

APPENDIX C

GEOTECHNICAL REPORT



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October 10, 2025

Mr. Dennis Andrews, Parks & Natural Resources Deputy Director



City of Rochester Hills

1000 Rochester Hills Dr.
Rochester Hills, MI 48309

RE: Geotechnical Exploration and Engineering Report
Nowicki Park Improvement Project
Adams Road
Rochester Hills, Oakland County, Michigan
PSI Report **No. 03811526**

Dear Mr. Andrews,

As requested, **Professional Service Industries, Inc. (PSI), an Intertek company**, has developed a geotechnical engineering report for the referenced Nowicki Park Improvement project located in Rochester Hills, MI. The results of this exploration and evaluation, together with our recommendations, are presented in the accompanying report, a copy of which is being transmitted herewith.

After plans and specifications are complete, PSI should review the final design and specifications to verify that the earthwork and recommendations are properly interpreted and implemented. **It is considered imperative that the geotechnical engineer and/or its representative be present** during earthwork operations to observe the field conditions with respect to the design assumptions and specifications. PSI will not be responsible for interpretations and field quality control observations made by others.

PSI appreciates the opportunity to provide geotechnical engineering and consulting services for your project and looks forward to working with you again. If you have any questions regarding this report, or if we may be of further service, please feel free to contact this office at your convenience.

Respectfully submitted,
PROFESSIONAL SERVICE INDUSTRIES, INC.

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**GEOTECHNICAL EXPLORATION
AND ENGINEERING REPORT**

FOR THE:

**NOWICKI PARK IMPROVEMENT PROJECT
ADAMS ROAD
ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN**

PREPARED FOR:

**CITY OF ROCHESTER HILLS
1000 ROCHESTER HILLS DR.
ROCHESTER HILLS, MI 48309**

PREPARED BY:

**PROFESSIONAL SERVICE INDUSTRIES, INC.
45000 HELM STREET, SUITE 200
PLYMOUTH, MICHIGAN 48170**

**OCTOBER 10, 2025
PSI PROJECT NO. 03811526**

Project Number: **03811526**
Nowicki Park Improvement Project
Rochester Hills, Michigan
October 10, 2025
Page 1



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TABLE OF CONTENTS

PROJECT INFORMATION 3

 PROJECT AUTHORIZATION 3

 PROJECT DESCRIPTION 3

 PURPOSE AND SCOPE OF SERVICES 4

SITE AND SUBSURFACE CONDITIONS..... 5

 SITE LOCATION AND DESCRIPTION..... 5

 FIELD EXPLORATION AND LABORATORY TESTING 6

 SURFACE/SUBSURFACE CONDITIONS 7

 GROUNDWATER INFORMATION 13

 DOUBLE-RING INFILTRATION (DRI) 13

 SITE SEISMIC CLASSIFICATION 14

EVALUATION AND RECOMMENDATIONS 15

 SITE PREPARATION 15

 SHALLOW FOUNDATION RECOMMENDATIONS 16

 HELICAL PILE RECOMMENDATIONS FOR BOARDWALK 18

 PILE GROUP EFFICIENCY RECOMMENDATIONS 19

 SIGN FOUNDATION RECOMMENDATIONS AND METHODOLOGY 20

 CONCRETE SLAB-ON-GRADE 21

 PAVEMENT SECTION RECOMMENDATIONS 21

CONSTRUCTION CONSIDERATIONS 24

 DRAINAGE AND GROUNDWATER CONSIDERATIONS..... 24

 EXCAVATION SAFETY CONSIDERATIONS 25

GEOTECHNICAL RISK..... 26

REPORT LIMITATIONS..... 27

APPENDIX 28

Figure 1 – Site Location Diagram

Figure 2 – Boring Location Diagram

Plate 1 through **Plate 6**- Pavement Core Photographs

Boring Logs (**SB-01** through **SB-46**)

PSI General Notes

Laboratory Test Results

ASFЕ – Important Information About Your Geotechnical Engineering Report

Infiltration Test Result



PROJECT INFORMATION

Project Authorization

This engineering report presents the results of our geotechnical engineering exploration and evaluation performed relative to the proposed Nowicki Park Improvement that is located at Adams Road in the City of Rochester Hills, Oakland County, Michigan. The following table provides Project Authorization information.

TABLE 1: PROJECT AUTHORIZATION

Project Name	Proposed Nowicki Park Improvement
Project Location	Adams Road, Rochester Hills, Oakland County, Michigan
Proposal Signed By	Mr. Dennis Andrews, Parks & Natural Resources Deputy Director
Authorization Company	City of Rochester Hills
Authorization Date	July 15, 2025
PSI Proposal No.	0381-456447
PSI Proposal Contents	Scope of Service and Lump Sum Fee

This exploration was performed for City of Rochester Hills in accordance with PSI Proposal No. 0381-456447 dated July 15, 2025. The authorization to perform this exploration and evaluation was in the form of acceptance of Intertek – PSI proposal signed by Mr. Dennis Andrews, Parks & Natural Resources Deputy Director of City of Rochester, on July 15, 2025.

Project Description

Project information was provided by Mr. Dennis Andrews, Parks & Natural Resources Deputy Director of the City of Rochester Hills, via email on July 10, 2025. The correspondence included the following documents:

- Request for Proposal
- Project site plan with quantities and locations of soil boring prepared by City of Rochester Hills.

Briefly, PSI understands that the City of Rochester Hills is planning a series of improvements to Nowicki Park, located along Adams Road in the City of Rochester Hills, Oakland County, Michigan. The planned enhancements include widening Adams Road, constructing a new parking lot, and adding paved trails and driveways. Additional developments will feature a new playground, detention pond, park entrance, building facilities, restrooms, pavilions, and a boardwalk. A new traffic signal will also be installed at the intersection of the park entrance and Adams Road to improve accessibility and safety.

As structural loading information has not been provided, based on the provided information PSI has considered maximum individual column and continuous wall loads of 75 kips and four to six kips per linear foot, respectively. PSI further understands that no structural design details are available currently.

The finished floor elevation was not provided by City of Rochester Hills. PSI anticipates approximately +/- 2 feet of cut/engineered fill will be required to achieve the proposed building's finished floor elevation (exclusive of any additional cut/fill associated with removal of unsuitable soil sections).



Based on information provided by Mr. Dennis Andrews, Parks & Natural Resources Deputy Director of the City of Rochester Hills, via email on July 10, 2025, review of the request for proposal and project site plan with quantities and locations of soil boring prepared by City of Rochester Hills, a summary of our understanding of the proposed park improvement is provided below in the following Project Description table.

TABLE 2: GENERAL PROJECT DESCRIPTION

Construction Types	Nowicki Park improvement include: Roadway widening, parking lot, paved trail, driveway, and playground. Building, bathrooms, pavilions, and traffic signal Boardwalk. Detention pond
Existing Grade Change within Project Site	± 8 feet estimate (Google Earth Pro)
Finished Floor Elevations	± 2 feet estimate
Anticipated Foundation Types	Spread and continuous footings will be utilized for the primary building structures and bathroom facilities. Helical piles are proposed for supporting lightweight structures such as pavilions and boardwalks. Traffic signal installations will be supported by deep foundation systems to ensure structural stability and durability.
Anticipated Maximum Design Column Loads	Up to 75 kips
Anticipated Maximum Design Wall Loads	Four to six kips per lineal feet
Pavement for Parking and Drives	Flexible Asphalt (HMAC)/Rigid concrete pavement
Design Traffic Load	Not provided

The geotechnical recommendations presented in this report are based on the available project information and results of our geotechnical exploration and evaluations. If any of the noted information, including structural loads, are considered incorrect or are changed, please inform PSI in writing so that we may amend the recommendations presented in this report if appropriate and if desired by City of Rochester Hills. PSI will not be responsible for the implementation of its recommendations when it is not notified of changes in the project. PSI should be consulted once the structure design has been finalized. Additional subsurface evaluation may need to be performed by PSI at that time.

Purpose and Scope of Services

The purpose of this field geotechnical exploration and evaluation was to assess the subsurface conditions at the site and to develop geotechnical design criteria for support of foundations and pavement for the planned improvement project. The scope of the exploration and analysis included a reconnaissance of the project site, completion of 46 soil borings, field and laboratory testing of representative portions of the recovered SPT split spoon and hand auger samples, and corresponding engineering analysis and evaluation of the subsurface materials encountered.



The scope of services did not include any environmental assessment for determining the presence or absence of wetlands, hazardous or toxic materials in the soil, bedrock, surface water, groundwater or air on, below or around this site. Any statement in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes. Prior to the development of any site an environmental assessment is advisable.

As directed by the scope of work/service provided by The City of Rochester Hills, PSI did not provide any service to evaluate or detect the presence of moisture, mold or other biological contaminants in or around any structure or any service that was designed or intended to prevent or lower the risk of the occurrence of the amplification of the same. The City of Rochester Hills acknowledges that mold is ubiquitous to the environment with mold amplification occurring when building materials are impacted by moisture. The City of Rochester Hills further acknowledges that site conditions are outside of PSI 's control and that mold amplification will likely occur or continue to occur in the presence of moisture. As such, PSI cannot and shall not be held responsible for the occurrence or recurrence of mold amplification.

PSI also provides an array of complementary environmental and industrial hygiene services to assist you in successfully assessing and developing properties such as the one referenced in this report. PSI's environmental consultants apply their experience, local geologic knowledge and thorough understanding of **ASTM** standards, environmental risk, and regulatory knowledge to conduct due diligence assessments of a wide range or property types and proposed developments.

SITE AND SUBSURFACE CONDITIONS

Site Location and Description

The project site is located along Adams Road in the City of Rochester Hills, Oakland County, Michigan. The project site consists of green space areas and concrete pavement as shown in **Figure No. 1** of the **Appendix**. The following table provides a generalized description of the existing site conditions based on visual observations during the field activities, as well as other available information.

TABLE 3: SITE DESCRIPTION

Site Location	Latitude: 42.690460; Longitude: -83.192414; Rochester Hills, MI
Site History	Heavily wooded area since April 1999 per Google Earth Pro
Existing Site Ground Cover	Heavily wooded area; green space areas
Existing Site Features	Relatively flat for large area
Existing Grade/Elevation Changes	±8 feet
Site Boundaries/Neighboring Development	North: Heavily wooded area East: Heavily wooded area South: Adams Road West: Heavily wooded area

The terrain across the project site was relatively level with grades varying on the order of approximately ± 8 feet, according to Google Earth Pro. The ground/concrete surface of the project site was firm at the time of the field services as indicated by the fact that the drilling rig experienced little difficulty in accessing



the boring locations.

Field Exploration and Laboratory Testing

The site subsurface conditions were determined by completion of 46 Standard Penetration Test-SPT soil borings located within the proposed improvement areas. 46 soil borings were advanced to depths ranged between approximately five to 35 feet below the existing ground surface within or near the proposed improvement areas (**SB-01** through **SB-46**). The boring design element, boring labels, approximate depths, and drilling footage are provided in the following table.

TABLE 4: FIELD EXPLORATION SUMMARY

Design Element	Number of Borings	Boring Depth (ft)	Drilling Footage (feet)
Roadway Widening, Parking Lot, Paved Trail, Driveway, or Playground	23	5	110
Detention Pond or Park Entrance	3	15	45
Building, Bathrooms, Pavilions, and Traffic Signal	13	25	300
Boardwalk	8	35	280
TOTAL:	47	---	735

The boring locations and depths of the borings were established, located, and marked in the field by PSI in accordance with the project site plan with proposed soil boring locations provided by City of Rochester Hills. The approximate soil boring locations are depicted in the Boring Location Diagrams, **Figure No. 2** included in the **Appendix**.

The soil borings were performed between July 17 and August 26, 2025, by means of a CME-55 and CME-75 truck-mounted drilling rigs equipped with a rotary head utilizing 2¼ and 3¼ inch hollow-stem augers and hand auger with Dynamic Cone Penetration Test (DCP) to advance the boreholes. Representative soil samples were recovered employing split-barrel sampling procedures in general accordance with "Penetration Test and Split-Barrel Sampling of Soils" (**ASTM D1586**). After completion of the test borings the holes were backfilled with the excavated soils. The field exploration description is provided on the table below.

TABLE 5: FIELD EXPLORATION DESCRIPTION

Drilling Equipment	Truck Mounted Drilling Equipment/Hand auger
Drilling Method	Continuous Hollow-Stem Augers and Hand Augers
Field Testing	Standard Penetration Test – SPT (ASTM D1586) and Dynamic Cone Penetrometer (ASTM D6951)
Sampling Procedure	Soils: ASTM D1587/1586
Sampling Frequency	2.5-foot intervals to a depth of 10 feet and at 5-foot intervals thereafter



Frequency of Groundwater Level Measurements	During and after drilling
Boring Backfill Procedures	Soil cuttings
Sample Preservation and Transportation Procedure	General Accordance with ASTM D4220

Determination of the ground surface elevations by survey at the test boring positions was not within the scope of PSI's services. The approximate ground surface elevations at the boring locations performed were obtained from Google Earth Pro. Prior to final design and construction, field measurement at the boring locations should be made by a professional land surveyor registered in the State of Michigan. References to depths in this report and on the attached boring logs are from the existing ground surface unless otherwise noted.

In addition to the field exploration, a representative laboratory-testing program was conducted to evaluate engineering characteristics and geotechnical parameters of the subsurface materials. The laboratory-testing program included visual classification and moisture content tests on all the material recovered. The unconfined compression strength of the plastic/cohesive soils encountered was approximately estimated utilizing a calibrated hand penetrometer. The results of these tests are indicated on the boring logs which are included in the **Appendix**. The laboratory testing program was conducted in general accordance with applicable **ASTM** specifications. The unused portion of the soil samples will be placed in storage at PSI's Lansing, Michigan facility. Unless otherwise requested in writing, the samples will be discarded after 60 days from the submission of the final report.

Surface/Subsurface Conditions

The following surface and subsurface descriptions are of a generalized nature and are provided to highlight the major soil strata encountered. The Boring Logs included in the **Appendix** should be reviewed for specific information as to individual boring locations. The stratification shown on the **Boring Logs** represents the conditions encountered at the specific boring locations. Variations may occur and should be expected between boring locations. The stratification represents the approximate boundary between subsurface materials; however, the actual transition may be gradual, abrupt, or not clearly defined. In the absence of foreign substances or debris, it is often difficult to distinguish between native soils and clean fill soil.

Geologically, the project site is situated in a glacial ground moraine that consists of till containing an unsorted, unstratified mixture of clay silt, sand and coarser fragments deposited discontinuously by advancing ice. Below the glacial till is a layer of sand. The surface and subsurface conditions encountered at the project site at the time of our field exploration are summarized in the table below.



Table 6: Existing Surface/Subsurface Conditions

Soil Boring	Depth	Approx. Elevation	Surficial Materials and Approximate Thickness	Major Native Soils
SB-01	25'	974'	5" Topsoil	Brown SANDY LEAN CLAY Brown/Gray SILTY LEAN CLAY Brown/Gray fine to coarse SILTY to CLAYEY SAND
SB-02	25'	978'	6" Topsoil	Brown fine to coarse SILTY to CLAYEY SAND Brown SANDY to SILTY LEAN CLAY Brown SANDY LEAN CLAY Gray SILTY LEAN CLAY
SB-03	25'	979'	7" Topsoil	Brown SANDY LEAN CLAY Brown/Gray SILTY LEAN CLAY Brown/Gray fine to coarse SILTY to CLAYEY SAND
SB-04	25'	989'	5.5" Topsoil	Brown SILTY LEAN CLAY Gray fine to coarse SILTY to CLAYEY SAND
SB-05	25'	989'	6" Topsoil	Brown SILTY LEAN CLAY Brown/Gray fine to coarse SILTY to CLAYEY SAND
SB-06	15'	970'	6.5" Topsoil	Brown SANDY LEAN CLAY Brown/Gray SILTY LEAN CLAY Brown SILT
SB-07	5'	987'	5" Topsoil	Brown SANDY LEAN CLAY
SB-08	5'	989'	6" Topsoil	Brown SANDY LEAN CLAY
SB-09	35'	982'	7" Topsoil	Brown/Gray SILTY LEAN CLAY Brown fine to coarse SILTY to CLAYEY SAND Brown SANDY to SILTY LEAN CLAY
SB-10	5'	971'	6" Topsoil	Brown fine to coarse SILTY to CLAYEY SAND Brown SANDY LEAN CLAY
SB-11	25'	976'	6" Topsoil	Brown SANDY LEAN CLAY Brown SILTY LEAN CLAY Brown/Gray fine to coarse SILTY to CLAYEY SAND
SB-12	5'	979'	6" Topsoil	Brown fine to coarse POORLY GRADED SAND
SB-13	5'	980'	4" Topsoil 1'20" Sand (Fill) Total: 2'	Brown fine to coarse POORLY GRADED SAND Brown SANDY LEAN CLAY
SB-14	5'	980'	5" Topsoil	Brown SANDY LEAN CLAY
SB-15	5'	989'	5" Topsoil	Brown SANDY LEAN CLAY
SB-16	5'	982'	2" Topsoil	Dark Brown SILTY LEAN CLAY



Table 6: Existing Surface/Subsurface Conditions

Soil Boring	Depth	Approx. Elevation	Surficial Materials and Approximate Thickness	Major Native Soils
SB-17	5'	983'	6" Topsoil	Brown SANDY LEAN CLAY
SB-18	35'	987'	8" Topsoil	Brown/Gray SILTY LEAN CLAY Brown SANDY to SILTY LEAN CLAY Brown SANDY SILT Brown fine to coarse SILTY to CLAYEY SAND
SB-19	35'	980'	7.5" Topsoil	Brown SILTY LEAN CLAY Gray fine to coarse SILTY to CLAYEY SAND Gray fine to coarse PORRLY GRADED SAND Gray SANDY to SILTY LEAN CLAY
SB-20	5'	985'	5" Topsoil	Brown fine to coarse SILTY to CLAYEY SAND
SB-21	5'	989'	6" Topsoil	Brown SANDY LEAN CLAY
SB-22	15'	970'	6" Topsoil	Brown/Gray SILTY LEAN CLAY Brown SILT
SB-24	35'	987'	10" Topsoil	Brown/Gray SILTY LEAN CLAY Gray fine to coarse SILTY to CLAYEY SAND Brown SANDY LEAN CLAY Brown SANDY to SILTY LEAN CLAY Seam SAND at a depth of 25 feet
SB-25	35'	986'	12" Topsoil	Brown SANDY LEAN CLAY Brown SANDY to SILTY LEAN CLAY Gray SILTY LEAN CLAY Gray fine to coarse SILTY to CLAYEY SAND
SB-25A	5'	981'	7" Topsoil	Brown SANDY LEAN CLAY
SB-26	5'	976'	12" Topsoil	Brown fine to coarse SILTY to CLAYEY SAND
SB-27	27'	987'	6" Topsoil	Brown/Gray fine to coarse SILTY to CLAYEY SAND Brown/Gray SANDY LEAN CLAY
SB-28	35'	979'	7" Topsoil	Brown/Gray SILTY LEAN CLAY Brown fine to coarse SILTY SAND Brown fine to coarse SILTY to CLAYEY SAND
SB-29	35'	977'	5.5" Topsoil	Brown SANDY LEAN CLAY Brown SILTY LEAN CLAY Gray fine to coarse SILTY to CLAYEY SAND Gray SANDY to SILTY LEAN CLAY Gray fine to coarse POORLY GRADED SAND



Table 6: Existing Surface/Subsurface Conditions

Soil Boring	Depth	Approx. Elevation	Surficial Materials and Approximate Thickness	Major Native Soils
SB-30	35'	977'	9.5" Topsoil	Brown/Gray SANDY LEAN CLAY Brown/Gray SANDY to SILTY LEAN CLAY Gray SILTY LEAN CLAY Gray fine to coarse SILTY to CLAYEY SAND
SB-31	17'	968'	5.5" Topsoil	Brown/Gray SANDY LEAN CLAY
SB-33	25'	976'	7" Topsoil	Brown fine to coarse SILTY to CLAYEY SAND Brown/Gray SILTY LEAN CLAY Gray SANDY to SILTY LEAN CLAY Gray SANDY LEAN CLAY
SB-34	25'	974'	4.5" Topsoil	Brown/Gray fine to coarse SILTY to CLAYEY SAND Brown/Gray SILTY LEAN CLAY
SB-35	25'	977'	6" Topsoil	Brown/Gray SILTY LEAN CLAY Brown/Gray fine to coarse SILTY to CLAYEY SAND
SB-36	25'	977'	12" Topsoil	Brown/Gray SILTY LEAN CLAY Brown/Gray SANDY to SILTY LEAN CLAY
SB-37	5'	971'	5" Topsoil	Brown fine to coarse SILTY to CLAYEY SAND
SB-38	5'	972'	9¾" Asphalt 1¾" Sand (Base) Total:11.5"	Gray SANDY LEAN CLAY Gray/Brown fine to coarse SILTY to CLAYEY SAND
SB-39	5'	975'	4" Topsoil 9" Silty Sand (Fill) Total:13"	Brown fine to coarse POORLY GRADED SAND
SB-40	5'	976'	12¾" Asphalt 2¾" Sand (Base) Total:15"	Brown fine to coarse SILTY to CLAYEY SAND Gray/Brown SANDY LEAN CLAY
SB-41	5'	981'	7" Asphalt 4" Sand (Base) Total:11"	Brown/Gray SILTY LEAN CLAY
SB-42	5'	980'	4.5" Topsoil	Brown SILTY LEAN CLAY Brown fine to coarse SILTY to CLAYEY SAND
SB-42A	5'	980'	9¼" Concrete 3¾" Sand (Base) Total:12.5"	Brown/Gray SILTY LEAN CLAY
SB-43	5'	985'	4" Topsoil	Brown fine to coarse SILTY to CLAYEY SAND Yellow/Gray SANDY LEAN CLAY



Table 6: Existing Surface/Subsurface Conditions

Soil Boring	Depth	Approx. Elevation	Surficial Materials and Approximate Thickness	Major Native Soils
SB-44	5'	985'	4" Topsoil	Brown fine to coarse POORLY GRADED SAND Brown SILTY LEAN CLAY
SB-45	25'	979'	9" Topsoil	Brown fine to coarse SILTY to CLAYEY SAND Brown/Gray SANDY LEAN CLAY Gray SANDY to SILTY LEAN CLAY Gray fine to coarse POORLY GRADED SAND
SB-45A	25'	979'	11" Concrete 3½" Sand (Base) Total:14.5"	Brown SANDY LEAN CLAY Brown/Gray fine to coarse SILTY to CLAYEY SAND Brown/Gray SILTY LEAN CLAY Gray SANDY to SILTY LEAN CLAY
SB-46	5'	978'	7" Asphalt 2½" Sand (Base) Total:9.5"	Brown fine to coarse SILTY to CLAYEY SAND Gray fine to coarse POORLY GRADED SAND

During the subsurface exploration program, the ground surface conditions at the soil boring locations varied depending on their positions. At locations **SB-01** through **SB-37**, **SB-39**, and **SB-42** through **SB-45**, the ground surface consisted of a topsoil layer ranging from approximately two to 12 inches in thickness. At locations **SB-38**, **SB-40**, **SB-41**, and **SB-46**, the surface layer comprised asphalt, with thicknesses ranging between approximately seven and 12.75 inches. Locations **SB-42A** and **SB-45A** were underlain by a concrete surface layer, varying between approximately 9.25 and 11 inches in thickness.

Beneath the asphalt/concrete pavement, a base course consisting of fine to coarse gravelly sand was encountered, typically ranging from 2½ to four inches in thickness. At boring locations **SB-13** and **SB-39**, an apparent layer of old fill material was encountered directly beneath the topsoil. This fill consisted of fine to coarse silty sand, containing variable amounts of gravel and brick fragments, and extended to depths of approximately one to two feet below the existing ground surface.

Native soils were encountered beneath the topsoil at all boring locations. These native soils generally consisted of sand to silty lean clay (CL and CL-ML), silty sand to sand (SM, SP-SM, SP), and sandy silt to silt (ML), as further described in the subsequent sections.

Brown/Gray Sandy to Silty Lean Clay: A stratum of native brown/gray sandy to silty lean clay with variable percentages of gravel was encountered directly below topsoil layer and below sandy soil layers at soil boring locations **SB-01** through **SB-11**, **SB-13** through **SB-19**, **SB-21** through **SB-25**, **SB-27** through **SB-36**, **SB-38**, **SB-40** through **SB-45**, and **SB-45A**. The brown/gray sandy to silty lean clay stratum extended to depths ranged between approximately two and the maximum depth of exploration of approximately 35 feet below the existing ground surface. The SPT-N values of the sandy to silty lean clay stratum ranged from four to 63 blows per foot (bpf). Unconfined compressive strength values approximately estimated



using a hand penetrometer ranged between $\frac{1}{4}$ and greater than $4\frac{1}{2}$ tsf indicating soft to hard consistencies. The Dynamic Cone Penetration (DCP) of the sandy to silty clay stratum at hand auger soil boring locations ranged between one and six drops per two inches. The moisture content of the tested sandy to silty clay samples ranged from six to 35 percent. The samples visually appeared to be in moist to wet conditions when examined in the laboratory. Atterberg limit tests performed on representative composite samples of the native brown/gray sandy to silty lean clay stratum prepared from preformed soil borings locations, indicates the soil to be low to moderately in plasticity with Liquid Limits (LL) ranging from 16 to 41 and Plastic Limits (PL) ranging from ten to 20; based on the low moisture contents indicated in the boring logs and the deep groundwater table, this stratum appears to be slightly over consolidated above the ground water table.

Brown/Gray Poorly Graded Sand to Silty to Clayey Sand: A native brown/gray poorly graded sand to silty to clayey sand (SM, SP-SM, SP) with variable percentage of gravel was encountered below top soil and sandy to silty lean clay layers at soil boring locations **SB-01** through **SB-05**, **SB-09**, **SB-11** through **SB-13**, **SB-18** through **SB-20**, **SB-23** through **SB-30**, **SB-32** through **SB-35**, **SB-37** through **SB-40**, and **SB-42** through **SB-46**. The brown/gray poorly graded sand to silty to clayey sand stratum extended depths ranged between approximately 3.5 feet and the maximum depth of exploration of approximately 35 feet below the existing ground surface. The Standard Penetration Test-SPT values (N values) of the poorly graded sand to silty to clayey sand layers ranged from three to 65 blows per foot, indicating a range of very loose to very dense relative densities. The Dynamic Cone Penetration (DCP) of the poorly graded sand to silty to clayey sand stratum at hand auger soil boring locations ranged between one and seven drops per two inches. The moisture contents of the tested poorly graded sand to silty to clayey sand samples ranged from six to 20 percent. The samples visually appeared to be in moist to wet conditions when examined in the laboratory.

Brown Sandy Silt to Silt. A stratum of native brown sandy silt to silt with variable percentages of clay and gravel interbedded sandy to silty lean clay layer at soil boring locations **SB-06** and **SB-22** at depths of approximately 8.5 and six feet below the existing ground surface and extended to depths ranged between approximately 13.5 and 8.5 feet below the existing ground surface, respectively. In addition, a stratum of native brown sandy silt to silt was encountered below sandy to silty lean clay layer at soil boring location **SB-18** at a depth of approximately 23.5 feet below the existing ground surface and extended to a depth of approximately 28.5 feet below the existing ground surface. The Standard Penetration Test-SPT values (N values) of the sandy silt layer ranged from 20 to 29 blows per foot, indicating medium dense relative densities. The moisture contents of the tested sandy silt samples ranged from seven to 19 percent. The samples visually appeared to be in a moist condition when examined in the laboratory. Atterberg limit tests performed on representative composite samples of the native brown sandy silt to silt stratum prepared from preformed soil boring locations **SB-18** and **SB-22**, indicates the soil to be low to moderately in plasticity with Liquid Limits (LL) ranging from 14 to 24 and Plastic Limits (PL) ranging from 11 to 20

Cobbles and/or boulders were not encountered during drilling operations. The boring logs included in the Appendix should be referenced with respect to this information. The presence of boulders and cobbles in the profile is a result of the geologic method of deposition of the soil materials at this site. Even where cobbles or boulders were not noted within the profile they could be encountered between the boring positions. The Contractor should be aware and equipped for this condition.



The above subsurface descriptions are of a generalized nature and are provided to highlight the major layers encountered. The Boring Logs included in the **Appendix** should be reviewed for specific information as to individual boring locations. The stratification shown on the Boring Logs represents the conditions encountered at the specific boring locations. Variations may occur and should be expected between boring locations. The stratification represents the approximate boundary between subsurface materials; however, the actual transition may be gradual, abrupt, or not clearly defined. In the absence of foreign substances or debris, it is often difficult to distinguish between native soils and clean fill soil.

Groundwater Information

Free groundwater was encountered during drilling operations and observed upon completion of drilling operations at soil boring locations **SB-05, SB-11, SB-25, SB-36, and SB-45A** at depths ranged between approximately 18 and 34 feet below the existing ground surface, during late-July to late-August 2025. Collapse of the soils above groundwater (i.e., “dry cave”) was not observed during drilling operations at any soil boring locations. The Boring Logs included in the Appendix should be reviewed for specific information as to depths of groundwater and dry caves.

Groundwater levels on this site are likely to vary because of seasonal conditions and fluctuations should be anticipated. Groundwater quantities and flow volumes will largely depend on the permeability of the soil profile. It is recommended that the site Contractor determine the actual groundwater levels at the time of the construction to evaluate groundwater impact on construction procedures.

Encased Infiltration Test

PSI completed encased infiltration testing on September 2, 2025. Testing was completed using a 4-inch inner diameter casing. The casing was seated to the depth corresponding to the bottom of the proposed detention basin (967 feet) and presoaked for two consecutive 30-minute durations to determine appropriate testing intervals. Testing was completed until a minimum of eight readings were completed or a stabilized rate of drop was observed. A summary of the infiltration rates is provided below.

Table 7: Encased Infiltration Test Results			
Test Location	Test Elevation (ft)	Soil at base of Infiltration Ring	Estimated Infiltration Rate (inch/hour)
IT-01	*967	Brown SILTY LEAN CLAY	≤ 0.01

**Based on the estimated ground surface elevation at the double ring infiltration testing location*

Results for the infiltration testing can be found within the **Appendix**. The attached test results represent the conditions only at the actual test location. Variations may occur and should be expected throughout the site.

References to depths in this report are from the existing ground surface unless otherwise noted. PSI generally encountered a brown sandy to silty clay with trace gravel at the tested elevations. The relative



soil boring logs should be reviewed for specific soils information at the testing locations. These records include soil descriptions and stratification of the soils. The soil boring logs are presented in the **Appendix**.

The stratification shown on the soil boring logs represent the conditions only at the actual observed locations. Variations may occur and should be expected across the project footprint. The stratification represents the approximate boundary between subsurface materials; however, the actual transition may be gradual. The soil descriptions were prepared on the basis of visual engineering classification of the soil conditions encountered in the field and sieve analysis completed on representative sample of soils collected at the infiltration elevation.

Site Seismic Classification

Oakland County in Michigan lies in the Central Stable Tectonic Region and in Seismic Zone Area 0 of probable seismic activity of the Building Officials Congress of America (BOCA), National Building Code, and the Uniform Building Code (UBC). This zone indicates that minor damage due to occasional earthquakes might be expected in this area.

In the 2015 Michigan Building Code (MBC), the State of Michigan has adopted the provisions of the International Building Code (IBC). The Site Class is based on a weighted average of known or estimated soil properties for the uppermost 100 feet of the subsurface profile. Soil borings at the project site extended to a maximum depth of approximately 35 feet below the existing ground surface. Based on the regional geologic mapping, as well as data available on the Water Well Record Retrieval System of the Department of Environmental Quality in the State of Michigan, PSI anticipates that the subsurface conditions below the explored depth may consist of alternating deposits of sand, gravel, and clay with bedrock located at a depth of approximately 100 feet or more below the existing ground surface. Bedrock most likely is part of the Saginaw formation. Based on our review of the available data, knowledge of regional geology and the Standard Penetration Test (SPT) N-values and approximated soil shear strength PSI estimates that the seismic design for this project, based on the upper 100 feet of the subsurface soil profile, would be **Site Class D**.

The 2018 International Building Code requires a site class for the calculation of earthquake design forces. This class is a function of soil type (i.e., depth of soil and stratum types). Based on the depth of the rock (i.e., weathered rock) and the estimated shear strength of the soil at the boring locations, **Site Class "D"** is also recommended.

