



INDEPENDENT TESTING TECHNOLOGIES

337 31st Avenue South • Waite Park, MN 56387 • (320) 253-4338 • www.independenttestingtech.com

AUGUST 8, 2023

**PROJECT 23-193
REPORT OF GEOTECHNICAL EXPLORATIONS**

For

**CITY PROJECT #24-13
FOX RIDGE ESTATES
STREET RECONSTRUCTION
RAMSEY, MINNESOTA**

Prepared For:

CITY OF RAMSEY



INDEPENDENT TESTING TECHNOLOGIES

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August 8, 2023

Mr. Joe Jeriancek
City of Ramsey
7550 Sunwood Drive NW
Ramsey, MN 55303

RE: 23-193 Report of Geotechnical Exploration
 City Project #24-13
 Fox Ridge Estates Street Reconstruction
 Ramsey, Minnesota

Dear Mr. Jeriancek:

Independent Testing Technologies, Inc. is pleased to submit the results of our subsurface investigation program for this project in Ramsey, Minnesota. This report represents our work on this project as authorized by you. It includes our recommendations regarding earthwork, fill and compaction, subgrade preparation, and pavement design. An electronic copy is enclosed.

The soils encountered were mostly fine grained sands (SM, SP-SM, SP) with layered silt (ML), silty lean clay (CL-ML), lean clay (CL) and highly plastic clay (CH). The sands (SP, SM) are excellent for roadway embankment material and roadway subgrade material. However, the silt (ML), silty clay (CL-ML) and highly plastic clay (CH) are considered very poor for pavement support. Silt (ML) and silty clay (CL-ML) are highly susceptible to frost heave and can lead to premature pavement failure. Highly plastic clays (CH) are susceptible to shrinking and swelling with seasonal moisture changes and can also cause premature pavement failure. We recommend the silt (ML), silty clay (CL-ML) and highly plastic clay (CH) soils be removed from the top four feet of finished roadway subgrade.

Mr. Jeriancek, it has been our pleasure to work with you on this project. Independent Testing appreciated the opportunity to perform this geotechnical evaluation and look forward to continuing our participation during the construction phase of this project. Please contact Patrick Johnson if you have any questions regarding this report. Please contact Tyler Burkes if you would like a proposal for the materials testing services that will be needed.

Sincerely,

A handwritten signature in blue ink that reads "Patrick Johnson".

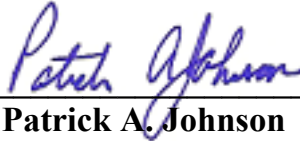
Patrick A. Johnson, P.E.
Minnesota License #22037

A handwritten signature in blue ink that reads "Kevin T. Reller".

Kevin T. Reller
President

CERTIFICATION

I hereby certify that this report was prepared
by me or under my direct supervision and that I am a
duly Licensed Engineer under the laws
of the State of Minnesota.



Patrick A. Johnson

Date: August 8, 2023 License No.: 22037

TABLE OF CONTENTS

A. Introduction	1
Purpose.....	1
Scope of Services.....	1
General Site Conditions	2
Available Subsurface Information	2
B. Exploration Program.....	2
Exploration Results.....	3
Penetration Test Results.....	4
Water Level Observations	5
Laboratory Testing.....	5
C. Engineering Review.....	6
Discussion.....	6
D. Recommendations	6
Utility Installation.....	7
Trench Backfill	7
Embankment/ Road Fill.....	8
E. Pavement Recommendations	9
F. Closing	10
Boring Location Plan.....	Appendix 1
Soil Boring Logs.....	Appendix 2

**GEOTECHNICAL EXPLORATIONS
CITY OF RAMSEY
CITY PROJECT # 24-13
FOX RIDGE ESTATES
STREET RECONSTRUCTION
RAMSEY, MINNESOTA
ITT PROJECT 23-193**

A. Introduction

This report is being prepared for use by our client on this specific project. We intend to present this report and our findings in the same logical manner that led us to arrive at our recommendations. This report is based on some general assumptions regarding the anticipated construction based on experience with similar projects. These assumptions and the entire report should be reviewed immediately upon receipt.

Purpose:

The purpose of our investigation was to evaluate the existing soil and water conditions on this site for the purpose of reconstructing the existing roadway. The project will consist of reconstruction of the existing streets in Fox Ridge Estates 1st and 2nd Additions in the northeast part of Ramsey, Minnesota. The streets include 170th Ave NW, 172nd Lane NW, 173rd Avenue NW, 174th Avenue NW, Wolfram Street NW, Tungsten Street NW, Sodium Street NW and Potassium Street NW. The streets will be reconstructed to an urban section. New storm sewers and watermains will be installed. In accordance with your written authorization, we have conducted a subsurface exploration program for the proposed project.

Scope of Services:

Our authorized scope of services included the following:

1. To core the pavement at twenty-six (26) locations to determine the existing pavement thickness.
2. To investigate the subsurface soil and water conditions encountered at those same twenty-six (26) locations using split spoon sampling. The borings were planned to depths of ten (10) feet at each location.

