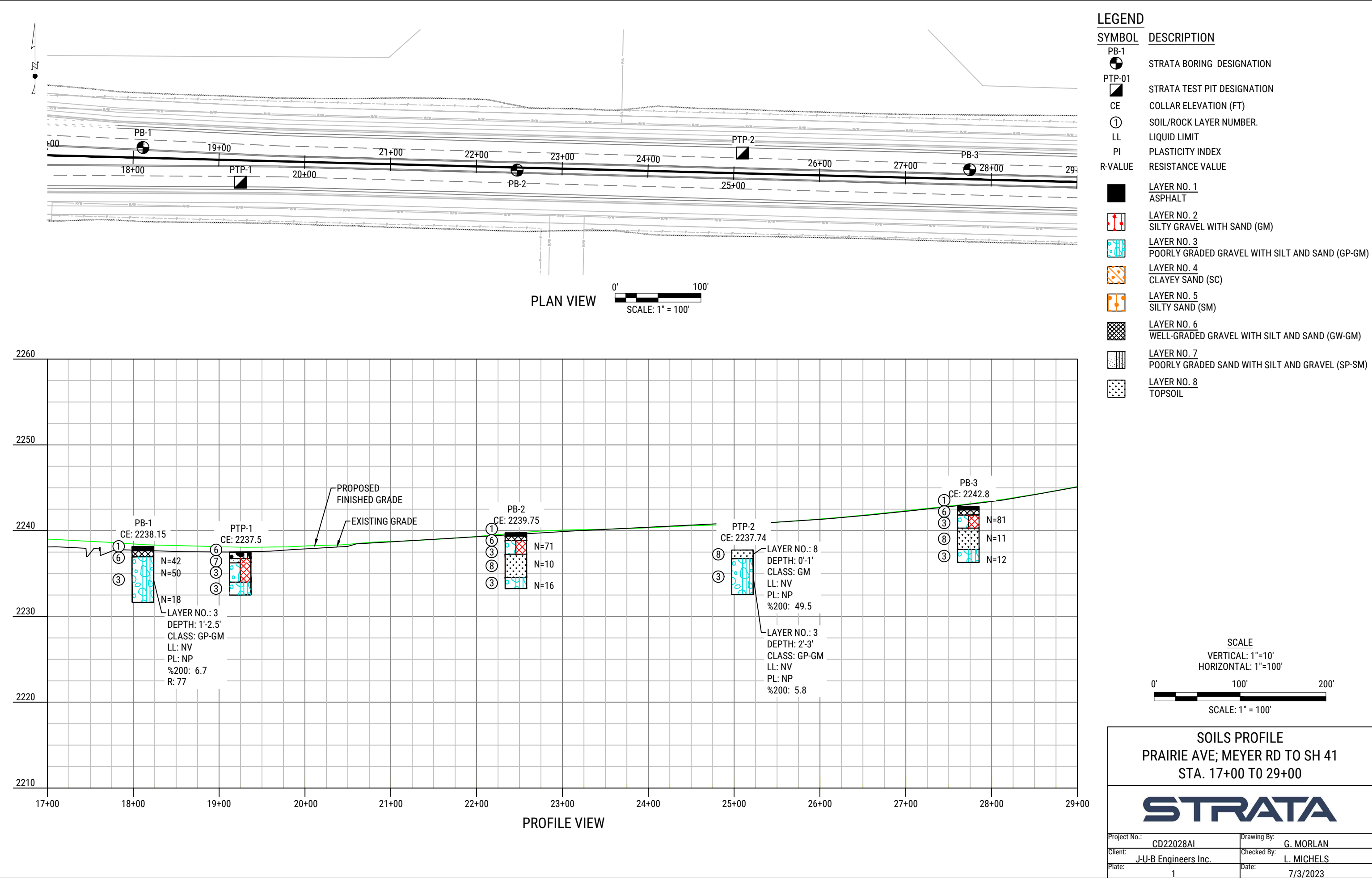
Project: KN23028 Prairie Ave; Meyer Rd to SH-41										STRATA			Test Pit: PTP-10	
Client: J-U-B					Equipment: Kubota KX057-4									
Date Excavated: 06-01-2023					Bucket Width: 24.0									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	DCP Blows	DCP Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks	
0.0	2244.3												Note: BGS = Below Ground Surface	
		Topsoil - Silty Gravel with Sand (GM), Dark brown, moist, fine to coarse rounded to subangular												
	2242.3													
2.5		Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, fine to coarse rounded to subrounded												
	2239.8													
Terminated at 4.5 Feet.												Latitude: 47.74462 Longitude: -116.87527 Northing: 2217816.0254 Easting: 2347822.7196		

TEST PIT - STRATA PROJECT.GDT - 7/17/23 18:22 - F:\HAYDEN\2022\CDP22028 - KN 22435 & 23028 - HAYDEN AVE & MEYER RD INT & PRAIRIE AVE: MEYER RD TO SH-41\CDP22028 - PRAIRIE WIDENING - FIELD AND LAB FOLDER\LOGS\CDP22028A\TEST PIT LOG

Project: KN23028 Prairie Ave; Meyer Rd to SH-41										STRATA			Test Pit: PTP-11	
Client: J-U-B					Equipment: Kubota KX057-4									
Date Excavated: 06-01-2023					Bucket Width: 24.0									
Depth to Groundwater: N.E.					Logged By: S. Litalien									
Depth (ft)	Elevation	USCS Description	Symbol	Sample Type	DCP Blows	DCP Value	Pocket Pen (TSF)	Moisture Content (%)	Dry Density (pcf)	Percent Passing the No. 200 Sieve	Liquid Limit	Plasticity Index	Remarks	
0.0	2245.8												Note: BGS = Below Ground Surface	
		Topsoil - Silty Gravel with Sand (GM), Dark brown, moist, fine to coarse rounded to subangular											R-Value - 79 pH - 6.02 Resistivity - 24,700 ohms-cm Sulfate - 6.27 mg/kg dry	
	2244.0		GM											
2.5		Poorly Graded Gravel with Silt and Sand (GP-GM), Brown, moist, fine to coarse rounded to subrounded						5.5		10.1	26	3		
5.0	2240.7		GP-GM											
Terminated at 5.1 Feet.														
Latitude: 47.74487 Longitude: -116.87474 Northing: 2217871.3959 Easting: 2347953.9413														