The USGS-NEHRP probabilistic ground motion values near Latitude 42.69041290N, and -83.19296663W are as follows:



Table 8: ASCE 7-16 Probabilistic Ground Motion Values					
Period (seconds)	2% Probability of Event in 50 years	Site Coefficients	Max. Spectral Acceleration Parameters	Design Spectral Acceleration Parameters	
0.2 (S_s)	8.8	$F_a = 1.6$	$S_{ms} = 0.141$	$S_{Ds} = 0.094$	$T_0 = 0.146$
1.0 (S_1)	4.3	$F_v = 2.4$	$S_{m1} = 0.104$	$S_{D1} = 0.069$	$T_s = 0.734$
$S_{ms} = F_a S_s$		$S_{Ds} = 2/3 * S_{ms}$	$T_0 = 0.2 * S_{D1} / S_{Ds}$		
$S_{m1} = F_v S_1$		$S_{D1} = 2/3 * S_{m1}$	$T_s = S_{D1} / S_{Ds}$		

The Site Coefficients, F_a and F_v were interpolated from 2021 IBC Tables 1613.3.3(1) and 1613.3.3(2) as a function of the site classification and the mapped spectral response acceleration at the short (S_s) and 1 second (S_1) periods. The development of shear strains tending to cause liquefaction of sand deposits is governed by the character of the ground motion (i.e. acceleration and frequency), soil type, groundwater level, and in-situ stress conditions; based in site soil conditions liquefaction occurrence is not expected.

EVALUATION AND RECOMMENDATIONS

Site Preparation

Prior to site grading activities or excavation for foundation elements, existing underground utilities, and structures, should be identified and rerouted or properly abandoned in-place. Existing underground utilities that are not re-routed or abandoned should be adequately marked and protected to minimize the potential for damage during construction activities.

Topsoil, existing pavement, undocumented fill, and soils containing organics (if encountered) can potentially undergo high and variable volume changes when subjected to loads, resulting in detrimental performance of floor slabs, pavements, structural fills, and shallow foundations placed on them. **Therefore, PSI recommends that topsoil, as well as any old fill soils or apparent old fill soils, be stripped from the planned construction areas and under PSI' s supervision.**

Proofroll. After the topsoil, old fill soils (if encountered), and loose/soft soils have been removed from the areas of construction and any cut sections are performed, exposed subgrades should be observed and be thoroughly proof rolled/compacted with a large, heavy rubber-tired vehicle prior to the placement of engineered fill or backfill required to achieve the proposed subgrade elevation. Areas that exhibit instability or are observed to rut or deflect excessively under the moving load should be further undercut, stabilized by aeration, drying (if wet) and additional compaction to attain a stable finished subgrade. The proof rolling/compacting and undercutting activities should be performed during a period of dry weather and should be performed under the supervision of the geotechnical engineer's representative. Exposed granular subgrades must be compacted to a minimum of 95 percent of the maximum dry density within three percent of the optimum moisture content as determined by **ASTM D-1557** (Modified Proctor).

Subgrade Improvement. Where subgrade conditions are not improved through aeration, drying and compaction, or where undercut and replacement is considered impractical due to the underlying soil and



groundwater conditions, it may be necessary to stabilize localized areas of subgrade instability with a woven geotextile, geogrid and a layer of well graded crushed concrete or well graded coarse aggregate such as **MDOT 4AA, 6A or 21AA**. The need for the use of geotextile, geogrid and the thickness and gradation requirements of the crushed aggregate layer required should be determined at the time of the subgrade preparation, based on the condition of the exposed subgrade at the time of construction. The subgrade should be stabilized prior to placement of engineered fill or aggregate base course. New engineered fill supporting at-grade structures should be an environmentally clean material, free of organic matter, frozen soil, or other deleterious material. The material proposed to be used as engineered fill should be evaluated and approved for use by a PSI geotechnical engineer or his representative prior to placement in the field.

Selected Fill. After the subgrade has been stabilized, any engineered fill required may then be placed by the contractor. PSI should monitor proper control of the placement and compaction of new fill soils. The new materials must be free of organic matter. Fill materials are to be placed in individual lifts not exceeding eight inches in loose thickness. Each lift is to be compacted to 95 percent of the maximum dry density within three percent of the optimum moisture content as determined in accordance with **ASTM Method D-1557** (Modified Proctor). A minimum of one test per 2,000 square feet of building should be performed for each lift, unless otherwise specified by the engineer. The moisture/density relationship (Proctor) of the material to be used as engineered fill should be evaluated by a PSI geotechnical engineer or his representative prior to placement in the field. PSI recommends one Proctor test for every 5,000 cubic yards of fill and one test per change of material.

Portions of native soils appear to be suitable for re-use as engineered fill provides the soils are free of organics and miscellaneous debris and particle sizes do not exceed three inches in diameter. PSI must be on site prior to re-use of the existing native and fill materials to document and verify that these soils are suitable for the intended use as engineered fill. Imported materials to be utilized as structural fill should meet (or be similar to) the requirements of **MDOT Class II** granular soil. Construction traffic should be restricted from the exposed subgrade to help reduce the potential for loosening of the subgrade soils, particularly where excess moisture is present from groundwater and/or precipitation. PSI recommends that the fill be strategically placed by the contractor so that the construction equipment remains on newly placed fill soils and not on the exposed subgrade during fill placement.

Shallow Foundation Recommendations

Undocumented fill and buried native soils with organics may be present in un-explored areas of the site. The bottoms of the undercut excavations must be continuously evaluated under PSI supervision prior to the placement of engineered backfill. Structural fill placement should be performed in accordance with the *Site Preparation Section* of this report.

Where the removal of localized unsuitable bearing material is performed beneath the proposed footings and the excavation is backfilled with compacted fill materials, the excavation must extend laterally beyond the perimeter of the foundation for a distance equal to one-half of the thickness of the engineered backfill placed below the footing bottom. The over excavation is necessary for proper support of lateral loads exerted through the fill by the foundations.



Bearing Capacity/Settlements. Based on the results of the subsurface exploration and engineering analyses, the allowable soil bearing capacities and anticipated settlements for the proposed buildings have been evaluated. The recommended foundation design parameters correspond to conventional shallow spread footings, continuous wall footings, and/or isolated foundations bearing on suitable native soils or engineered fill. The following table summarizes the recommended bearing capacities and estimated settlements for each building location in relation to the corresponding soil boring data. These values should be used as a reference during the design phase to ensure proper foundation performance.

Table 9: Recommended Net Allowable Bearing Capacity		
Structure	Soil Boring No.	Net Allowable Bearing Capacity (psf)
Maintenance Building 1	SB-01	3,000
Community Building	SB-02 & SB-03	2,750
Family Bathroom	SB-27	3,000
Maintenance Building 2	SB-34	2,750

The recommended bearing capacities are considered net allowable values and already account for typical dead and live load conditions. The estimated settlements are based on the assumption that foundations are constructed in accordance with the recommendations outlined in the site preparation and foundation design sections of this report. Proper site grading, compaction of engineered fill, and quality control during construction are essential to achieve the anticipated performance. Any deviation from these conditions may require re-evaluation of the bearing capacity and settlement estimates.

Following the previous bearing capacity values, estimated total settlements should be less than one inch with differential settlement of half of the total settlement provided the following design and construction details are incorporated.

Footings Geometry. In order to protect against frost action, perimeter footings, exterior footings and footings located in unheated areas must bear at a minimum depth of three and one-half feet below final surface grades. Interior footings not subject to frost action may be found at a depth of at least 18 inches below the floor slab, provided that these foundations will be bearing on properly placed engineered backfill or suitable native soils. Footing supporting individual columns should have a minor dimension of no less than 30 inches and a minimum wall footing width of no less than 18 inches, even if those dimensions result in stresses below the allowable bearing capacity. The purpose of limiting the footing size is to prevent "punching" shear deformation and to provide for vertical stability.

Foundation Considerations. Where bearing soils are granular in nature, PSI recommends that the foundation inverts be compacted in place by several passes of a vibratory compactor, prior to placement of formwork or cast-in-place foundation concrete, to densify any soils disturbed during excavation as well as to densify the underlying native granular soils. The compaction should continue until no additional densification is observed with additional passes.



Unsuitable soils may be present at the bearing surface. Therefore, PSI recommends that the foundation excavations be observed and tested by a representative of PSI to verify that the observed conditions are consistent with the geotechnical report; this is especially important at this site due to the presence of old fill material and relatively wet native soils encountered at some boring locations. Where bearing surfaces are not suitable to support foundations, they should be undercut and replaced with engineered fill or flowable fill, or foundations should be extended to bear directly on suitable native soils.

Depending on the soil and groundwater conditions at the time of construction, it may be necessary to stabilize the foundation bottoms with free drainage crushed stone. In order to reduce the effects of differential movement that may occur due to variations in the character of the supporting soils and variations in seasonal moisture contents, it is recommended that building and wall footings be suitably reinforced.

Helical Pile Recommendations for Boardwalk

Based on the project information provided, data collected from the soil test borings, laboratory testing, and engineering analysis (*Helical Anchors Inc. Engineering Manual*), it is PSI's opinion that helical piles (Helical Anchors Inc.) may be an adequate foundation system for support of the proposed boardwalk. The capacity of the piles will be a function of the soil's internal friction angle, shear strength, as well as the number and size of the helixes used.

Based on the end unit bearing values computed, an analysis of helical piles with a bearing at a minimum depth of approximately **25 feet** below the existing ground surface at locations around **SB-08, SB-18, SB-19, and SB-28** through **SB-30**, and a 2^{3/8}" diameter tubular shaft helical pile with 10" and 12" helix diameters (six feet pile space) was performed. The following table indicates the depth required to achieve a nominal single pile capacity ranged between 66.5 kips and 90.7 kips for 10" and 12" helixes at a location near to all boring locations:

Table 10: Recommended Helical Pile Depths			
Helical Piles with a 10" & 12" Helix (2^{3/8}" Shaft Diameter)			
(6 feet pile space)			
Boring Location	Nominal Axial Resistance (unfactored) (Kips)	Tip Depth from Ground Surface (feet)	*Tip Elevation (feet)
SB-09	66.80	25	*957
SB-18	22.86	25	*953
SB-19	64.64	25	*955
SB-28	8.57	25	*954
SB-29	66.36	25	*953
SB-30	14.28	25	*952

**Based on the estimated ground surface elevation at the boring locations*



The values given in **Table 11** are unfactored and should be divided by a recommended factor-of-safety of 2.0 to achieve the design capacities of the piles. Shaft helical pile skin friction should be neglected. To develop the full capacity of the piles, PSI recommends that a minimum of three times the diameter of the lower helix be provided between the individual plates.

Based on the pile capacity calculations performed by PSI within the borings' location, it appears that the required minimum working pile unfactored design load ranged between 8.57 kips and 66.80 kips per pile can be developed at this site for 2^{3/8}" diameter Tubular Shaft helical piles with 10" and 12" helix diameters where extended through the soft to firm clay, to and into the native stiff to very stiff stratum to minimum depth of approximately 25 feet below the existing ground surface. Once the nominal axial resistance is factored, final number of helical piles can be determined.

The Structural Engineer should evaluate the need for the proposed new building addition to be structurally independent of the existing building structure to allow for independent movement between the existing building and the proposed new building addition. Where new helical pile foundations are planned adjacent to foundations supporting the existing basement walls, the effects of overlapping soil stresses must be considered. The working load capacity of the helical anchors noted above must not be exceeded.

PSI recommends that field testing be performed during and following installation of the anchors to verify that the calculated design load capacities are achieved in the field. Field testing should include monitoring the torque to capacity feedback, which verifies that the required capacity has been achieved. Care must be taken not to over torque the shafts during installation. The helical shaft and plate components must be properly sized for the anticipated soil conditions to be encountered during installation, especially where helical piles are extended to and into the medium dense sand stratum encountered below a depth of approximately 25 feet below the existing ground surface at this site.

PSI recommends a minimum of one load test be performed on an installed anchor. Load testing should be performed in accordance with **ASTM D3689** for static axial tensile loads; **ASTM D1143** for static axial compressive loads; and **ASTM D3966** for lateral loads. The type(s) of load test(s) performed should be based on the controlling load(s) exerted on the anchors by the proposed structure.

The above estimated helical pile capacity and minimum embedment depths are provided for informational purposes only and to evaluate the suitability of the site for support of the proposed building addition on a helical pile foundation system. Helical screw piles or anchors are generally designed and installed by a design-build specialty contractor. PSI recommends that the manufacturer or specialty design contractor determine the actual helical anchor shaft type, size and diameter as well as the required number, diameter, spacing and thickness of the helical bearing plates and the associated costs.

Pile Group Efficiency Recommendations

For pile groups subjected to vertical loads, the total capacity is typically less than the sum of the individual pile capacities due to group interaction, with the reduction depending on pile spacing; for piles in cohesive or plastic soils, the group efficiency factor may be taken as approximately one when the center-to-center spacing is equal to or greater than three pile diameters. For laterally loaded piles, additional reductions



occur due to overlapping soil resistance zones, and the extent of this reduction depends on the ratio of pile spacing to shaft diameter (S/D). For helical piles with tubular shaft diameters of 2^{3/8} inches (0.1979 ft) installed at six feet spacing, the S/D ratios are approximately 30.3. Industry guidance (e.g., Reese & Matlock, FHWA, AASHTO) indicates that no lateral capacity reduction is required when S/D is greater than about eight, while a modest reduction of roughly 10% is appropriate for S/D values between about five and eight. Accordingly, for the 2^{3/8} -inch diameter piles at six feet spacing, no reduction is necessary, and the group efficiency factor for lateral loading can be taken as one.

Sign Foundation Recommendations and Methodology

PSI assumes that the proposed mast arm signal pole will be 30 feet in height and mounted to a 42-inch diameter drilled pier foundation using a 6-bolt configuration. The mast arm signal pole will be constructed at northwest quadrant of the Adams Road and Baypoint Drive intersection (**SB-45**). The drilled pier foundations will be sized per the MDOT Standard Plan “Traffic Signal Mast Arm Pole Foundation Design Table – SIG-DESIGN-248-A” dated May 17, 2024.

The following table summarizes the recommended minimum foundation diameter and length, anticipated construction method, casing requirements and concrete type, based on the average soil criteria along the length of the drilled pier shaft estimated from the soil borings performed and the above referenced MDOT SIG-DESIGN-248-A standard design tables:

Table 11 – Traffic Signal Foundation Design Recommendations						
Quadrant Boring No. (Max Span Length)	Controlling Average Soil Condition	Drilled Pier			Construction Method	Concrete Type
		Length (ft)	Mast Arm Type	Diam (inches)		
SB-45 (<100')	Medium Clay	14.0	Single	42	Wet Temporary Casing	Grade T, Tremie Placement
		15.5	Double			

Based on the subsurface conditions encountered at the boring locations performed, the soils exposed within the upper portion of the drilled pier excavations are anticipated to consist predominately of sand soils underlain by sandy to silty clay soils at **SB-45**. Groundwater or perched water was encountered during drilling at an approx. depth of 20 feet below the existing ground surface. Difficulty with groundwater seepage and caving and sloughing of the soils into the drilled pier foundation excavations are anticipated. Therefore, PSI anticipates a temporary casing will be necessary to create a stable excavation at the proposed mast arm signal pole locations.

Concrete may be placed using the “Free Fall Placement” method where placed in a dry excavation. The concrete mix should conform to Grade T for dry placement methods as outlined in Section 701 of the “2020 MDOT Standard Specifications for Construction”. Where it is not possible to create a water-tight seal, the concrete must be placed by “Tremie Placement” method when placed under wet construction methods. The concrete mix should conform to Grade T when placed by tremie methods as outlined in Section 701 of the “2020 MDOT Standard Specifications for Construction”.



Where a temporary steel casing is used, a positive head of concrete should be kept in the casing prior to pulling the casing, to reduce the risk of soil and groundwater outside the casing from contaminating the concrete in the shaft and causing the shaft to "neck". After the drilled pier has been completed to near the proper elevation with an appropriate head of concrete, the temporary casing can be withdrawn during simultaneous concrete placement. The drilled pier concrete must be placed in such a way that the reinforcing steel is not shifted laterally or vertically. To reduce lateral movement of the drilled pier, the contractor must place the foundation concrete in intimate contact with undisturbed natural soil. Any voids or enlargements along the drilled pier shaft excavation should be filled with concrete at the time of drilled pier concrete placement.

PSI recommends that the MDOT resident engineer or his representative observe the drilled pier foundation construction. The observation should include maintenance of accurate records of the drilled pier depth, dimensions, soil and groundwater conditions, verification of the presence and size of the reinforcing steel cage and anchor bolts, and verification that the foundation bearing material is suitable and consistent with the soil borings performed.

Concrete Slab-on-Grade

The subgrade soils utilized for the support of slabs-on-grade should be prepared as indicated in the Site Preparation Section of this report. It appears that newly placed engineered fill (emplaced on suitable native soils) will be adequate for support of concrete slabs. If soft, loose or unsuitable fill soils are encountered at the subgrade level, we recommend that these materials be undercut to an adequate depth and replaced with properly compacted granular or low plasticity fill soil. Proof-Rolling, as discussed earlier in this report, should be performed to identify any soft or unsuitable soils, which should then be removed from the floor slab area prior to fill placement and/or floor slab construction.

A granular mat should be provided between the floor slab and the subgrade soil. It should be four inches or greater in thickness and be properly compacted as recommended in this report. The granular mat materials should comply with the current version of **ACI 302.1**.

Slabs should be suitably reinforced to make them as rigid as necessary. Proper joints should be provided at the junctions of the slab and the foundation system so that a small amount of independent movement can occur without causing damage. The floor areas should be provided with joints at frequent intervals to compensate for concrete volume changes during curing. If a vapor retarder/barrier is utilized, placement should be following the current version of ACI 302.1, local building codes and the recommendations of the flooring manufacturer. **A modulus of subgrade reaction for the native soils (or imported fills) specified and conditioned as described in this report of 110 psi/in (pci) may be used for the floor slab design.** This value may be confirmed in the field by performing a 1-foot by 1-foot plate load test. However, depending on how the slab load is applied, the value must be geometrically modified.

Pavement Section Recommendations

Based on the scope of service requested by City of Rochester, California Bearing Ratio (CBR) analysis was not performed on samples of the expected subgrade soils. In lieu of extensive testing for determination of pavement subgrade support characteristics, we have made considerations based on our experience



and the results from the Standard Penetration Test (SPT), Dynamic Cone Penetration Test (DCP), and laboratory testing performed. These considerations are based on the removal and replacement of any existing fill soil affecting the pavement areas or subgrade as discussed in the Site Preparation Section of this report.

Estimated Soil Parameters

- Estimated Cohesive/Plastic Subgrade CBR 3 to 4 percent.
- Design Cohesive Subgrade Resilient Modulus (M_R) = 4,000 to 5,000 psi

Parking Lots, Driveways, And Paved Trail (SB-01 through SB-36)

Recommended Design Inputs

- Reliability = 85% flexible & 95% rigid
- Standard Deviation = 0.49 flexible & 0.39 rigid
- Initial Serviceability Index = 4.2
- Terminal Serviceability Index = 2.0
- New HMA Layer Coefficient = 0.42
- New Aggregate Base Layer Coefficient = 0.14

Traffic Considerations (20-year Design Life)

- Light Duty - 25,000 ESAL's (Construction and Service; automobile parking areas)
- Medium Duty - 100,000 ESAL's (Construction and Service; automobile roadways)

The CBR value should be verified by the most updated version of the ASTM laboratory test method **D1883**, and specific traffic frequencies and axle loading determined prior to pavement design acceptance. In accepting the following pavement designs based on the correlated CBR value, City of Rochester must then accept a greater risk of over-design or pavement failure and/or higher maintenance costs.

In view of the available soil information, the recommended site preparation activities, and from experience on similar projects, PSI is providing the following pavement sections for the pavement areas on this site. The first flexible profile will consist of a "medium duty" pavement, to be used by passenger vehicles in the main parking areas. The second flexible profile will be a "heavy duty" pavement, which should be utilized in areas of channeled traffic (i.e., entrance and exit drives and areas of heavy loading). The third section will be a rigid concrete pavement, which may be a more suitable alternative for the heavy-duty areas, and for areas supporting dumpsters, or where garbage and delivery trucks are turning and/or parking.

For the subgrade conditions and anticipated traffic loads, we have calculated a minimum required flexible design structural number 2.00 for standard duty. Based on the *PAVEExpress* software design outputs and local practices, PSI recommends the following minimum pavement sections:



Table 12: Pavement Sections			
Pavement Section	Light Duty – Flexible (25,000 ESAL’s)	Standard Duty – Flexible (100,000 ESAL’s)	Standard Duty – Rigid (100,000 ESAL’s)
Wearing Course	1" MDOT 36A	1" MDOT 36A	6" MDOT S1 Concrete
Leveling Course	2" MDOT 13A	2½" MDOT 13A	
Aggregate Course	6" MDOT 21AA	8" MDOT 21AA	8" MDOT 21AA

The flexible pavement designs should incorporate high quality; high stability plant mixes being supplied with design properties; and aggregate gradation meeting or exceeding the requirements as outlined in the 2012 MDOT Standard Specification Section 501. The crushed aggregate base course should conform to the requirements of **MDOT Class 21AA**.

The above pavement sections are based on the **AASHTO** design methods for flexible and rigid pavement design and are based on a design life of 20 years and the estimated subgrade support values. The sections represent typical medium and heavy-duty type pavement sections for use in design. Final pavement section design should be provided by the design civil engineers based on actual traffic volumes and axle loads, laboratory determined CBR tests, and the owner's design life requirements. Periodic maintenance should be expected and performed on all pavements during the service life. All pavement materials and construction procedures should conform to (Michigan Department of Transportation) MDOT or appropriate local requirements.

Placement of geogrid below flexible pavements may be a suitable alternative to utilizing a rigid pavement section in heavy-duty areas (particularly near the entrances and exits). The geogrid reinforcement should be placed immediately below the aggregate base (**MDOT 21AA**) stratum. Construction equipment should not be permitted on the geogrid reinforcement; otherwise, damage may occur to the geogrid product. Furthermore, all other recommendations regarding the transportation, stockpiling, and installation of the geogrid reinforcement by the manufacturer should be followed. PSI should observe and document the installation of the geogrid product.

These pavements may be placed after the subgrade has been properly prepared as outlined in this report. Unstable areas should be treated as outlined therein. Appropriate drainage, including finger drains around catch basins and perimeter drainage must be incorporated into the pavement design. **Inadequate drainage will result in heaving and significant distress to the pavement.**

The aggregate base should comply with the gradation requirements of an MDOT 21AA (or similar) dense-graded aggregate. It should be compacted to 95 percent of the maximum dry density as determined by **ASTM D1557** (Modified Proctor). The asphalt leveling and wearing courses and concrete for the development should comply with the master composition requirements of **MDOT 2012** Standard Specifications for Construction and Supplemental Specifications. The placement of the pavement should also comply with MDOT construction specifications.

It is recommended that rigid concrete pavement be provided. This will provide for the proposed dumpster pad. Concrete design parameters include: (a) a 28-day mean modulus of rupture of 670 psi, and (b) a 28-day mean modulus of elasticity of approximately 4,200,000 psi. In addition, the concrete mix design should consist of normal weight concrete with a minimum 28-day compressive strength of 4,000 psi when



tested in accordance with **ASTM C39**. The concrete should contain an air-entraining admixture to resist the effects of freezing and thawing. The design of joints, joint spacing, doweling and steel/wire mesh reinforcement was not included in PSI's Scope-of-Services, but should conform to the applicable local or MDOT requirements.

Vehicle traffic or the loading of a partially constructed pavement section will likely cause premature pavement failure. All vehicle traffic or pavement loading should be restricted until the pavement section has been completely constructed or the partial pavement section must be designed for this purpose, particularly if construction traffic will use the partial pavement.

It should be recognized that all pavements require regular maintenance and occasional repairs to keep the pavements in a serviceable condition. Of particular value, is a timely sealing of joints and cracks, which if left un-repaired, can serve to permit water to enter the pavement section and cause rapid deterioration of the pavement during freeze-thaw cycles. The need for such maintenance and repair is not necessarily indicative of premature pavement failure. However, if appropriate maintenance and repairs are not performed on a timely basis, the serviceable life of the pavement can be reduced significantly.

Adams Road Widening (SB-37 through SB-46)

- Estimated Average Subgrade CBR = 3 to 5 percent
- Estimated Average Subgrade Modulus, $M_R = 4,000$ to $6,000$ psi
- For poorly graded sand (SP) prepared as subgrade to receive new pavement, a CBR value of 6 and resilient modulus of $7,000$ psi may be used for design and reconstruction of the pavement section.

The pavement design should be based on the **AASHTO** design methods for flexible pavement design and based on a design life of 20 years. Final pavement section thicknesses should be provided by the design civil engineers based on actual traffic volumes and axle loads, laboratory determined California Bearing Ratio tests, and the owner's design life requirements. Periodic maintenance should be expected and performed on all pavements during the service life. All pavement materials and construction procedures should conform to (Michigan Department of Transportation) MDOT or appropriate local requirements.

CONSTRUCTION CONSIDERATIONS

Drainage and Groundwater Considerations

Free groundwater was encountered during drilling operations and observed upon completion of drilling operations at soil boring locations **SB-05**, **SB-11**, **SB-25**, **SB-36**, and **SB-45A** at depths ranged between approximately 18 and 34 feet below the existing ground surface, during late-July to late-August 2025. Therefore, difficulty with groundwater seepage and subgrade instability may not be anticipated during earthwork, foundation excavation and construction associated with the proposed project. However, it is possible for the groundwater table to vary within the depths explored during other times of the year depending upon climatic conditions (seasonal fluctuation). PSI recommends that the contractor verify the actual groundwater and seepage conditions at the time of the construction activities and propose the groundwater control methods for the Engineer's approval, including the disposal of discharge water. Every effort should be made to keep the excavations and any other prepared subgrades dry if water is



encountered or if rainfall or snowmelt occurs during construction. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

Water should not be allowed to collect in foundation or subsurface level excavations or other prepared subgrades of the construction area, either during or after construction. Water accumulation should be removed from shallow excavations by pumping from sump pits placed around the perimeter of the excavation. Positive site surface drainage should be provided to reduce infiltration of surface water. The grades should be sloped away from the proposed structures and surface drainage should be collected and discharged.

Excavation Safety Considerations

Care must be taken so that all excavations are properly backfilled with suitable material compacted in accordance with the procedures outlined in this report. Before the backfill is placed, all water and loose debris should be removed from these excavations. Typically, soils penetrated by augers can be removed with conventional earthmoving equipment (backhoe and/or trencher). However, subsurface excavation equipment varies, and field refusal conditions may vary as well. Therefore, it is possible that difficult excavation conditions may be encountered at the proposed site location between the boring locations. Excavation near any existing structure or utility must be performed with the utmost of care and under the supervision of the geotechnical engineer's representative. Locations of all underground utilities within the proposed site must be verified by the Contractor prior to excavation.

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (**OSHA**) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document was issued to better insure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavation or footing excavations, be constructed in accordance with OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the Owner and the Contractor could be liable for substantial penalties.

The Contractor is solely responsible for designing and constructing stable, safe, temporary excavations and should shore, slope or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The Contractor's "responsible person", as defined in **29 CFR Part 1926**, must evaluate the soil exposed in the excavations as part of the Contractor's safety procedures.

The angle of the excavation side slopes must strictly be decided based on the soil type and unconfined compressive strength of the excavated soil per OSHA requirements. For Type A soils, such as clay above water table having unconfined compressive strength values equal to or more than 1½ ton per square foot (tsf), the maximum allowable slope for excavations up to 20 feet deep is ¾ (Horizontal) :1 (Vertical). For Type B soils, such as clay above water table having unconfined compressive strength values between ½ to 1½ ton per square foot (tsf), or angular gravel, the maximum allowable slope for excavations up to 20 feet deep is 1 (Horizontal) :1 (Vertical). For Type C soils, such as clay above water table having unconfined



compressive strength values less than ½ ton per square foot (tsf), or granular soils such as gravel and sand, and all submerged soils, the maximum allowable slope for excavations up to 20 feet deep is 1½ (Horizontal) :1 (Vertical). The Contractor should be aware that slope height, slope inclination, and excavation depth should not exceed the specified local, state, and federal regulations.

Earthwork, subgrade preparation, and foundation construction operations must be conducted in strict accordance with the project specifications and under the supervision of the geotechnical engineer or his representative. PSI is providing this information solely as a service to City of Rochester Hills. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulation.

GEOTECHNICAL RISK

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment, experience, and regular observation during construction activities and equipment installations. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as planned. The engineering recommendations presented in the preceding sections constitute PSI's professional estimate of those measures that are necessary for the proposed structure to perform according to the proposed design based on the information generated and referenced during this evaluation, and PSI's experience in working with these conditions.



REPORT LIMITATIONS

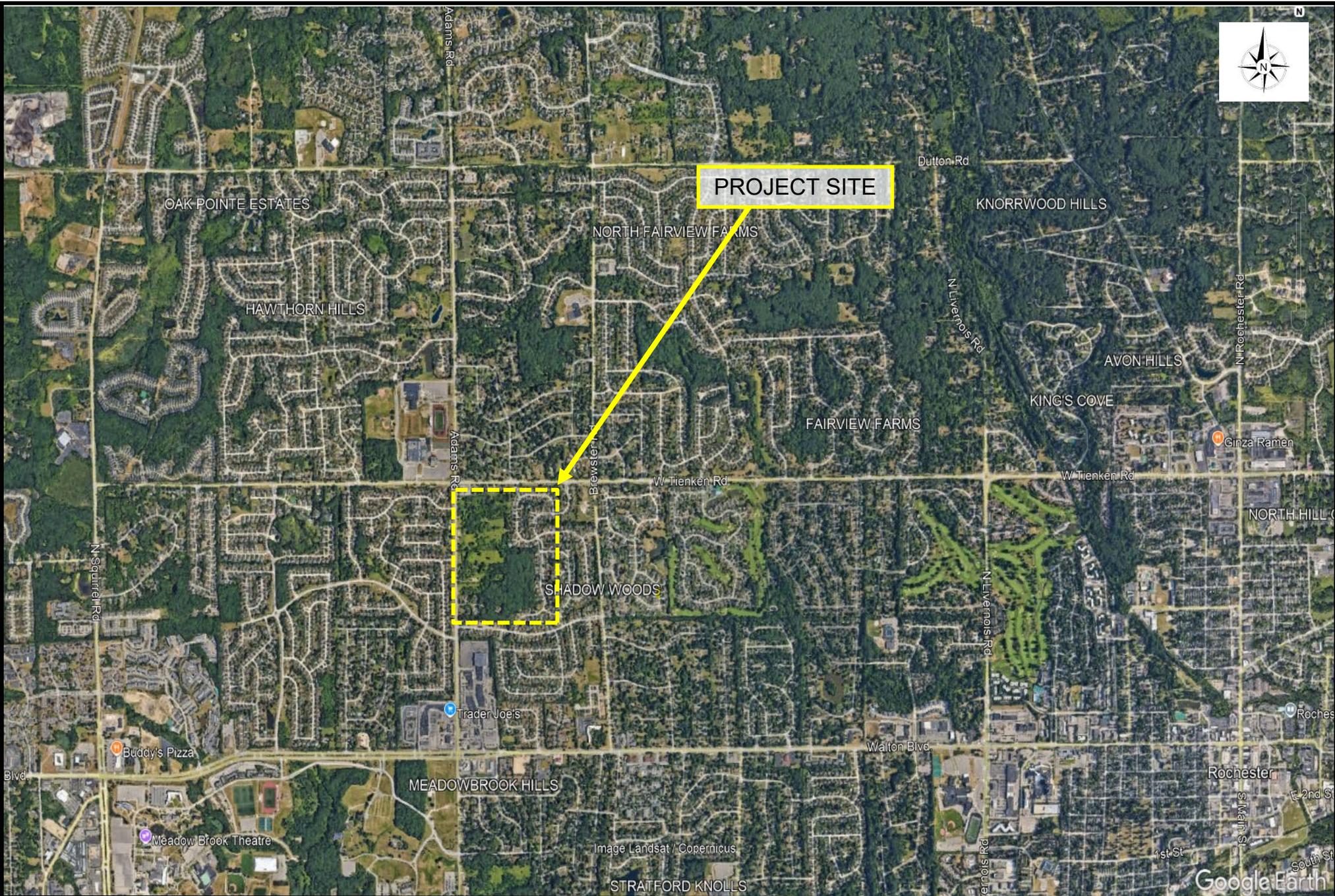
The recommendations submitted for the Nowicki Park Improvement Project that is located along Adams Road in the City of Rochester Hills, Oakland County, Michigan are based on the available soil information and the design details furnished by **the City of Rochester Hills**. If there are any revisions to the plans or structural loads for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI must be notified immediately to determine if changes in the foundation recommendations are required. If PSI is not retained to perform these functions, PSI cannot be responsible for the impact of those conditions on the performance of the project.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

After the plans and specifications are complete, PSI should be retained to review the final design plans and specifications. This review is required to verify that the engineering recommendations are appropriate for the final configuration and that they have been properly incorporated into the design documents. This report has been prepared for the exclusive use of The City of Rochester Hills for specific application to Nowicki Park Improvement Project that is located along Adams Road in the City of Rochester Hills, Oakland County, Michigan.