3. To provide a report of our findings including a summary of our findings with pavement thickness at each boring location as well as recommendations regarding earthwork, fill and compaction, subgrade preparation, and pavement design with an estimated design R-value.

General Site Conditions:

The project is located on the northeast side of the City of Ramsey, on the west side of Minnesota Highway 47 and south of Trott Brook. The project is an existing residential neighborhood. The site is fairly level, with slopes of 2-6 percent.

Available Subsurface Information:

According to the Geologic Map of Minnesota, Quaternary Geology, prepared by Howard C. Hobbs and Joseph E. Goebel (1982, Minnesota Geological Survey), this site lies within an outwash unit not associated with a particular moraine. It is associated with the Des Moines glaciation of Pleistocene, Late Wisconsinan age. The drift is derived from parent material in North Dakota and Manitoba.

According to the Soil Survey of Anoka County prepared by the Soil Conservation Service, the site lies within the Hubbard- Nymore Soil Associations. These consist of nearly level to gently sloping, excessively drained soils that are sandy throughout. The individual soils mapped on the site are sandy with few limitations for development of local streets. However, there are some marsh and silt loams mapped in the center of the site.

B. Exploration Program

Twenty- six (26) split-spoon soil borings were conducted on this project. The borings were advanced to depths of 10 feet using a 3 ¼ inch I.D. hollow stem auger. Samples were obtained every 2 ½ feet using a 2-inch O.D. split-spoon sampler in accordance with the American Society for Testing and Materials (ASTM D1586). Standard penetration values (N-values) were obtained at each sample interval by driving the sampler into the soil using a 140-pound hammer falling 30 inches. After an initial set of 6 inches, the number of blows required to drive the sampler 12 inches is known as the standard penetration resistance or N-value. Where the sampler cannot be driven at least 6 inches by 50 blows of the hammer, the total number of blows as well as the distance driven is reported on the boring logs.

Groundwater levels were noted during drilling and immediately after completion. The holes were backfilled with the auger cuttings and patched with bituminous cold patch. Some settlement of the bore holes may be expected. All the borings were conducted with a truck mounted rig.

Exploration Results:

The pavement was cored at each boring location prior to drilling the boring. The cores were obtained to get accurate pavement thickness. Photos of each core are included in appendix 1.

The borings were all conducted in the existing paved streets and encountered 0.75 to 3.5 inches of bituminous over 2.0 to 7.0 inches of aggregate base. The depth of bituminous and aggregate encountered at each location are shown in the following table:

Boring	Bituminous	Aggregate	Boring	Bituminous	Aggregate	Boring	Bituminous	Aggregate
SB-1	2.0"	4.0"	SB-10	2.75"	6.5"	SB-19	2.0"	3.0"
SB-2	2.0"	4.0"	SB-11	2.0"	5.0"	SB-20	2.5"	2.5"
SB-3	2.5"	4.5"	SB-12	3.25"	4.5"	SB-21	3.5"	2.0"
SB-4	2.5"	4.5"	SB-13	0.75"	5.5"	SB-22	2.0"	3.0"
SB-5	2.75"	6.0"	SB-14	2.25"	3.5"	SB-23	2.5"	5.5"
SB-6	2.25"	4.5"	SB-15	2.25"	5.5"	SB-24	2.25"	4.0"
SB-7	2.5"	3.5"	SB-16	2.0"	4.0"	SB-25	2.0"	5.0"
SB-8	2.5"	2.5"	SB-17	2.5"	7.0"	SB-26	2.5"	5.0"
SB-9	2.0"	5.0"	SB-18	2.25"	5.0"			

Below the pavement and aggregate, most of the borings encountered fine grained, poorly graded sand (SP) to termination at 11.5 feet.

Below the pavement and aggregate, boring SB-3 encountered fine grained, poorly graded sand (SP) to 4.0 feet, followed by highly plastic clay (CH) to 7.5 feet and then fine grained, poorly graded sand (SP) to 10.0 feet and poorly graded sand with wilt (SP-SM) to termination at 11.5 feet. Below the pavement and aggregate, boring SB-7 encountered fine grained, clayey sand (SC) to 5.0 feet, followed by sandy lean clay (CL) to 7.5 feet and then fine grained, poorly graded sand (SP) to termination at 11.5 feet. Below the pavement and aggregate, boring SB-9 encountered fine grained, silty sand (SM) to 4.0 feet, followed by silt (ML) to 8.0 feet, silty lean clay (CL-ML) to 10.0 and

then highly plastic clay (CH) to termination at 11.5 feet.