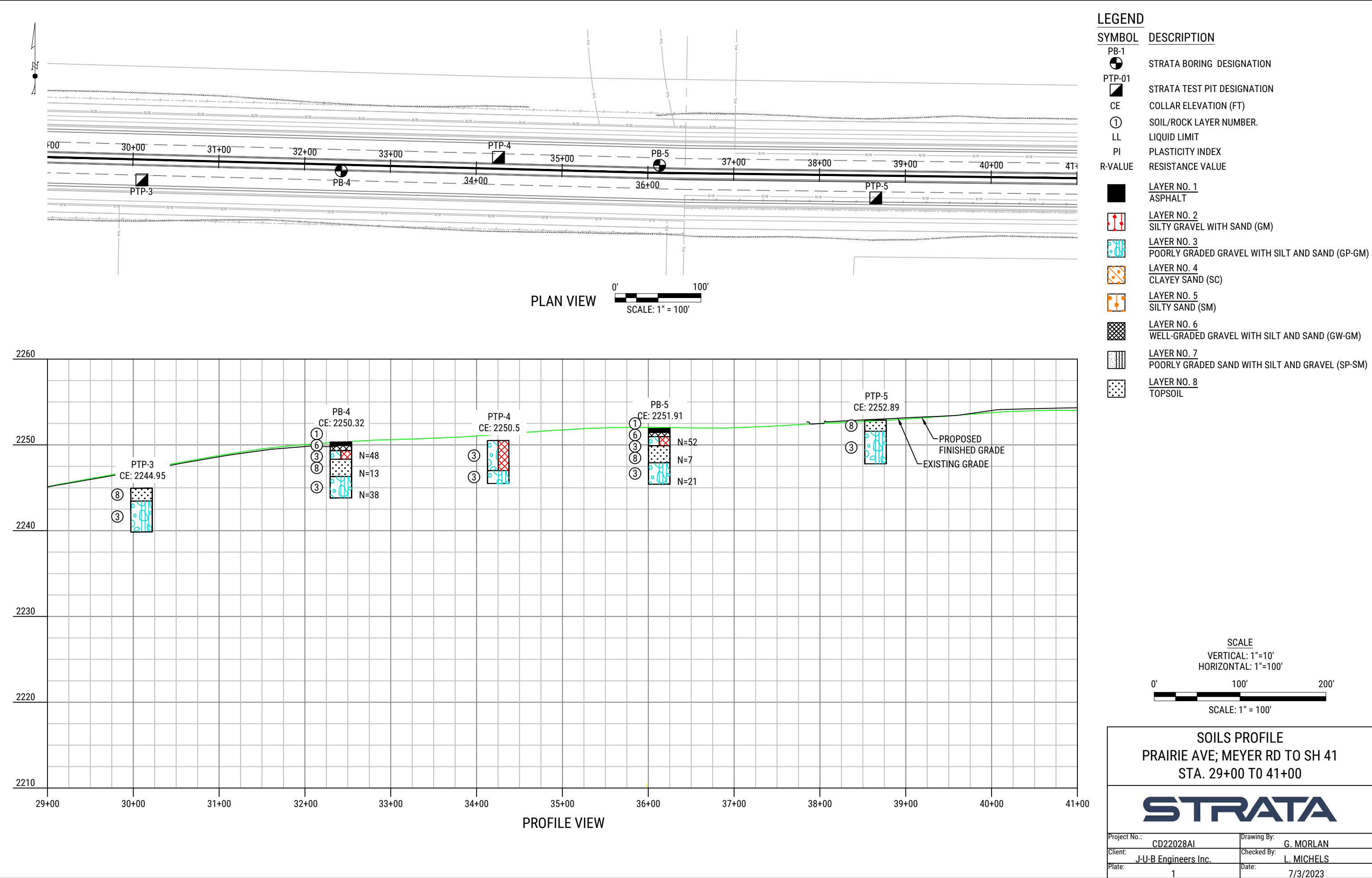
APPENDIX B

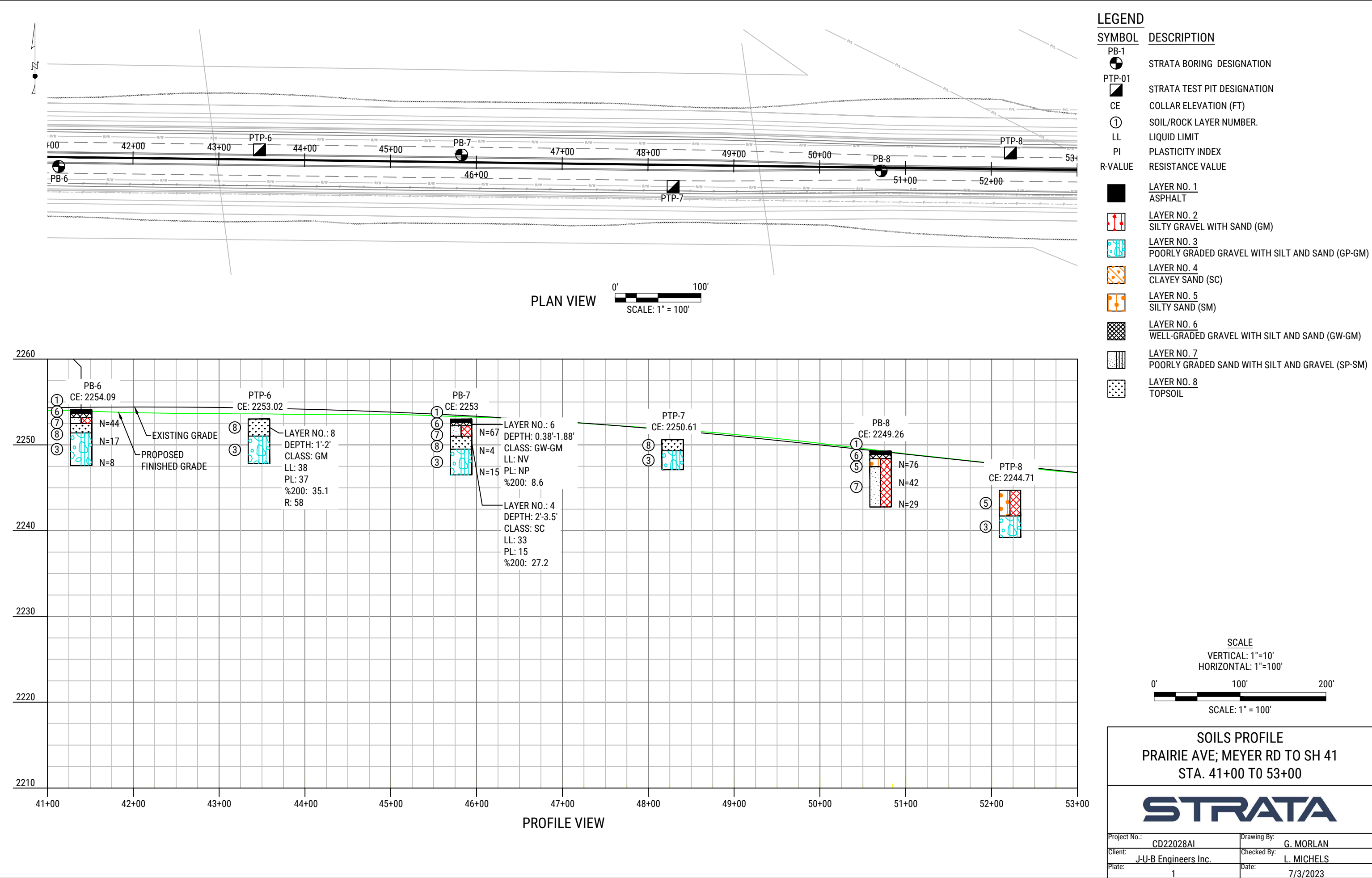
Soil Profile Drawings



LEGEND

SYMBOL	DESCRIPTION
PB-1	STRATA BORING DESIGNATION
PTP-01	STRATA TEST PIT DESIGNATION
CE	COLLAR ELEVATION (FT)
①	SOIL/ROCK LAYER NUMBER.
LL	LIQUID LIMIT
PI	PLASTICITY INDEX
R-VALUE	RESISTANCE VALUE
	LAYER NO. 1 ASPHALT
	LAYER NO. 2 SILTY GRAVEL WITH SAND (GM)
	LAYER NO. 3 POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)
	LAYER NO. 4 CLAYEY SAND (SC)
	LAYER NO. 5 SILTY SAND (SM)
	LAYER NO. 6 WELL-GRADED GRAVEL WITH SILT AND SAND (GW-GM)
	LAYER NO. 7 POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)
	LAYER NO. 8 TOPSOIL





APPENDIX C

Laboratory Test Results



Summary of Laboratory Test Results

Project: Prairie Ave.; Meyer Rd to SH-41
Client: J-U-B Engineers, Inc.

ITD Project No. / Key No.:
STRATA Project No.:

23028
CD22028AI

Location	Depth	Soil	Passing	Passing	Idaho T-8	Chemistry Suite			In-Situ	Atterberg Limits			Organic Content
	(feet)	Class.	No. 200 (%)	No. 4 (%)	R-Value	pH	Resistivity (ohm-cm)	Sulfate (mg/kg)	Moisture (%)	LL	PL	PI	
PB-1	0.5-2	GW-GM							2.9				
PB-1	1-2.5	GP-GM	6.7	31	77					NV	NP		
PB-1	5-6.5	GP-GM							4.6				
PB-2	2.5-4	GM							14.9				
PB-2	5-6.5	GP-GM							9.2				
PB-3	0.38-1.88	GP-GM							2.9				
PB-3	2.5-4	GM							12.2				
PB-3	5-6.3	GP-GM							9.4				
PB-4	2.5-4	SC							15.0				
PB-4	5-6.5	GP-GM							3.8				
PB-5	0.45-1.95	GP-GM							3.2				
PB-5	5-6.5	GP-GM							6.8				
PB-6	2.5-4	GP-GM							7.9				
PB-6	5-6.5	GP-GM							3.8				
PB-7	0.38-1.88	GW-GM	8.6	54					3.9	NV	NP		
PB-7	2-3.5	SC	27.2	71		7.02	4180	76.4	10.4	33	15	18	3.7
PB-7	2.5-4	SC							10.4				
PB-8	2.5-4	SP-SM							3.7				
PB-8	5-6.5	SP-SM							4.5				
PB-9	0.4-1.9	GW-GM							2.3				
PB-9	1-2.5	SM	14.4	61		8.51	7810	19.9		NV	NP		
PB-9	2.5-4	SP-SM			76								
PB-10	2.5-4	GM							12.3				
PB-10	5-6.5	GP-GM							7.8				
PB-11	0.38-1.88	GW-GM							3.1				
PB-11	2.5-4	GP-GM							9.6				
PTP-1	1.25-2.5	GP-GM							4.5				
PTP-2	0-1	GM	49.5	71					20.7	NV	NP		11.4
PTP-2	2-3	GP-GM	5.8	34					3.9	NV	NP		
PTP-4	1-3	GP-GM							5.1				
PTP-6	1-2	GM	35.1	63	58	5.99	16100	5.04	15.5	38	37	1	7.2
PTP-7	0-1.3	GM							9.5				
PTP-11	1.8-3	GP-GM	10.1	41	79	6.02	24700	6.27	5.5	26	23	3	

Hayden
1016 West Hayden Avenue
Hayden, ID 83835
Phone: 208.772.2428

Client

J-U-B Engineers, Inc.
7825 N. Meadowlark Way
Coeur d'Alene, ID 83815

Project

CD22028AI
KN23028 Prarie Ave; Meyer Rd to SH-41
Post Falls, ID 83854

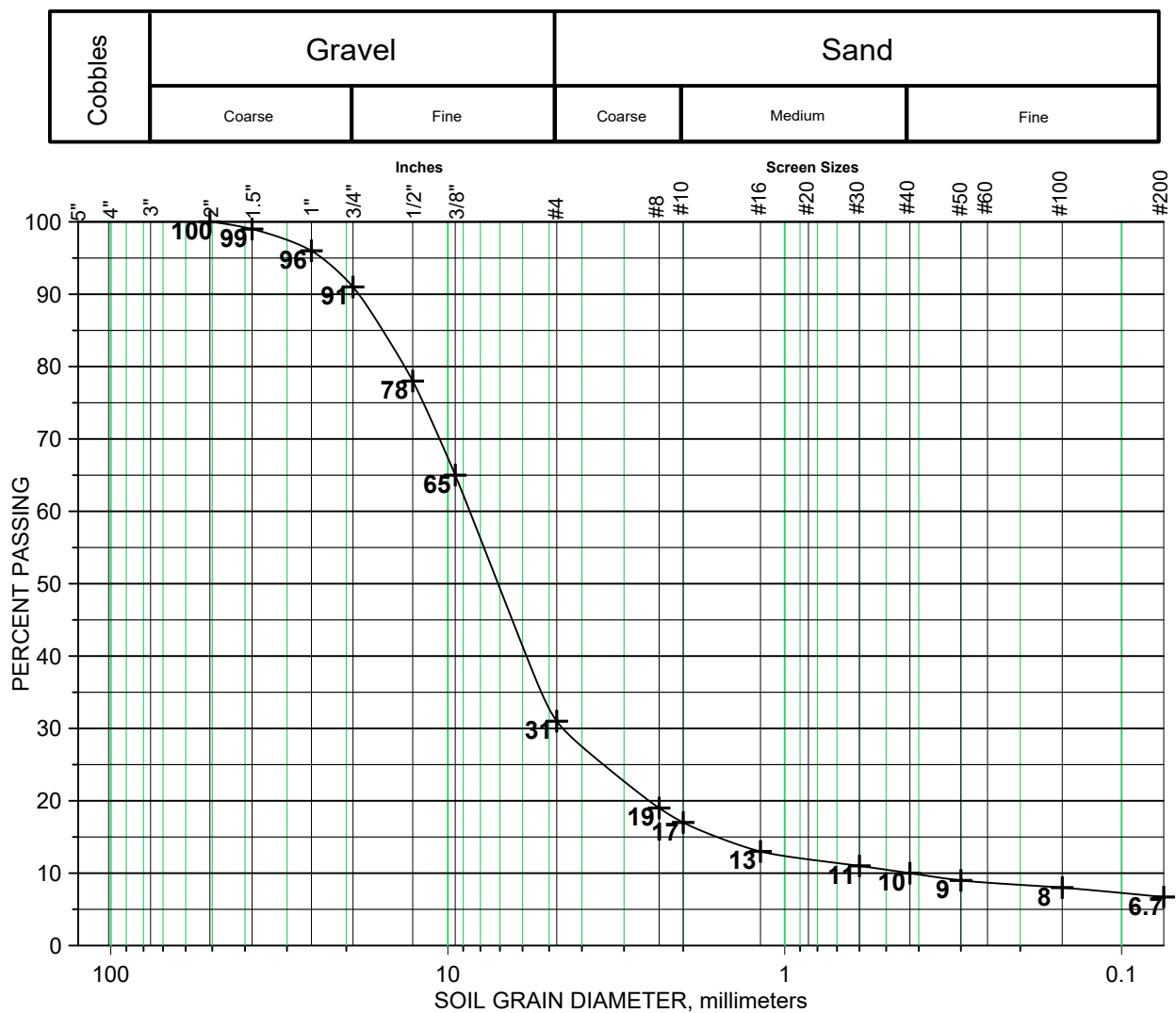
SAMPLE INFORMATION

SAMPLE NO.: 43505
SPECIMEN SIZE: Bulk
USCS CLASSIFICATION: Poorly Graded Gravel with Silt and Sand (GP-GM)