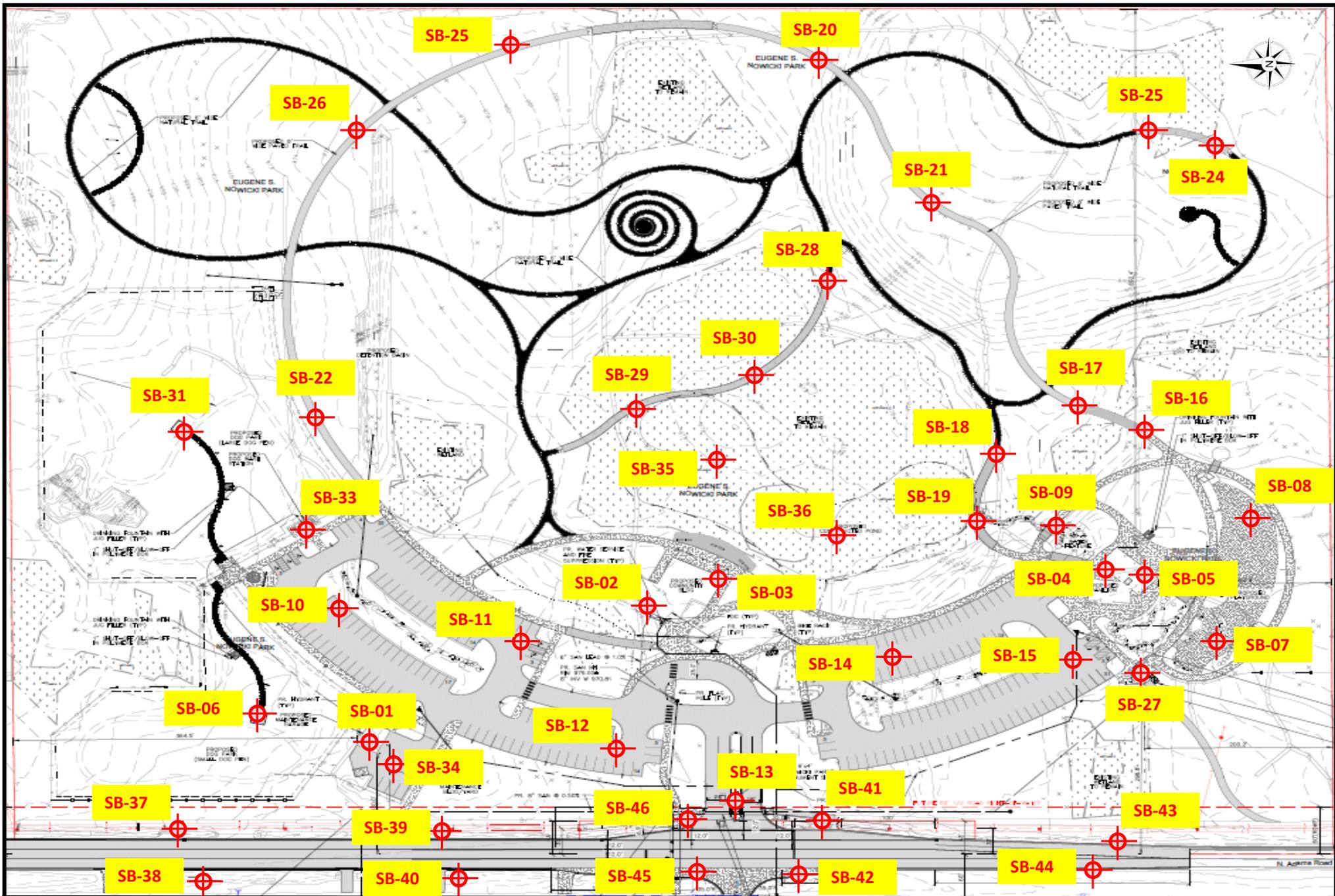


APPENDIX



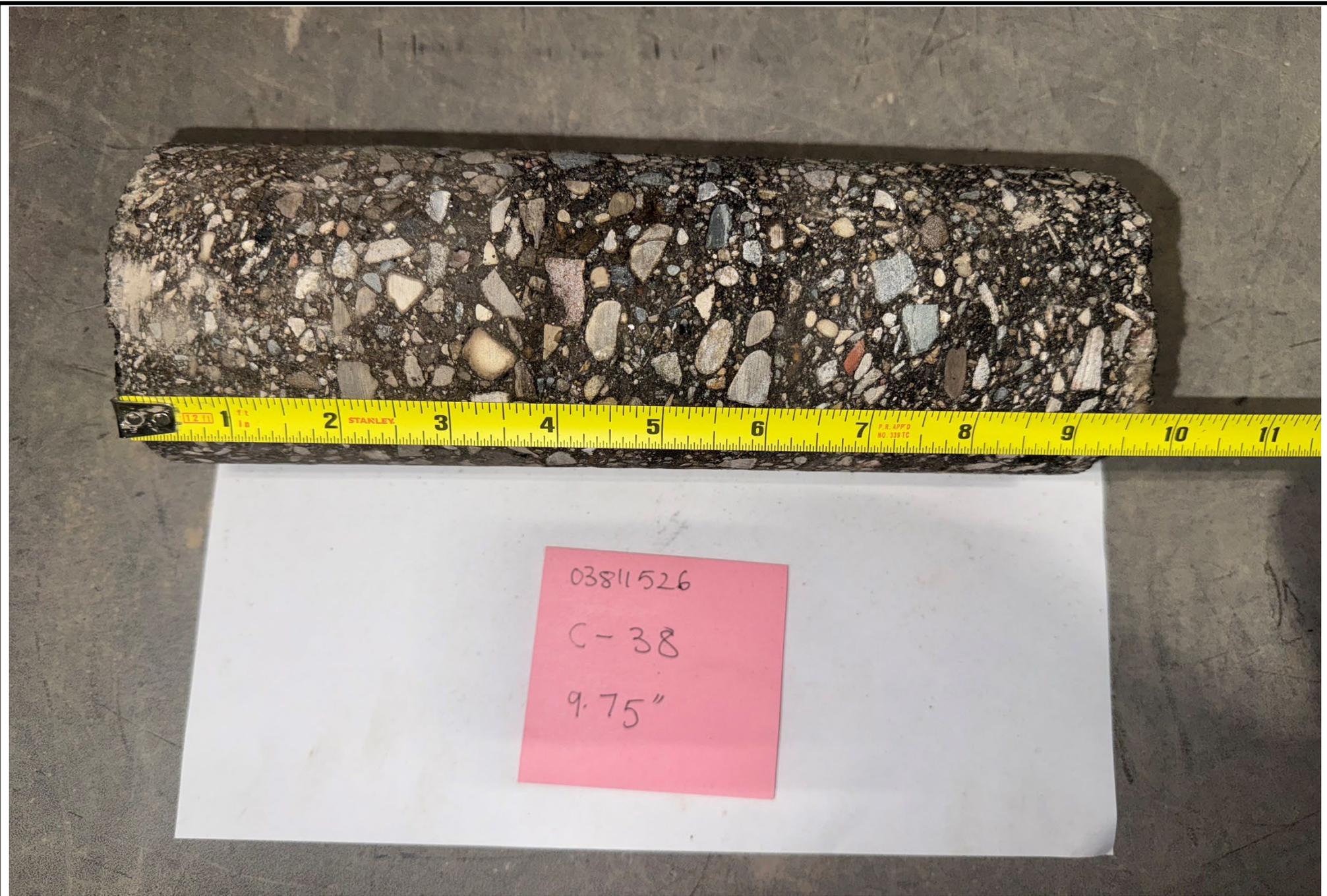
SITE LOCATION DIAGRAM
Nowicki Park Improvements
Adams Rd
Rochester Hills, MI

FIGURE NO. 1
PSI Project No. 03811526
Prepared By: Rabia Azam
Prepared On: 7/16/2025



BORING LOCATION DIAGRAM
Nowicki Park Improvements
Adams Rd
Rochester Hills, MI

FIGURE NO. 2
PSI Project No. 03811526
Prepared By: Rabia Azam
Prepared On: 7/16/2025



C- 38 Asphalt Core

Date cored: 8/21/2025

Concrete Thickness: 9.75 inches

PSI Project Name: Nowicki Park Improvements

PLATE NO. 1

PSI Project No. 03811526

Prepared By: Rabia Azam

Prepared On: 8/26/2025



03811526

C-40

12.75"



C- 40 Asphalt Core

Date cored: 8/21/2025

Concrete Thickness: 12.75 inches

PSI Project Name: Nowicki Park Improvements

PLATE NO. 2

PSI Project No. 03811526

Prepared By: Rabia Azam

Prepared On: 8/26/2025



03811526
C-41
7.0"



C- 41 Asphalt Core
Date cored: 8/21/2025
Concrete Thickness: 7.0 inches
PSI Project Name: Nowicki Park Improvements

PLATE NO. 3
PSI Project No. 03811526
Prepared By: Rabia Azam
Prepared On: 8/26/2025

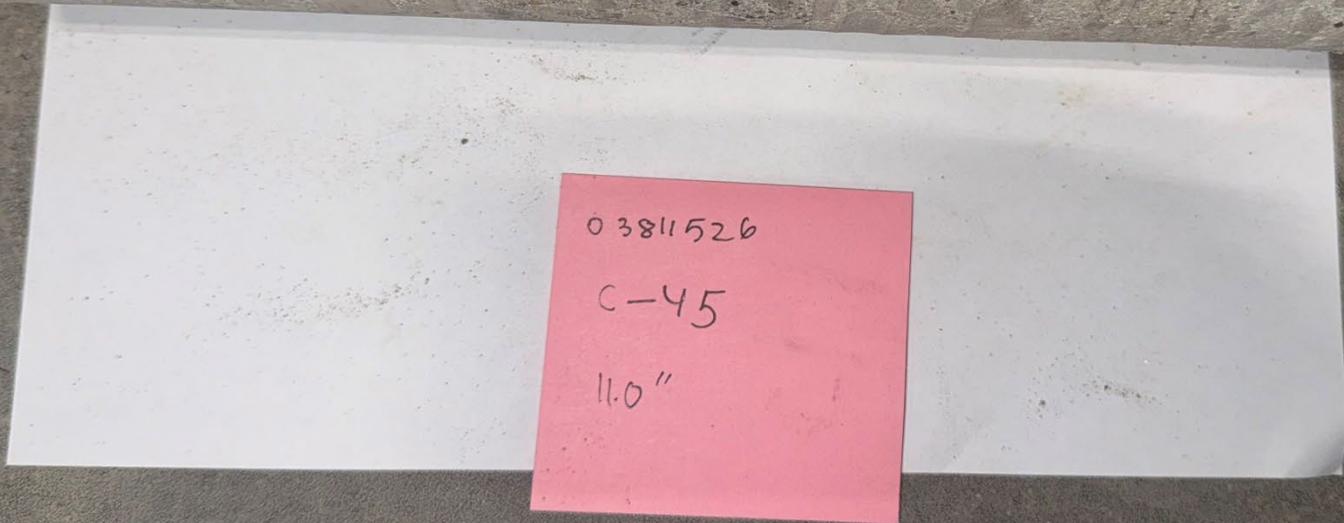


03811526
C-42
[REDACTED]
9.25"



C-42 Concrete Core (Re-drilled)
Date cored: 8/21/2025
Concrete Thickness: 9.25 inches
PSI Project Name: Nowicki Park Improvements

PLATE NO. 4
PSI Project No. 03811526
Prepared By: Rabia Azam
Prepared On: 8/26/2025



C- 45 Concrete Core (Re-drilled)

Date cored: 8/21/2025

Concrete Thickness: 11.0 inches

PSI Project Name: Nowicki Park Improvements

PLATE NO. 5

PSI Project No. 03811526

Prepared By: Rabia Azam

Prepared On: 8/26/2025



03811526
C-46
7.0"



C- 46 Asphalt Core
Date cored: 8/21/2025
Concrete Thickness: 7.0 inches
PSI Project Name: Nowicki Park Improvements

PLATE NO. 6
PSI Project No. 03811526
Prepared By: Rabia Azam
Prepared On: 8/26/2025

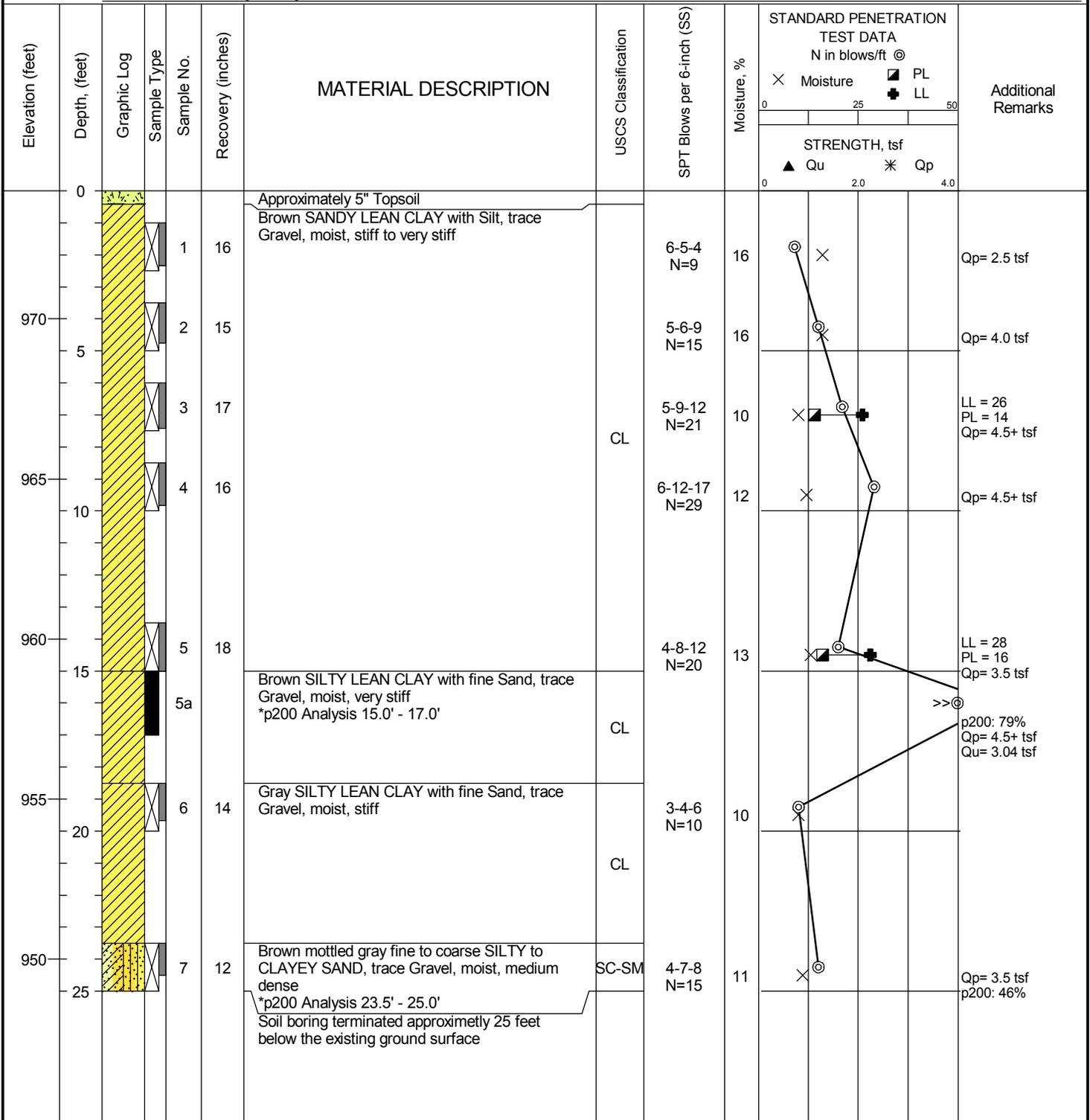
DATE STARTED: 7/21/25
DATE COMPLETED: 7/21/25
COMPLETION DEPTH: 25.0 ft
BENCHMARK: N/A
ELEVATION: 974 ft
LATITUDE: 42.691426°
LONGITUDE: -83.193971°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-01

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams



Professional Service Industries, Inc.
 45000 Helm Street, Suite 200
 Plymouth, MI 48170
 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/23/25
DATE COMPLETED: 7/23/25
COMPLETION DEPTH: 25.0 ft
BENCHMARK: N/A
ELEVATION: 978 ft
LATITUDE: 42.690753°
LONGITUDE: -83.19322°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-02

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	STANDARD PENETRATION TEST DATA		Additional Remarks
									N in blows/ft @		
									Moisture, %		
									0 25 50	X Moisture ◻ PL ◻ LL	
										STRENGTH, tsf	
										▲ Qu * Qp	
									0 2.0 4.0		
978	0	Approximately 6.0" Topsoil									
975	3	Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, very loose		1	18		SC-SM	1-1-2 N=3	14		
970	5	Brown SANDY to SILTY LEAN CLAY, trace Gravel, moist, firm		2	18		CL-ML	4-4-3 N=7	11		LL = 17 PL = 12
965	10	Brown SANDY LEAN CLAY with Silt, trace Gravel, moist, very stiff		3	17			4-7-9 N=16	13		Qp = 1.25 tsf
960	15			4	18		CL	5-8-10 N=18	14		LL = 26 PL = 15 Qp = 4.5+ tsf
955	20	Gray SILTY LEAN CLAY with fine Sand, trace Gravel, moist, stiff to very stiff		5	18			5-8-9 N=17	10		Qp = 4.5+ tsf
950	25			6	18		CL	3-5-7 N=12	28		LL = 34 PL = 19 Qp = 2.5 tsf
945	25			7	18			4-5-7 N=12	11		Qp = 1.5 tsf
		Soil boring terminated approximately 25 feet below the existing ground surface									



Professional Service Industries, Inc.
 45000 Helm Street, Suite 200
 Plymouth, MI 48170
 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/28/25
DATE COMPLETED: 7/28/25
COMPLETION DEPTH: 25.0 ft
BENCHMARK: N/A
ELEVATION: 979 ft
LATITUDE: 42.690533°
LONGITUDE: -83.193108°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-03

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks	
0		Approximately 7.0" Topsoil										
975	15	Brown SANDY LEAN CLAY with Silt, trace Gravel, moist, soft	1	15			CL	3-2-2 N=4	17	⊗	Qp = 2.5 tsf	
975	16	Brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, stiff to very stiff	2	16			CL	3-4-9 N=13	13	⊗, ⊕, ⊞	LL = 24 PL = 14 Qp = 4.5+ tsf	
970	14		3	14			CL	4-7-10 N=17	10	⊗, ⊕	Qp = 4.5+ tsf	
970	17	Gray SILTY LEAN CLAY with fine Sand, trace Gravel, moist, very stiff to hard	4	17			CL	5-13-18 N=31	11	⊗, ⊕	Qp = 4.5+ tsf	
965	16		5	16			CL	5-7-9 N=16	10	⊗, ⊕	LL = 19 PL = 11 Qp = 2.5 tsf	
960	17	Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, medium dense *p200 Analysis 18.5' - 20.0'	6	17			SC	3-5-9 N=14	12	⊗	p200: 43%	
955	17	Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, medium dense *p200 Analysis 23.5' - 25.0'	7	17			SC	3-4-9 N=13	10	⊗	Qp = 2.0 tsf p200: 39%	
	25	Soil boring terminated approximately 25 feet below the existing ground surface										



Professional Service Industries, Inc.
 45000 Helm Street, Suite 200
 Plymouth, MI 48170
 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/22/25
 DATE COMPLETED: 7/22/25
 COMPLETION DEPTH: 25.0 ft
 BENCHMARK: N/A
 ELEVATION: 989 ft
 LATITUDE: 42.689386°
 LONGITUDE: -83.193133°
 STATION: N/A OFFSET: N/A

DRILL COMPANY: PSI, Inc.
 DRILLER: Z. Simpson LOGGED BY: I. Alhemyari
 DRILL RIG: CME-55 Truck Rig
 DRILLING METHOD: 3.25" HSA
 SAMPLING METHOD: SS
 HAMMER TYPE: Automatic
 EFFICIENCY: 80%
 REVIEWED BY: T. Khalaff

BORING SB-04

Water
 ▽ While Drilling N/A
 ▽ Upon Completion N/A
 ▽ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

REMARKS: borehole backfilled with auger cuttings

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0		Approximately 5.5" Topsoil									
985	5	Brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, firm to very stiff		1	16		4-4-3 N=7	17	17	Qp = 0.5 tsf	
980	10			2	14		5-10-11 N=21	12	12	LL = 25 PL = 13 Qp = 4.5+ tsf	
975	15			3	16		6-8-12 N=20	12	12	Qp = 4.5+ tsf	
970	20			4	16		7-10-17 N=27	13	13	LL = 28 PL = 15 Qp = 4.5+ tsf	
965	25			5	17		7-12-14 N=26	12	12	Qp = 4.5+ tsf	
		Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, medium dense *p200 Analysis 23.5' - 25.0'		6	17		3-5-7 N=12	9	9	Qp = 0.5 tsf	
		Soil boring terminated approximately 25 feet below the existing ground surface		7	17		3-4-9 N=13	9	9	Qp = 1.0 tsf p200: 46%	



Professional Service Industries, Inc.
 45000 Helm Street, Suite 200
 Plymouth, MI 48170
 Telephone: (248) 957-9911

PROJECT NO.: 03811526
 PROJECT: Nowicki Park Improvements
 LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/22/25
 DATE COMPLETED: 7/22/25
 COMPLETION DEPTH: 25.0 ft
 BENCHMARK: N/A
 ELEVATION: 989 ft
 LATITUDE: 42.689245°
 LONGITUDE: -83.193047°
 STATION: N/A OFFSET: N/A

DRILL COMPANY: PSI, Inc.
 DRILLER: Z. Simpson LOGGED BY: I. Alhemyari
 DRILL RIG: CME-55 Truck Rig
 DRILLING METHOD: 3.25" HSA
 SAMPLING METHOD: SS
 HAMMER TYPE: Automatic
 EFFICIENCY: 80%
 REVIEWED BY: T. Khalaff

BORING SB-05

Water
 ▽ While Drilling 25 feet
 ▽ Upon Completion 25 feet
 ▽ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

REMARKS: borehole backfilled with auger cuttings

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0		Approximately 6.0" Topsoil									
985	15	Brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, firm to very stiff		1	15		CL	3-2-2 N=4	15	Qp = 0.25 tsf	
985	16			2	16		CL	3-8-12 N=20	13	Qp = 4.5+ tsf	
980	16			3	16		CL	4-7-14 N=21	12	LL = 26 PL = 15 Qp = 4.5+ tsf	
980	16			4	16		CL	7-13-14 N=27	12	Qp = 4.5+ tsf	
975	17			5	17		CL	5-13-16 N=29	13	LL = 23 PL = 12 Qp = 3.5 tsf	
970	20	Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, medium dense *p200 Analysis 18.5' - 20.0'		6	16		SC-SM	7-10-17 N=27	16	p200: 16%	
965	25	Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist to wet, medium dense *p200 Analysis 23.5' - 25.0'		7	16		SC-SM	5-5-6 N=11	10	Qp = 1.25 tsf p200: 43%	
		Soil boring terminated approximately 25 feet below the existing ground surface									



Professional Service Industries, Inc.
 45000 Helm Street, Suite 200
 Plymouth, MI 48170
 Telephone: (248) 957-9911

PROJECT NO.: 03811526
 PROJECT: Nowicki Park Improvements
 LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/21/25
DATE COMPLETED: 7/21/25
COMPLETION DEPTH: 15.0 ft
BENCHMARK: N/A
ELEVATION: 970 ft
LATITUDE: 42.691789°
LONGITUDE: -83.193935°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-06

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0		Approximately 6.5" Topsoil									
		Brown SANDY LEAN CLAY with Silt, trace Gravel, moist, stiff		1	16		CL	4-5-5 N=10	15		Qp= 3.25 tsf
		Brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, firm to stiff		2	15		CL	1-1-3 N=4	34		Qp= 1.5 tsf
965	5			3	18		CL	2-3-7 N=10	13		LL = 20 PL = 12 Qp= 2.5 tsf
		Brown SILT with fine Sand, moist, dense		4	16		ML	6-13-16 N=29	19		Qp= 0.5 tsf
960	10			5	16		CL	2-5-5 N=10	12		Qp= 2.0 tsf
955	15					Gray SILTY LEAN CLAY with fine Sand, trace Gravel, moist, stiff					
		Soil boring terminated approximately 15 feet below the existing ground surface									



Professional Service Industries, Inc.
 45000 Helm Street, Suite 200
 Plymouth, MI 48170
 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/18/25 **DRILL COMPANY:** PSI, Inc.
DATE COMPLETED: 7/18/25 **DRILLER:** Z. Simpson **LOGGED BY:** I. Alhemyari
COMPLETION DEPTH: 5.0 ft **DRILL RIG:** Hand Auger
BENCHMARK: N/A **DRILLING METHOD:** HA
ELEVATION: 987 ft **SAMPLING METHOD:**
LATITUDE: 42.688994° **HAMMER TYPE:** Automatic
LONGITUDE: -83.193419° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** T. Khalaff
REMARKS: borehole backfilled with auger cuttings

BORING SB-07

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @				Additional Remarks	
									X Moisture □ PL + LL	STRENGTH, tsf ▲ Qu * Qp				
								0 25 50						
985	0					Approximately 5.0" Brown topsoil Brown SANDY LEAN CLAY with Silt, trace Gravel, moist	CL	35				X		
	5					Hand Auger terminated approximately 5 feet below the existing ground surface		18				X		
						DCP RESULTS at 1': 1 drops ber 2- Inch at 3.5': 3 drops ber 2- Inch								



Professional Service Industries, Inc.
 45000 Helm Street, Suite 200
 Plymouth, MI 48170
 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/18/25	DRILL COMPANY: PSI, Inc.	BORING SB-08
DATE COMPLETED: 7/18/25	DRILLER: Z. Simpson LOGGED BY: I. Alhemyari	
COMPLETION DEPTH: 5.0 ft	DRILL RIG: Hand Auger	Water <input type="checkbox"/> While Drilling N/A <input type="checkbox"/> Upon Completion N/A <input type="checkbox"/> Cave In Depth N/A
BENCHMARK: N/A	DRILLING METHOD: HA	BORING LOCATION: See Boring Location Diagrams
ELEVATION: 989 ft	SAMPLING METHOD:	
LATITUDE: 42.688994°	HAMMER TYPE: Automatic	
LONGITUDE: -83.192899°	EFFICIENCY: N/A	
STATION: N/A OFFSET: N/A	REVIEWED BY: T. Khalaff	
REMARKS: borehole backfilled with auger cuttings		

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @				Additional Remarks
									<input type="checkbox"/> Moisture <input type="checkbox"/> PL <input type="checkbox"/> LL				
									STRENGTH, tsf <input type="checkbox"/> Qu <input type="checkbox"/> Qp				
0						Approximately 6.0" Topsoil							
						Brown SANDY LEAN CLAY with Silt, trace Gravel, moist	CL	18	×				
985						Hand Auger terminated approximately 5 feet below the existing ground surface		18	×				
	5					DCP RESULTS at 1': 3 drops ber 2- Inch at 3.5': 1 drops ber 2- Inch							

	Professional Service Industries, Inc. 45000 Helm Street, Suite 200 Plymouth, MI 48170 Telephone: (248) 957-9911	PROJECT NO.: 03811526
		PROJECT: Nowicki Park Improvements
		LOCATION: City of Rochester Hills
		Oakland County, Michigan

DATE STARTED: 7/23/25
DATE COMPLETED: 7/23/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 982 ft
LATITUDE: 42.689522°
LONGITUDE: -83.192855°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-09

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0		Approximately 7.0" Topsoil									
980		Brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, very stiff to hard		1	16		CL	2-3-18 N=21	16	Qp = 2.5 tsf	
5				2	15		CL	5-9-13 N=22	11	LL = 24 PL = 15 Qp = 4.0 tsf	
975				3	16		CL	7-11-13 N=24	9	Qp = 4.5+ tsf	
10				4	17		CL	6-14-17 N=31	11	Qp = 4.5+ tsf	
970											
15		Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, loose to medium dense *p200 Analysis 18.5' - 20.0'		5	17		SC-SM	3-5-7 N=12	9	Qp = 1.0 tsf	
965											
20				6	17		SC-SM	3-3-6 N=9	10	Qp = 1.5 tsf p200: 47%	
960											
25		Gray SILTY LEAN CLAY with fine Sand, trace Gravel, moist, stiff to very stiff		7	16		CL	3-4-4 N=8	24	LL = 30 PL = 18 Qp = 0.25 tsf	
955											

Continued Next Page



Professional Service Industries, Inc.
 45000 Helm Street, Suite 200
 Plymouth, MI 48170
 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/23/25
DATE COMPLETED: 7/23/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 982 ft
LATITUDE: 42.689522°
LONGITUDE: -83.192855°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-09

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
950	30			8	17	Gray SILTY LEAN CLAY with fine Sand, trace Gravel, moist, stiff to very stiff	CL	6-10-11 N=21	10	X Moisture ◻ PL ◉ ◻ LL	Qp = 1.5 tsf
	35			9	17	Brown SANDY to SILTY LEAN CLAY, trace Gravel, moist, very hard	CL-ML	14-29-34 N=63	6	X Moisture ◻ PL ◉ ◻ LL	>> LL = 16 PL = 11 Qp = 3.0 tsf
						Soil boring terminated approximately 35 feet below the existing ground surface					



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 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

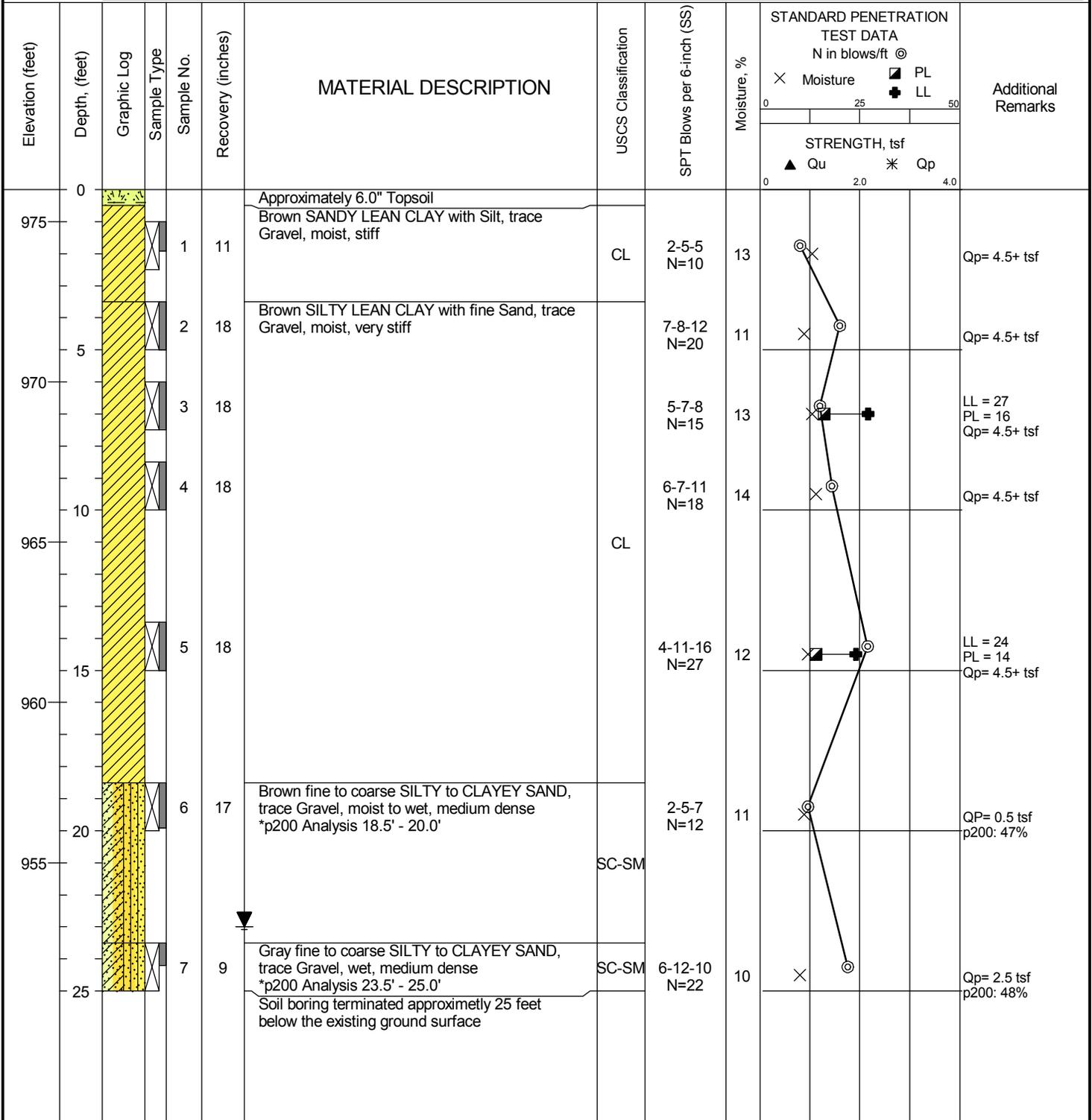
DATE STARTED: 7/23/25
DATE COMPLETED: 7/23/25
COMPLETION DEPTH: 25.0 ft
BENCHMARK: N/A
ELEVATION: 976 ft
LATITUDE: 42.691036°
LONGITUDE: -83.19317°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-11