Below the pavement and aggregate, borings SB-10 and SB-15 both encountered native, fine grained poorly graded sand with silt (SP-SM) to 5.0 feet, followed by poorly graded sand (SP) to termination at 11.5 feet. Below the pavement and aggregate, boring SB-12 encountered fine grained, silty sand (SM) to 5.0 feet, followed by highly plastic clay (CH) to 7.5 feet and then fine grained, poorly graded sand (SP) to termination at 11.5 feet. Below the pavement and aggregate, boring SB-13 encountered fine grained, silty clayey sand (SC-SM) fill to 5.0 feet, followed by native, poorly graded sand (SP) to termination at 11.5 feet. Below the pavement and aggregate, boring SB-14 encountered fine grained, poorly graded sand (SP) to 5.0 feet, followed by clayey sand (SC) to 7.5 feet, silty sand (SM) to 10.0 feet, and then highly plastic clay (CH) to termination at 11.5 feet.

Below the pavement and aggregate, boring SB-20 encountered fine grained, poorly graded sand (SP) to 5.0 feet, followed by highly plastic clay (CH) to termination at 11.5 feet. Below the pavement and aggregate, boring SB-23 encountered fine grained, clayey sand (SC) to 5.0 feet, followed by poorly graded sand (SP) to termination at 11.5 feet. Below the pavement and aggregate, boring SB-24 encountered fine grained, poorly graded sand with silt (SP-SM) to 5.0 feet, followed by silty sand (SM) to 7.5 feet, poorly graded sand with silt (SP-SM) to 10.0 feet and then poorly graded sand (SP) to termination at 11.5 feet. Below the pavement and aggregate, boring SB-26 encountered fine grained, poorly graded sand (SP) to 5.0 feet, followed by silt (ML) to 7.5 feet, and then poorly graded sand (SP) to termination at 11.5 feet.

Penetration Test Results:

The blow counts in the sandy soils (SM, SP-SM, SM, SC-SM) ranged from 2 to 29 which are very low to moderate, indicating they are in a very loose to medium dense condition. The blow counts in the silt (ML) and clay (CH, CL-ML) soils ranged from 4 to 8 which are very low to moderate, indicating they are in a very soft to stiff condition. Refusal of the spoon or auger did not occur in any of the borings. Drilling was relatively easy.

Water Level Observations:

Observations of the subsurface water conditions were made during drilling operations. Groundwater was only encountered in five of the borings at the time of drilling. The following table shows the depth to water at each boring:

Boring	Water	Boring	Water	Boring	Water	Boring	Water
SB-1	None	SB-8	None	SB-15	None	SB-22	None
SB-2	None	SB-9	5' 0"	SB-16	None	SB-23	None
SB-3	None	SB-10	None	SB-17	None	SB-24	8' 0"
SB-4	None	SB-11	None	SB-18	None	SB-25	10' 6"
SB-5	None	SB-12	None	SB-19	None	SB-26	9' 7"
SB-6	None	SB-13	10' 0"	SB-20	None		
SB-7	None	SB-14	None	SB-21	None		

The water levels were observed over a short period of time. However, we feel they are an accurate representation of the true groundwater conditions on this site due to the high permeability of the native sandy soils. It should be noted that fluctuations in the level of the groundwater can occur due to variations in rainfall, temperature, spring thaw and other factors not evident at the time of our investigation.

Mottled soils were observed. Mottled native soils are a historical indication of a temporarily or seasonally saturated soil condition. Grey soils were also observed. Grey native soils are an indication of a permanently saturated soil condition.

Laboratory Testing

Moisture Content Tests- Moisture content tests were performed on every split spoon sample in accordance with ASTM method D2216; *Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass*. Individual test results are shown on the boring logs adjacent to the sample that was tested.

C. Engineering Review

Discussion:

The soils encountered near the surface on these sites are predominantly fine grained, silty sands (SM), poorly graded sands with silt (SP-SM) and poorly graded sands (SP). They appear to mostly be outwash materials. The native sands (SM, SP-SM, SP) are considered excellent material for use as roadway subgrade material and for bituminous pavement support.

Highly plastic clay was encountered in borings SB-3, SB-9, SB-12, SB-14, and SB-20. Silt (ML) and silty clay (CL-ML) was encountered in borings SB-9 and SB-26. The silt (ML) and highly plastic clay (CH) encountered in these borings are very poor for subgrade material.

The silt (ML) and silty clay (CL-ML) are very susceptible to frost heave and can move several inches between the frozen and thawed state during seasonal changes. The highly plastic clays are very susceptible to seasonal moisture variations and can also have movements of several inches between wet periods and dry periods. Neither the silt (ML) or highly plastic clay (CH) should remain within four (4) feet of finished grade in pavement areas. For the most part, the silt (ML), silty clay (CL-ML) and highly plastic clay (CH) were encountered at depths deeper than 4 feet. It is likely these poor soils will only be encountered in utility trenches during installation.

Based on our observation, it appears the roadway embankment was stable through the entire project area. Unless it is known that there is some issue in the embankment in the project area, it is our opinion that the existing roadway embankment can remain in place.

D. Recommendations

The following recommendations are based on our understanding of the proposed project. If our understanding of the project is not accurate or if changes are made to the project scope, please inform us so that our recommendations can be amended, if necessary. We have included recommendations regarding earthwork and construction that may help in cost estimates and aid in design. We should be allowed to review the proposed construction plans to provide further detailed recommendations, if necessary. Without the opportunity to review the final construction plans, the recommendations made in this report may no longer be valid.