SAMPLE DATE: 3/23/2023
TEST DATE: 4/19/2023
SAMPLED BY: S. Litalien
TESTED BY: S. Vouk

METHOD: Bulk Exploration

BORING NO.: PB-1
DEPTH (FT): 1.0'-2.5'



Reviewed by: Luke Michels, P.E.
Engineering Services Manager

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ASTM D6913-17

Report Date: 4/19/23

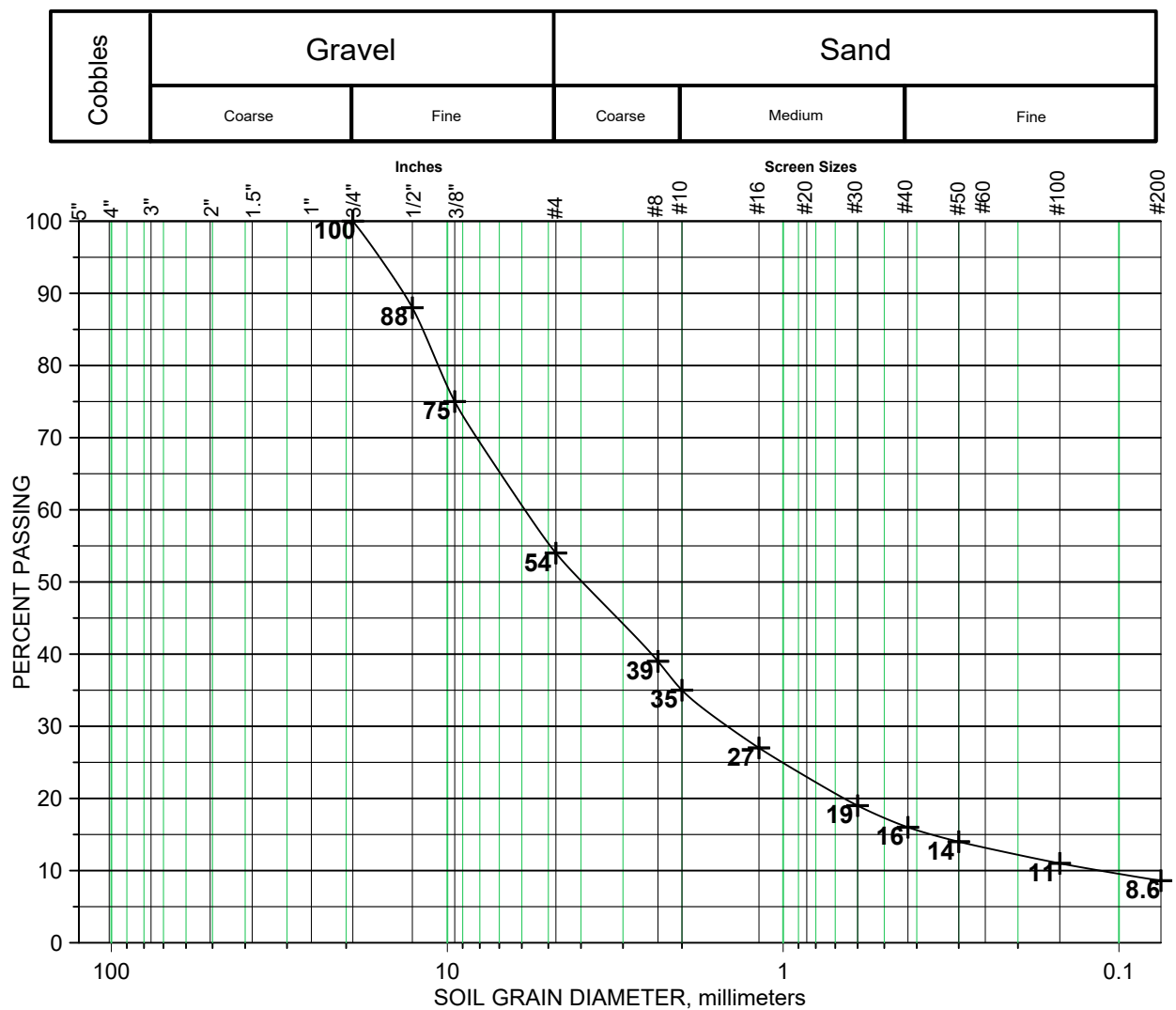
Hayden
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Phone: 208.772.2428

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J-U-B Engineers, Inc.
7825 N. Meadowlark Way
Coeur d'Alene, ID 83815

Project
CD22028AI
KN23028 Prairie Ave; Meyer Rd to SH-41
Post Falls, ID 83854

SAMPLE INFORMATION

SAMPLE NO.:	43509	SAMPLE DATE:	3/23/2023
SPECIMEN SIZE:	Gallon Bag	TEST DATE:	4/19/2023
USCS CLASSIFICATION:	Well Graded Gravel with Silt and Sand (GW-GM)	SAMPLED BY:	S. Litalien
		TESTED BY:	S. Vouk
METHOD:	ASTM D6151 Hollow Stem Auger	BORING NO.:	PB-7
		DEPTH (FT):	0.38'-0.88'



Reviewed by: Luke Michels, P.E.
Engineering Services Manager

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Report Date: 4/19/23

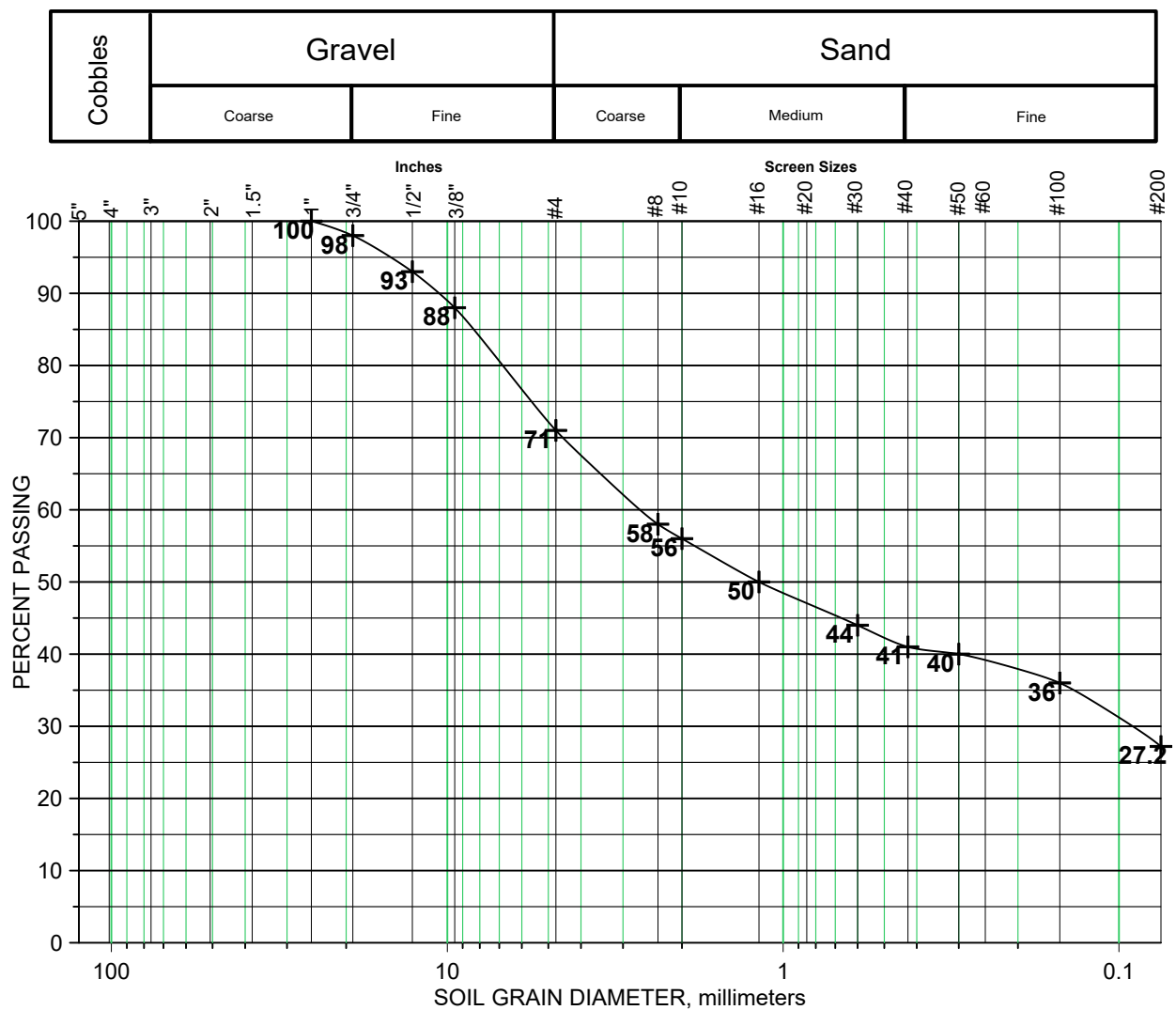
Hayden
1016 West Hayden Avenue
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7825 N. Meadowlark Way
Coeur d'Alene, ID 83815

Project
CD22028AI
KN23028 Prarie Ave; Meyer Rd to SH-41
Post Falls, ID 83854

SAMPLE INFORMATION

SAMPLE NO.:	43507	SAMPLE DATE:	3/23/2023
SPECIMEN SIZE:	Bulk	TEST DATE:	4/19/2023
USCS CLASSIFICATION:	Clayey Sand with Gravel (SC)	SAMPLED BY:	S. Litalien
		TESTED BY:	S. Vouk
METHOD:	Bulk Sampling	BORING NO.:	PB-7
		DEPTH (FT):	2.0'-3.5'