Water	▽ While Drilling	23 feet
	▼ Upon Completion	23 feet
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams



Professional Service Industries, Inc.
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 Plymouth, MI 48170
 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/18/25	DRILL COMPANY: PSI, Inc.	BORING SB-12									
DATE COMPLETED: 7/18/25	DRILLER: Z. Simpson LOGGED BY: I. Alhemyari										
COMPLETION DEPTH: 5.0 ft	DRILL RIG: Hand Auger	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:5%; text-align: center;">Water</td> <td style="width:15%;"><input type="checkbox"/> While Drilling</td> <td style="width:80%;">N/A</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Upon Completion</td> <td>N/A</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Cave In Depth</td> <td>N/A</td> </tr> </table>	Water	<input type="checkbox"/> While Drilling	N/A		<input type="checkbox"/> Upon Completion	N/A		<input type="checkbox"/> Cave In Depth	N/A
Water	<input type="checkbox"/> While Drilling		N/A								
	<input type="checkbox"/> Upon Completion		N/A								
	<input type="checkbox"/> Cave In Depth	N/A									
BENCHMARK: N/A	DRILLING METHOD: HA	BORING LOCATION: See Boring Location Diagrams									
ELEVATION: 979 ft	SAMPLING METHOD:										
LATITUDE: 42.690735°	HAMMER TYPE: Automatic										
LONGITUDE: -83.193946°	EFFICIENCY: N/A										
STATION: N/A OFFSET: N/A	REVIEWED BY: T. Khalaff										
REMARKS: borehole backfilled with auger cuttings											

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STRENGTH, tsf	Additional Remarks
0						Approximately 6.0" Topsoil				
975						Brown fine to coarse POORLY GRADED SAND with Silt, trace Gravel, moist	SP-SM	9	×	
5						Hand Auger terminated approximately 5 feet below the existing ground surface		8	×	
						<p>DCP RESULTS</p> <p>at 1': 1 drops ber 2- Inch</p> <p>at 3.5': 1 drops ber 2- Inch</p>				

	Professional Service Industries, Inc. 45000 Helm Street, Suite 200 Plymouth, MI 48170 Telephone: (248) 957-9911	PROJECT NO.: 03811526
		PROJECT: Nowicki Park Improvements
		LOCATION: City of Rochester Hills
		Oakland County, Michigan

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 7/18/25	DRILL COMPANY: PSI, Inc.	BORING SB-13										
DATE COMPLETED: 7/18/25	DRILLER: Z. Simpson LOGGED BY: I. Alhemyari											
COMPLETION DEPTH: 5.0 ft	DRILL RIG: Hand Auger	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="text-align: center; vertical-align: middle;">Water</td> <td style="text-align: center;">▽</td> <td>While Drilling</td> <td style="text-align: right;">N/A</td> </tr> <tr> <td style="text-align: center;">▼</td> <td>Upon Completion</td> <td style="text-align: right;">N/A</td> </tr> <tr> <td style="text-align: center;">▽</td> <td>Cave In Depth</td> <td style="text-align: right;">N/A</td> </tr> </table>	Water	▽	While Drilling	N/A	▼	Upon Completion	N/A	▽	Cave In Depth	N/A
Water	▽			While Drilling	N/A							
	▼			Upon Completion	N/A							
	▽	Cave In Depth	N/A									
BENCHMARK: N/A	DRILLING METHOD: HA	BORING LOCATION: See Boring Location Diagrams										
ELEVATION: 980 ft	SAMPLING METHOD:											
LATITUDE: 42.690335°	HAMMER TYPE: Automatic											
LONGITUDE: -83.194227°	EFFICIENCY: N/A											
STATION: N/A OFFSET: N/A	REVIEWED BY: T. Khalaff											
REMARKS: borehole backfilled with auger cuttings												

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks								
									<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">Moisture</td> <td style="text-align: center;">■</td> <td style="text-align: center;">PL</td> </tr> <tr> <td style="text-align: center;">+</td> <td style="text-align: center;">LL</td> <td colspan="2"></td> </tr> </table>	X	Moisture	■	PL	+	LL			
X	Moisture	■	PL															
+	LL																	
									<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">STRENGTH, tsf</td> </tr> <tr> <td style="text-align: center;">▲</td> <td style="text-align: center;">* Qp</td> </tr> </table>	STRENGTH, tsf		▲	* Qp					
STRENGTH, tsf																		
▲	* Qp																	
	0					Approximately 4.0" Topsoil												
						Brown fine to coarse POORLY GRADED SAND with Silt, trace Gravel, moist (FILL)												
						Brown fine to coarse POORLY GRADED SAND with Silt, trace Gravel, moist	SP-SM	8	X									
						Brown SANDY LEAN CLAY with Silt, trace Gravel, moist	CL	18	X									
975	5					Hand Auger terminated approximately 5 feet below the existing ground surface												
						DCP RESULTS at 1': 3 drops ber 2- Inch at 3.5': 4 drops ber 2- Inch												

	Professional Service Industries, Inc. 45000 Helm Street, Suite 200 Plymouth, MI 48170 Telephone: (248) 957-9911	PROJECT NO.: 03811526
		PROJECT: Nowicki Park Improvements
		LOCATION: City of Rochester Hills
		Oakland County, Michigan

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 7/18/25
DATE COMPLETED: 7/18/25
COMPLETION DEPTH: 5.0 ft
BENCHMARK: N/A
ELEVATION: 980 ft
LATITUDE: 42.690075°
LONGITUDE: -83.193353°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: Hand Auger
DRILLING METHOD: HA
SAMPLING METHOD:
HAMMER TYPE: Automatic
EFFICIENCY: N/A
REVIEWED BY: T. Khalaff

BORING SB-14

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @				Additional Remarks
									Moisture	PL	LL		
0						Approximately 5.0" Topsoil Brown SANDY LEAN CLAY with Silt, trace Gravel, trace hair roots, moist *p200 Analysis 3.5' - 5.0'	CL	8	×				
975	5					Hand Auger terminated approximately 5 feet below the existing ground surface DCP RESULTS at 1': 3 drops ber 2- Inch at 3.5': 1 drops ber 2- Inch		11	×				p200: 53%



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/18/25	DRILL COMPANY: PSI, Inc.	BORING SB-15
DATE COMPLETED: 7/18/25	DRILLER: Z. Simpson LOGGED BY: I. Alhemyari	
COMPLETION DEPTH: 5.0 ft	DRILL RIG: Hand Auger	Water <input type="checkbox"/> While Drilling N/A <input type="checkbox"/> Upon Completion N/A <input type="checkbox"/> Cave In Depth N/A
BENCHMARK: N/A	DRILLING METHOD: HA	BORING LOCATION: See Boring Location Diagrams
ELEVATION: 989 ft	SAMPLING METHOD:	
LATITUDE: 42.689405°	HAMMER TYPE: Automatic	
LONGITUDE: -83.193501°	EFFICIENCY: N/A	
STATION: N/A OFFSET: N/A	REVIEWED BY: T. Khalaff	
REMARKS: borehole backfilled with auger cuttings		

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @				Additional Remarks	
									<input type="checkbox"/> Moisture <input type="checkbox"/> PL <input type="checkbox"/> LL					
									STRENGTH, tsf <input type="checkbox"/> Qu <input type="checkbox"/> Qp					
								0	25	50				
								0	2.0	4.0				
0						Approximately 5.0" Topsoil								
						Brown SANDY LEAN CLAY with Silt, trace Gravel, moist	CL	16						
985						Hand Auger terminated approximately 5 feet below the existing ground surface		19						
	5					DCP RESULTS at 1': 3 drops ber 2- Inch at 3.5': 6 drops ber 2- Inch								

	Professional Service Industries, Inc. 45000 Helm Street, Suite 200 Plymouth, MI 48170 Telephone: (248) 957-9911	PROJECT NO.: 03811526
		PROJECT: Nowicki Park Improvements
		LOCATION: City of Rochester Hills
		Oakland County, Michigan

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 7/18/25 **DRILL COMPANY:** PSI, Inc.
DATE COMPLETED: 7/18/25 **DRILLER:** Z. Simpson **LOGGED BY:** I. Alhemyari
COMPLETION DEPTH: 5.0 ft **DRILL RIG:** Hand Auger
BENCHMARK: N/A **DRILLING METHOD:** HA
ELEVATION: 982 ft **SAMPLING METHOD:**
LATITUDE: 42.689348° **HAMMER TYPE:** Automatic
LONGITUDE: -83.192443° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** T. Khalaff
REMARKS: borehole backfilled with auger cuttings

BORING SB-16

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @				Additional Remarks	
									X Moisture □ PL + LL					
									STRENGTH, tsf ▲ Qu * Qp					
								0	25	50	0	2.0	4.0	
980	0	[Hatched Box]				Approximately 2.0" Topsoil Dark brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist	CL	27						
	5					Hand Auger terminated approximately 5 feet below the existing ground surface		22						
						DCP RESULTS at 1': 1 drops ber 2- Inch at 3.5': 2 drops ber 2- Inch								



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 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/18/25	DRILL COMPANY: PSI, Inc.	BORING SB-17
DATE COMPLETED: 7/18/25	DRILLER: Z. Simpson LOGGED BY: I. Alhemyari	
COMPLETION DEPTH: 5.0 ft	DRILL RIG: Hand Auger	Water <input type="checkbox"/> While Drilling N/A <input type="checkbox"/> Upon Completion N/A <input type="checkbox"/> Cave In Depth N/A
BENCHMARK: N/A	DRILLING METHOD: HA	BORING LOCATION: See Boring Location Diagrams
ELEVATION: 983 ft	SAMPLING METHOD:	
LATITUDE: 42.689461°	HAMMER TYPE: Automatic	
LONGITUDE: -83.192242°	EFFICIENCY: N/A	
STATION: N/A OFFSET: N/A	REVIEWED BY: T. Khalaff	
REMARKS: borehole backfilled with auger cuttings		

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
									<input type="checkbox"/> Moisture <input type="checkbox"/> PL <input type="checkbox"/> LL	
									STRENGTH, tsf <input type="checkbox"/> Qu <input type="checkbox"/> Qp	
0	0					Approximately 6.0" Topsoil				
980						Brown SANDY LEAN CLAY with Silt, trace Gravel, moist *p200 Analysis 3.5' - 5.0'	CL	28	×	
5	5					Hand Auger terminated approximately 5 feet below the existing ground surface		18	×	p200: 65%
						DCP RESULTS at 1': 2 drops ber 2- Inch at 3.5': 4 drops ber 2- Inch				

	Professional Service Industries, Inc. 45000 Helm Street, Suite 200 Plymouth, MI 48170 Telephone: (248) 957-9911	PROJECT NO.: 03811526
		PROJECT: Nowicki Park Improvements
		LOCATION: City of Rochester Hills
		Oakland County, Michigan

The stratification lines represent approximate boundaries. The transition may be gradual.

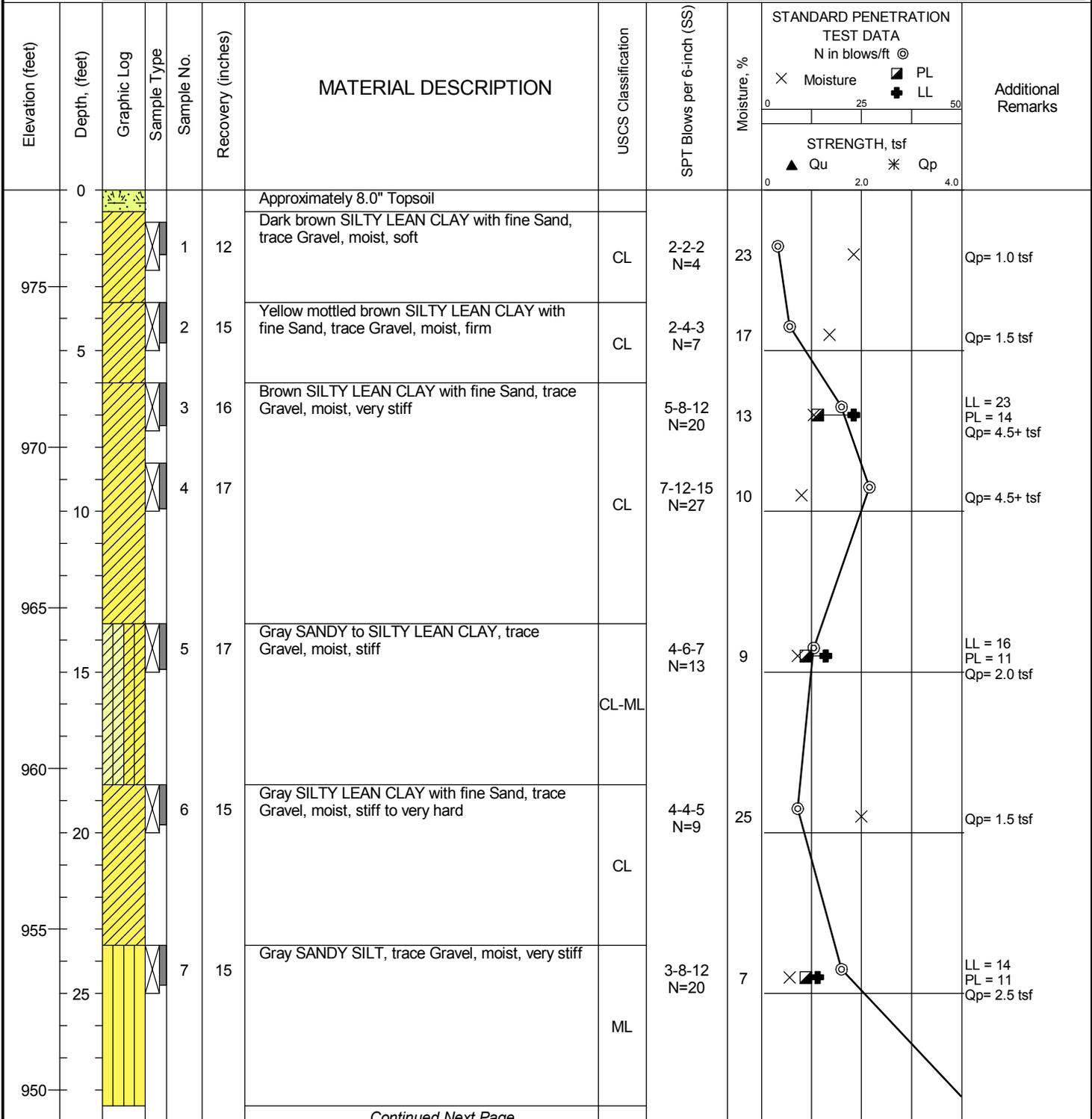
DATE STARTED: 7/23/25
DATE COMPLETED: 7/23/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 978 ft
LATITUDE: 42.689774°
LONGITUDE: -83.192771°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-18

Water	▽	While Drilling	N/A
	▼	Upon Completion	N/A
	▽	Cave In Depth	N/A

BORING LOCATION:
 See Boring Location Diagrams



	Professional Service Industries, Inc. 45000 Helm Street, Suite 200 Plymouth, MI 48170 Telephone: (248) 957-9911	PROJECT NO.: 03811526 PROJECT: Nowicki Park Improvements LOCATION: City of Rochester Hills Oakland County, Michigan
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DATE STARTED: 7/23/25
DATE COMPLETED: 7/23/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 978 ft
LATITUDE: 42.689774°
LONGITUDE: -83.192771°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-18

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ⊙ X Moisture PL + LL	STRENGTH, tsf ▲ Qu * Qp	Additional Remarks
945	30			8	16	Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, dense *p200 Analysis 33.5' - 35.0'	SC-SM	16-23-35 N=58	7	X	⊙	>> Qp= 2.5 tsf
35	35			9	16	Soil boring terminated approximetly 25 feet below the existing ground surface		8-19-11 N=30	7	X	⊙	Qp= 3.0 tsf p200: 43%



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 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/23/25
DATE COMPLETED: 7/23/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 980 ft
LATITUDE: 42.689711°
LONGITUDE: -83.192907°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-19

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
0		Approximately 7.5" Topsoil									
		Brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, firm to very stiff		1	15		3-3-2 N=5	14	14	Qp = 1.75 tsf	
975	5			2	16		3-7-11 N=18	13	13	LL = 26 PL = 15 Qp = 4.5+ tsf	
				3	16		CL 5-10-15 N=25	13	13	Qp = 4.5+ tsf	
970	10			4	16		6-10-16 N=26	12	12	LL = 23 PL = 13 Qp = 4.5+ tsf	
		Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, loose to medium dense *p200 Analysis 18.5' - 20.0'		5	15		3-6-10 N=16	9	9	Qp = 4.5+ tsf	
965	15			6	16		SC-SM 3-4-4 N=8	10	10	Qp = 0.75 tsf p200: 49%	
960	20			7	18		5-11-18 N=29	6	6		
955	25	Gray fine to coarse POORLY GRADED SAND with Silt, trace Gravel, moist, medium dense									
Continued Next Page											



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/23/25
DATE COMPLETED: 7/23/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 980 ft
LATITUDE: 42.689711°
LONGITUDE: -83.192907°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-19

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
950	30			8	18	Gray SANDY to SILTY LEAN CLAY, trace Gravel, moist, very stiff	CL-ML	4-8-21 N=29	6	X Moisture ◻ PL + LL 0 25 50	LL = 17 PL = 11 Qp = 4.5+ tsf
945	35			9	18	Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, very dense	SC-SM	21-41-24 N=65	7	▲ Qu * Qp 0 2.0 4.0	>> ◉ Qp = 4.5+ tsf
						Soil boring terminated approximately 35 feet below the existing ground surface					



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 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/18/25	DRILL COMPANY: PSI, Inc.	BORING SB-20
DATE COMPLETED: 7/18/25	DRILLER: Z. Simpson LOGGED BY: I. Alhemyari	
COMPLETION DEPTH: 5.0 ft	DRILL RIG: Hand Auger	Water <input type="checkbox"/> While Drilling N/A <input type="checkbox"/> Upon Completion N/A <input type="checkbox"/> Cave In Depth N/A
BENCHMARK: N/A	DRILLING METHOD: HA	BORING LOCATION: See Boring Location Diagrams
ELEVATION: 985 ft	SAMPLING METHOD:	
LATITUDE: 42.69018°	HAMMER TYPE: Automatic	
LONGITUDE: -83.190582°	EFFICIENCY: N/A	
STATION: N/A OFFSET: N/A	REVIEWED BY: T. Khalaff	
REMARKS: borehole backfilled with auger cuttings		

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
0						Approximately 7.0" Topsoil Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist *p200 Analysis 3.5' - 5.0'	SC-SM	11	X	
980	5					Hand Auger terminated approximately 5 feet below the existing ground surface DCP RESULTS at 1': 2 drops ber 2- Inch at 3.5': 2 drops ber 2- Inch		14	X	p200: 43%

	Professional Service Industries, Inc. 45000 Helm Street, Suite 200 Plymouth, MI 48170 Telephone: (248) 957-9911	PROJECT NO.: 03811526
		PROJECT: Nowicki Park Improvements
		LOCATION: City of Rochester Hills
		Oakland County, Michigan

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 7/18/25 **DRILL COMPANY:** PSI, Inc.
DATE COMPLETED: 7/18/25 **DRILLER:** Z. Simpson **LOGGED BY:** I. Alhemyari
COMPLETION DEPTH: 5.0 ft **DRILL RIG:** Hand Auger
BENCHMARK: N/A **DRILLING METHOD:** HA
ELEVATION: 989 ft **SAMPLING METHOD:**
LATITUDE: 42.689813° **HAMMER TYPE:** Automatic
LONGITUDE: -83.191318° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** T. Khalaff
REMARKS: borehole backfilled with auger cuttings

BORING SB-21

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	STANDARD PENETRATION TEST DATA				Additional Remarks
								N in blows/ft @				
								Moisture, %	Moisture	PL	LL	
									▲ Qu	* Qp		
0	0					Approximately 6.0" Topsoil						
						Brown SANDY LEAN CLAY with Silt, trace Gravel, moist	CL	18	×			
985	5					Hand Auger terminated approximately 5 feet below the existing ground surface		20	×			
						DCP RESULTS at 1': 2 drops ber 2- Inch at 3.5': 2 drops ber 2- Inch						



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/22/25
DATE COMPLETED: 7/22/25
COMPLETION DEPTH: 15.0 ft
BENCHMARK: N/A
ELEVATION: 970 ft
LATITUDE: 42.691727°
LONGITUDE: -83.192448°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-22

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0		Approximately 6.0" Topsoil									
		Brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, very stiff		1	16		CL	3-5-10 N=15	14		Qp= 4.5+ tsf
965	5			2	16		CL	4-7-12 N=19	11	X Moisture ◻ PL ◼ LL	LL = 24 PL = 16 Qp= 4.5+ tsf
		Brown SILT with fine Sand, moist, medium dense		3	16		ML	5-9-15 N=24	17		LL = 24 PL = 20 Qp= 1.5 tsf
960	10			4	16		CL	6-12-14 N=26	12		LL = 21 PL = 12 Qp= 4.0 tsf
		Gray SILTY LEAN CLAY, trace Sand, trace Gravel, moist, stiff to very stiff									
955	15			5	17		CL	3-5-7 N=12	12		Qp= 1.25 tsf
		Soil boring terminated approximately 15 feet below the existing ground surface									



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

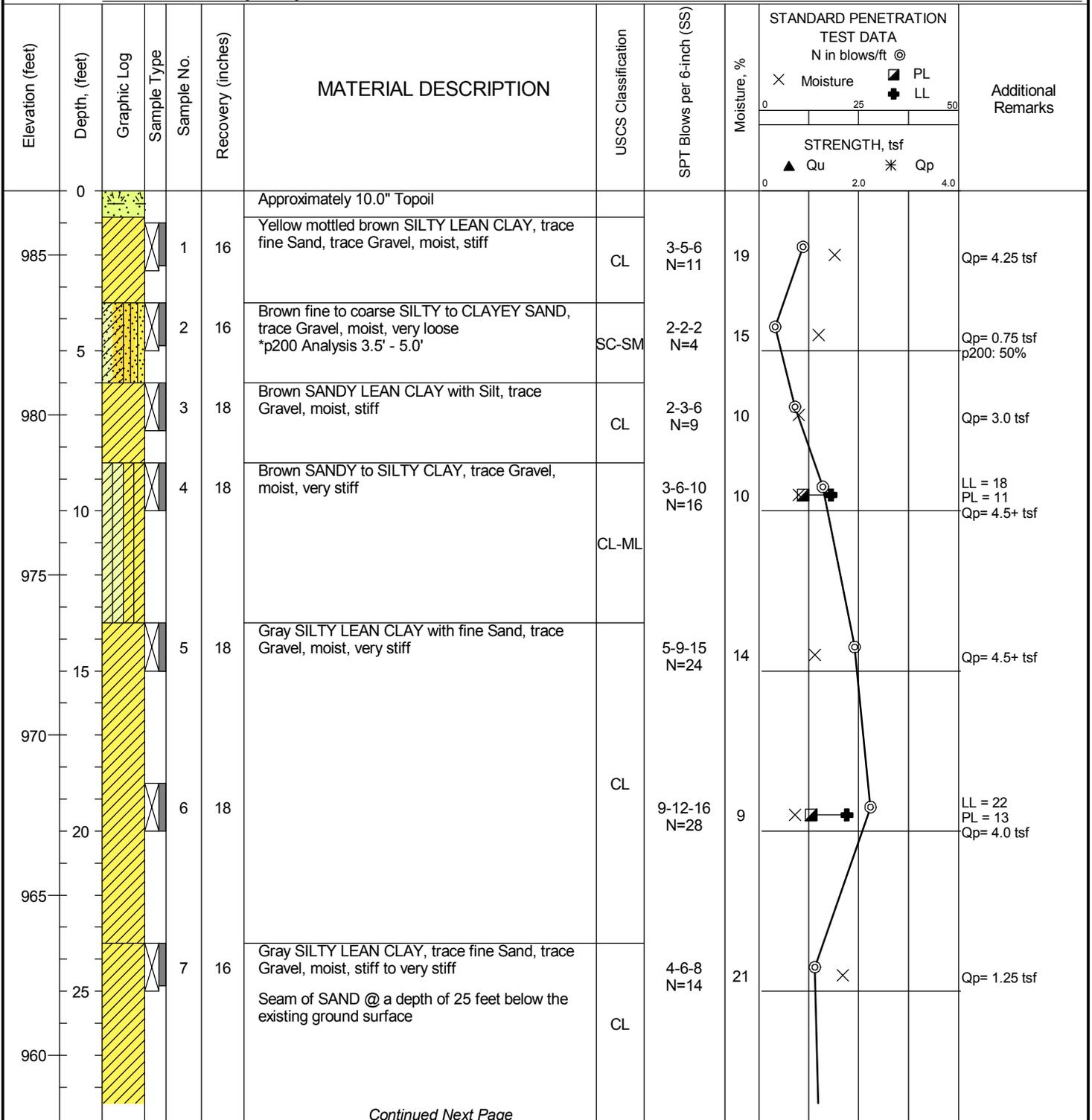
DATE STARTED: 8/12/25
DATE COMPLETED: 8/12/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 987 ft
LATITUDE: 42.689495°
LONGITUDE: -83.19105°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: Diedrich D-50 ATV
DRILLING METHOD: 2.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 85%
REVIEWED BY: T. Khalaff

BORING SB-24

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 8/12/25 **DRILL COMPANY:** PSI, Inc.
DATE COMPLETED: 8/12/25 **DRILLER:** Z. Simpson **LOGGED BY:** I. Alhemyari
COMPLETION DEPTH: 35.0 ft **DRILL RIG:** Diedrich D-50 ATV
BENCHMARK: N/A **DRILLING METHOD:** 2.25" HSA
ELEVATION: 987 ft **SAMPLING METHOD:** SS
LATITUDE: 42.689495° **HAMMER TYPE:** Automatic
LONGITUDE: -83.19105° **EFFICIENCY:** 85%
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** T. Khalaff
REMARKS: borehole backfilled with auger cuttings

BORING SB-24

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ⊙ X Moisture ⊠ PL ⊕ LL	STRENGTH, tsf ▲ Qu * Qp	Additional Remarks
955	30		8	16		Gray SILTY LEAN CLAY, trace fine Sand, trace Gravel, moist, stiff to very stiff	CL	4-5-10 N=15	25	⊙	⊠	LL = 26 PL = 16 Qp = 2.5 tsf
35	35		9	17		Soil boring terminated approximately 35 feet below the existing ground surface		5-8-8 N=16	12	X ⊙		Qp = 3.0 tsf



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

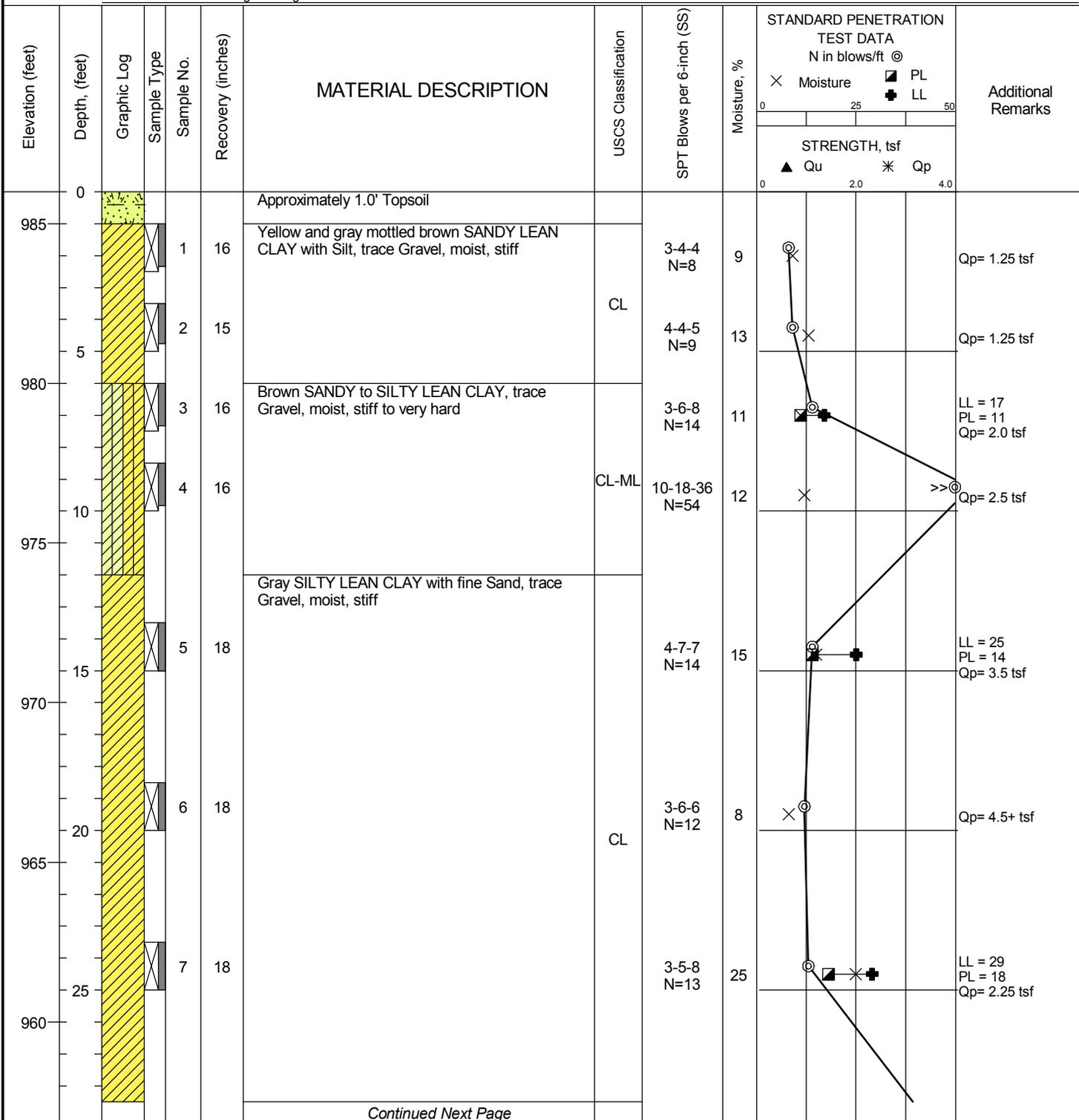
DATE STARTED: 8/11/25
DATE COMPLETED: 8/11/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 986 ft
LATITUDE: 42.689492°
LONGITUDE: -83.190858°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: Diedrich D-50 ATV
DRILLING METHOD: 2.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 85%
REVIEWED BY: T. Khalaff

BORING SB-25

Water	▽ While Drilling	34 feet
	▼ Upon Completion	34 feet
	▽ Cave In Depth	N/A

BORING LOCATION:
 See Boring Location Diagrams



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 8/11/25 **DRILL COMPANY:** PSI, Inc.
DATE COMPLETED: 8/11/25 **DRILLER:** Z. Simpson **LOGGED BY:** I. Alhemyari
COMPLETION DEPTH: 35.0 ft **DRILL RIG:** Diedrich D-50 ATV
BENCHMARK: N/A **DRILLING METHOD:** 2.25" HSA
ELEVATION: 986 ft **SAMPLING METHOD:** SS
LATITUDE: 42.689492° **HAMMER TYPE:** Automatic
LONGITUDE: -83.190858° **EFFICIENCY:** 85%
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** T. Khalaff
REMARKS: borehole backfilled with auger cuttings