Utility Installation:

We recommend that all utility pipes lay in non-organic mineral soils capable of supporting the pipes. Excessive over-excavation beneath the pipes should be avoided. We recommend that 2 to 6 inches of granular bedding material be placed and compacted around the pipe to aid in aligning the pipe for line and grade. The natural sand (SP) soils appear suitable for this purpose. The silt (ML) and clay (CL,CL-ML, CH) are not. Compaction should be done very carefully by hand to prevent the pipe from shifting. We recommend that the backfill be compacted with a vibratory sheep's foot roller after the backfill is 2 feet above the top of the pipe. Vibratory compaction should only be used on clean sands or silty sands at or below optimum moisture.

We recommend that excavations slope at a 1.5:1 (horizontal: vertical) ratio from the bottom of the excavation to the surface. Stockpiled material should be kept at least 2 feet from the edge of the excavation. This is the minimum required by OSHA. We recommend all construction vehicles be kept at least 5 feet from the edge of the excavation. An escape ladder should be provided at all times while workers are in the excavation. All excavations must meet OSHA standards (29 CFR1926).

Trench Backfill:

The on-site soils consisting of poorly graded sands (SM, SP) are considered excellent for use as utility trench backfill. These soils are generally easy to work with and compact with vibratory compaction equipment.

The on-site soils consisting of silt (ML), silty clays (CL-ML) and highly plastic clay (CH) are considered very poor material for backfill. These soils will be wet and will require drying or mixing to reach optimum moisture for compaction. In addition, they are highly susceptible to seasonal moisture variations and frost heave. The silts (ML), silty clays (CL-ML) and highly plastic clay (CH) should not be used as utility trench backfill within 4 feet of finished subgrade.

No organic soils, roots, stumps, logs, brush, etc. should be used as structural fill below any

pavement section. We recommend that all fill material be free of soft, wet, or frozen soils, highly expansive soils, rubble, debris, and rocks in excess of 6 inches in diameter. The fill should be as uniform as possible both in composition and moisture content.

We recommend all fill be compacted to the minimum relative density levels shown in the table below:

Location	Recommended Compaction Level (Percent of Std. Proctor ASTM D698)
Below Pavements, deeper than 3 feet from finished subgrade	95%
Below Pavements within 3 feet of finished subgrade	100%
Landscape Areas	90%

We recommend all fill placed in the roadway areas be compacted in 8-inch loose lifts. All fill should be compacted at a moisture content within plus or minus 3% of the optimum moisture as determined by a standard proctor. We recommend compaction tests be taken on any utility trench backfill at a rate of one test per 200 feet in the bottom, middle and top thirds of the trench backfill. We recommend compaction tests be taken at a rate of one test for two feet depth of fill per 200 linear feet of roadway fill. We recommend compaction tests be taken at a rate of one test per 200 linear feet on the finished roadway subgrade and aggregate base layer.

Embankment/ Road Fill:

The on-site soils consisting of fine grained, poorly graded sand (SP), poorly graded sand with silt (SP-SM) and silty sands (SM) are considered excellent material for use as roadway subgrade material. These soils are easy to compact using vibratory compaction equipment near their optimum moisture contents.

The silt (ML), silty clay (CL-ML) and highly plastic clay (CH) should be avoided for embankment fill material within four feet of finished grade.

We recommend that any imported fill and utility trench backfill material consist of mineral soils meeting the requirements specified below. No organic soils, roots, stumps, logs, brush, etc.

should be used as structural fill below any utility structure or pavement section. We recommend that all fill and utility trench backfill material be free of soft, wet, or frozen soils, highly expansive soils, rubble, debris, and rocks in excess of 6 inches in diameter. The fill material should be as uniform as possible both in composition and moisture content.

We recommend that all embankment fill material be placed in 12-inch loose lifts and compacted to a minimum of 95% of standard proctor maximum density (ASTM D698). Any fill placed in the top 3 feet of the road subgrade should be compacted to at least 100% of standard proctor maximum density. All fill material should be compacted at a moisture content within plus or minus 2% of the optimum moisture as determined by a standard proctor. We recommend compaction tests be taken at a minimum rate of one test per two feet of fill per 200 linear feet of roadway subgrade, and aggregate base material.

E. Pavement Recommendations

We recommend the subgrade consist of poorly graded sand (SP). The silt (ML), silty clay (CL-ML) and highly plastic clay (CH) should not be placed within 4 feet of finished subgrade. The silty sand (SM), poorly graded sand with silt (SP-SM) and poorly graded sand (SP) outwash soils on site this site are classified as A-3 soils in accordance with the American Association of State Highway Transportation Officials (AASHTO) classification system. A-3 soils are rated as excellent material for use as roadway subgrade material. Without benefit of a laboratory R-value determination and based on Mn/Dot guidelines, we recommend an R-value of 70 be assumed for the onsite soils.