Reviewed by: Luke Michels, P.E.
Engineering Services Manager

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Report Date: 4/19/23

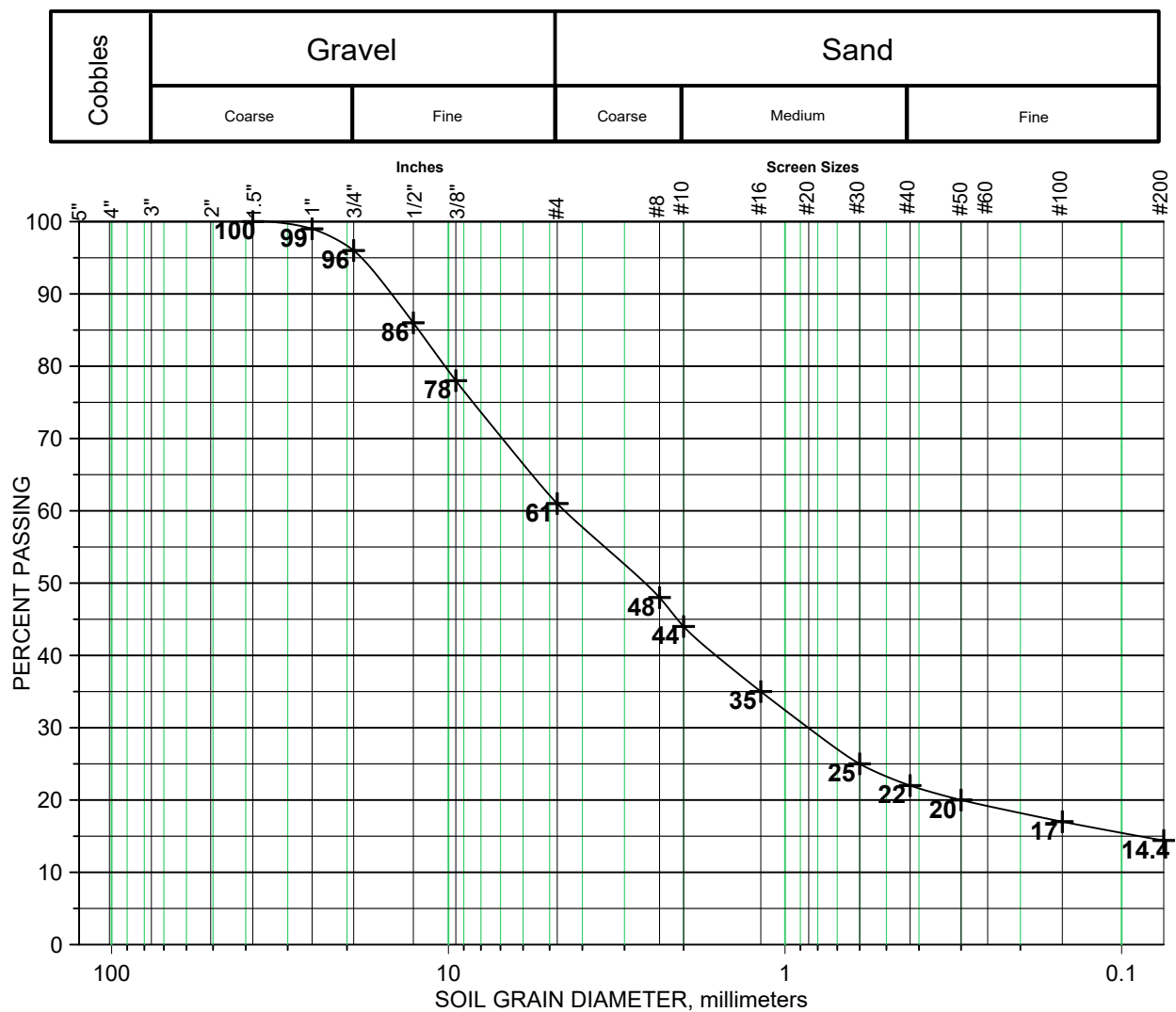
Hayden
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Phone: 208.772.2428

Client
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7825 N. Meadowlark Way
Coeur d'Alene, ID 83815

Project
CD22028AI
KN23028 Prarie Ave; Meyer Rd to SH-41
Post Falls, ID 83854

SAMPLE INFORMATION

SAMPLE NO.:	43508	SAMPLE DATE:	3/23/2023
SPECIMEN SIZE:	Bulk	TEST DATE:	4/19/2023
USCS CLASSIFICATION:	Silty Sand with Gravel (SM)	SAMPLED BY:	S. Litalien
		TESTED BY:	S. Vouk
METHOD:	Bulk Exploration	BORING NO.:	PB-9
		DEPTH (FT):	1.0'-2.5'



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Engineering Services Manager

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ASTM D6913-17

Report Date: 06/26/2023

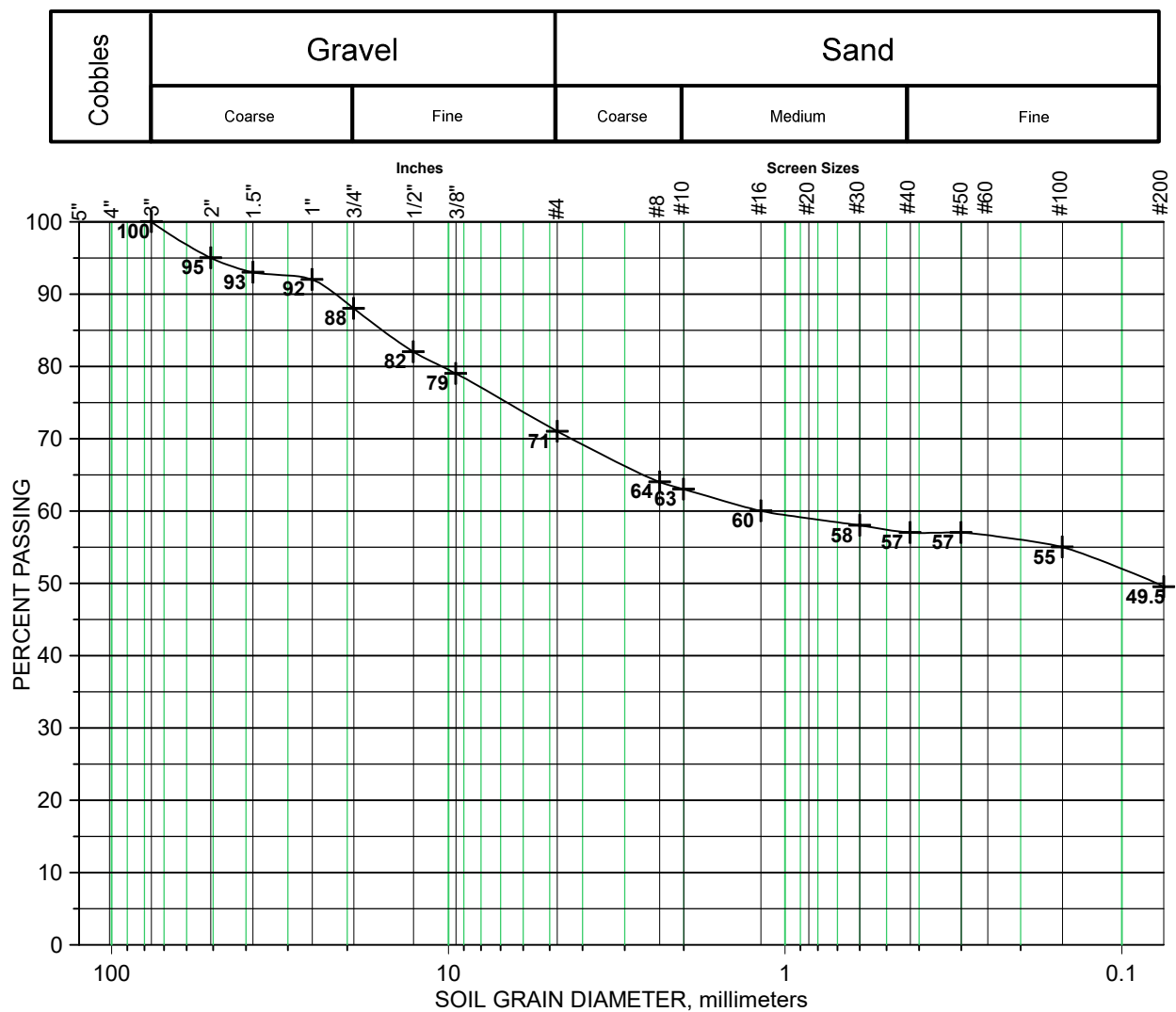
Hayden
1016 West Hayden Avenue
Hayden, ID 83835
Phone: 208.772.2428

Client
J-U-B Engineers, Inc.
7825 N. Meadowlark Way
Coeur d'Alene, ID 83815

Project
CD22028AI
KN23028 Prairie Ave; Meyer Rd to SH-41
Post Falls, ID 83854

SAMPLE INFORMATION

SAMPLE NO.:	45714	SAMPLE DATE:	06/01/2023
SPECIMEN SIZE:	Bulk	TEST DATE:	06/21/2023
USCS CLASSIFICATION:	Silty Gravel with Sand (GM)	SAMPLED BY:	S. Litalien
		TESTED BY:	S. Watson
METHOD:	Bulk Exploration	TEST PIT NO.:	PTP-2
		DEPTH (FT):	0.0-1.0