BORING SB-25

Water	▽ While Drilling	34 feet
	▼ Upon Completion	34 feet
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
955	30			8	17	Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist to wet, very dense *p200 Analysis 33.5' - 35.0'	SC-SM	9-16-28 N=44	10	STANDARD PENETRATION TEST DATA N in blows/ft © X Moisture PL LL STRENGTH, tsf ▲ Qu * Qp	
	35			9	16	Soil boring terminated approximately 35 feet below the existing ground surface		14-24-36 N=60	8		>> © p200: 28%



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/17/25	DRILL COMPANY: PSI, Inc.	BORING SB-25A
DATE COMPLETED: 7/17/25	DRILLER: Z. Simpson LOGGED BY: I. Alhemyari	
COMPLETION DEPTH: 5.0 ft	DRILL RIG: Hand Auger	Water <input type="checkbox"/> While Drilling N/A <input checked="" type="checkbox"/> Upon Completion N/A <input type="checkbox"/> Cave In Depth N/A
BENCHMARK: N/A	DRILLING METHOD: HA	BORING LOCATION: See Boring Location Diagrams
ELEVATION: 981 ft	SAMPLING METHOD:	
LATITUDE: 42.691028°	HAMMER TYPE: Automatic	
LONGITUDE: -83.19066°	EFFICIENCY: N/A	
STATION: N/A OFFSET: N/A	REVIEWED BY: T. Khalaff	
REMARKS: borehole backfilled with auger cuttings		

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
									<input checked="" type="checkbox"/> Moisture <input type="checkbox"/> PL <input type="checkbox"/> LL	
									STRENGTH, tsf <input type="checkbox"/> Qu <input type="checkbox"/> Qp	
980	0					Approximately 7.0" Topsoil Brown SANDY LEAN CLAY with Silt, trace hair roots, trace Gravel, moist *p200 Analysis 3.5' - 5.0'	CL	10	×	
	5					Hand Auger terminated approximately 5 feet below the existing ground surface DCP RESULTS at 1': 2 drops ber 2- Inch at 3.5': 3 drops ber 2- Inch		10	×	p200: 51%

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		PROJECT: Nowicki Park Improvements
		LOCATION: City of Rochester Hills
		Oakland County, Michigan

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 7/17/25
DATE COMPLETED: 7/17/25
COMPLETION DEPTH: 5.0 ft
BENCHMARK: N/A
ELEVATION: 976 ft
LATITUDE: 42.691547°
LONGITUDE: -83.19106°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: Hand Auger
DRILLING METHOD: HA
SAMPLING METHOD:
HAMMER TYPE: Automatic
EFFICIENCY: N/A
REVIEWED BY: T. Khalaff

BORING SB-26

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @				Additional Remarks	
									X Moisture ▣ PL ▣ LL	STRENGTH, tsf ▲ Qu * Qp				
								0	0	25	50			
									0	2.0	4.0			
975	0					Approximatey 1.0' Topsoil								
						Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist *p200 Analysis 3.5' - 5.0'	SC-SM	11	X					
	5					Hand Auger terminated approximately 5 feet below the existing ground surface		9	X				p200: 31%	
						DCP RESULTS at 1': 2 drops ber 2- Inch at 3.5': 4 drops ber 2- Inch								



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

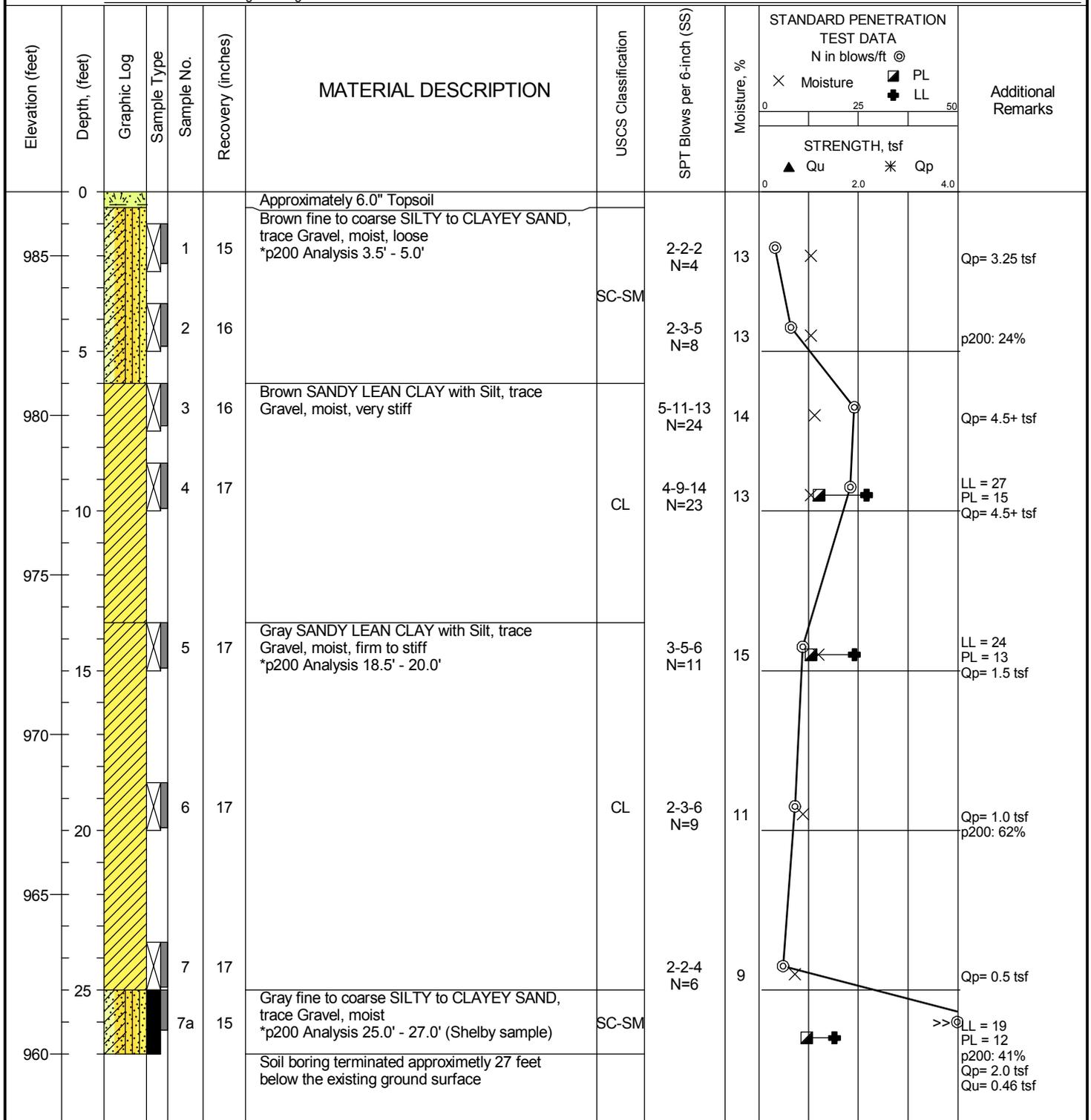
DATE STARTED: 7/22/25
 DATE COMPLETED: 7/22/25
 COMPLETION DEPTH: 27.0 ft
 BENCHMARK: N/A
 ELEVATION: 987 ft
 LATITUDE: 42.689246°
 LONGITUDE: -83.193612°
 STATION: N/A OFFSET: N/A
 REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
 DRILLER: Z. Simpson LOGGED BY: I. Alhemyari
 DRILL RIG: CME-55 Truck Rig
 DRILLING METHOD: 3.25" HSA
 SAMPLING METHOD: SS
 HAMMER TYPE: Automatic
 EFFICIENCY: 80%
 REVIEWED BY: T. Khalaff

BORING SB-27

Water: While Drilling N/A
 Upon Completion N/A
 Cave In Depth N/A

BORING LOCATION: See Boring Location Diagrams



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 PROJECT: Nowicki Park Improvements
 LOCATION: City of Rochester Hills
 Oakland County, Michigan

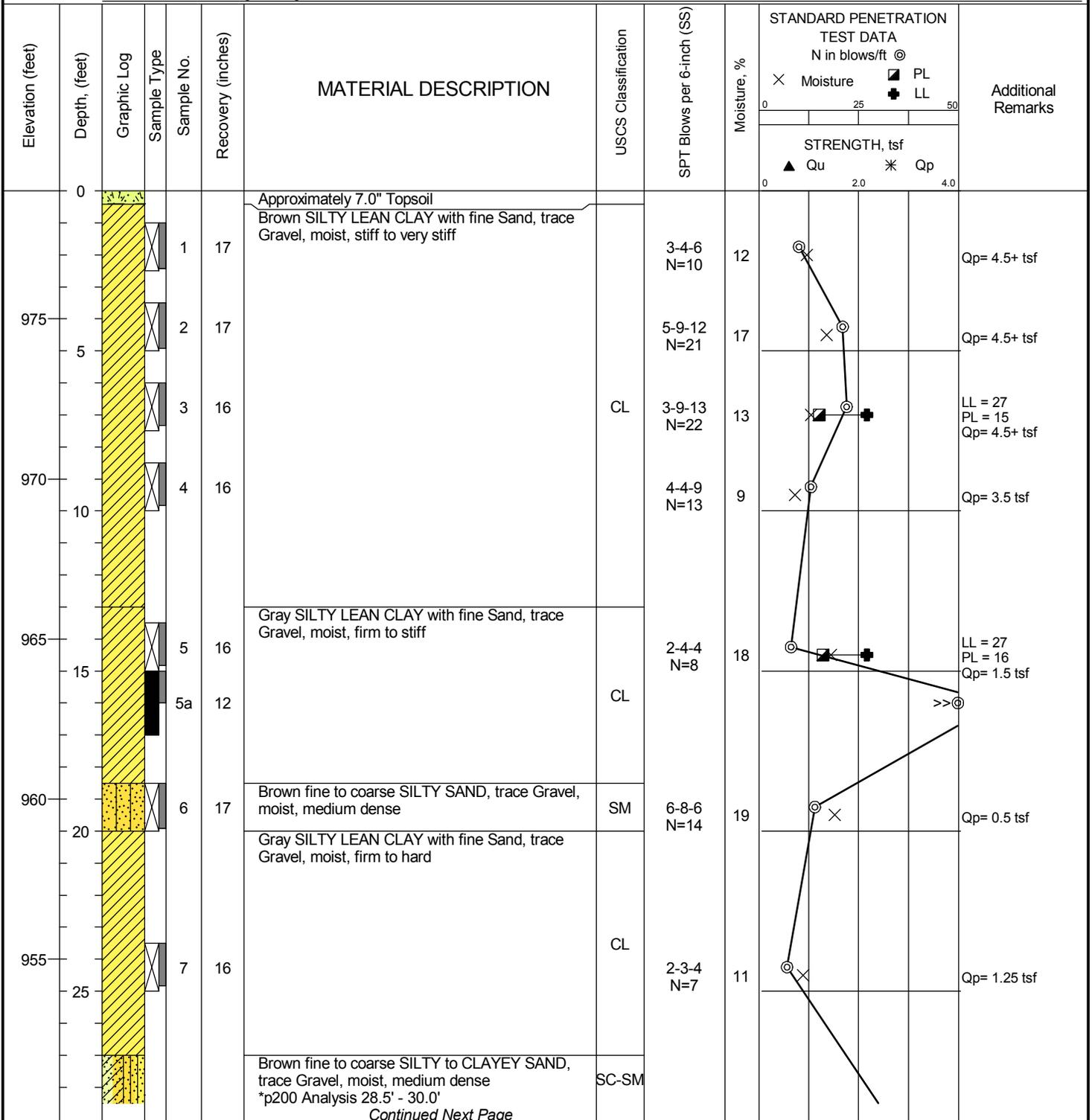
DATE STARTED: 7/29/25
DATE COMPLETED: 7/29/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 979 ft
LATITUDE: 42.690177°
LONGITUDE: -83.191894°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-28

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams



Continued Next Page



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/29/25
DATE COMPLETED: 7/29/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 979 ft
LATITUDE: 42.690177°
LONGITUDE: -83.191894°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-28

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
950	30		8	16	16	Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, medium dense *p200 Analysis 28.5' - 30.0'	SC-SM	26-22-12 N=34	7	STANDARD PENETRATION TEST DATA N in blows/ft ⊙ X Moisture □ PL + LL STRENGTH, tsf ▲ Qu * Qp	Qp= 1.5 tsf p200: 34%
945	35		9	16	16	Soil boring terminated approximately 35 feet below the existing ground surface		12-10-13 N=23	7		



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LOCATION: City of Rochester Hills
 Oakland County, Michigan

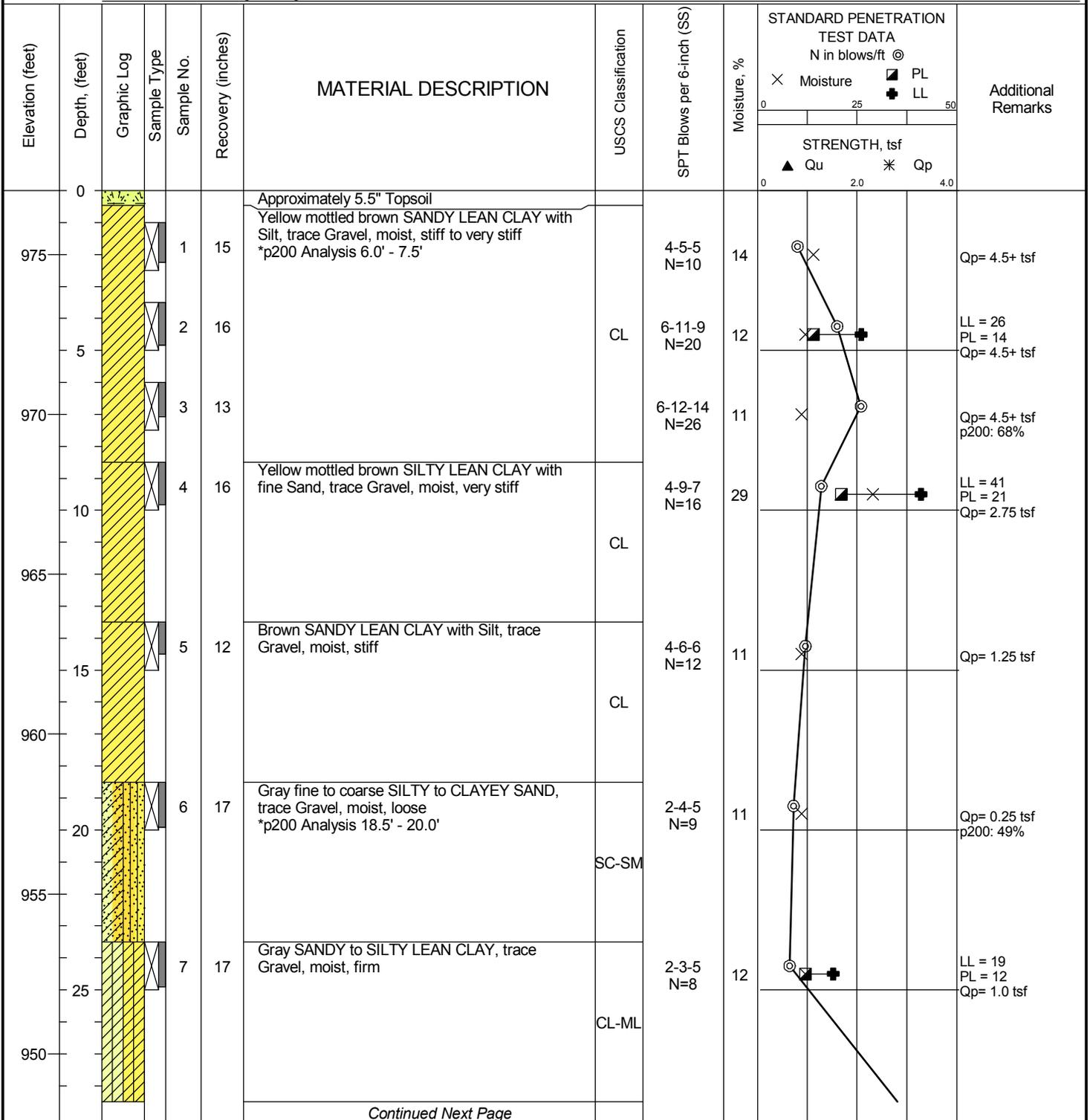
DATE STARTED: 7/28/25
DATE COMPLETED: 7/28/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 977 ft
LATITUDE: 42.690772°
LONGITUDE: -83.192369°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-29

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/28/25
DATE COMPLETED: 7/28/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 977 ft
LATITUDE: 42.690772°
LONGITUDE: -83.192369°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-29

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
945	30			8	17	Gray fine to coarse POORLY GRADED SAND, trace Silt, trace Gravel, moist, dense	SP	9-15-25 N=40	16	STANDARD PENETRATION TEST DATA N in blows/ft ⊙ X Moisture PL LL STRENGTH, tsf ▲ Qu * Qp	
35	35			9	17	Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, very dense	SC-SM	18-20-38 N=58	6		>>⊙ Qp= 2.5 tsf
						Soil boring terminated approximately 35 feet below the existing ground surface					



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 8/26/25
DATE COMPLETED: 8/26/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 977 ft
LATITUDE: 42.69049°
LONGITUDE: -83.192072°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 2.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 92%
REVIEWED BY: T. Khalaff

BORING SB-30

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks	
0		Approximately 9.5" Topsoil										
975	13	Yellow mottled brown SANDY LEAN CLAY with Silt, trace Gravel, moist, firm to very stiff	1	13			CL	3-4-5 N=9	15	Qp = 4.0 tsf		
5	16		2	16			CL	4-6-12 N=18	11	Qp = 4.5+ tsf		
970	17	Brown SANDY to SILTY LEAN CLAY, trace Gravel, moist, very stiff	3	17			CL-ML	4-7-8 N=15	11	LL = 18 PL = 12 Qp = 2.5 tsf		
10	17		4	17			CL-ML	3-8-10 N=18	20	Qp = 4.0 tsf		
965	15	Gray SILTY LEAN CLAY with fine Sand, trace Gravel, moist, firm	5	17			CL	2-2-3 N=5	19	Qp = 0.5 tsf		
960	20	Gray SANDY LEAN CLAY with Silt, trace Gravel, moist, stiff	6	17			CL	3-5-7 N=12	11	LL = 24 PL = 12 Qp = 1.5 tsf		
955	25		7	15			CL	5-4-4 N=8	12	Qp = 1.0 tsf		
950		Continued Next Page										



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 8/26/25
DATE COMPLETED: 8/26/25
COMPLETION DEPTH: 35.0 ft
BENCHMARK: N/A
ELEVATION: 977 ft
LATITUDE: 42.69049°
LONGITUDE: -83.192072°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 2.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 92%
REVIEWED BY: T. Khalaff

BORING SB-30

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
945	30			8	10	Gray SANDY to SILTY LEAN CLAY, trace Gravel, moist, very stiff	CL-ML	6-9-11 N=20	12	Moisture: X PL: ◻ LL: + Qu: ▲ Qp: *	LL = 18 PL = 11 Qp = 0.25 tsf
35	35			9	16	Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, medium dense *p200 Analysis 33.5' - 35.0' Soil boring terminated approximately 35 feet below the existing ground surface	SC-SM	12-13-10 N=23	9	X	Qp = 1.0 tsf p200: 47%



Professional Service Industries, Inc.
 45000 Helm Street, Suite 200
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 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/23/25
 DATE COMPLETED: 7/23/25
 COMPLETION DEPTH: 17.0 ft
 BENCHMARK: N/A
 ELEVATION: 968 ft
 LATITUDE: 42.692044°
 LONGITUDE: -83.192473°
 STATION: N/A OFFSET: N/A
 REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
 DRILLER: Z. Simpson LOGGED BY: I. Alhemyari
 DRILL RIG: CME-55 Truck Rig
 DRILLING METHOD: 3.25" HSA
 SAMPLING METHOD: SS
 HAMMER TYPE: Automatic
 EFFICIENCY: 80%
 REVIEWED BY: T. Khalaff

BORING SB-31

Water: While Drilling N/A
 Upon Completion N/A
 Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
968	0	Approximately 5.5" Topsoil									
965	3	Brown SANDY LEAN CLAY with Silt, trace Gravel, moist, stiff to very stiff		1	16		CL	2-3-5 N=8	12	Qp = 4.5+ tsf	
960	5			2	16		CL	4-7-9 N=16	14	Qp = 4.5+ tsf	
960	10			3	16		CL	4-7-11 N=18	12	LL = 25 PL = 14 Qp = 4.5+ tsf	
955	10			4	17		CL	5-10-13 N=23	12	Qp = 4.5+ tsf	
955	15	Gray SANDY LEAN CLAY with Silt, trace Gravel, moist, stiff *p200 Analysis 15.0' - 17.0' (Shelby sample)		5	17		CL	3-5-7 N=12	9	Qp = 2.25 tsf	
	17	Soil boring terminated approximately 17 feet below the existing ground surface		5a						LL = 22 PL = 12 p200: 61% Qp = 1.42 tsf Qu = 1.58 tsf	



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PROJECT NO.: 03811526
 PROJECT: Nowicki Park Improvements
 LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/24/25
DATE COMPLETED: 7/24/25
COMPLETION DEPTH: 25.0 ft
BENCHMARK: N/A
ELEVATION: 976 ft
LATITUDE: 42.691112°
LONGITUDE: -83.193072°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-33

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	STANDARD PENETRATION TEST DATA		Additional Remarks	
									N in blows/ft @			
									Moisture, %		STRENGTH, tsf	
									×	Moisture	■	PL
									○	LL	+	LL
									▲	Qu	*	Qp
975	0	Approximately 7.0" Topsoil										
975	10	Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, loose		1	10		SC-SM	11-6-3 N=9	14	○	×	Qp= 2.0 tsf
970	5	Brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, stiff to hard		2	16			3-5-9 N=14	15	○		Qp= 4.5+ tsf
970	10			3	16		CL	5-10-16 N=26	13	○	■	LL = 26 PL = 15 Qp= 4.5+ tsf
965	10			4	16			8-18-20 N=38	12	○	×	Qp= 4.5+ tsf
960	15	Gray SILTY LEAN CLAY with fine Sand, trace Gravel, moist, stiff *p200 Analysis 15.0' - 17.0' (Shelby sample)		5	17		CL	3-5-8 N=13	10	○	×	Qp= 3.0 tsf
960	20			5a						○	■	LL = 26 PL = 10 p200: 75% Qp= 0.25 tsf Qu= 2.96 tsf
955	20	Gray SANDY to SILTY LEAN CLAY, trace Gravel, moist, stiff		6	16		CL-ML	3-6-7 N=13	10	○	■	LL = 16 PL = 11 Qp= 3.0 tsf
955	25	Gray SANDY LEAN CLAY with Silt, trace Gravel, moist, stiff *p200 Analysis 23.5' - 25.0'		7	16		CL	3-4-7 N=11	11	○	×	Qp= 2.75 tsf p200: 56%
		Soil boring terminated approximately 25 feet below the existing ground surface										



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 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/21/25
DATE COMPLETED: 7/21/25
COMPLETION DEPTH: 25.0 ft
BENCHMARK: N/A
ELEVATION: 974 ft
LATITUDE: 42.691383°
LONGITUDE: -83.194148°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-34

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	STANDARD PENETRATION TEST DATA		Additional Remarks	
									N in blows/ft @			
									Moisture, %		STRENGTH, tsf	
									×	⊙	■	+
									▲	*		
0						Approximately 4.5" Topsoil						
				1	14	Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, medium dense	SC-SM	3-5-7 N=12	10	⊙		Qp= 1.5 tsf
970	5			2	16	Brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, firm to very stiff		7-10-11 N=21	12	×	⊙	Qp= 1.0 tsf
				3	16			6-8-11 N=19	13	×	⊙	LL = 25 PL = 14 Qp= 4.5+ tsf
965	10			4	17		CL	4-10-13 N=23	12	×	⊙	Qp= 4.5+ tsf
960	15			5	16	Gray SILTY LEAN CLAY with fine Sand, trace Gravel, stiff	CL	3-3-6 N=9	12	×	⊙	LL = 21 PL = 12 Qp= 2.0 tsf
955	20			6	16	Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, loose *p200 Analysis 18.5' - 20.0'	SC-SM	3-5-4 N=9	7	×	⊙	Qp= 1.25 tsf p200: 46%
950	25			7	16	Gray SILTY LEAN CLAY with fine Sand, trace Gravel, moist, firm	CL	2-4-5 N=9	13	×	⊙	LL = 19 PL = 11 Qp= 0.25 tsf
						Soil boring terminated approximately 25 feet below the existing ground surface						



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

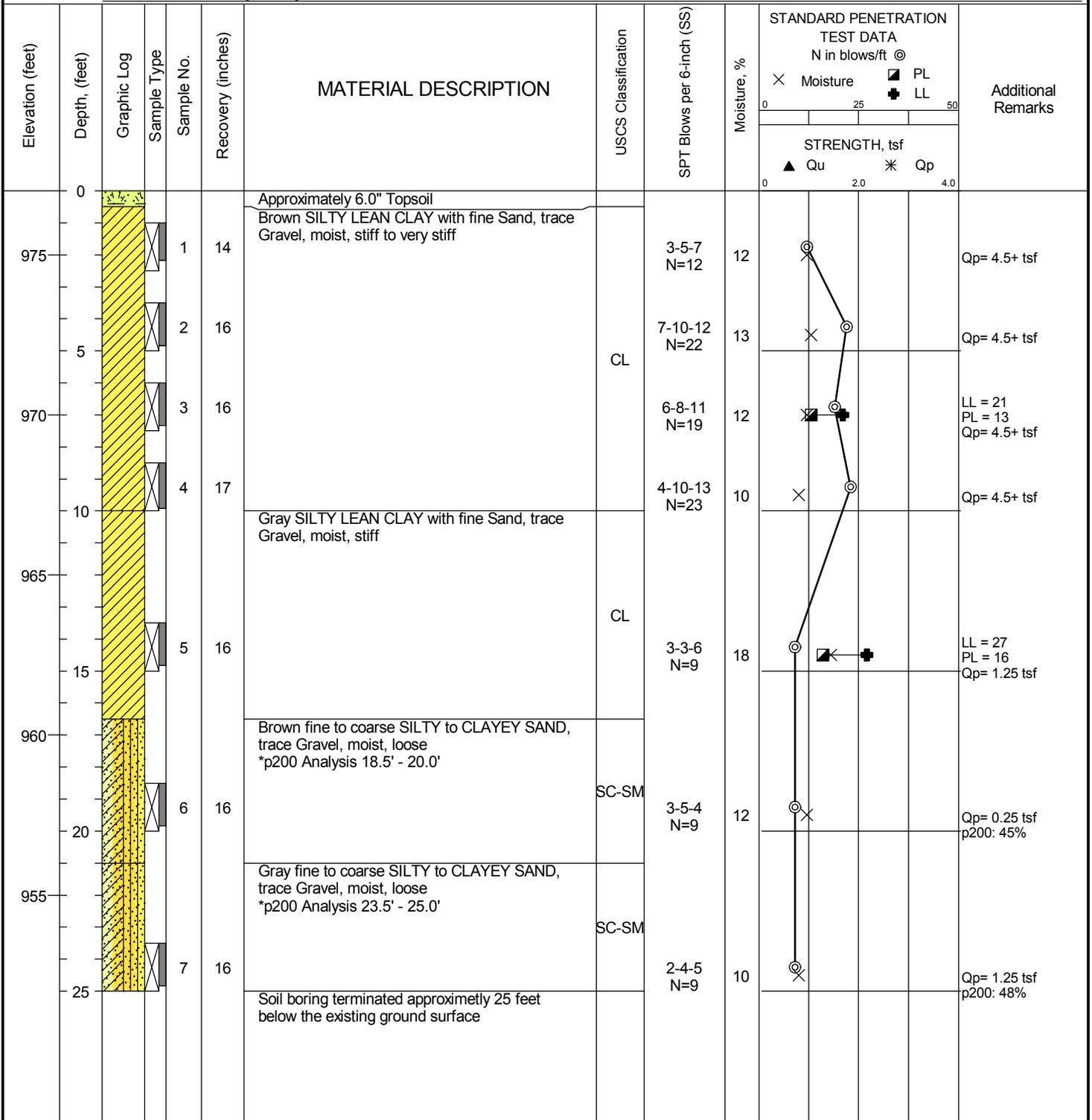
DATE STARTED: 7/28/25
DATE COMPLETED: 7/28/25
COMPLETION DEPTH: 25.0 ft
BENCHMARK: N/A
ELEVATION: 977 ft
LATITUDE: 42.690547°
LONGITUDE: -83.192568°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-35

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 8/11/25
DATE COMPLETED: 8/11/25
COMPLETION DEPTH: 25.0 ft
BENCHMARK: N/A
ELEVATION: 977 ft
LATITUDE: 42.690099°
LONGITUDE: -83.193099°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: Diedrich D-50 ATV
DRILLING METHOD: 2.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 85%
REVIEWED BY: T. Khalaff

BORING SB-36

Water
 ∇ While Drilling 18 feet
 ▼ Upon Completion 23 feet
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	STANDARD PENETRATION TEST DATA		Additional Remarks
									N in blows/ft @	Moisture, %	
0						Approximately 1.0' Topsoil					
975				1	17	Yellow mottled brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, firm to stiff	CL	1-2-3 N=5	20	×	Qp = 1.25 tsf
5				2	16		CL	3-6-6 N=12	10	×	Qp = 3.0 tsf
970				3	17	Yellow mottled brown SANDY to SILTY LEAN CLAY, trace Gravel, moist, stiff to very stiff		4-5-5 N=10	11	⊗	LL = 19 PL = 12 Qp = 3.0 tsf
10				4	18		CL-ML	4-6-10 N=16	13	×	Qp = 4.5+ tsf
965				5	18	Gray SANDY to SILTY LEAN CLAY, trace Gravel, moist to wet, firm		3-3-4 N=7	11	⊗	LL = 17 PL = 10 Qp = 2.5 tsf
960				6	15	Gray SILTY LEAN CLAY with fine Sand, trace Gravel, wet, firm	CL	2-3-3 N=6	25	×	Qp = 0.5 tsf
955				7	16	Gray SANDY to SILTY LEAN CLAY, trace Gravel, wet, very stiff	CL-ML	11-8-9 N=17	12	⊗	LL = 17 PL = 11 Qp = 1.5 tsf
25						Soil boring terminated approximately 25 feet below the existing ground surface					



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/18/25
DATE COMPLETED: 7/18/25
COMPLETION DEPTH: 5.0 ft
BENCHMARK: N/A
ELEVATION: 971 ft
LATITUDE: 42.691994°
LONGITUDE: -83.194465°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: Hand Auger
DRILLING METHOD: HA
SAMPLING METHOD:
HAMMER TYPE: Automatic
EFFICIENCY: N/A
REVIEWED BY: T. Khalaff

BORING SB-37

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
970	0					Approximately 5.0" Topsoil				
						Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist *p200 Analysis 3.5' - 5.0'	SC-SM	9	×	
	5					Hand Auger terminated approximately 5 feet below the existing ground surface		11	×	p200: 42%
						DCP RESULTS at 1': 5 drops ber 2- Inch at 3.5': 2 drops ber 2- Inch				



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 8/21/25
DATE COMPLETED: 8/21/25
COMPLETION DEPTH: 5.0 ft
BENCHMARK: N/A
ELEVATION: 972 ft
LATITUDE: 42.691863°
LONGITUDE: -83.194625°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Tatem
DRILL RIG: CME-75 Truck Rig
DRILLING METHOD: Solid Stem
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 92%
REVIEWED BY: T. Khalaff

BORING SB-38

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0						Approximately 9.75" Asphalt					
970				1	12	Approximately 1.75" Dark gray fine to coarse GRAVELLY SAND with Silt, moist (BASE) Dark gray SANDY LEAN CLAY with Silt, trace Gravel, moist, stiff	CL	18-9-4 N=13	15		Qp= 2.5 tsf
5				2	17	Gray mottled brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, loose *p200 Analysis 3.5' - 5.0' Soil boring terminated approximately 5 feet below the existing ground surface	SC-SM	2-3-5 N=8	15		Qp= 1.0 tsf p200: 40%



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/18/25	DRILL COMPANY: PSI, Inc.	BORING SB-39
DATE COMPLETED: 7/18/25	DRILLER: Z. Simpson LOGGED BY: I. Alhemyari	
COMPLETION DEPTH: 5.0 ft	DRILL RIG: Hand Auger	Water <input type="checkbox"/> While Drilling N/A <input type="checkbox"/> Upon Completion N/A <input type="checkbox"/> Cave In Depth N/A
BENCHMARK: N/A	DRILLING METHOD: HA	BORING LOCATION: See Boring Location Diagrams
ELEVATION: 975 ft	SAMPLING METHOD:	
LATITUDE: 42.691414°	HAMMER TYPE: Automatic	
LONGITUDE: -83.194418°	EFFICIENCY: N/A	
STATION: N/A OFFSET: N/A	REVIEWED BY: T. Khalaff	
REMARKS: borehole backfilled with auger cuttings		