In using the above R-value for bituminous pavement design, it is essential that the subgrade be constructed of uniform soils at a moisture content and density in accordance with Mn Dot specification 2105 and capable of passing a test roll in accordance with Mn Dot specification 2111. The native, undisturbed soils may need preparation (drying and compacting) to pass a proof roll. If the subgrade is not compacted, uniform and capable of passing a test roll, then we recommend the subgrade be scarified and recompacted or subcut and geotextile fabric placed

along with select granular material meeting Mn Dot specification 3149. The top of subgrade should be compacted to a minimum of 100% of standard proctor maximum density. The subgrade should be sloped towards the edges to provide drainage.

F. Closing

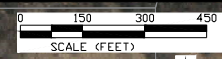
Our work was performed for geotechnical purposes only and not to document the presence or extent of any contamination on the site. We can note that our crew did not detect any obvious contamination by sight or smell during drilling operations. However, human senses are limited in terms of contamination detection and, therefore, the lack of detection through human sensing does not preclude the possibility of the presence of contamination of the site.

This report represents the result of our subsurface investigation and is based on information gathered at specific locations. Subsurface conditions can change a great deal over short horizontal distances. Also, the actual interface between strata will likely be a gradual transition rather than an abrupt change as represented on the boring logs.

Geotechnical engineering is based extensively on opinion. Therefore, the data contained in this report should be used as a guide, and we recommend that construction monitoring be performed by a qualified geotechnical engineer or technician. We recommend ITT be retained to perform construction observation and materials testing on this project due to our familiarity with the soils. Any changes in the subsurface conditions from those found during this geotechnical exploration should be brought to the attention of a soils engineer.

APPENDIX 1

BORING LOCATION PLAN



DATE	REVISION

DESIGNED BY: ---	DATE: 05/31/23
DRAWN BY: LWC	
CHECKED BY: ---	FILE: 24-13

CITY OF RAMSEY
 7550 SUNWOOD DRIVE
 RAMSEY, MN 55303
 (763) 427-1410 FAX (763) 433-9898

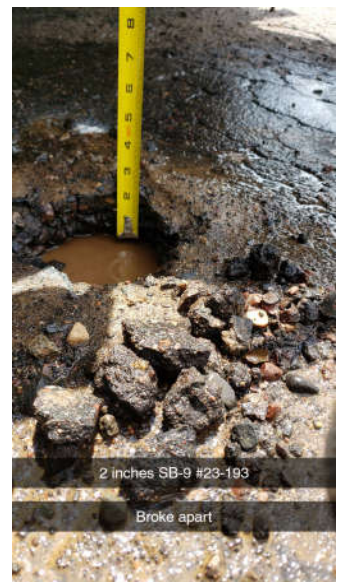


24-13 SOIL BORING LOCATION MAP

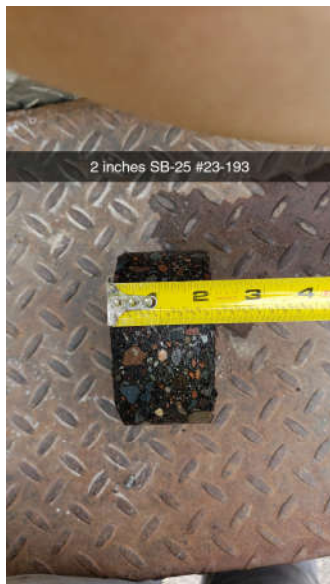
FOX RIDGE ESTATES 1ST & 2ND RECONSTRUCTION CITY
 PROJECT NO. 24-13 CITY OF RAMSEY, MINNESOTA

APPENDIX 2

SOIL BORING LOGS







INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/20/23 BORING #: SB-1
START TIME: 11:40 END TIME: 12:00**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: Wolfram St NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
6.0"		2.0 inches Bituminous, 4.0 inches Aggregate				
	SP	POORLY GRADED SAND, fine grained, brown.				
5.0			1	26	5.0	
			2	8	4.2	
		fine to medium grained	3	7	8.0	
10.0			4	8	7.6	
11.5						
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 8" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/20/23 BORING #: SB-2
START TIME: 12:00 END TIME: 12:20**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: Wolfram St NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
6.0"		2.0 inches Bituminous, 4.0 inches Aggregate				
5.0	SP	POORLY GRADED SAND, fine to medium grained, light greyish brown.	1	10	3.2	
			2	7	3.0	
			3	16	3.0	
10.0		w/ GRAVEL, light brown.	4	17	2.5	
11.5		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 5' 11" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/20/23 BORING #: SB-3
START TIME: 12:20 END TIME: 12:45**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: Wolfram St NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
7.0"		2.5 inches Bituminous, 4.5 inches Aggregate				
4.0	SP	POORLY GRADED SAND, fine grained, grey.	1	11	11.7	
5.0	CH	HIGHLY PLASTIC CLAY, grey, mottled.	2	7	27.8	
7.5	SP	POORLY GRADED SAND, fine grained, brown, mottled.	3	7	9.1	
10.0	SP-SM	POORLY GRADED SAND w/ SILT, fine grained, brown.	4	5	13.5	
11.5		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 7' 6" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/21/23 BORING #: SB-4
START TIME: 9:30 END TIME: 9:50**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: Tungsten St NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
7.0"		2.5 inches Bituminous, 4.5 inches Aggregate				
	SP	POORLY GRADED SAND, fine to medium grained, brown.				
5.0			1	9	2.6	
			2	5	2.8	
			3	7	5.4	
10.0		light grey.				
11.5			4	10	3.0	
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 7" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/21/23 BORING #: SB-5
START TIME: 10:10 END TIME: 10:30**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: Sodium St NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
8.75"		2.75 inches Bituminous, 6.0 inches Aggregate				
5.0	SP	POORLY GRADED SAND, fine grained, brown.	1	29	3.6	
			2	14	4.8	
10.0			3	9	4.9	
11.5			4	7	4.6	
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 5" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
 FOX RIDGE ESTATES 1&2
 STREET IMPROVEMENTS
 RAMSEY, MINNESOTA**