Reviewed by: Luke Michels, P.E.
Engineering Services Manager

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ASTM D6913-17

Report Date: 06/26/2023

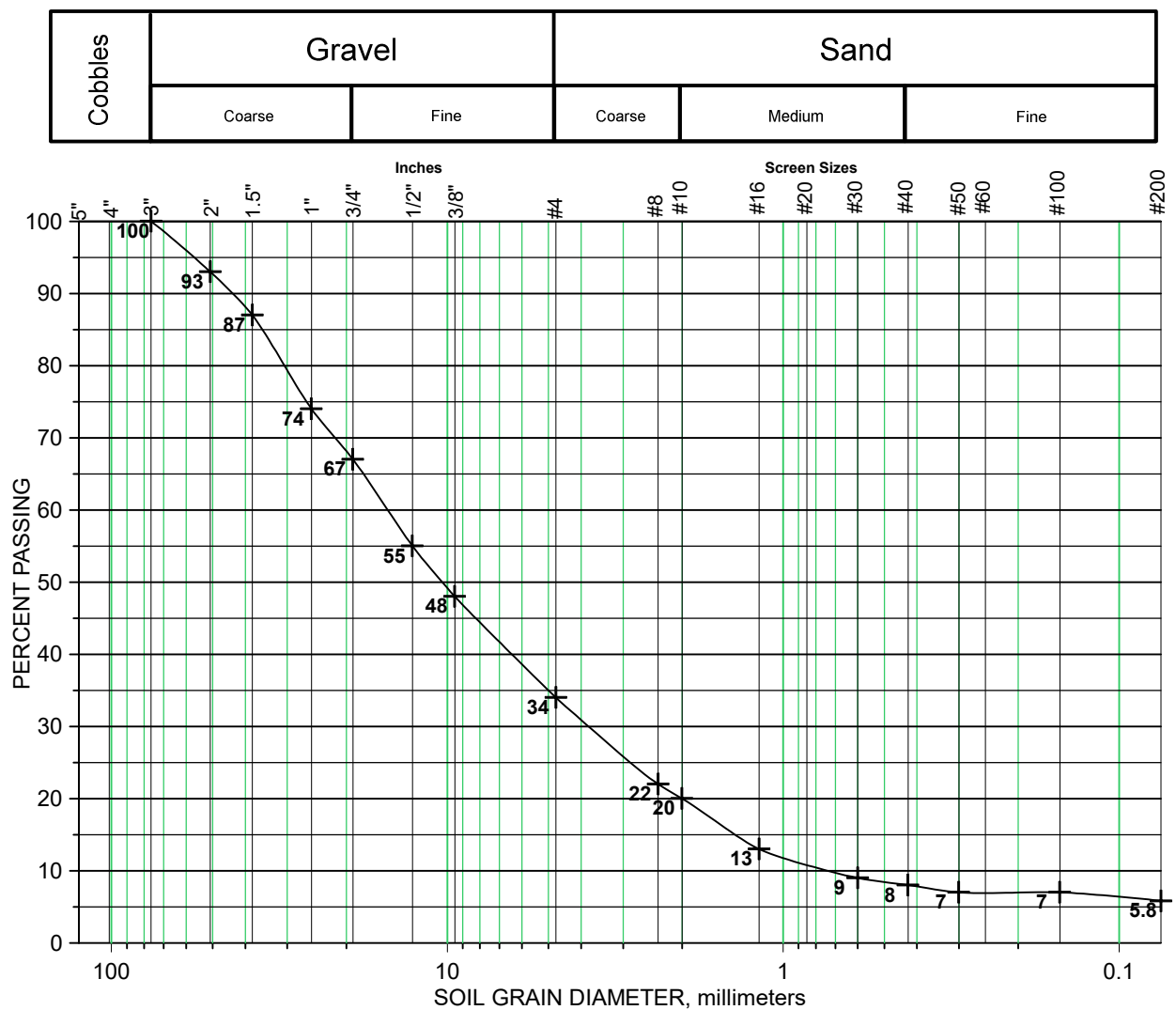
Hayden
1016 West Hayden Avenue
Hayden, ID 83835
Phone: 208.772.2428

Client
J-U-B Engineers, Inc.
7825 N. Meadowlark Way
Coeur d'Alene, ID 83815

Project
CD22028AI
KN23028 Prairie Ave; Meyer Rd to SH-41
Post Falls, ID 83854

SAMPLE INFORMATION

SAMPLE NO.:	45713	SAMPLE DATE:	06/01/2023
SPECIMEN SIZE:	Bulk	TEST DATE:	06/21/2023
USCS CLASSIFICATION:	Poorly Graded Gravel with Silt and Sand (GP-GM)	SAMPLED BY:	S. Litalien
		TESTED BY:	S. Watson
METHOD:	Bulk Exploration	TEST PIT NO.:	PTP-2
		DEPTH (FT):	2.0-3.0



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Report Date: 06/26/2023

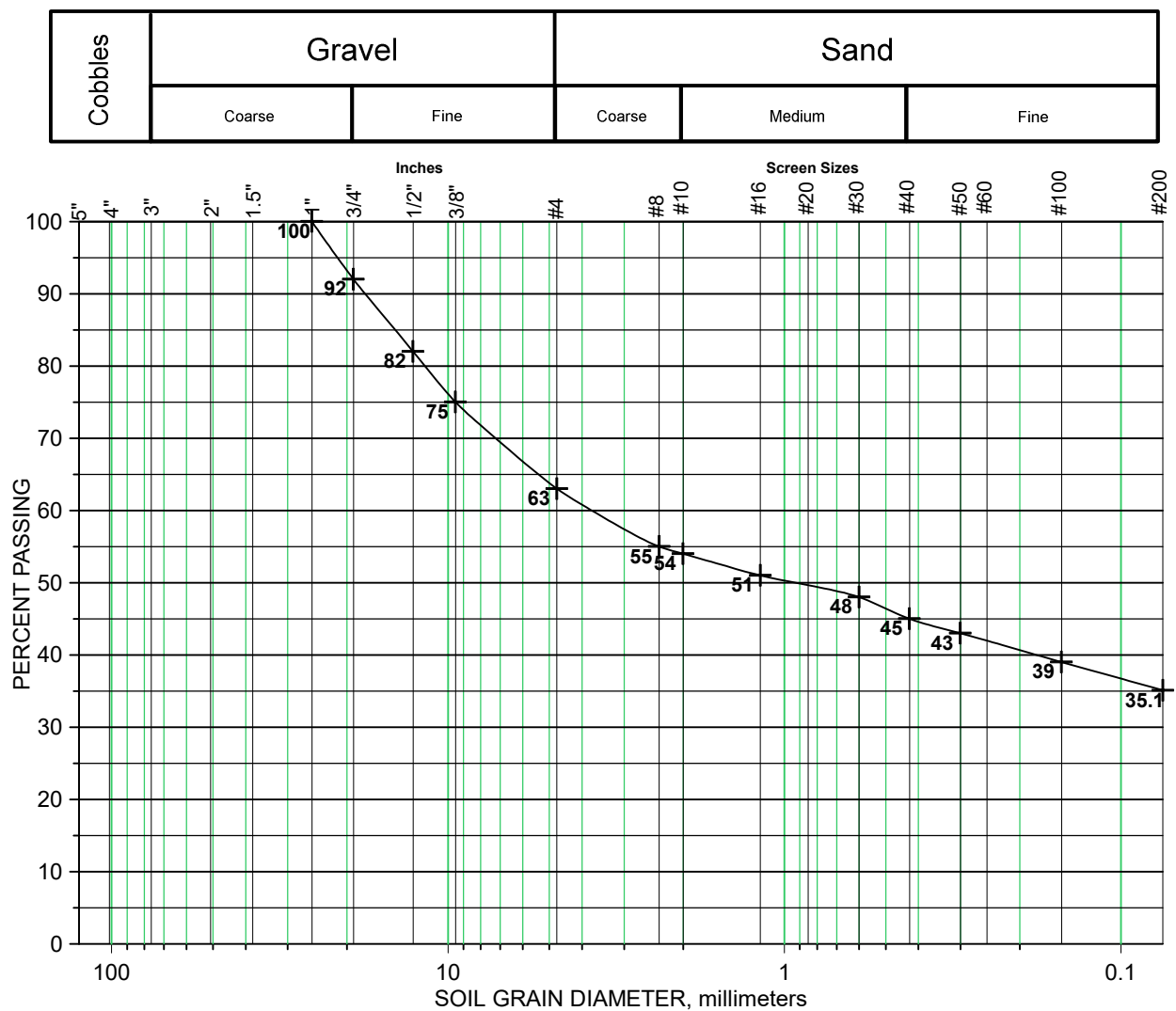
Hayden
1016 West Hayden Avenue
Hayden, ID 83835
Phone: 208.772.2428

Client
J-U-B Engineers, Inc.
7825 N. Meadowlark Way
Coeur d'Alene, ID 83815

Project
CD22028AI
KN23028 Prairie Ave; Meyer Rd to SH-41
Post Falls, ID 83854

SAMPLE INFORMATION

SAMPLE NO.:	45711	SAMPLE DATE:	06/01/2023
SPECIMEN SIZE:	Bulk	TEST DATE:	06/21/2023
USCS CLASSIFICATION:	Silty Gravel with Sand (GM)	SAMPLED BY:	S. Litalien
		TESTED BY:	S. Watson
METHOD:	Bulk Exploration	TEST PIT NO.:	PTP-6
		DEPTH (FT):	1.0-2.0



Reviewed by: Luke Michels, P.E.
Engineering Services Manager

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ASTM D6913-17

Report Date: 06/26/2023

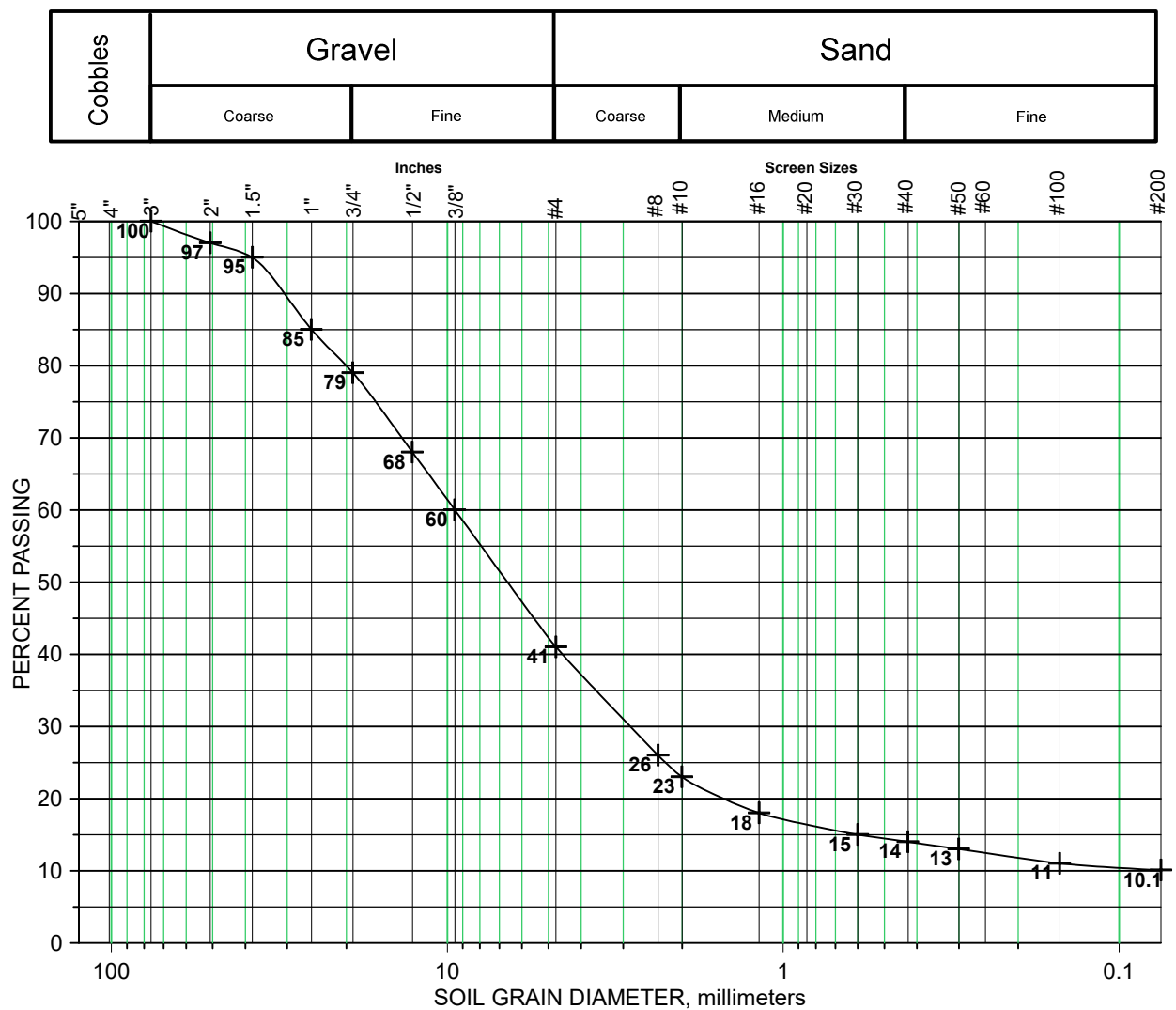
Hayden
1016 West Hayden Avenue
Hayden, ID 83835
Phone: 208.772.2428