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STRENGTH, tsf	Additional Remarks
	0					Approximately 4.0" Topsoil Dark brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, trace Bricks, moist (Fill)				
						Brown fine to coarse POORLY GRADED SAND with Silt, trace Gravel, moist	SP-SM	13	X	
970	5					Hand Auger terminated approximately 5 feet below the existing ground surface		12	X	
						DCP RESULTS at 1': 7 drops ber 2- Inch at 3.5': 2 drops ber 2- Inch				

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		PROJECT: Nowicki Park Improvements
		LOCATION: City of Rochester Hills
		Oakland County, Michigan

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 8/21/25
DATE COMPLETED: 8/21/25
COMPLETION DEPTH: 5.0 ft
BENCHMARK: N/A
ELEVATION: 976 ft
LATITUDE: 42.691205°
LONGITUDE: -83.1946°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Tatem
DRILL RIG: CME-75 Truck Rig
DRILLING METHOD: Solid Stem
SAMPLING METHOD:
HAMMER TYPE: Automatic
EFFICIENCY: 92%
REVIEWED BY: T. Khalaff

BORING SB-40

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STRENGTH, tsf	Additional Remarks
975	0					Approximately 12.75" Asphalt				
	10		1		10	Approximately 2.25" Dark gray fine to coarse GRAVELLY SAND with Silt, moist (BASE) Dark brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, loose	SC-SM	11-5-4 N=9	14	Qp= 1.25 tsf
	15		2		15	Gray mottled brown SANDY LEAN CLAY with Silt, trace Gravel, moist, firm	CL	2-2-4 N=6	13	Qp= 4.5+ tsf
	5					Soil boring terminated approxmetly 5 feet below the existing ground surface				



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 8/21/25 **DRILL COMPANY:** PSI, Inc.
DATE COMPLETED: 8/21/25 **DRILLER:** Z. Simpson **LOGGED BY:** I. Tatem
COMPLETION DEPTH: 5.0 ft **DRILL RIG:** CME-75 Truck Rig
BENCHMARK: N/A **DRILLING METHOD:** Solid Stem
ELEVATION: 981 ft **SAMPLING METHOD:** SS
LATITUDE: 42.689993° **HAMMER TYPE:** Automatic
LONGITUDE: -83.194358° **EFFICIENCY:** 92%
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** T. Khalaff
REMARKS: borehole backfilled with auger cuttings

BORING SB-41

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
980	0	Asphalt				Approximately 7.0" Asphalt					
		GRAVELLY SAND		1	10	Approximately 4.0" Dark gray fine to coarse GRAVELLY SAND with Silt, moist (BASE)	CL	7-2-2 N=4	16	0.5	Qp= 0.5 tsf
		SILTY LEAN CLAY		2	13	Gray mottled dark brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, soft	CL	3-5-6 N=11	10	3.5	Qp= 3.5 tsf
	5					Soil boring terminated approximately 5 feet below the existing ground surface					



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/21/25	DRILL COMPANY: PSI, Inc.	BORING SB-42
DATE COMPLETED: 7/21/25	DRILLER: Z. Simpson LOGGED BY: I. Alhemyari	
COMPLETION DEPTH: 5.0 ft	DRILL RIG: CME-55 Truck Rig	Water <input type="checkbox"/> While Drilling N/A <input type="checkbox"/> Upon Completion N/A <input type="checkbox"/> Cave In Depth N/A
BENCHMARK: N/A	DRILLING METHOD: 3.25" HSA	BORING LOCATION: See Boring Location Diagrams
ELEVATION: 980 ft	SAMPLING METHOD: SS	
LATITUDE: 42.690295°	HAMMER TYPE: Automatic	
LONGITUDE: -83.194566°	EFFICIENCY: 80%	
STATION: N/A OFFSET: N/A	REVIEWED BY: T. Khalaff	
REMARKS: borehole backfilled with auger cuttings		

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
										<input type="checkbox"/> Moisture <input type="checkbox"/> PL <input type="checkbox"/> LL STRENGTH, tsf <input type="checkbox"/> Qu <input type="checkbox"/> Qp	
0		Approximately 4.5" Topsoil									
		Brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, firm		1	14		CL	5-3-2 N=5	14	⊗	
975	5	Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, loose		2	16	*p200 Analysis 3.5' - 5.0'	SC-SM	2-2-5 N=7	16	⊗	p200: 35%
		Soil boring terminated approximately 5 feet below the existing ground surface									

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DATE STARTED: 8/21/25
DATE COMPLETED: 8/21/25
COMPLETION DEPTH: 5.0 ft
BENCHMARK: N/A
ELEVATION: 980 ft
LATITUDE: 42.690295°
LONGITUDE: -83.194566°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-75 Truck Rig
DRILLING METHOD: Solid Stem
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 92%
REVIEWED BY: T. Khalaff

BORING SB-42A

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
0						Approximately 9.25" Concrete					
				1	15	Approximately 3.25" Dark gray fine to coarse GRAVELLY SAND with Silt, moist (BASE)	CL	10-2-2 N=4			
				2	16	Gray mottled dark brown SILTY LEAN CLAY with Sand, trace Gravel, moist, soft	CL				
975	5					Yellow-gray mottled brown SILTY LEAN CLAY with Sand, trace Gravel, moist, firm	CL	2-3-5 N=8			
						Soil boring terminated approximately 5 feet below the existing ground surface					



Professional Service Industries, Inc.
 45000 Helm Street, Suite 200
 Plymouth, MI 48170
 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/21/25
DATE COMPLETED: 7/21/25
COMPLETION DEPTH: 5.0 ft
BENCHMARK: N/A
ELEVATION: 985 ft
LATITUDE: 42.689271°
LONGITUDE: -83.194375°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

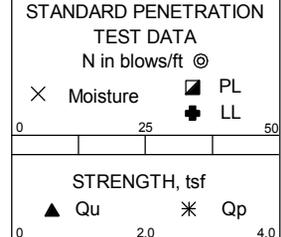
DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-43

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
 See Boring Location Diagrams
 Offset 8' to the Southwest

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0						Approximately 4.0" Topsoil					
				1	14	Dak brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, medium dense	SC-SM	4-7-5 N=12	9		
980	5			2	16	Yellow and gray mottled brown SANDY LEAN CLAY with Silt, trace Gravel, moist, very stiff	CL	3-8-22 N=30	12		
						Soil boring terminated approximately 5 feet below the existing ground surface					



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 7/21/25	DRILL COMPANY: PSI, Inc.	BORING SB-44
DATE COMPLETED: 7/21/25	DRILLER: Z. Simpson LOGGED BY: I. Alhemyari	
COMPLETION DEPTH: 5.0 ft	DRILL RIG: CME-55 Truck Rig	Water <input type="checkbox"/> While Drilling N/A <input type="checkbox"/> Upon Completion N/A <input type="checkbox"/> Cave In Depth N/A
BENCHMARK: N/A	DRILLING METHOD: 3.25" HSA	BORING LOCATION: See Boring Location Diagrams
ELEVATION: 984 ft	SAMPLING METHOD: SS	
LATITUDE: 42.689376°	HAMMER TYPE: Automatic	
LONGITUDE: -83.194518°	EFFICIENCY: 80%	
STATION: N/A OFFSET: N/A	REVIEWED BY: T. Khalaff	
REMARKS: borehole backfilled with auger cuttings		

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
										<input type="checkbox"/> Moisture <input type="checkbox"/> PL <input type="checkbox"/> LL STRENGTH, tsf <input type="checkbox"/> Qu <input type="checkbox"/> Qp	
0		Approximately 4.0" Topsoil									
		Brown fine to coarse POORLY GRADED SAND with Silt, trace Gravel, moist, medium dense		1	14		SP-SM	3-5-6 N=11	9	X	
980		Brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist, firm		2	16		CL	2-3-5 N=8	12	X	
5		Soil boring terminated approximately 5 feet below the existing ground surface									

	Professional Service Industries, Inc. 45000 Helm Street, Suite 200 Plymouth, MI 48170 Telephone: (248) 957-9911	PROJECT NO.: 03811526
		PROJECT: Nowicki Park Improvements
		LOCATION: City of Rochester Hills
		Oakland County, Michigan

DATE STARTED: 7/21/25
DATE COMPLETED: 7/21/25
COMPLETION DEPTH: 25.0 ft
BENCHMARK: N/A
ELEVATION: 979 ft
LATITUDE: 42.690539°
LONGITUDE: -83.194584°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-55 Truck Rig
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 80%
REVIEWED BY: T. Khalaff

BORING SB-45

Water
 ∇ While Drilling N/A
 ▼ Upon Completion N/A
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams
 Offset 8' to the South

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0		Approximately 9.0" Topsoil									
975	15	Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, loose *p200 Analysis 3.5' - 5.0'		1	15		SC-SM	4-3-2 N=5	12		Qp = 1.5 tsf
975	14	Brown SANDY LEAN CLAY with Silt, trace Gravel, moist, very stiff		2	14			2-2-3 N=5	16		p200: 16%
970	16			3	16			5-5-10 N=15	14		Qp = 4.5+ tsf
970	18			4	18		CL	6-12-12 N=24	13		LL = 27 PL = 15 Qp = 4.5+ tsf
965	16	Gray SANDY to SILTY CLAY, trace Gravel, moist, very stiff		5	16		CL-ML	4-8-9 N=17	11		LL = 19 PL = 12 Qp = 4.5+ tsf
960	16	Gray SANDY LEAN CLAY with Silt, trace Gravel, moist to wet, stiff		6	16		CL	4-5-8 N=13	10		Qp = 3.25 tsf
955	15	Gray fine to coarse POORLY GRADED SAND, trace Silt, trace Gravel, wet, medium dense		7	15		SP	6-9-7 N=16	10		Qp = 2.5 tsf
		Soil boring terminated approximately 25 feet below the existing ground surface									



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 Plymouth, MI 48170
 Telephone: (248) 957-9911

PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 8/21/25
DATE COMPLETED: 8/21/25
COMPLETION DEPTH: 25.0 ft
BENCHMARK: N/A
ELEVATION: 979 ft
LATITUDE: 42.690539°
LONGITUDE: -83.194584°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Alhemyari
DRILL RIG: CME-75 Truck Rig
DRILLING METHOD: 2.25" HSA
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 92%
REVIEWED BY: T. Khalaff

BORING SB-45A

Water
 ∇ While Drilling 20 feet
 ▼ Upon Completion 23 feet
 ∇ Cave In Depth N/A

BORING LOCATION:
 See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0						Approximately 11.0' Concrete					
975	3			1	13	Approximately 3.5" Dark gray fine to coarse GRAVELLY SAND with Silt, moist (BASE) Brown SANDY LEAN CLAY with Silt, trace Gravel, moist, firm	CL	5-5-3 N=8	12		Qp = 1.0 tsf
975	5			2	16	Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, loose *p200 Analysis 3.5' - 5.0'	SC-SM	2-2-3 N=5	20		Qp = 2.5 tsf p200: 31%
970	10			3	16	Brown SILTY LEAN CLAY with fine Sand, trace Gravel, moist to wet, stiff	CL	2-4-6 N=10	14		Qp = 3.75 tsf
970	10			4	17	Gray SILTY LEAN CLAY with fine Sand, trace Gravel, moist to wet, stiff to very stiff	CL	3-5-5 N=10	11		LL = 20 PL = 12 Qp = 3.75 tsf
965	15			5	14		CL	4-8-11 N=19	11		Qp = 3.75 tsf
960	20			6	16	Gray SANDY to SILTY LEAN CLAY, trace Gravel, wet, stiff	CL-ML	4-5-10 N=15	10		LL = 17 PL = 10 Qp = 3.5 tsf
955	25			7	16	Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel, wet, medium dense *p200 Analysis 23.5' - 25.0'	SC-SM	11-8-8 N=16	10		Qp = 2.5 tsf p200: 42%
						Soil boring terminated approximately 25 feet below the existing ground surface					



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

DATE STARTED: 8/21/25
DATE COMPLETED: 8/21/25
COMPLETION DEPTH: 5.0 ft
BENCHMARK: N/A
ELEVATION: 978 ft
LATITUDE: 42.690708°
LONGITUDE: -83.194412°
STATION: N/A **OFFSET:** N/A
REMARKS: borehole backfilled with auger cuttings

DRILL COMPANY: PSI, Inc.
DRILLER: Z. Simpson **LOGGED BY:** I. Tatem
DRILL RIG: CME-75 Truck Rig
DRILLING METHOD: Solid Stem
SAMPLING METHOD: SS
HAMMER TYPE: Automatic
EFFICIENCY: 92%
REVIEWED BY: T. Khalaff

BORING SB-46

Water	▽ While Drilling	N/A
	▼ Upon Completion	N/A
	▽ Cave In Depth	N/A

BORING LOCATION:
See Boring Location Diagrams

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0		Approximately 7.0" Asphalt									
975		Approximately 2.5" Dark gray fine to coarse GRAVELLY SAND with Silt, moist (BASE)		1	13	Dark brown fine to coarse SILTY to CLAYEY SAND, trace Gravel, moist, loose	SC-SM	3-3-2 N=5	12	⊗	Qp= 1.5 tsf
5		Gray fine to coarse POORLY GRADED SAND with Silt, trace Gravel, moist, loose		2	16	*p200 Analysis 3.5' - 5.0'	SP-SM	2-2-3 N=5	20	⊗	p200: 10%
		Soil boring terminated approximately 5 feet below the existing ground surface									



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PROJECT NO.: 03811526
PROJECT: Nowicki Park Improvements
LOCATION: City of Rochester Hills
 Oakland County, Michigan

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.	☒ SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
HSA: Hollow Stem Auger - typically 3 1/4" or 4 1/4" I.D. openings, except where noted.	■ ST: Shelby Tube - 3" O.D., except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry	▮ RC: Rock Core
R.C.: Diamond Bit Core Sampler	⬇ TC: Texas Cone
H.A.: Hand Auger	☞ BS: Bulk Sample
P.A.: Power Auger - Handheld motorized auger	☒ PM: Pressuremeter
	CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N ₆₀ : A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q _u : Unconfined compressive strength, TSF
Q _p : Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL), %
DD: Dry unit weight, pcf
▼, ▼, ▼ Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

<u>Relative Density</u>	<u>N - Blows/foot</u>
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

<u>Description</u>	<u>Criteria</u>
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

<u>Component</u>	<u>Size Range</u>
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

<u>Description</u>	<u>Criteria</u>
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

<u>Q_u - TSF</u>	<u>N - Blows/foot</u>	<u>Consistency</u>
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

<u>Description</u>	<u>Criteria</u>
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

<u>Description</u>	<u>Criteria</u>	<u>Description</u>	<u>Criteria</u>
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick	Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick	Lensed:	Inclusion of small pockets of different soils
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing	Layer:	Inclusion greater than 3 inches thick (75 mm)
Slickensided:	Fracture planes appear polished or glossy, sometimes striated	Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
		Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

<u>Q_u - TSF</u>	<u>Consistency</u>
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

<u>Description</u>	<u>Criteria</u>
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

<u>Voids</u>	<u>Void Diameter</u>
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

<u>Component</u>	<u>Size Range</u>
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

<u>Rock Mass Description</u>	<u>RQD Value</u>
Excellent	90 - 100
Good	75 - 90
Fair	50 - 75
Poor	25 - 50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

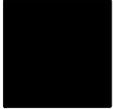
NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS	
			GRAPH	LETTER		
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS CLEAN GRAVELS (LITTLE OR NO FINES)			GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
				GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES	
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)			GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
					SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
					SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	SAND AND SANDY SOILS CLEAN SANDS (LITTLE OR NO FINES)				SM	SILTY SANDS, SAND - SILT MIXTURES
					SC	CLAYEY SANDS, SAND - CLAY MIXTURES
					ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
	FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
				MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50					CH	INORGANIC CLAYS OF HIGH PLASTICITY
					OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
					PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

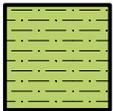
Graphic Symbols for Materials and Rock Deposits



CONCRETE
Portland Cement Concrete



BITUMINOUS CONCRETE



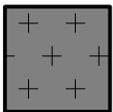
CLAYSTONE



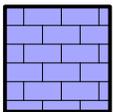
COAL
Coal, Anthracite Coal



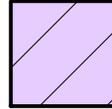
CONGLOMERATE/BRECCIA
Conglomerate, Breccia



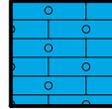
IGNEOUS ROCK
Anorthosite, Basalt, Metabasalt, Diabase (Gabbro), Gabbro, Granite/Granodionite, Homfels, Pegmatite, Rhyolite/Metarhyolite



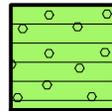
LIMESTONE
Limestone, Dolomite



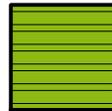
METAMORPHIC ROCK
Amphibolite, Gneiss, Marble, Phyllite, Quartzite, Schist, Serpentinite, Slate



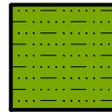
CHERT



SANDSTONE
Sandstone, Orthoquartzite (Sandstone)



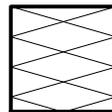
SHALE



SILTSTONE



NO RECOVERY



VOID



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-01
Project Number:	03811526	Sample Number:	SS7
Sample Date:	7/21/2025	Sample Depth:	23.5' - 25.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown mottled fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	265.71
Dry Weight of Sample and Tare before Wash (g):	426.09
Dry Weight of Sample and Tare after Wash (g):	352.45
Loss By Wash (g):	73.6
% Loss By Wash:	45.9%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-01
Sample No.: SS3
Sample Depth: 6.0' - 7.5'
Date: 8/14/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 34.20%

Air-dried Sample

Sample Description: Brown SANDY LEAN CLAY with Silt, trace Gravel

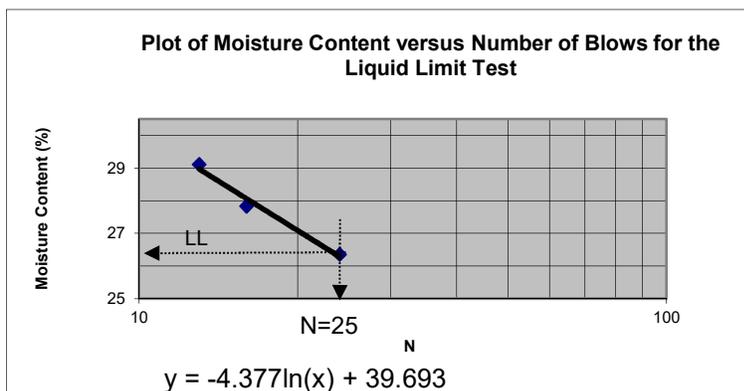
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
62	11.55	27.32	24.08	24	25.9
446	11.52	25.82	22.75	16	27.3
174	12.50	25.94	22.95	13	28.6

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
143	12.46	28.08	26.18	13.8
28	11.07	23.89	22.34	13.8

13.8



Liquid Limit (LL) = **26**
 Plastic Limit (PL) = **14**
 Plasticity Index (PI) = **12**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-01
Sample No.: SS5
Sample Depth: 13.5' - 15.0'
Date: 8/13/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 30.54%

Air-dried Sample

Sample Description: Brown SANDY LEAN CLAY with Silt, trace Gravel

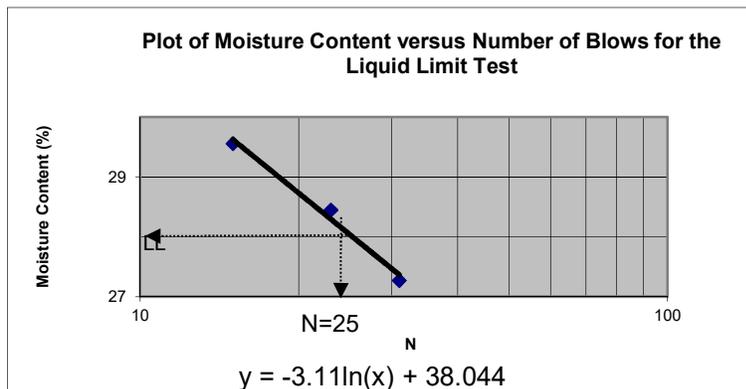
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
378	11.62	21.28	19.21	31	27.3
472	11.46	21.80	19.51	23	28.4
9A	11.18	20.56	18.42	15	29.6

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
10A	11.02	19.75	18.56	15.8
175	12.35	21.49	20.24	15.8

15.8



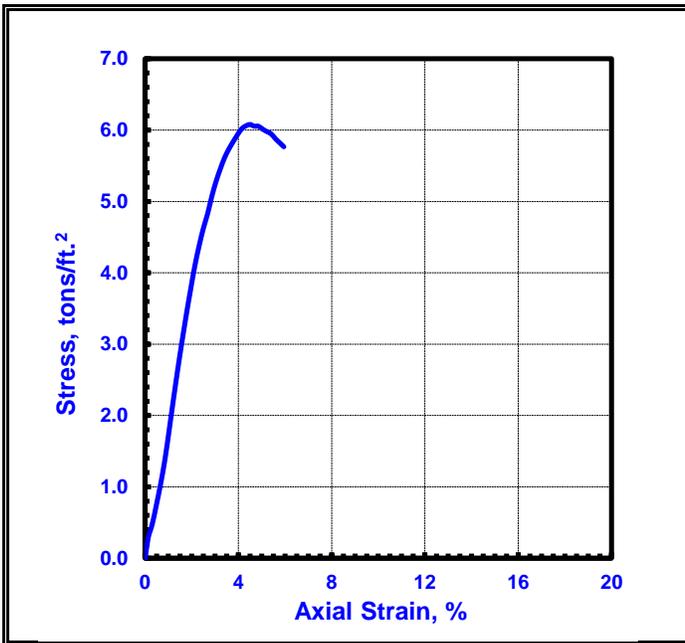
Liquid Limit (LL) = **28**
 Plastic Limit (PL) = **16**
 Plasticity Index (PI) = **12**
 PI = LL - PL

Unconfined Compression Test ASTM D 2166

Test Date: **8/20/2025**

Project Name: Nowicki Park Improvements	Project Number: 3811526
Boring Number: SB-01	Depth, feet: 15 - 17'
Liquid Limit: NA	Plastic Limit: NA
Hand Pen/Torvane: 4.5 tsf	Specific Gravity (Assumed): 2.800
Classification: Brown LEAN CLAY - with sand, trace gravel	Sample Condition: Undisturbed

Oven: 0381-30-GC Load Cell: 1519	Scale: EP22001	Calipers: 381-CP-02 Load Frame: 10			
Sample Data	1	2	3	Average	Height/Dia. Ratio
Diameter (D), in.:	2.842	2.849	2.841	2.844	1.97
Height (H), in.:	5.613	5.596	5.619	5.609	
Area, ft ² :	0.044	Volume, ft ³ :		0.021	Seating:
Moisture Data	Before (Trimmings)	After Test (Middle)	Specimen	Before	After
Tare ID:	152	473	Wet Weight, gms:	1331.70	1331.70
Tare Wt., gm:	12.44	11.63	Dry Weight, gms:	1191.93	
Wet Wt.+Tare, gm:	81.1	68.7	Moisture, %:	12.8%	12.8%
Dry Wt.+Tare, gm:	52.52	62.71	Wet Unit Wt., pcf:	142.4	142.4
Wt. of Water, gm:	7.78	5.99	Dry Unit Wt., pcf:	126.3	126.3
Dry Soil Wt., gm:	60.88	51.08	Void Ratio, pcf:	0.384	0.384
Moisture:	12.8%	11.7%	Saturation, %:	93.3%	93.3%



RESULTS	
Actual Strain Rate, (%/min.):	1.25
Failure Strain at Peak Stress, %:	4.50
Max. Compressive Stress, tsf:	6.08
Undrained Shear Strength (tsf):	3.04
Failure Type:	Multiple Shear Planes

Remarks:	Other tests may have been performed in accordance with ASTM D1140, ASTM D4318, ASTM D854				
Tested By:	RA	Computed By:	SS	Checked By:	K. Jaradat



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-01 (Shelby)
Project Number:	03811526	Sample Number:	SS5a
Sample Date:	7/21/2025	Sample Depth:	15.0' - 17.0'
Test Date:	8/21/2025	Tested By:	Rabia Azam
		Checked By:	

Sample Description: **Brown LEAN CLAY - with sand, trace gravel**

Tare Number / Tare Weight (g):	231.18
Dry Weight of Sample and Tare before Wash (g):	541.25
Dry Weight of Sample and Tare after Wash (g):	295.21
Loss By Wash (g):	246.0
% Loss By Wash:	79.3%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-02
Sample No.: SS2
Sample Depth: 3.5' - 5.0'
Date: 8/14/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 35.50%

Air-dried Sample

Sample Description: Brown SANDY LEAN CLAY with Silt, trace Gravel

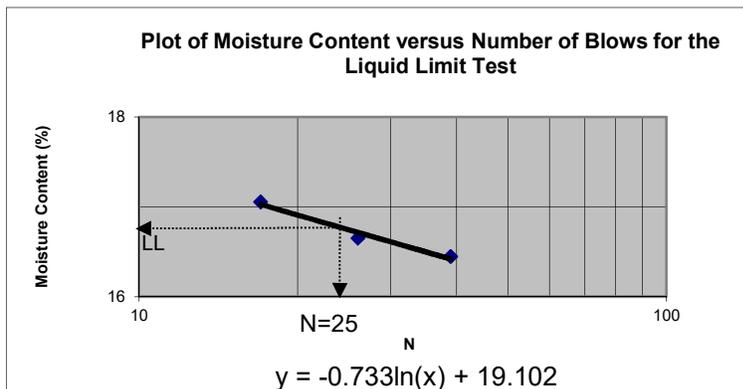
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W_1 (g)	Weight of Can + Wet Soil W_2 (g)	Weight of Can + Dry Soil W_3 (g)	Number of Blows (N)	Moisture Content w (%)
411	11.55	34.77	31.49	39	16.4
357	11.57	25.86	23.82	26	16.7
390	11.65	30.18	27.48	17	17.1

PLASTIC LIMIT TEST

Can No.	Weight of Can W_1 (g)	Weight of Can + Wet Soil W_2 (g)	Weight of Can + Dry Soil W_3 (g)	Plastic Limit w (%)
108	12.33	22.11	21.05	12.2
164	12.41	26.00	24.53	12.1

12.1



Liquid Limit (LL) = **17**
 Plastic Limit (PL) = **12**
 Plasticity Index (PI) = **5**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-02
Sample No.: SS4
Sample Depth: 8.5' - 10.0'
Date: 8/12/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 31.11%

Air-dried Sample

Sample Description: Brown SANDY LEAN CLAY with Silt, trace Gravel

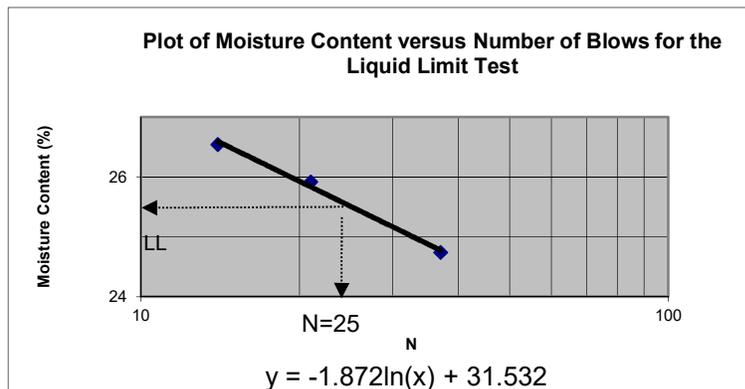
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
4	11.06	28.91	25.37	37	24.7
374	11.70	26.81	23.70	21	25.9
434	11.56	23.86	21.28	14	26.5

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
2A	10.93	18.97	17.91	15.2
158	12.37	21.77	20.57	14.6

14.9



Liquid Limit (LL) = 26
 Plastic Limit (PL) = 15
 Plasticity Index (PI) = 11
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-02
Sample No.: SS6
Sample Depth: 18.5' - 20.0'
Date: 8/12/2025
Tested by: Isabela Tatem
Checked by: TK
Estimated % Soil retained on No. 40: 10.61%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

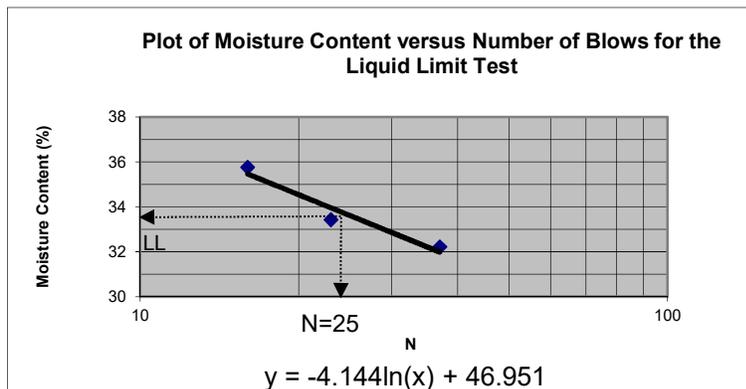
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
448	11.52	27.69	23.75	37	32.2
162	12.26	26.91	23.24	23	33.4
407	11.56	25.91	22.13	16	35.8

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
150	12.45	21.15	19.76	19.0
428	11.64	18.87	17.68	19.7

19.4



Liquid Limit (LL) = **34**
 Plastic Limit (PL) = **19**
 Plasticity Index (PI) = **15**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-03
Sample No.: SS2
Sample Depth: 3.5' - 5.0'
Date: 8/12/2025
Tested by: Isabela Tatem
Checked by: TK
Estimated % Soil retained on No. 40: 29.05%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

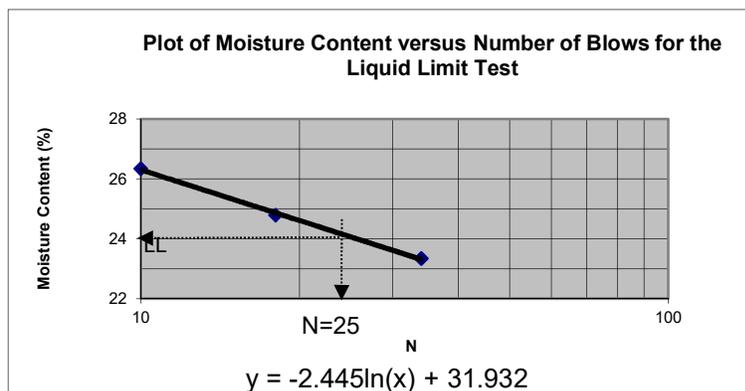
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
116	12.42	30.70	27.24	34	23.3
37	11.02	25.62	22.72	18	24.8
149	12.38	27.44	24.30	10	26.3

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
102	12.46	18.98	18.15	14.6
131	12.41	17.90	17.25	13.4

14.0



Liquid Limit (LL) = **24**
 Plastic Limit (PL) = **14**
 Plasticity Index (PI) = **10**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-03
Sample No.: SS5
Sample Depth: 13.5' - 15.0'
Date: 8/12/2025
Tested by: Rabia Azam
Checked by: TK

Estimated % Soil retained on No. 40: 26.46% **Air-dried Sample**

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

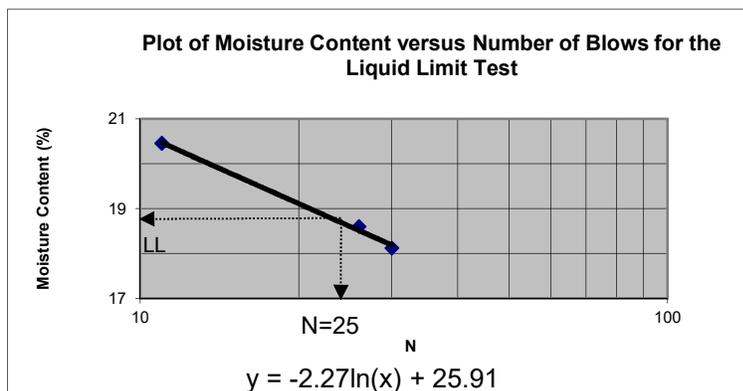
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
341	12.55	25.98	23.92	30	18.1
419	11.03	20.15	18.72	26	18.6
187	10.87	22.00	20.11	11	20.5

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
111	12.29	26.01	24.69	10.6
40	11.42	28.65	26.97	10.8