**DATE: 7/21/23 BORING #: SB-6
 START TIME: 10:30 END TIME: 10:50**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
 CREW: CD/NH**

LOCATION: Sodium St NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
6.75"		2.25 inches Bituminous, 4.5 inches Aggregate				
	SP	POORLY GRADED SAND, fine to medium grained, brown.				
5.0		light brown	1	11	2.9	
			2	6	2.6	
		light greyish brown.	3	8	2.4	
10.0			4	14	2.8	
11.5		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 8" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA

DATE: 7/21/23 BORING #: SB-7
START TIME: 11:10 END TIME: 11:30

METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH

LOCATION: Sodium St NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
6.0"		2.5 inches Bituminous, 3.5 inches Aggregate				
	SC	CLAYEY SAND, fine grained, brown, grey, mottled.	1	5	11.2	
5.0						
	CL	SANDY LEAN CLAY, w/ fine grained SAND, reddish brown.	2	8	21.9	
7.5						
	SP	POORLY GRADED SAND, fine grained, brown.	3	8	10.5	
10.0						
			4	8	5.1	
11.5						
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 7' after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
 FOX RIDGE ESTATES 1&2
 STREET IMPROVEMENTS
 RAMSEY, MINNESOTA**

**DATE: 7/21/23 BORING #: SB-8
 START TIME: 1:00 END TIME: 1:30**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
 CREW: CD/NH**

LOCATION: Quicksilver St NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
5.0"		2.5 inches Bituminous, 2.5 inches Aggregate				
	SP	POORLY GRADED SAND, fine grained, brown.				
			1	7	3.0	
5.0		fine to medium grained				
			2	4	3.3	
		fine grained.				
			3	8	3.2	
10.0		light greyish brown.				
			4	17	4.2	
11.5		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 8" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/20/23 BORING #: SB-9
START TIME: 9:40 END TIME: 10:00**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: Potassium Ct NW- See Boring Location

ELEVATION:

Page 1 of 1

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
7.0"		2.0 inches Bituminous, 5.0 inches Aggregate				
	SM	SILTY SAND, fine grained, reddish brown, mottled.	1	8	17.5	
4.0						
5.0	ML	SILT, brown, mottled.	2	4	24.7	V Water encountered at 5.0 feet during drilling.
8.0						
	CL-ML	SILTY LEAY CLAY, brown.	3	4	29.9	
10.0						
	CH	HIGHLY PLASTIC CLAY, grey, brown, mottled.	4	8	42.4	
11.5						
		Boring complete to 11.5 feet. Water encountered at 5.0 feet during drilling. No water encountered to cave-in at 8' 4" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA

DATE: 7/20/23 BORING #: SB-10
START TIME: 10:00 END TIME: 10:20

METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH

LOCATION: Potassium Ct NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
9.25"		2.75 inches Bituminous, 6.5 inches Aggregate				
5.0	SP-SM	POORLY GRADED SAND w/ SILT, fine grained, brown.	1	9	7.4	
10.0	SP	POORLY GRADED SAND, fine grained, brown.	2	10	3.6	
			3	4	6.6	
11.5		light greyish brown.	4	8	3.7	
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 8" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/20/23 BORING #: SB-11
START TIME: 10:20 END TIME: 10:40**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: Potassium St NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
7.0"		2.0 inches Bituminous, 5.0 inches Aggregate				
5.0	SP	POORLY GRADED SAND, fine grained, reddish brown, mottled.	1	7	4.6	
			2	3	3.9	
			3	8	3.3	
10.0		fine to medium grained.	4	7	2.3	
11.5		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 2" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/20/23 BORING #: SB-12
START TIME: 9:20 END TIME: 9:40**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: Potassium St NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
7.75'		3.25 inches* Bituminous, 4.5 inches Aggregate				* 1.0 inches of solid Bit.
	SM	SILTY SAND, fine grained, brown.	1	11	19.7	* 1.75 inches of disintegrated Bit.
5.0						
	CH	HIGHLY PLASTIC CLAY, brown, mottled.	2	8	34.7	
7.5						
	SP	POORLY GRADED SAND, fine grained, light brown.	3	13	3.4	
10.0						
			4	12	3.5	
11.5						
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 7' after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/20/23 BORING #: SB-13
START TIME: 9:00 END TIME: 9:20**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: Potassium St NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes	
6.25'		0.75 inches Bituminous, 5.5 inches Aggregate					
	SC-SM	SILTY CLAYEY SAND, fine grained, grey. FILL	1	26	7.1		
5.0							
	SP	POORLY GRADED SAND, fine grained, brown. mottled.	2	12	3.1		
			3	9	6.3		
10.0		fine to medium grained					
11.5			4	4	18.7	V Water encountered at 10.0 feet during drilling.	
		Boring complete to 11.5 feet. Water encountered at 10.0 feet during drilling. No water encountered to cave-in at 6' 8" after completion.					