Client
J-U-B Engineers, Inc.
7825 N. Meadowlark Way
Coeur d'Alene, ID 83815

Project
CD22028AI
KN23028 Prairie Ave; Meyer Rd to SH-41
Post Falls, ID 83854

SAMPLE INFORMATION

SAMPLE NO.:	45712	SAMPLE DATE:	06/01/2023
SPECIMEN SIZE:	Bulk	TEST DATE:	06/21/2023
USCS CLASSIFICATION:	Poorly Graded Gravel with Silt and Sand (GP-GM)	SAMPLED BY:	S. Litalien
		TESTED BY:	S. Watson
METHOD:	Bulk Exploration	TEST PIT NO.:	PTP-11
		DEPTH (FT):	1.8-3.0



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Engineering Services Manager

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Idaho T-8

Client

J-U-B Engineers, Inc.

Report Date: 04/05/2023

Project

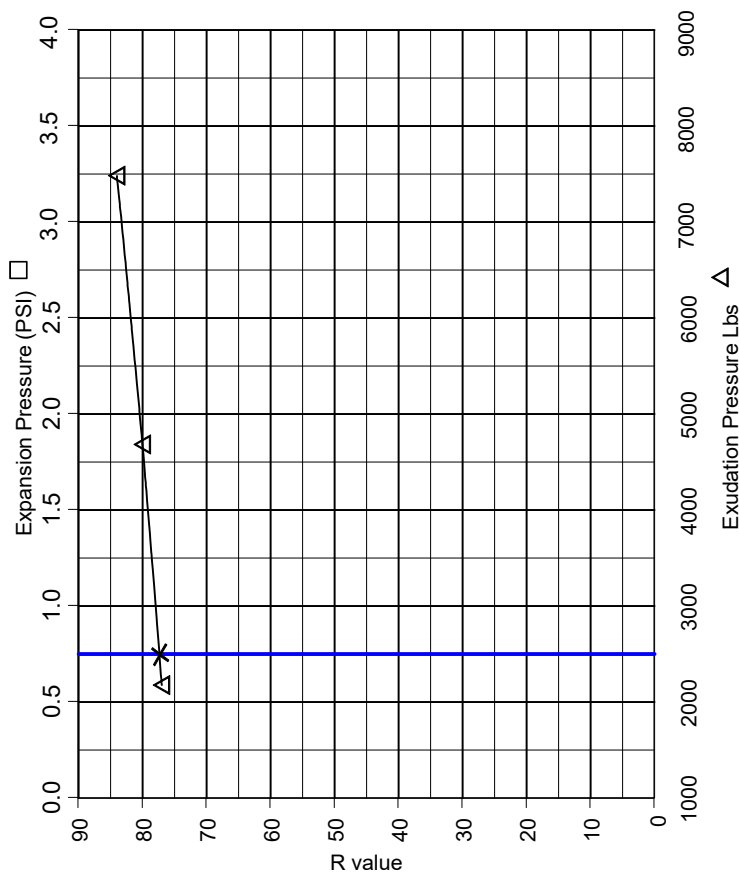
Boise
8653 W. Hackamore Drive
Boise, ID 83709
Phone: 208.376.8200

CD22028AI
KN23028 Prairie Ave;
Meyer Rd to SH-41, Post Falls HD

SAMPLE INFORMATION

SAMPLE No.: 43534 **SAMPLE DATE:** 03/23/2023 **BORING No.:** PB-1
SPECIMEN SIZE: Bulk **TEST DATE:** 04/05/2023 **DEPTH (FT):** 1.0-2.5
USCS CLASSIFICATION: Poorly Graded Gravel with Silt and Sand (GP-GM) **SAMPLED BY:** S. Litalien
TESTED BY: J. Willhite
METHOD: Bulk Exploration

R-VALUE: 77



R VALUE DATA

Percolation:	Fast	Point 1	Point 2	Point 3
Exudation, PSI		173	372	595
Dry Density, PCF		128.2	120.2	115.8
Moisture Content, %		8.7	7.8	6.8
Exp. Pressure, PSI		0.00	0.00	0.00

GRADATION: AASHTO T-11, T27

SCREEN SIZE	AS RECEIVED % PASSING	AS TESTED % PASSING
4"		
3"		
2"		
1"		
3/4"		100
1/2"		
3/8"		
No. 4		
No. 8		
No. 16		
No. 30		
No. 50		
No. 100		
No. 200		

Keith Wildman

Reviewed by Keith Wildman
Laboratory Services Coordinator

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Idaho T-8

Client

J-U-B Engineers, Inc.

Report Date: 04/06/2023

Project

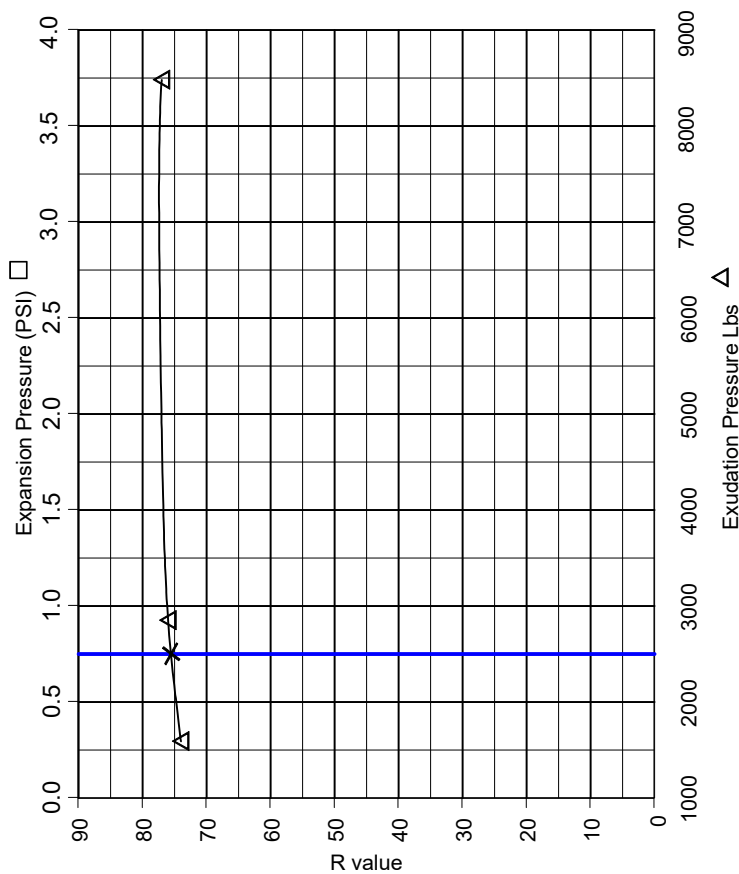
Boise
8653 W. Hackamore Drive
Boise, ID 83709
Phone: 208.376.8200

CD22028AI
KN23028 Prairie Ave;
Meyer Rd to SH-41, Post Falls HD

SAMPLE INFORMATION

SAMPLE No.: 43535 **SAMPLE DATE:** 03/23/2023 **BORING No.:** PB-9
SPECIMEN SIZE: Bulk **TEST DATE:** 04/06/2023 **DEPTH (FT):** 2.5-4.0
USCS CLASSIFICATION: Poorly Graded Sand with Silt and Gravel (SP-SM) **SAMPLED BY:** S. Litalien
TESTED BY: J. Willhite
METHOD: Bulk Exploration

R-VALUE: 76



R VALUE DATA

Percolation:	Fast	Point 1	Point 2	Point 3
Exudation, PSI		127	227	675
Dry Density, PCF		134.4	133.1	126.8
Moisture Content, %		8.8	7.9	6.6
Exp. Pressure, PSI		0.00	0.00	0.00

GRADATION: AASHTO T-11, T27

SCREEN SIZE	AS RECEIVED % PASSING	AS TESTED % PASSING
4"		
3"		
2"		
1"		
3/4"		100
1/2"		
3/8"		
No. 4		
No. 8		
No. 16		
No. 30		
No. 50		
No. 100		
No. 200		