10.7



Liquid Limit (LL) = **19**
 Plastic Limit (PL) = **11**
 Plasticity Index (PI) = **8**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-03
Project Number:	03811526	Sample Number:	SS6
Sample Date:	7/28/2025	Sample Depth:	18.5' - 20.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	227.69
Dry Weight of Sample and Tare before Wash (g):	397.08
Dry Weight of Sample and Tare after Wash (g):	324.98
Loss By Wash (g):	72.1
% Loss By Wash:	42.6%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-03
Project Number:	03811526	Sample Number:	SS7
Sample Date:	7/28/2025	Sample Depth:	23.5' - 25.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	216.85
Dry Weight of Sample and Tare before Wash (g):	395.90
Dry Weight of Sample and Tare after Wash (g):	325.55
Loss By Wash (g):	70.4
% Loss By Wash:	39.3%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-04
Sample No.: SS2
Sample Depth: 3.5' - 5.0'
Date: 8/13/2025
Tested by: Isabela Tatem
Checked by: TK
Estimated % Soil retained on No. 40: 25.03%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

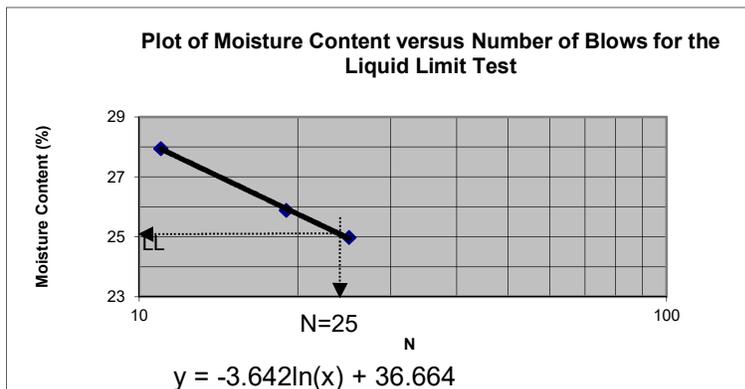
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
392	11.62	26.68	23.67	25	25.0
42A	11.09	26.02	22.95	19	25.9
475	11.58	26.00	22.85	11	28.0

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
371	11.63	21.95	20.75	13.2
468	11.80	25.34	23.73	13.5

13.3



Liquid Limit (LL) = 25
 Plastic Limit (PL) = 13
 Plasticity Index (PI) = 12
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-04
Sample No.: SS4
Sample Depth: 8.5' - 10.0'
Date: 8/15/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 20.14%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

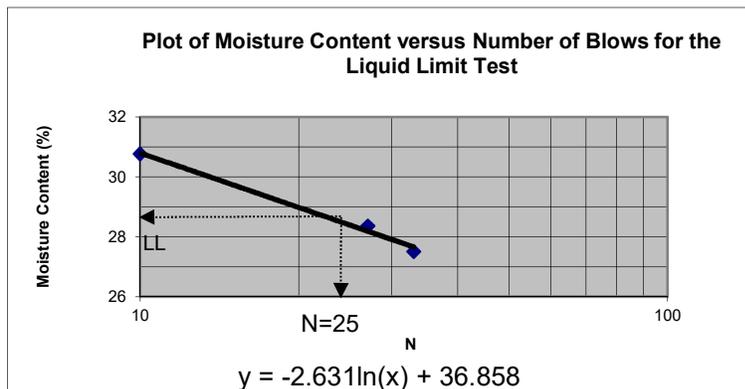
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
119	12.45	20.33	18.63	33	27.5
200	12.45	22.27	20.10	27	28.4
64	11.11	19.95	17.87	10	30.8

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
440	11.78	20.51	19.43	14.1
127	12.40	24.12	22.6	14.9

14.5



Liquid Limit (LL) = **28**
 Plastic Limit (PL) = **15**
 Plasticity Index (PI) = **13**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-04
Project Number:	03811526	Sample Number:	SS7
Sample Date:	7/22/2025	Sample Depth:	23.5' - 25.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	220.59
Dry Weight of Sample and Tare before Wash (g):	398.31
Dry Weight of Sample and Tare after Wash (g):	316.95
Loss By Wash (g):	81.4
% Loss By Wash:	45.8%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-05
Sample No.: SS3
Sample Depth: 6.0' - 7.5'
Date: 8/12/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 25.03%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

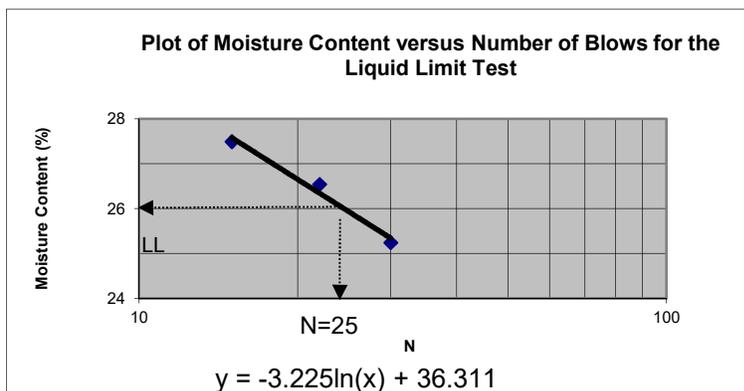
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
341	11.59	26.28	23.32	30	25.2
419	11.46	25.05	22.20	22	26.5
187	11.11	27.62	24.06	15	27.5

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
408	11.53	17.81	17.02	14.4
124	12.45	18.66	17.86	14.8

14.6



Liquid Limit (LL) = **26**
 Plastic Limit (PL) = **15**
 Plasticity Index (PI) = **11**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-05
Sample No.: SS5
Sample Depth: 13.5' - 15.0'
Date: 8/13/2025
Tested by: Isabela Tatem
Checked by: TK
Estimated % Soil retained on No. 40: 29.23%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

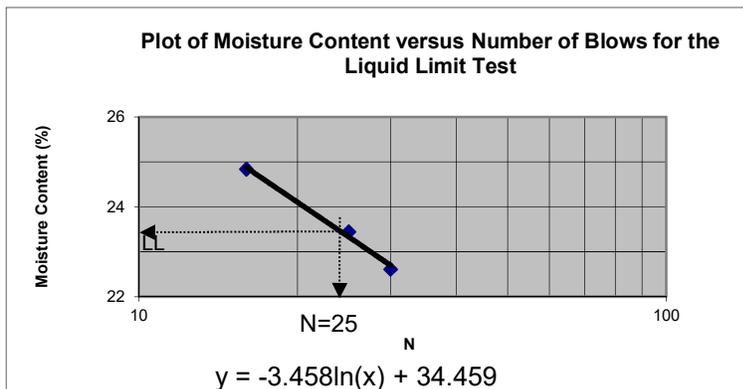
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
9	11.04	28.12	24.97	30	22.6
19A	11.04	26.73	23.75	25	23.4
34	11.22	26.50	23.46	16	24.8

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
462	11.54	22.19	21.03	12.2
35A	11.07	21.10	19.99	12.4

12.3



Liquid Limit (LL) = **23**
 Plastic Limit (PL) = **12**
 Plasticity Index (PI) = **11**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-05
Project Number:	03811526	Sample Number:	SS6
Sample Date:	7/22/2025	Sample Depth:	18.5' - 20.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY SAND, trace Gravel**

Tare Number / Tare Weight (g):	220.69
Dry Weight of Sample and Tare before Wash (g):	451.65
Dry Weight of Sample and Tare after Wash (g):	415.35
Loss By Wash (g):	36.3
% Loss By Wash:	15.7%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-05
Project Number:	03811526	Sample Number:	SS7
Sample Date:	7/22/2025	Sample Depth:	23.5' - 25.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	224.55
Dry Weight of Sample and Tare before Wash (g):	442.69
Dry Weight of Sample and Tare after Wash (g):	348.6
Loss By Wash (g):	94.1
% Loss By Wash:	43.1%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-06
Sample No.: SS3
Sample Depth: 6.0' - 7.5'
Date: 9/2/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 26.16%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

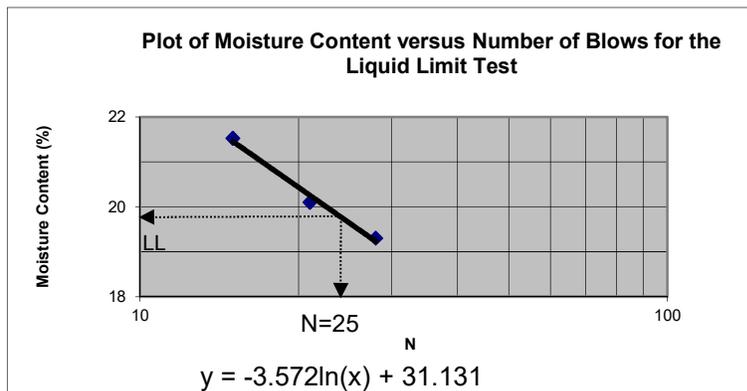
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
115	12.43	32.08	28.90	28	19.3
123	12.24	32.43	29.05	21	20.1
331	11.35	33.65	29.70	15	21.5

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
160	12.46	25.75	24.31	12.2
19a	11.03	22.26	21.04	12.2

12.2



Liquid Limit (LL) = **20**
 Plastic Limit (PL) = **12**
 Plasticity Index (PI) = **8**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-9
Sample No.: SS2
Sample Depth: 3.5' - 5.0'
Date: 8/11/2025
Tested by: Isabela Tatem
Checked by: TK
Estimated % Soil retained on No. 40: 27.18%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

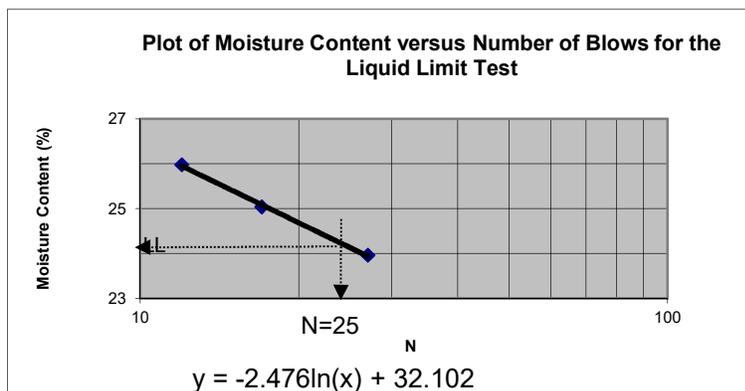
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
177	12.43	29.14	25.91	27	24.0
176	12.37	29.05	25.71	17	25.0
479	11.49	31.81	27.62	12	26.0

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
455	11.61	19.45	18.48	14.1
159	12.32	20.48	19.42	14.9

14.5



Liquid Limit (LL) = **24**
 Plastic Limit (PL) = **15**
 Plasticity Index (PI) = **9**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-09
Project Number:	03811526	Sample Number:	SS6
Sample Date:	7/23/2025	Sample Depth:	18.5' - 20.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	223.08
Dry Weight of Sample and Tare before Wash (g):	407.38
Dry Weight of Sample and Tare after Wash (g):	320.59
Loss By Wash (g):	86.8
% Loss By Wash:	47.1%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-9
Sample No.: SS7
Sample Depth: 23.5' - 25.0'
Date: 8/13/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 19.25%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

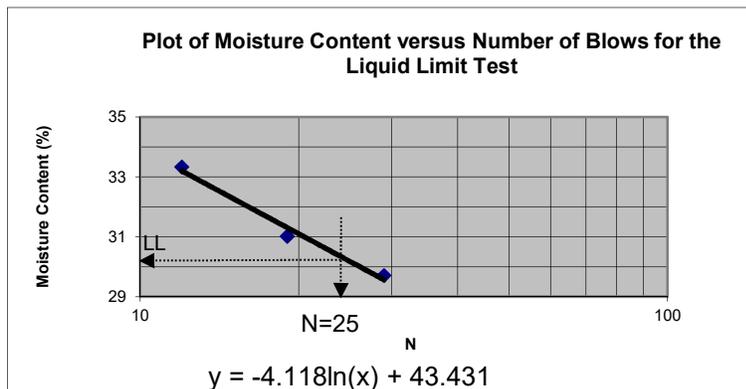
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
404	11.52	19.16	17.41	29	29.7
461	11.74	19.30	17.51	19	31.0
40	11.38	18.26	16.54	12	33.3

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
345	11.58	25.92	23.79	17.4
6A	11.06	22.54	20.81	17.7

17.6



Liquid Limit (LL) = **30**
 Plastic Limit (PL) = **18**
 Plasticity Index (PI) = **12**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-9
Sample No.: SS9
Sample Depth: 33.5' - 35.0'
Date: 8/12/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 42.05%

Air-dried Sample

Sample Description: Brown SANDY LEAN CLAY with Silt, trace Gravel

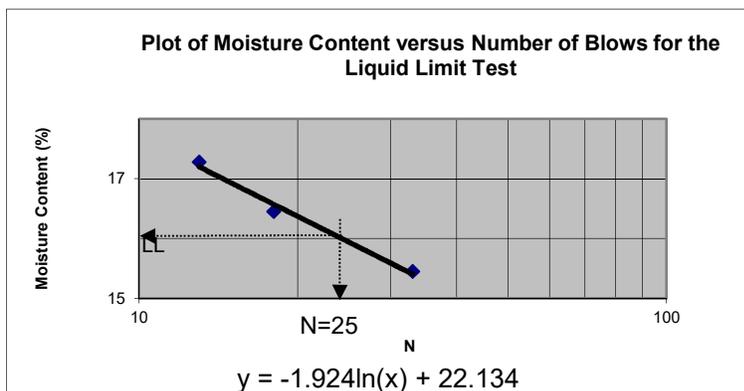
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
336	11.62	21.26	19.97	33	15.4
133	12.46	21.38	20.12	18	16.4
427	11.39	22.25	20.65	13	17.3

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
346	11.60	24.17	22.92	11.0
46a	11.36	21.94	20.92	10.7

10.9



Liquid Limit (LL) = **16**
 Plastic Limit (PL) = **11**
 Plasticity Index (PI) = **5**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-11
Sample No.: SS3
Sample Depth: 6.0' - 7.5'
Date: 8/15/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 20.60%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

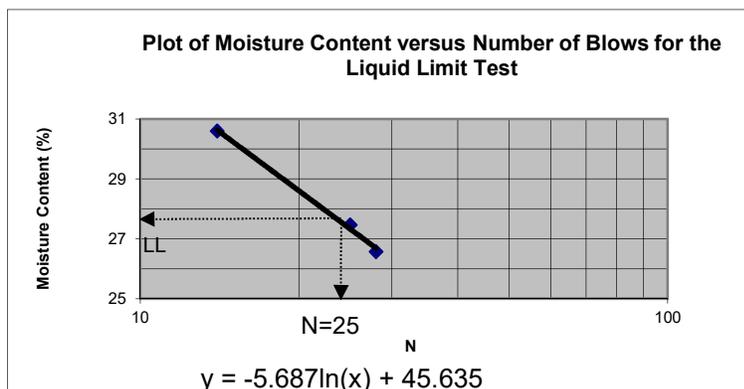
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
59	11.03	27.32	23.90	28	26.6
343	11.67	30.42	26.38	25	27.5
366	11.64	31.27	26.67	14	30.6

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
7	11.03	24.22	22.40	16.0
334	11.63	23.40	21.81	15.6

15.8



Liquid Limit (LL) = 27
 Plastic Limit (PL) = 16
 Plasticity Index (PI) = 11
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-11
Sample No.: SS5
Sample Depth: 13.5' - 15.0'
Date: 8/14/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 18.82%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

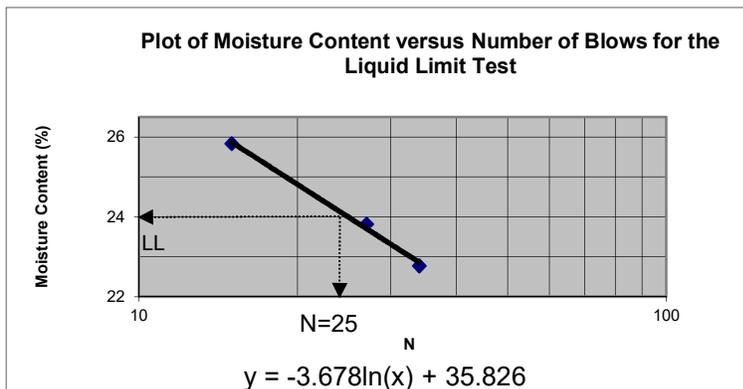
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
182	12.43	30.22	26.92	34	22.8
69	11.12	30.77	26.99	27	23.8
187	12.35	33.10	28.84	15	25.8

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
458	11.58	24.30	22.77	13.7
379	11.66	25.89	24.2	13.5

13.6



Liquid Limit (LL) = 24
 Plastic Limit (PL) = 14
 Plasticity Index (PI) = 10
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-11
Project Number:	03811526	Sample Number:	SS6
Sample Date:	7/23/2025	Sample Depth:	18.5' - 20.0'
Test Date:	8/1/2025	Tested By:	Isabela Tatem
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	221.87
Dry Weight of Sample and Tare before Wash (g):	382.97
Dry Weight of Sample and Tare after Wash (g):	307.56
Loss By Wash (g):	75.4
% Loss By Wash:	46.8%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-11
Project Number:	03811526	Sample Number:	SS7
Sample Date:	7/23/2025	Sample Depth:	23.5' - 25.0'
Test Date:	8/1/2025	Tested By:	Isabela tatem
		Checked By:	TK

Sample Description: **Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	222.12
Dry Weight of Sample and Tare before Wash (g):	393.91
Dry Weight of Sample and Tare after Wash (g):	311.47
Loss By Wash (g):	82.4
% Loss By Wash:	48.0%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-14
Project Number:	03811526	Sample Number:	SS2
Sample Date:	7/18/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown SANDY LEAN CLAY with Silt, trace Gravel, trace hair roots**

Tare Number / Tare Weight (g):	222.57
Dry Weight of Sample and Tare before Wash (g):	379.53
Dry Weight of Sample and Tare after Wash (g):	296.16
Loss By Wash (g):	83.4
% Loss By Wash:	53.1%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-17
Project Number:	03811526	Sample Number:	SS2
Sample Date:	7/18/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/1/2025	Tested By:	Isabela Tatem
		Checked By:	TK

Sample Description: **Brown SANDY LEAN CLAY with Silt, trace Gravel**

Tare Number / Tare Weight (g):	221.92
Dry Weight of Sample and Tare before Wash (g):	359.44
Dry Weight of Sample and Tare after Wash (g):	270.43
Loss By Wash (g):	89.0
% Loss By Wash:	64.7%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-18
Sample No.: SS3
Sample Depth: 6.0' - 7.5'
Date: 8/13/2025
Tested by: Isabela Tatem
Checked by: TK
Estimated % Soil retained on No. 40: 25.37%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

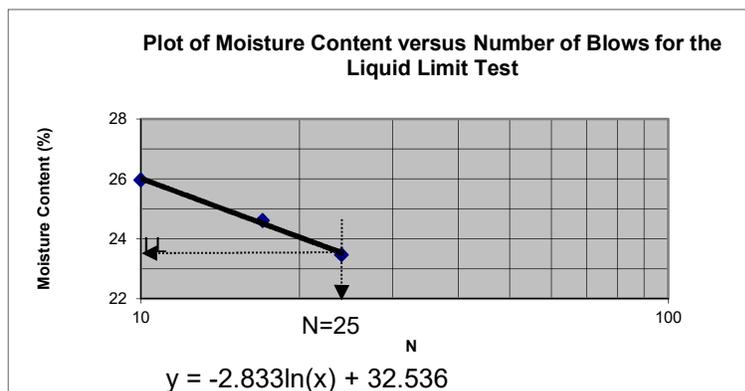
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
443	11.59	32.79	28.76	24	23.5
153	12.47	29.48	26.12	17	24.6
33AB	11.21	29.01	25.34	10	26.0

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
349	11.74	18.20	17.43	13.5
107	12.45	19.81	18.93	13.6

13.6



Liquid Limit (LL) = **23**
 Plastic Limit (PL) = **14**
 Plasticity Index (PI) = **9**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-18
Sample No.: SS5
Sample Depth: 13.5' - 15.0'
Date: 8/13/2025
Tested by: Isabela Tatem
Checked by: TK
Estimated % Soil retained on No. 40: 33.17%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

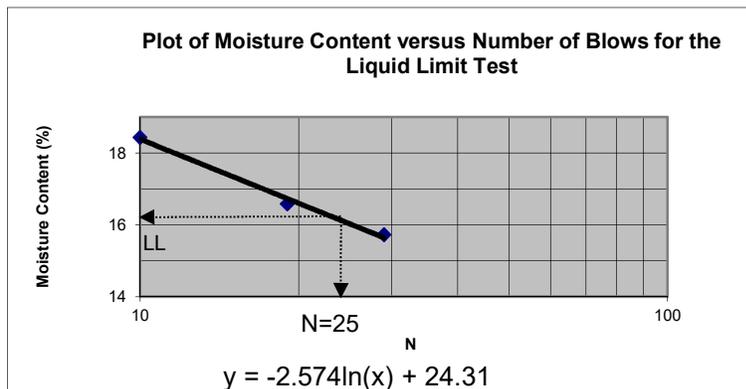
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
435	11.62	29.43	27.01	29	15.7
151	10.98	26.30	24.12	19	16.6
436	11.70	27.31	24.88	10	18.4

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
64	11.14	20.53	19.64	10.5
444	11.77	20.23	19.42	10.6

10.5



Liquid Limit (LL) = **16**
 Plastic Limit (PL) = **11**
 Plasticity Index (PI) = **5**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-18
Project Number:	03811526	Sample Number:	SS9
Sample Date:	7/23/2025	Sample Depth:	33.5' - 35.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	222.21
Dry Weight of Sample and Tare before Wash (g):	408.49
Dry Weight of Sample and Tare after Wash (g):	328.66
Loss By Wash (g):	79.8
% Loss By Wash:	42.9%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-19
Sample No.: SS2
Sample Depth: 3.5' - 5.0'
Date: 8/12/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 25.84%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

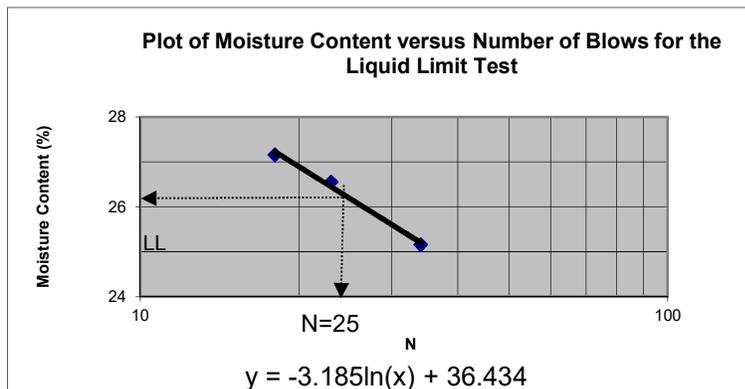
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
151	10.99	26.51	23.39	34	25.2
72	11.19	27.87	24.37	23	26.6
8	11.01	29.83	25.81	18	27.2

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
169	12.49	29.60	27.36	15.1
163	12.41	23.62	22.18	14.7

14.9



Liquid Limit (LL) = 26
 Plastic Limit (PL) = 15
 Plasticity Index (PI) = 11
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-19
Sample No.: SS4
Sample Depth: 8.5' - 10.0'
Date: 8/13/2025
Tested by: Isabela Tatem
Checked by: TK

Estimated % Soil retained on No. 40: 28.62% **Air-dried Sample**

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

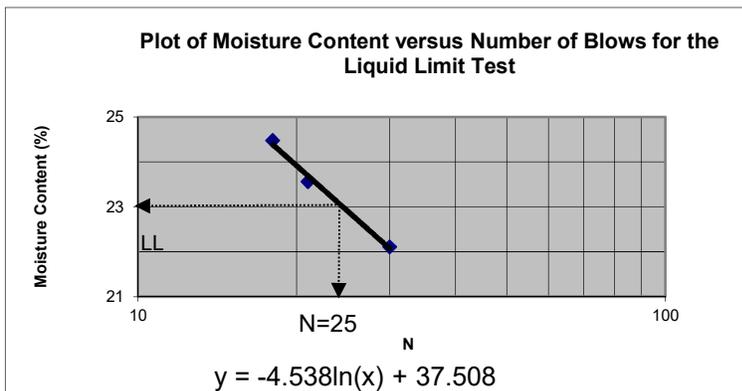
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
128	12.26	28.00	25.15	30	22.1
15	10.98	27.34	24.22	21	23.6
24	11.02	28.92	25.40	18	24.5

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
444	11.74	21.81	20.66	12.9
158	12.37	23.03	21.8	13.0

13.0



Liquid Limit (LL) = **23**
 Plastic Limit (PL) = **13**
 Plasticity Index (PI) = **10**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-19
Project Number:	03811526	Sample Number:	SS6
Sample Date:	7/23/2025	Sample Depth:	18.5' - 20.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	210.7
Dry Weight of Sample and Tare before Wash (g):	368.34
Dry Weight of Sample and Tare after Wash (g):	291.32
Loss By Wash (g):	77.0
% Loss By Wash:	48.9%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-20
Project Number:	03811526	Sample Number:	SS2
Sample Date:	7/18/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/1/2025	Tested By:	Isabela Tatem
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	223.06
Dry Weight of Sample and Tare before Wash (g):	395.50
Dry Weight of Sample and Tare after Wash (g):	321.07
Loss By Wash (g):	74.4
% Loss By Wash:	43.2%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-22
Sample No.: SS4
Sample Depth: 8.5' - 10.0'
Date: 8/15/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 23.11%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

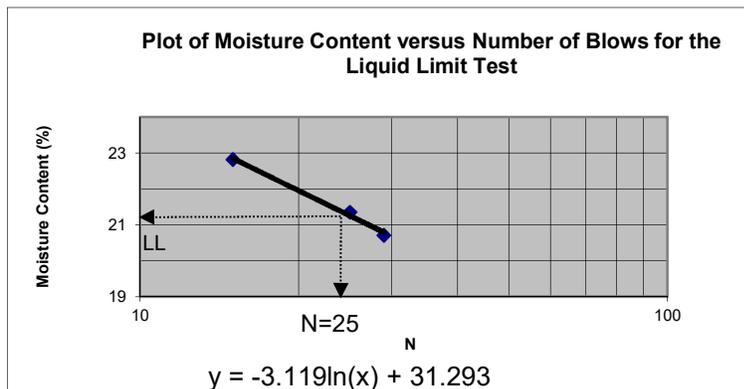
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
2	11.15	30.50	27.18	29	20.7
107	12.43	29.48	26.48	25	21.4
195	12.30	28.66	25.62	15	22.8

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
132	12.48	24.10	22.84	12.2
206	12.44	26.01	24.53	12.2

12.2



Liquid Limit (LL) = **21**
 Plastic Limit (PL) = **12**
 Plasticity Index (PI) = **9**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-24
Project Number:	03811526	Sample Number:	SS2
Sample Date:	8/12/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/21/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	235.25
Dry Weight of Sample and Tare before Wash (g):	394.22
Dry Weight of Sample and Tare after Wash (g):	314.55
Loss By Wash (g):	79.7
% Loss By Wash:	50.1%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-24
Sample No.: SS4
Sample Depth: 8.5' - 10.0'
Date: 8/22/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 45.69%

Air-dried Sample

Sample Description: Brown SANDY LEAN CLAY with Silt, trace Gravel

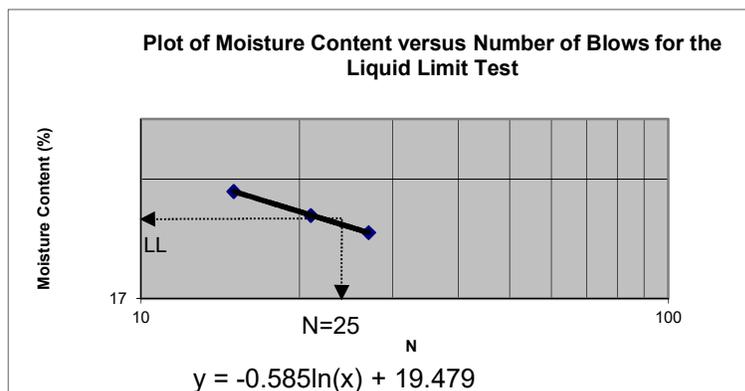
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
149	12.36	24.00	22.25	21	17.7
10a	11.00	20.51	19.09	27	17.6
9a	11.15	20.90	19.42	15	17.9

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
472	11.44	22.34	21.23	11.3
434	11.56	26.68	25.16	11.2

11.3



Liquid Limit (LL) = **18**
 Plastic Limit (PL) = **11**
 Plasticity Index (PI) = **7**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-24
Sample No.: SS6
Sample Depth: 18.5' - 20.0'
Date: 8/22/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 28.54%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

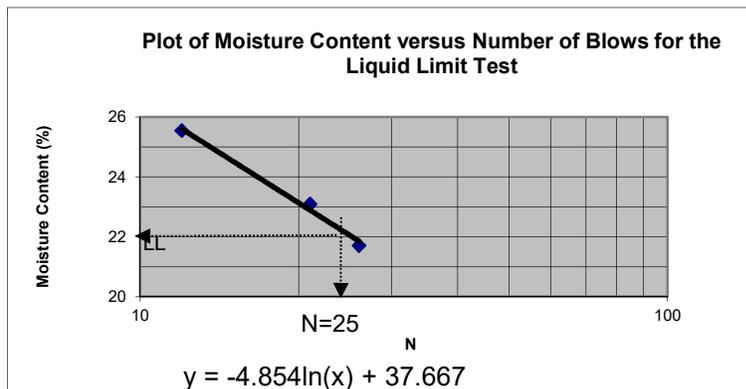
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
349	11.69	33.56	29.66	26	21.7
10	11.14	29.21	25.82	21	23.1
30	11.13	32.90	28.47	12	25.5

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
466	11.49	27.88	26.05	12.6
114	12.36	27.94	26.21	12.5

12.5



Liquid Limit (LL) = **22**
 Plastic Limit (PL) = **13**
 Plasticity Index (PI) = **9**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-24
Sample No.: SS8
Sample Depth: 28.5' - 30.0'
Date: 8/22/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 10.90% **Air-dried Sample**
Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel, sand seams

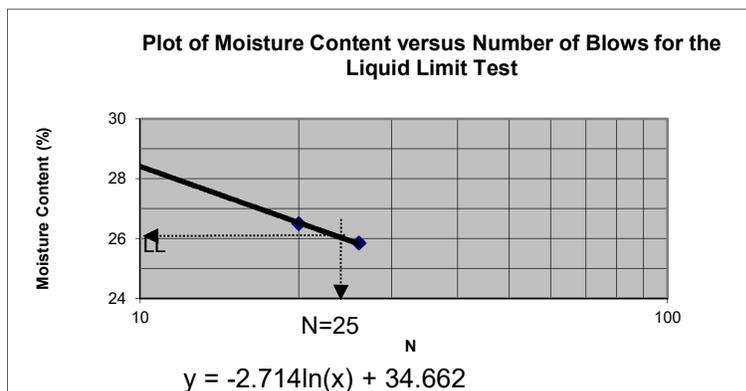
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
122	12.32	20.89	19.13	26	25.8
66	11.22	20.53	18.58	20	26.5
7a	10.94	20.49	18.36	9	28.7

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
11	10.99	26.43	24.34	15.7
121	12.26	27.12	25.1	15.7

15.7



Liquid Limit (LL) = **26**
 Plastic Limit (PL) = **16**
 Plasticity Index (PI) = **10**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-25
Sample No.: SS3
Sample Depth: 6.0' - 7.5'
Date: 8/22/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 31.73%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

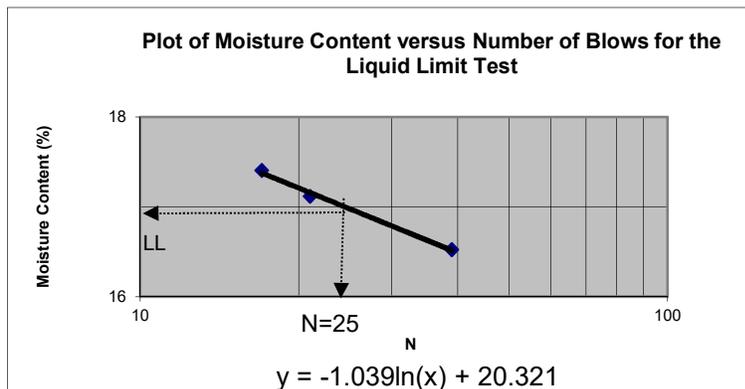
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
143	12.46	21.98	20.63	39	16.5
359	11.61	21.53	20.08	21	17.1
443	11.54	22.40	20.79	17	17.4