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/21/23 BORING #: SB-14
START TIME: 1:50 END TIME: 2:10**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: Potassium St NW- See Boring Location

ELEVATION:

Page 1 of 1

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
5.75'		2.25 inches Bituminous, 3.5 inches Aggregate				
	SP	POORLY GRADED SAND, fine grained, brown.	1	11	13.2	
5.0						
	SC	CLAYEY SAND, fine grained, brown.	2	8	12.1	
7.5						
	SM	SILTY SAND, fine grained, brown.	3	7	18.2	
10.0						
	CH	HIGHLY PLASTIC CLAY, grey.	4	5	38.5	
11.5						
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 7' 7" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/21/23 BORING #: SB-15
START TIME: 11:30 END TIME: 12:00**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: 174th Ave NW- See Boring Location

ELEVATION:

Page 1 of 1

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
7.75'		2.25 inches Bituminous, 5.5 inches Aggregate				
	SP-SM	POORLY GRADED SAND w/ SILT, fine grained, brown, mottled.	1	20	6.3	
5.0						
	SP	POORLY GRADED SAND, fine grained, brown, mottled.	2	6	4.6	
			3	6	7.4	
10.0		fine to medium grained.				
			4	4	7.7	
11.5						
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 9" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/21/23 BORING #: SB-16
START TIME: 12:00 END TIME: 12:30**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: 174th Ave NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
6.0"		2.0 inches Bituminous, 4.0 inches Aggregate				
	SP	POORLY GRADED SAND, fine grained, brown.				
			1	7	4.9	
5.0		fine to medium grained.				
			2	4	4.9	
		fine grained.	3	2	4.0	
10.0						
			4	5	5.8	
11.5						
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 7" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/21/23 BORING #: SB-17
START TIME: 10:30 END TIME: 11:10**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: 173rd Ave NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
9.5"		2.5 inches Bituminous, 7.0 inches Aggregate				
5.0	SP	POORLY GRADED SAND, fine to medium grained, brown. fine grained	1	6	5.7	
			2	3	3.7	
10.0			3	11	3.4	
11.5			4	10	4.4	
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 5' 9" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/21/23 BORING #: SB-18
START TIME: 1:30 END TIME: 1:50**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: 173rd Ave NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
7.25'		2.25 inches Bituminous, 5.0 inches Aggregate				
5.0	SP	POORLY GRADED SAND, fine grained, brown.	1	10	3.2	
			2	7	2.4	
		fine to medium grained	3	5	3.5	
10.0		light greyish brown.	4	15	1.8	
11.5		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 3" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/21/23 BORING #: SB-19
START TIME: 8:30 END TIME: 8:50**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: 172nd Ln NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
5.0"		2.0 inches Bituminous, 3.0 inches Aggregate				
	SP	POORLY GRADED SAND, fine grained, brown.				
5.0			1	23	4.5	
			2	12	3.2	
10.0		light greyish brown.	3	5	3.9	
11.5			4	6	5.6	
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 8" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/21/23 BORING #: SB-20
START TIME: 8:50 END TIME: 9:10**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: 172nd Ln NW- See Boring Location

ELEVATION:

Page 1 of 1

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
5.0"		2.5 inches Bituminous, 2.5 inches Aggregate				
	SP	POORLY GRADED SAND, fine grained, grey.	1	10	13.5	
5.0						
	CH	HIGHLY PLASTIC CLAY, grey, brown, mottled.	2	5	31.2	
			3	6	27.4	
10.0						
			4	6	25.8	
11.5						
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 5' 5" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA

DATE: 7/21/23 BORING #: SB-21
START TIME: 9:10 END TIME: 9:30

METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH

LOCATION: 172nd Ln NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
5.5"		3.5 inches Bituminous, 2.0 inches Aggregate				
	SP	POORLY GRADED SAND, fine to medium grained, brown.				
5.0		mottled.	1	7	3.7	
		light greyish brown.	2	6	3.9	
10.0			3	6	3.4	
11.5			4	14	3.9	
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 4" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/21/23 BORING #: SB-22
START TIME: 9:50 END TIME: 10:10**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: 172nd Ln NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
5.0"		2.0 inches Bituminous, 3.0 inches Aggregate				
	SP	POORLY GRADED SAND, fine grained, brown.				
5.0			1	11	2.2	
			2	7	3.9	
10.0		light grey	3	14	4.7	
11.5			4	10	3.4	
		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 9" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/20/23 BORING #: SB-23
START TIME: 8:30 END TIME: 9:00**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: 172nd Ave NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
8.0"		2.5 inches Bituminous, 5.5 inches Aggregate				
	SC	CLAYEY SAND, fine grained, reddish brown.	1	11	11.4	
5.0		POORLY GRADED SAND, fine grained, brown, mottled.	2	7	5.9	
	SP	brown.	3	4	8.9	
10.0			4	4	7.0	
11.5		Boring complete to 11.5 feet. No water encountered during drilling. No water encountered to cave-in at 6' 4" after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/20/23 BORING #: SB-24
START TIME: 11:20 END TIME: 11:40**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: 170th Ave NW- See Boring Location

ELEVATION:

Page 1 of 1

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
6.25'		2.25 inches Bituminous, 4.0 inches Aggregate				
	SP-SM	POORLY GRADED SAND w/ SILT, fine grained, brown.	1	9	7.9	
5.0						
	SM	SILTY SAND, fine grained, brown, mottled.	2	3	20.2	
7.5						
	SP-SM	POORLY GRADED SAND w/ SILT, fine grained, brown.	3	11	21.8	V Water encountered at 8 feet during drilling.
10.0						
	SP	POORLY GRADED SAND, fine grained, brown.	4	9	22.8	
11.5						
		Boring complete to 11.5 feet. Water encountered at 8 feet during drilling. No water encountered to cave-in at 7' after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/20/23 BORING #: SB-25
START TIME: 11:00 END TIME: 11:20**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: 170th Ave NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes
7.0"		2.0 inches Bituminous, 5.0 inches Aggregate				
	SP	POORLY GRADED SAND, fine grained, brown.				
5.0			1	14	3.4	
			2	8	3.6	
			3	6	5.3	
10.0			4	6	15.5	V Water encountered at 10.5 feet during drilling.
11.5						
		Boring complete to 11.5 feet. Water encountered at 10.5 feet during drilling. No water encountered to cave-in at 7' after completion.				

INDEPENDENT TESTING TECHNOLOGIES, INC. LOG OF SOIL BORING

**PROJECT: 23-193 CITY OF RAMSEY
FOX RIDGE ESTATES 1&2
STREET IMPROVEMENTS
RAMSEY, MINNESOTA**

**DATE: 7/20/23 BORING #: SB-26
START TIME: 10:40 END TIME: 11:00**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: CD/NH**

LOCATION: 170th Ave NW- See Boring Location

ELEVATION:

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	W _n	Notes	
7.5"		2.5 inches Bituminous, 5.0 inches Aggregate					
	SP	POORLY GRADED SAND, fine grained, brown.	1	21	6.5		
5.0							
	ML	SILT, grey, brown, mottled.	2	8	25.9		
7.5						V Water encountered at 9' 7" during drilling.	
	SP	POORLY GRADED SAND, fine grained, greyish brown. wet.	3	13	20.9		
10.0		grey					
11.5			4	9	26.9		
		Boring complete to 11.5 feet. Water encountered at 9' 7" during drilling. No water encountered to cave-in at 6' 10" after completion.					

Unified Soil Classification (USC) System (from ASTM D 2487)

Major Divisions		Group Symbol	Typical Names
Course-Grained Soils More than 50% retained on the 0.075 mm (No. 200) sieve	Gravels 50% or more of course fraction retained on the 4.75 mm (No. 4) sieve	Clean Gravels	GW Well-graded gravels and gravel-sand mixtures, little or no fines
			GP Poorly graded gravels and gravel-sand mixtures, little or no fines
		Gravels with Fines	GM Silty gravels, gravel-sand-silt mixtures
			GC Clayey gravels, gravel-sand-clay mixtures
	Sands 50% or more of course fraction passes the 4.75 (No. 4) sieve	Clean Sands	SW Well-graded sands and gravelly sands, little or no fines
			SP Poorly graded sands and gravelly sands, little or no fines
		Sands with Fines	SM Silty sands, sand-silt mixtures
			SC Clayey sands, sand-clay mixtures
Fine-Grained Soils More than 50% passes the 0.075 mm (No. 200) sieve	Silts and Clays Liquid Limit 50% or less	ML Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	
		CL Inorganic clays of low to medium plasticity, gravelly/sandy/silty/lean clays	
		OL Organic silts and organic silty clays of low plasticity	
	Silts and Clays Liquid Limit greater than 50%	MH Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts	
		CH Inorganic clays or high plasticity, fat clays	
		OH Organic clays of medium to high plasticity	
Highly Organic Soils		PT Peat, muck, and other highly organic soils	

Prefix: G = Gravel, S = Sand, M = Silt, C = Clay, O = Organic

Suffix: W = Well Graded, P = Poorly Graded, M = Silty, L = Clay, LL < 50%, H = Clay, LL > 50%