Keith Wildman

Reviewed by Keith Wildman
Laboratory Services Coordinator

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Idaho T-8

Client

Boise
8653 W. Hackamore Drive
Boise, ID 83709
Phone: 208.376.8200

J-U-B Engineers, Inc.
7825 N. Meadowlark Way
Coeur d'Alene, ID 83815

Report Date: 6/29/2023

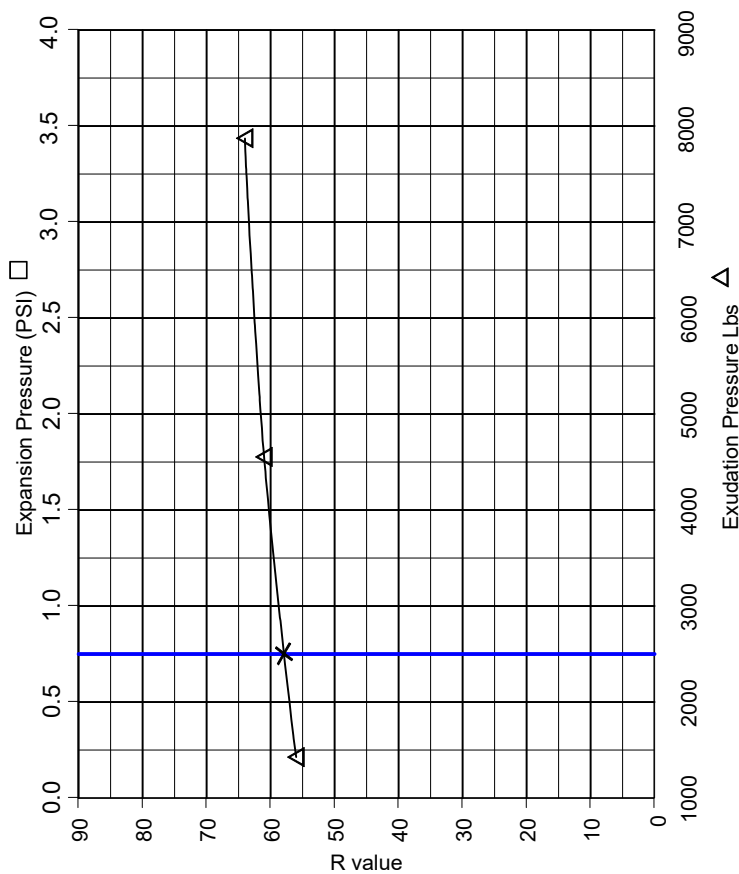
Project

CD22028AI
KN23028 Prairie Ave; Meyer Rd to SH-41
Post Falls, ID 83854

SAMPLE INFORMATION

SAMPLE No.:	45711	SAMPLE DATE:	6/01/2023	TEST PIT No.:	PTP-6
SPECIMEN SIZE:	Bulk	TEST DATE:	6/14/2023	DEPTH (FT):	1.0-2.0
USCS CLASSIFICATION:	Silty Gravel with Sand (GM)	SAMPLED BY:	S. Litalien		
		TESTED BY:	J. Willhite		
METHOD: Bulk Exploration					

R-VALUE: 58



R VALUE DATA

Percolation:	Fast	Point 1	Point 2	Point 3
Exudation, PSI		113	362	626
Dry Density, PCF		100.6	105.4	105.4
Moisture Content, %		21.1	20.1	19.6
Exp. Pressure, PSI		0.00	0.28	0.40

GRADATION: AASHTO T-11, T27

SCREEN SIZE	AS RECEIVED % PASSING	AS TESTED % PASSING
4"		
3"		
2"		
1"		
3/4"	92	100
1/2"		
3/8"		
No. 4		
No. 8		
No. 16		
No. 30		
No. 50		
No. 100		
No. 200		

Reviewed by Keith Wildman
Laboratory Services Coordinator

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Idaho T-8

Client

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8653 W. Hackamore Drive
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Phone: 208.376.8200

J-U-B Engineers, Inc.
7825 N. Meadowlark Way
Coeur d'Alene, ID 83815

Report Date: 6/29/2023

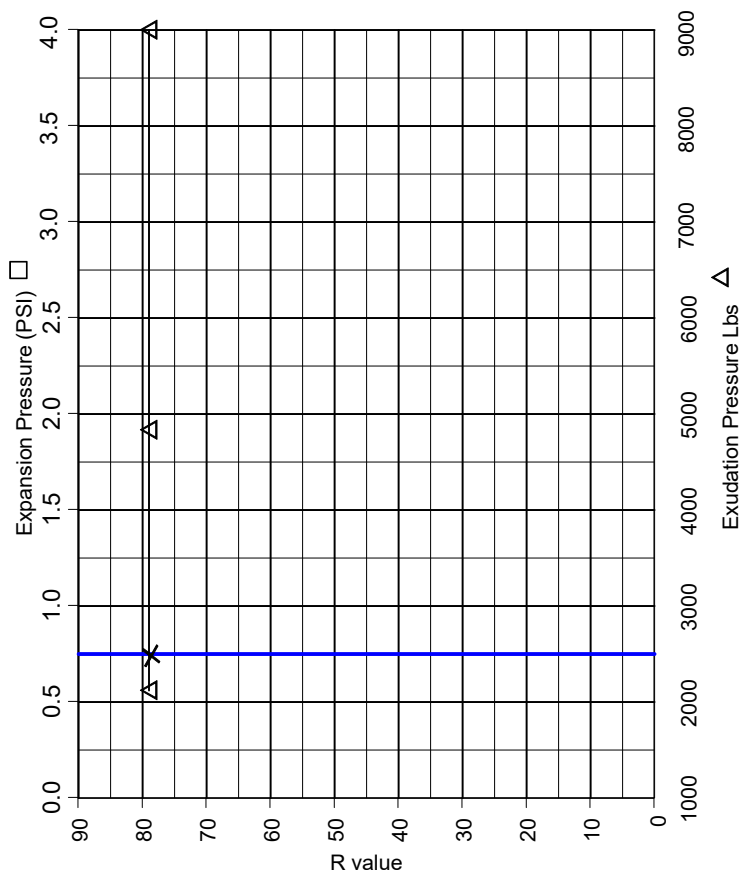
Project

CD22028AI
KN23028 Prairie Ave; Meyer Rd to SH-41
Post Falls, ID 83854

SAMPLE INFORMATION

SAMPLE No.:	45712	SAMPLE DATE:	6/01/2023	TEST PIT No.:	PTP-11
SPECIMEN SIZE:	Bulk	TEST DATE:	6/14/2023	DEPTH (FT):	1.8-3.0
USCS CLASSIFICATION:	Poorly Graded Gravel with Silt and Sand (GP-GM)	SAMPLED BY:	S. Litalien		
		TESTED BY:	J. Willhite		
METHOD:	Bulk Exploration				

R-VALUE: 79



R VALUE DATA

Percolation:	Fast	Point 1	Point 2	Point 3
Exudation, PSI		169	385	716
Dry Density, PCF		128.4	126.5	123.0
Moisture Content, %		11.3	10.4	9.9
Exp. Pressure, PSI		0.00	0.00	0.00

GRADATION: AASHTO T-11, T27

SCREEN SIZE	AS RECEIVED % PASSING	AS TESTED % PASSING
4"		
3"		
2"		
1"		
3/4"	79	100
1/2"		
3/8"		
No. 4		
No. 8		
No. 16		
No. 30		
No. 50		
No. 100		
No. 200		

Reviewed by Keith Wildman
Laboratory Services Coordinator

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504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - email spokane@anateklabs.com

Client: Strata, Inc. - Spokane
Address: 10020 E. Knox Ave. #200
Spokane, WA 99206
Attn: Luke Michels

Work Order: WDD0037
Project: CD22028AI
Reported: 4/17/2023 16:12

Analytical Results Report

Sample Location: PB-7; 2-3.5
Lab/Sample Number: WDD0037-01 **Collect Date:** 03/23/23 12:00
Date Received: 04/03/23 16:52 **Collected By:** Steve Litalien
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
% Solids	91.8	%	0.100	4/5/23 15:00	BAN	SM 2540 G	
pH	7.02	pH Units	0.984	4/5/23 15:30	ILG	EPA 9045D	
Resistivity	4180	ohms-cm	1.00	4/10/23 16:25	ILG	ASTM G 57a	
Sulfate	76.4	mg/kg dry	1.45	4/13/23 22:10	ELS	EPA 300.0	

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Analytical Results Report

(Continued)

Sample Location: PB-9; 1.0-2.5'
Lab/Sample Number: WDD0037-02 Collect Date: 03/23/23 12:00
Date Received: 04/03/23 16:52 Collected By: Steve Litalien
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
% Solids	97.6	%	0.100	4/5/23 15:00	BAN	SM 2540 G	
pH	8.51	pH Units	0.986	4/5/23 15:31	ILG	EPA 9045D	
Resistivity	7810	ohms-cm	1.00	4/10/23 16:37	ILG	ASTM G 57a	
Sulfate	19.9	mg/kg dry	1.28	4/13/23 22:30	ELS	EPA 300.0	

Authorized Signature,



Brock Gerger For Kathleen Sattler, Laboratory Manager

PQL Practical Quantitation Limit
ND Not Detected
MCL EPA's Maximum Contaminant Level
Dry Sample results reported on a dry weight basis
* Not a state-certified analyte

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Certifications

Code	Description	Facility	Number
W WA DOE	Washington Department of Ecology	Anatek-Spokane, WA	C585

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Quality Control Data

Inorganics

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BDD0551 - W Ions										
Blank (BDD0551-BLK1)										
Sulfate	ND		1.50	mg/kg wet						
Prepared & Analyzed: 4/13/2023										
LCS (BDD0551-BS1)										
Sulfate	3.92			mg/L	4.00		98.0	90-110		
Prepared & Analyzed: 4/13/2023										

Chain of Custody Record

Anatek Lal
1282 Alturas Drive, Moscow ID
504 E Sprague Ste D, Spokane ID

WD D0037



Due: 04/18/23

Turn Around

Please refer to c

www.anateklabs.com/pricing-lists

✓ Normal

Next Day*

2nd Day*

Other*

Phone

✓ Email

*All rush order requests must have prior approval

Company Name: STRATA	Project Manager: Luke Michels
Address: 1016 W. Hayden Ave.	Project Name & #: CD22028AI
City: Hayden State: ID Zip: 83835	Purchase Order #:
Phone: 208-772-2428	Sampler Name & Phone: Steve Litalien; 208-818-7535
Email Address(es): lmichels@stratageotech.com	

[illegible]

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Client: Strata, Inc. - CdA
Address: 1016 W. Hayden Avenue
Hayden, ID 83835
Attn: Luke Michels

Work Order: WDF0994
Project: KN23028 Prairie Ave Meyer Rd
Reported: 6/27/2023 15:18

Analytical Results Report

Sample Location: PTP-6 @ 1.0'-2.0'
Lab/Sample Number: WDF0994-01 **Collect Date:** 06/01/23 00:00
Date Received: 06/19/23 14:05 **Collected By:** Steve Litalien
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
% Solids	87.1	%	0.100	6/26/23 11:18	BAN	SM 2540 G	
pH	5.99	pH Units	0.986	6/21/23 13:28	ILG	EPA 9045D	H3
Resistivity	16100	ohms-cm	1.00	6/21/23 17:30	ILG	ASTM G 57a	
Sulfate	5.04	mg/kg dry	1.65	6/27/23 6:02	AAI	EPA 300.0	

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Sample Location: PTP-11 @ 1.8'-3.0"
Lab/Sample Number: WDF0994-02 Collect Date: 06/01/23 00:00
Date Received: 06/19/23 14:05 Collected By: Steve Litalien
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
% Solids	92.4	%	0.100	6/26/23 11:18	BAN	SM 2540 G	
pH	6.02	pH Units	0.986	6/21/23 13:29	ILG	EPA 9045D	H3
Resistivity	24700	ohms-cm	1.00	6/21/23 17:40	ILG	ASTM G 57a	
Sulfate	6.27	mg/kg dry	1.48	6/27/23 6:22	AAI	EPA 300.0	

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Authorized Signature,



Brock Gerger For Kathleen Sattler, Laboratory Manager

H3	Sample was received past holding time.
PQL	Practical Quantitation Limit
ND	Not Detected
MCL	EPA's Maximum Contaminant Level
Dry	Sample results reported on a dry weight basis
*	Not a state-certified analyte

RPD	Relative Percent Difference
%REC	Percent Recovery
Source	Sample that was spiked or duplicated.

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Quality Control Data

Inorganics

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BDF1058 - W Ions										
Blank (BDF1058-BLK1)										
Sulfate	ND		1.50	mg/kg wet						
LCS (BDF1058-BS1)										
Sulfate	4.17			mg/L	4.00		104	90-110		



Chain of Custody Record

Anatek Labs
1282 Alturas Drive, Moscow
504 E Sprague Ste D, Spokane

WDF0994



Due: 06/26/23

Company Name: Strata				Project Manager: Luke Michels				Turn Around									
Address: 10020 E Knox Ave, suite 200				Project Name & #: KN23028 Prairie Ave; Meyer Rd...				Please refer to our normal turn around times at www.anateklabs.com/pricing-lists									
City: Spokane		State: WA		Zip: 99206		Purchase Order #: CD22028AI		☐ Normal		☐ Phone							
Phone: (509) 891-1904						Sampler Name & Phone: S. Litalien, 208.818.7535		☐ Next Day*		☐ Email							
Email Address(es): lmichels@stratageotech.com								☐ 2nd Day*		*All rush order requests must have prior approval							
☒ Other* 06/26/2023																	
				List Analyses Requested								Note Special Instructions/Comments					
Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of Containers	Sample Volume	pH	Sulfates	Resistivity									
	PTP-6 @1.0' - 2.0'	06/01/2023	Soil	1	GAL	X	X	X									
	PTP - 11 @ 1.8' - 3.0"	06/01/2023	Soil	1	GAL	X	X	X									
pH received out of holding																	
Inspection Checklist																	
Received Intact?														☒ Y	☐ N		
Labels & Chains Agree?														☒ Y	☐ N		
Containers Sealed?														☒ Y	☐ N		
No VOC Head Space?														☒ Y	☐ N		
Cooler?														☐ Y	☒ N		
Ice/Ice Packs Present?														☐ Y	☒ N		
Temperature (°C):														21.3° IR6			
Number of Containers:														2 bags			
Shipped Via:														WJ			
Preservative:																	
Date & Time:														6-19-23 10:14			
Inspected By:														Brtz			
Relinquished by				Printed Name				Signature				Company		Date		Time	
Received by				Shawn Watson				[Signature]				Strata		06/14/23		10:12	
Relinquished by				[Signature]				[Signature]				Anatek		6-19-23		10:13	
Received by																	
Relinquished by																	
Received by																	

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Appendix D

Pavement Design Calculations

$$TI = 9.0(1,409,468 \text{ ESALs}/10^6)^{0.119} = 9.38$$

FLEXIBLE ASPHALT PAVEMENT DESIGN - GRAVEL EQUIVALENCY (GE) METHOD

Project: KN23028 - Prairie Ave; Meyer Rd to SH-41
 Project No: CD22028AI
 Date: 1-May-23
 Section: Prairie Ave

Design Subgrade Support R-value: 40

Estimated Traffic Index (T.I.): 9.5 (to nearest 0.5)

Regional Climate Factor, F: 1.10 (see figure 510.04.01.1
ITD Materials Manual)

Material Substitution Ratios

Asphalt: 1.80

Base: 1.00

Subbase: 0.85

Aggregate Base Course Minimum Support R-value: 80

Subbase Minimum Support R-value: 60

Minimum Design Gravel Equivalence (GE)= 2.006 feet

Recommended Asphalt Concrete Thickness: 0.372 feet

Design Asphalt Thickness: 0.38 feet (0.15 feet min.)
4.5 inch (0.25 feet min. on ATPB)

Recommended Aggregate Base Course Thickness: 0.663 feet

Design Base Thickness: 0.50 feet (0.35 feet min.)
(round to next 0.05 feet) 6.0 inch (ATB, ATPB, UTB)

Recommended Subbase Course Thickness: 0.978 feet

Design Subbase Thickness: 1.00 feet (0.35 feet min., if used
(round to next 0.05 feet) 12.0 inch or 2 x max particle size)

DESIGN PAVEMENT SECTION:

Asphalt concrete: 0.38 feet

Base course: 0.50 feet

Subbase course: 1.00 feet

GE Provided : 2.03 feet

Minimum GE Required: 2.01 feet

FLEXIBLE ASPHALT PAVEMENT DESIGN - GRAVEL EQUIVALENCY (GE) METHOD

Project: KN23028 - Prairie Ave; Meyer Rd to SH-41
Project No: CD22028AI
Date: 1-May-23
Section: Prairie Ave

Design Subgrade Support R-value: 60

Estimated Traffic Index (T.I.): 9.5 (to nearest 0.5)

Regional Climate Factor, F: 1.10 (see figure 510.04.01.1
ITD Materials Manual)

Material Substitution Ratios

Asphalt: 1.80

Base: 1.00

Subbase: 0.85

Aggregate Base Course Minimum Support R-value: 80

Subbase Minimum Support R-value: 60

Minimum Design Gravel Equivalence (GE)= 1.338 feet

Recommended Asphalt Concrete Thickness: 0.372 feet

Design Asphalt Thickness: 0.38 feet (0.15 feet min.)
4.5 inch (0.25 feet min. on ATPB)

Recommended Aggregate Base Course Thickness: 0.663 feet

Design Base Thickness: 0.67 feet (0.35 feet min.)
(round to next 0.05 feet) 8.0 inch (ATB, ATPB, UTB)

Recommended Subbase Course Thickness: 0.000 feet

Design Subbase Thickness: 0.00 feet (0.35 feet min., if used
(round to next 0.05 feet) 0.0 inch or 2 x max particle size)

DESIGN PAVEMENT SECTION:

Asphalt concrete: 0.38 feet

Base course: 0.67 feet

Subbase course: 0.00 feet

GE Provided : 1.34 feet

Minimum GE Required: 1.34 feet

LTPPBind 3.1 Program Output For Asphalt Binder Grade Selection

Prairie Ave; Meyer Rd to SH-41
Project No.: CD22028AI

PG Binder Selection

Parameter	A=1 km	B=38 km	C=47 km	D=50 km	E=51 km
Station ID	✓ ID1956	✓ ID0667	✗ ID8062	✗ ID4831	✗ WA7938
Elevation, m	1997	1927	2154	2155	2188
Degree-Days >10 C	2537	1967	2512	2534	2346
Low Air Temperature, C	-20.3	-20.8	-21.4	-21.3	-22
Low Air Temp. Std Dev	4.7	4.3	5.2	5.4	5.5

Input Data

Latitude, Degree

47.69

Lowest Yearly Air Temperature, C

-20.6

Yearly Degree-Days>10 Deg.C

2252

Low Air Temp. Standard Dev., Deg C

4.5

Temperature Adjustments

Base HT PG

52

Desired Reliability, %

98

Depth of Layer, mm

0

Traffic Adjustments for HT

Traffic Speed

Traffic Loading	Fast	Slow
Up to 3 M. ESAL	0.0	2.8
3 to 10 M. ESAL	7.8	10.3
10 to 30 M. ESAL	13.2	15.5
Above 30 M. ESAL	15.5	17.7

PG Temperature	HIGH	LOW
PG Temp. at 50% Reliability	49.9	-16.7
PG Temp. at Desired Reliability	54.0	-24.7
Adjustments for Traffic	2.8	
Adjustments for Depth	0.0	0.0
Adjusted PG Temperature	56.8	-24.7
Selected PG Binder Grade	58	-28

?

Recalculate PG

Save

Cancel

STRATA

Appendix E

Infiltration Test Results

Project Number:	CD22028A
Project Name:	Prairie Ave; Meyer Rd to SH-41
Date:	6/1/2023
Tester:	Travis Morton
Test Location:	PTP-2

Ring Diameter:	12	inch
Ring Area:	113.097336	in^2
Ring Stick Up:	9	in

Constant Head		
Time Interval (min)	Volume Added in Interval (gal)	Flow Rate in Interval (GPM)
0-10	0.95	0.095
10-20	0.93	0.093
20-30	0.73	0.073
30-40	0.65	0.065
40-50	0.56	0.056
50-60	0.51	0.051
60-70	0.55	0.055
70-80	0.51	0.051
80-90	0.5	0.05
90-100	0.51	0.051
100-110	0.49	0.049
110-120	0.448	0.0448
Average Flow Rate (GPM)		0.06115
Average Infiltration Rate (in/hr)		7.493890073

Falling Head		
Time (min)	Distance of Head below Top of Ring (in)	Infiltration Rate in Interval (in/hr)
0		-
5	0.6	7.2
10	1.2	7.2
15	1.8	7.2
20	2.3	6
25	2.8	6
30	3.3	6
Average Falling Head Infiltration Rate (in/hr)		6.6

References:

Appendix 4D - Single Ring Infiltrometer Test Method - Spokane Regional Stormwater Manual

Appendix 6.B.3 - Estimating Surface Infiltration Rate and Field Permeability Rate Using Single-Ring Infiltrometer Methods - Stormwater Management Manual for Eastern Washington

Project Number:	CD22028A
Project Name:	Prairie Ave; Meyer Rd to SH-41
Date:	6/1/2023
Tester:	Travis Morton
Test Location:	PTP -11

Ring Diameter:	12	inch
Ring Area:	113.097336	in^2
Ring Stick Up:	9	in

Constant Head		
Time Interval (min)	Volume Added in Interval (gal)	Flow Rate in Interval (GPM)
0-10	0.75	0.075
10-20	0.75	0.075
20-30	0.55	0.055
30-40	0.71	0.071
40-50	0.64	0.064
50-60	0.5	0.05
60-70	0.56	0.056
70-80	0.58	0.058
80-90	0.48	0.048
90-100	0.5	0.05
100-110	0.43	0.043
110-120	0.35	0.035
Average Flow Rate (GPM)		0.056666667
Average Infiltration Rate (in/hr)		6.944460684

Falling Head		
Time (min)	Distance of Head below Top of Ring (in)	Infiltration Rate in Interval (in/hr)
0		-
5	0.5	6
10	1	6
15	1.5	6
20	2	6
25	2.5	6
30	3	6
Average Falling Head Infiltration Rate (in/hr)		6

References:

Appendix 4D - Single Ring Infiltrometer Test Method - Spokane Regional Stormwater Manual

Appendix 6.B.3 - Estimating Surface Infiltration Rate and Field Permeability Rate Using Single-Ring Infiltrometer Methods - Stormwater Management Manual for Eastern Washington