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
399	11.50	24.65	23.30	11.4
27	11.03	24.04	22.71	11.4

11.4



Liquid Limit (LL) = **17**
 Plastic Limit (PL) = **11**
 Plasticity Index (PI) = **6**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-25
Sample No.: SS5
Sample Depth: 13.5' - 15.0'
Date: 8/21/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 29.29%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

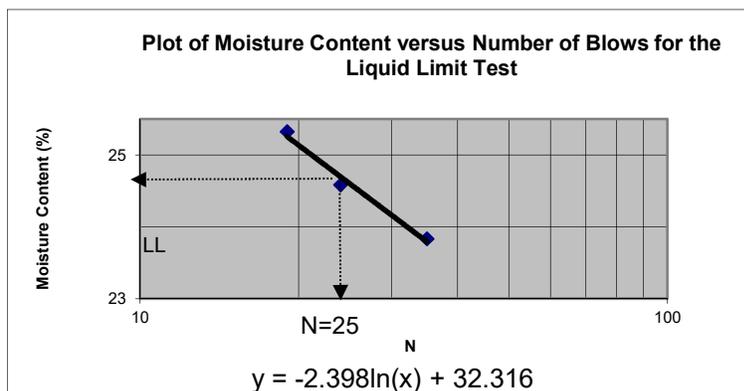
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
24	11.00	30.12	26.44	35	23.8
418	11.52	31.79	27.79	24	24.6
471	11.57	29.88	26.18	19	25.3

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
29	11.10	26.49	24.65	13.6
29-a	10.94	25.99	24.13	14.1

13.8



Liquid Limit (LL) = **25**
 Plastic Limit (PL) = **14**
 Plasticity Index (PI) = **11**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-25
Sample No.: SS7
Sample Depth: 23.5' - 25.0'
Date: 8/22/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 20.59%

Air-dried Sample

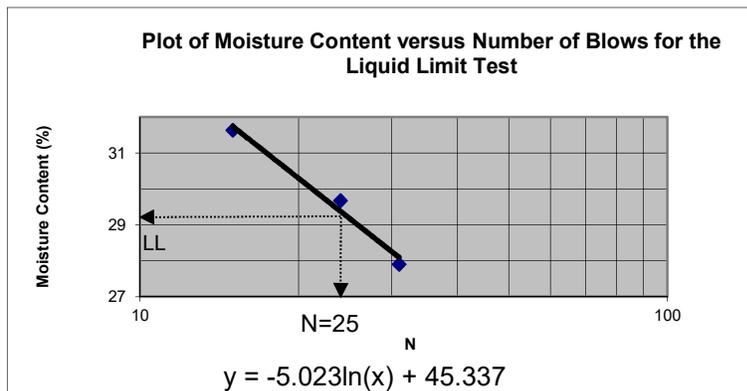
Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
60	11.65	30.40	26.31	31	27.9
105	12.47	29.34	25.48	24	29.7
192	12.35	30.66	26.26	15	31.6

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
158	12.35	27.57	25.28	17.7
5	11.08	23.90	21.96	17.8
				17.8



Liquid Limit (LL) = **29**
 Plastic Limit (PL) = **18**
 Plasticity Index (PI) = **11**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-25
Project Number:	03811526	Sample Number:	SS9
Sample Date:	8/11/2025	Sample Depth:	33.5' - 35.0'
Test Date:	8/21/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray fine to coarse SILTY SAND with Gravel**

Tare Number / Tare Weight (g):	216.49
Dry Weight of Sample and Tare before Wash (g):	448.48
Dry Weight of Sample and Tare after Wash (g):	383.79
Loss By Wash (g):	64.7
% Loss By Wash:	27.9%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-25A
Project Number:	03811526	Sample Number:	SS2
Sample Date:	7/17/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/1/2025	Tested By:	Isabela Tatem
		Checked By:	TK

Sample Description: **Brown SANDY LEAN CLAY with Silt, trace Gravel, trace hair Roots**

Tare Number / Tare Weight (g):	222.5
Dry Weight of Sample and Tare before Wash (g):	369.64
Dry Weight of Sample and Tare after Wash (g):	294.2
Loss By Wash (g):	75.4
% Loss By Wash:	51.3%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-26
Project Number:	03811526	Sample Number:	SS2
Sample Date:	7/17/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	222.4
Dry Weight of Sample and Tare before Wash (g):	403.69
Dry Weight of Sample and Tare after Wash (g):	347.57
Loss By Wash (g):	56.1
% Loss By Wash:	31.0%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-27
Project Number:	03811526	Sample Number:	SS2
Sample Date:	7/22/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY SAND, trace Gravel**

Tare Number / Tare Weight (g):	209.04
Dry Weight of Sample and Tare before Wash (g):	383.44
Dry Weight of Sample and Tare after Wash (g):	342.49
Loss By Wash (g):	41.0
% Loss By Wash:	23.5%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-27
Sample No.: SS4
Sample Depth: 8.5' - 10.0'
Date: 8/15/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 33.10%

Air-dried Sample

Sample Description: Brown SANDY LEAN CLAY with Silt, trace Gravel

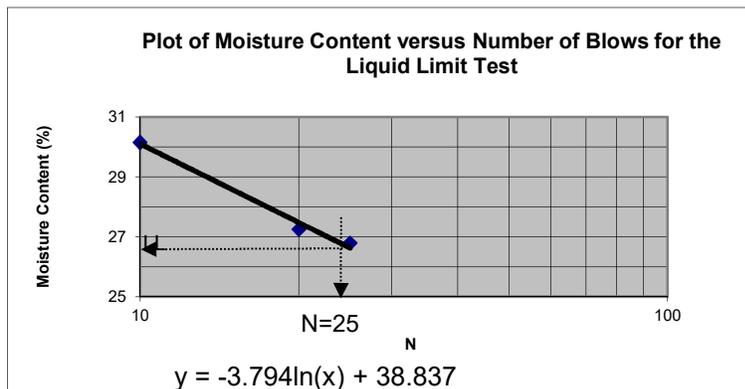
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
24A	11.08	21.68	19.44	25	26.8
467	11.58	21.48	19.36	20	27.2
20A	11.08	18.59	16.85	10	30.2

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
339	11.58	20.50	19.34	14.9
479	11.50	19.39	18.36	15.0

15.0



Liquid Limit (LL) = **27**
 Plastic Limit (PL) = **15**
 Plasticity Index (PI) = **12**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-27
Sample No.: SS5
Sample Depth: 13.5' - 15.0'
Date: 8/13/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 34.69%

Air-dried Sample

Sample Description: Gray SANDY LEAN CLAY with Silt, trace Gravel

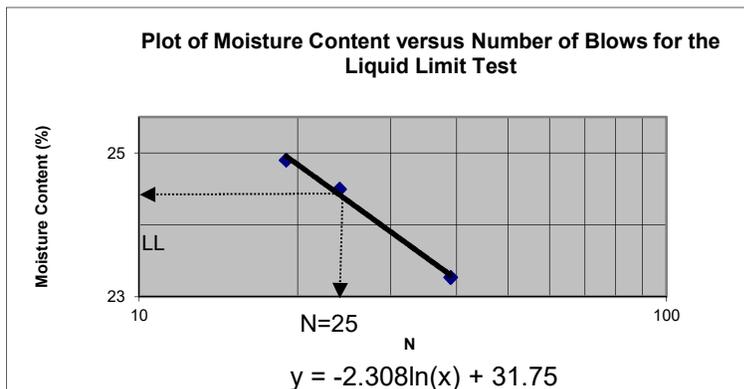
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
146	12.45	22.78	20.83	39	23.3
32a	11.19	21.10	19.15	24	24.5
30	11.13	20.56	18.68	19	24.9

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
27	11.02	23.98	22.52	12.7
444	11.74	22.93	21.63	13.1

12.9



Liquid Limit (LL) = **24**
 Plastic Limit (PL) = **13**
 Plasticity Index (PI) = **11**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-27
Project Number:	03811526	Sample Number:	SS6
Sample Date:	7/22/2025	Sample Depth:	18.5' - 20.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray SANDY LEAN CLAY with Silt, trace Gravel**

Tare Number / Tare Weight (g):	234.03
Dry Weight of Sample and Tare before Wash (g):	388.65
Dry Weight of Sample and Tare after Wash (g):	292.23
Loss By Wash (g):	96.4
% Loss By Wash:	62.4%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-27 (Shelby)
Project Number:	03811526	Sample Number:	SS7a
Sample Date:	7/22/2025	Sample Depth:	25.0' - 27.0'
Test Date:	8/20/2025	Tested By:	Rabia Azam
		Checked By:	

Sample Description: **Gray CLAYEY SAND - with gravel**

Tare Number / Tare Weight (g):	275.7
Dry Weight of Sample and Tare before Wash (g):	573.63
Dry Weight of Sample and Tare after Wash (g):	450.51
Loss By Wash (g):	123.1
% Loss By Wash:	41.3%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-27 (Shelby)
Sample No.: SS7a
Sample Depth: 25.0' - 27.0'
Date: 8/21/2025
Tested by: Rabia Azam

Checked by:
Estimated % Soil retained on No. 40: 30.36% **Air-dried Sample**

Sample Description: Gray CLAYEY SAND - with gravel

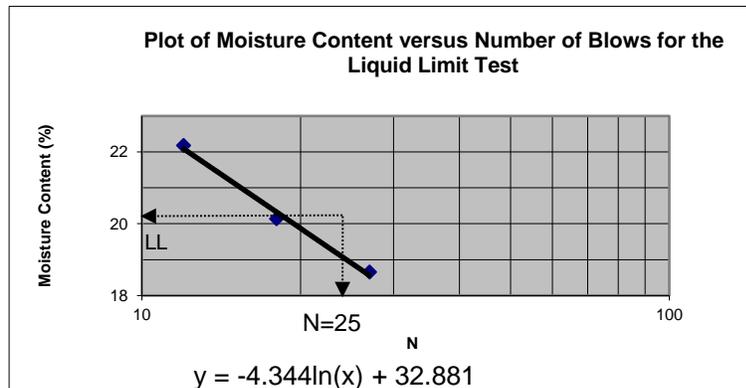
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
4a	11.10	21.53	19.89	27	18.7
344	11.46	21.72	20.00	18	20.1
374	11.72	21.36	19.61	12	22.2

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
435	11.65	18.87	18.11	11.8
102	12.43	22.50	21.45	11.6

11.7



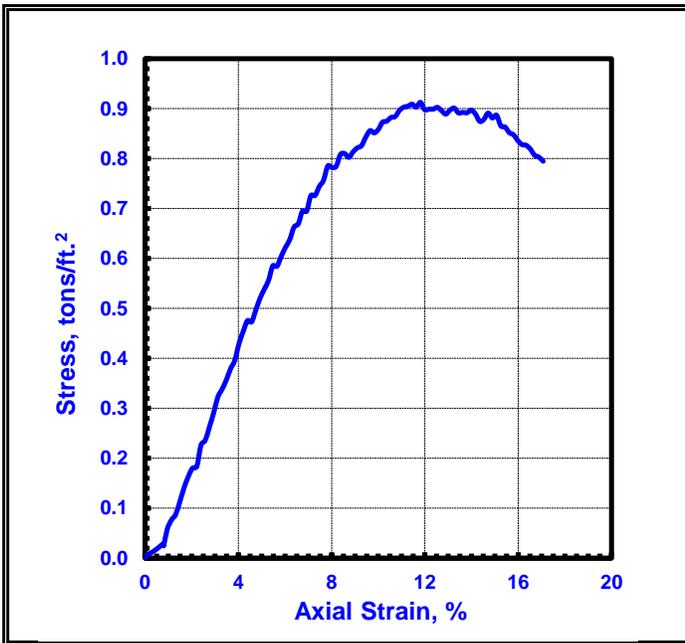
Liquid Limit (LL) = **19**
 Plastic Limit (PL) = **12**
 Plasticity Index (PI) = **7**
 PI = LL - PL

Unconfined Compression Test ASTM D 2166

Test Date: **8/20/2025**

Project Name: Nowicki Park Improvements		Project Number: 3811526	
Boring Number: SB-27	Depth, feet: 25 - 27'	Sample No./ID: SS7a	
Liquid Limit: 19	Plastic Limit: 12	Plasticity Index: 7	
Hand Pen/Torvane: 2.0 tsf		% Passing 200: 41%	Specific Gravity (Assumed): 2.800
Classification: Gray CLAYEY SAND - with gravel		Sample Condition: Undisturbed	

Oven: 0381-30-GC		Scale: EP22001		Calipers: 381-CP-02	
Load Cell: 1519				Load Frame: 10	
Sample Data	1	2	3	Average	Height/Dia. Ratio
Diameter (D), in.:	2.767	2.745	2.799	2.770	1.98
Height (H), in.:	5.482	5.483	5.494	5.486	
Area, ft ² :	0.042	Volume, ft ³ :		0.019	Seating:
Moisture Data	Before (Trimmings)	After Test (Middle)	Specimen	Before	After
Tare ID:	409	157	Wet Weight, gms:	1302.00	1301.20
Tare Wt., gm:	11.46	12.39	Dry Weight, gms:	1183.33	
Wet Wt.+Tare, gm:	77.45	81.83	Moisture, %:	12.0%	12.0%
Dry Wt.+Tare, gm:	52.52	75.54	Wet Unit Wt., pcf:	150.0	149.9
Wt. of Water, gm:	7.06	6.29	Dry Unit Wt., pcf:	133.9	133.9
Dry Soil Wt., gm:	58.93	63.15	Void Ratio, pcf:	0.304	0.305
Moisture:	12.0%	10.0%	Saturation, %:	110.2%	109.9%



RESULTS	
Actual Strain Rate, (%/min.):	0.58
Failure Strain at Peak Stress, %:	11.81
Max. Compressive Stress, tsf:	0.91
Undrained Shear Strength (tsf):	0.46
Failure Type:	Bulge W/ Shear Planes

Remarks: Other tests may have been performed in accordance with ASTM D1140, ASTM D4318, ASTM D854		
Tested By: RA	Computed By: SS	Checked By: K. Jaradat

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-28
Sample No.: SS3
Sample Depth: 6.0' - 7.5'
Date: 8/12/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 22.94%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

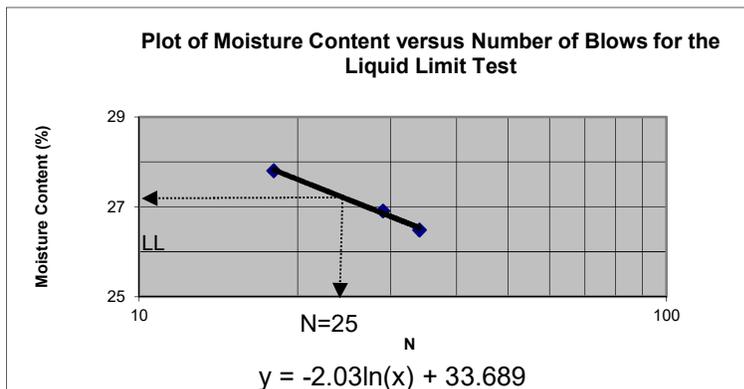
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
170	12.45	21.08	19.25	29	26.9
381	11.54	17.70	16.41	34	26.5
32A	11.21	20.54	18.51	18	27.8

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
146	12.42	27.77	25.79	14.8
444	11.75	26.06	24.22	14.8

14.8



Liquid Limit (LL) = **27**
 Plastic Limit (PL) = **15**
 Plasticity Index (PI) = **12**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-28
Sample No.: SS5
Sample Depth: 13.5' - 15.0'
Date: 8/22/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 19.78%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

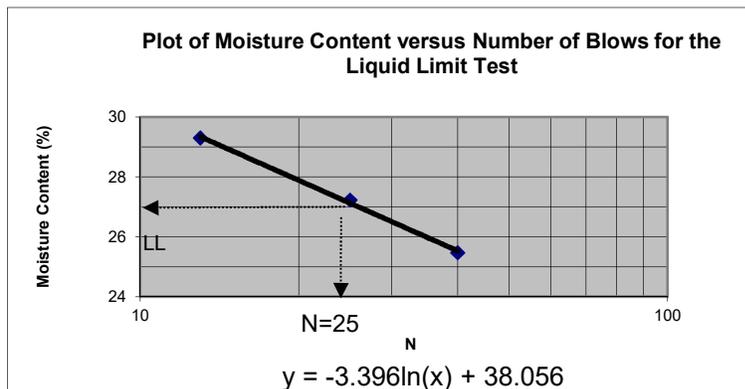
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
103	12.18	20.26	18.62	40	25.5
183	12.41	20.26	18.58	25	27.2
41a	11.06	19.93	17.92	13	29.3

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
384	11.65	24.62	22.84	15.9
198	12.28	22.89	21.43	16.0

15.9



Liquid Limit (LL) = **27**
 Plastic Limit (PL) = **16**
 Plasticity Index (PI) = **11**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-28
Project Number:	03811526	Sample Number:	SS8
Sample Date:	7/29/2025	Sample Depth:	28.5' - 30.0'
Test Date:	8/21/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	221.86
Dry Weight of Sample and Tare before Wash (g):	421.55
Dry Weight of Sample and Tare after Wash (g):	353.36
Loss By Wash (g):	68.2
% Loss By Wash:	34.1%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-29
Sample No.: SS2
Sample Depth: 3.5' - 5.0'
Date: 8/14/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 29.28%

Air-dried Sample

Sample Description: Yellow mottled brown SANDY LEAN CLAY with Silt, trace Gravel

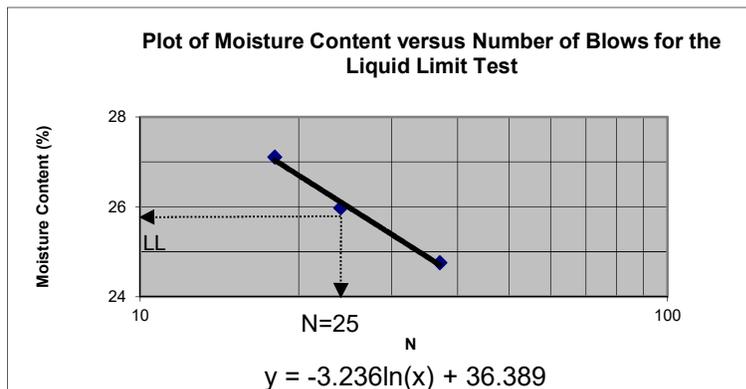
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
39	11.37	29.31	25.75	37	24.8
161	12.47	28.23	24.98	24	26.0
28A	11.16	36.57	31.15	18	27.1

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
17A	11.08	23.58	22.02	14.3
367	11.62	24.25	22.67	14.3

14.3



Liquid Limit (LL) = **26**
 Plastic Limit (PL) = **14**
 Plasticity Index (PI) = **12**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-29
Project Number:	03811526	Sample Number:	SS3
Sample Date:	7/28/2025	Sample Depth:	6.0' - 7.5'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Yellow mottled brown SANDY LEAN CLAY with Silt, trace Gravel**

Tare Number / Tare Weight (g):	222.38
Dry Weight of Sample and Tare before Wash (g):	359.36
Dry Weight of Sample and Tare after Wash (g):	266.04
Loss By Wash (g):	93.3
% Loss By Wash:	68.1%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-29
Sample No.: SS4
Sample Depth: 8.5' - 10.0'
Date: 8/12/2025
Tested by: Isabela Tatem
Checked by: TK
Estimated % Soil retained on No. 40: 22.32%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

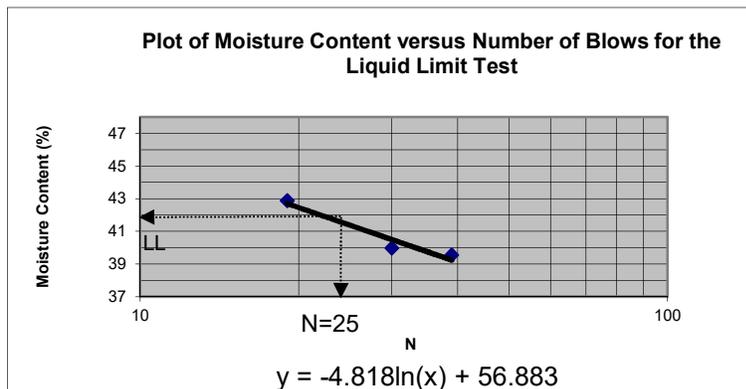
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
146	12.43	25.13	21.53	39	39.6
29	11.11	24.52	20.69	30	40.0
466	11.59	26.05	21.71	19	42.9

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
431	11.59	17.89	16.78	21.4
35AB	11.03	17.38	16.29	20.7

21.1



Liquid Limit (LL) = **41**
 Plastic Limit (PL) = **21**
 Plasticity Index (PI) = **20**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-29
Project Number:	03811526	Sample Number:	SS6
Sample Date:	7/28/2025	Sample Depth:	18.5' - 20.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	222.57
Dry Weight of Sample and Tare before Wash (g):	405.05
Dry Weight of Sample and Tare after Wash (g):	315.39
Loss By Wash (g):	89.7
% Loss By Wash:	49.1%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-29
Sample No.: SS7
Sample Depth: 23.5' - 25.0'
Date: 8/14/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 46.79%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

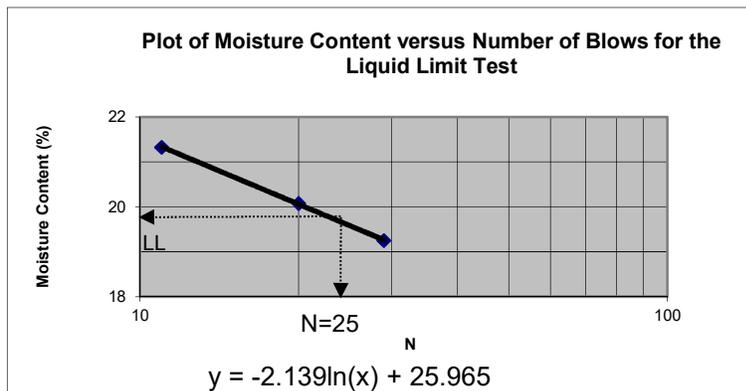
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
428	11.65	21.28	19.62	11	20.8
131	12.40	23.15	21.39	20	19.6
102	12.42	22.49	20.90	29	18.8

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
147	12.48	20.98	20.05	12.3
35A	11.02	18.56	17.74	12.2

12.2



Liquid Limit (LL) = **19**
 Plastic Limit (PL) = **12**
 Plasticity Index (PI) = **7**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-30
Sample No.: SS3
Sample Depth: 6.0' - 7.5'
Date: 8/28/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 29.21%

Air-dried Sample

Sample Description: Brown SANDY LEAN CLAY with fine Sand, trace Gravel

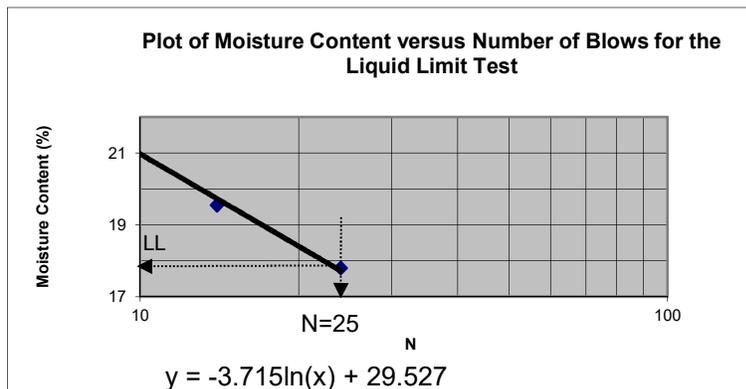
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
479	11.49	21.02	19.58	24	17.8
24a	11.07	19.02	17.72	14	19.5
467	11.55	19.70	18.26	9	21.5

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
339	11.55	25.38	23.91	11.9
20a	11.08	22.97	21.71	11.9

11.9



Liquid Limit (LL) = **18**
 Plastic Limit (PL) = **12**
 Plasticity Index (PI) = **6**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-30
Sample No.: SS6
Sample Depth: 18.5' - 20.0'
Date: 8/28/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 30.14%

Air-dried Sample

Sample Description: Gray SANDY LEAN CLAY with Silt, trace Gravel

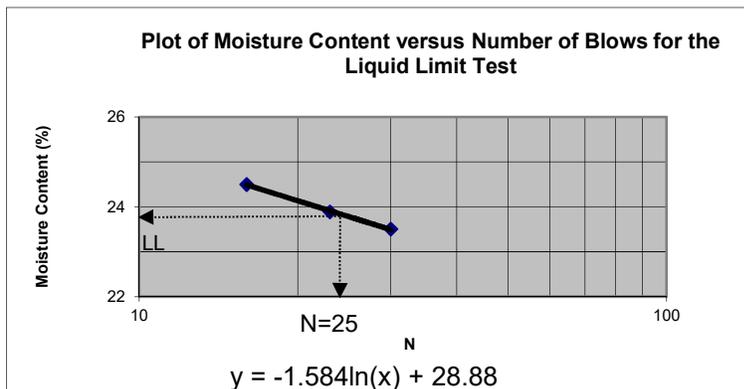
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
62	11.56	20.23	18.58	30	23.5
108	12.32	20.41	18.85	23	23.9
343	11.68	19.10	17.64	16	24.5

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
153	12.48	25.30	24.10	10.3
28	11.10	23.24	21.86	12.8

11.6



Liquid Limit (LL) = 24
 Plastic Limit (PL) = 12
 Plasticity Index (PI) = 12
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-30
Sample No.: SS8
Sample Depth: 28.5' - 30.0'
Date: 8/28/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 28.30%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY - with Sand and Gravel

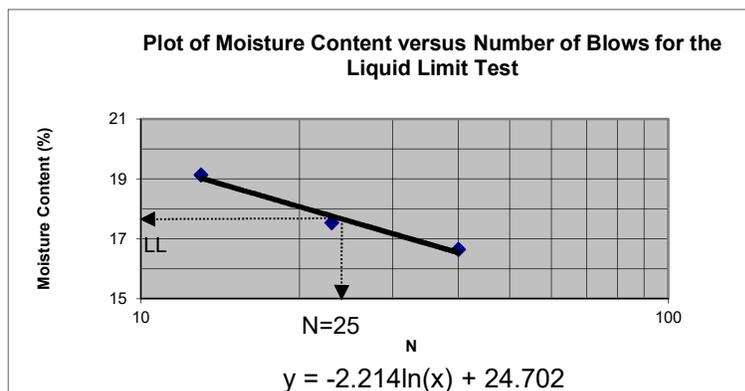
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
354	11.49	21.02	19.66	40	16.6
164	12.42	23.88	22.17	23	17.5
411	11.58	21.73	20.10	13	19.1

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
59	11.04	25.39	24.00	10.7
131	12.37	25.84	24.56	10.5

10.6



Liquid Limit (LL) = **18**
 Plastic Limit (PL) = **11**
 Plasticity Index (PI) = **7**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-30
Project Number:	03811526	Sample Number:	SS9
Sample Date:	8/26/2025	Sample Depth:	33.5' - 35.0'
Test Date:	8/27/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	166.61
Dry Weight of Sample and Tare before Wash (g):	350.55
Dry Weight of Sample and Tare after Wash (g):	263.63
Loss By Wash (g):	86.9
% Loss By Wash:	47.3%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-31
Sample No.: SS3
Sample Depth: 6.0' - 7.5'
Date: 9/2/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 30.01%

Air-dried Sample

Sample Description: Brown SANDY LEAN CLAY with Silt, trace Gravel

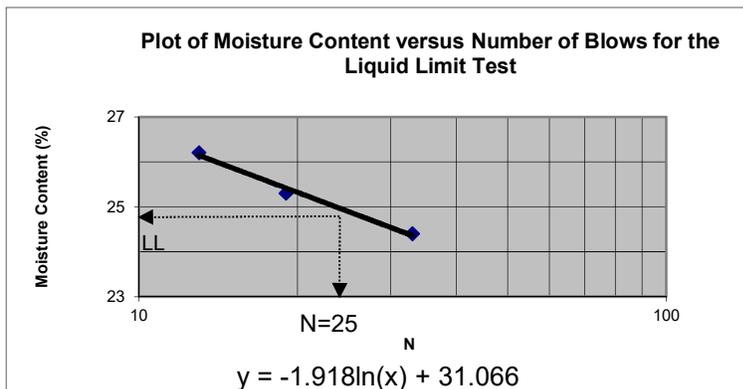
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
459	11.54	20.41	18.67	33	24.4
33ab	11.20	21.36	19.25	13	26.2
124	12.42	21.58	19.73	19	25.3

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
34	10.97	24.36	22.76	13.6
468	11.74	25.54	23.89	13.6

13.6



Liquid Limit (LL) = **25**
 Plastic Limit (PL) = **14**
 Plasticity Index (PI) = **11**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-31 (Shelby)
Project Number:	03811526	Sample Number:	SS5a
Sample Date:	7/23/2025	Sample Depth:	15.0' - 17.0'
Test Date:	8/28/2025	Tested By:	Saifulrahman Saif
		Checked By:	

Sample Description: **Gray sandy LEAN CLAY - trace gravel**

Tare Number / Tare Weight (g):	162.76
Dry Weight of Sample and Tare before Wash (g):	521.90
Dry Weight of Sample and Tare after Wash (g):	302.14
Loss By Wash (g):	219.8
% Loss By Wash:	61.2%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-31 (Shelby)
Sample No.: SS5a
Sample Depth: 15.0' - 17.0'
Date: 8/21/2025
Tested by: Rabia Azam

Checked by:
Estimated % Soil retained on No. 40: 30.53% **Air-dried Sample**

Sample Description: Gray sandy LEAN CLAY - trace gravel

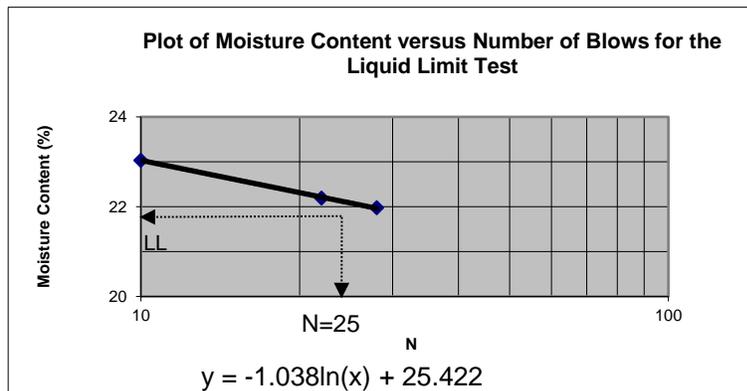
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
477	11.66	21.57	19.77	22	22.2
379	11.66	23.26	21.17	28	22.0
32AB	11.09	22.68	20.51	10	23.0

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
162	12.32	31.98	29.89	11.9
432	11.44	25.85	24.32	11.9

11.9

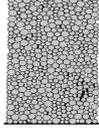


Liquid Limit (LL) = **22**
 Plastic Limit (PL) = **12**
 Plasticity Index (PI) = **10**
 PI = LL - PL

Total Stress Triaxial Compression

Unconsolidated Undrained (Multiple Specimen)

Summary Report

Sample Details	<i>sketch showing specimen location in original sample</i>			
Depth				
Description				
Type				
Initial Sample Length	H_i	(mm)	76.3	
Initial Sample Diameter	D_i	(mm)	37.9	
Initial Sample Weight	W_i	(gr)	201.0	
Bulk Density	ρ_0	(Mg/m ³)	2.33	
Particle Density	ρ_s	(Mg/m ³)	2.65	

Initial Conditions			
Specimen			
Initial Cell Pressure	σ_3	(kPa)	0
Shearing Rate (/min)	$\dot{\epsilon}_\%$	(%)	1.66
Membrane Thickness	t_m	(mm)	0.30
Initial Moisture	$\omega_i\%$	(%)	5.68
Initial Dry Density	ρ_{d0}	(Mg/m ³)	2.21
Initial Voids Ratio	e_0	.	0.20
Initial Degree of Saturation	S_o	(%)	24

Final Conditions			
Axial Strain At Failure	$\epsilon_f\%$	(%)	19.23
Major Principal Stress At Failure	$(\sigma_1 - \sigma_3)_f$	(kPa)	377.00
Minor Principal Stress at Failure	σ_3f	(kPa)	0.1
Undrained Compressive Strength	σ_{1f}	(kPa)	377.00
Final Moisture	$\omega_f\%$	(%)	13
Final Dry Density	ρ_{df}	(Mg/m ³)	2.06
Final Voids Ratio	e_f	.	0.29
Final Degree of Saturation	S_f	(%)	17.3

Notes



Failure Sketch
(surface inclination)

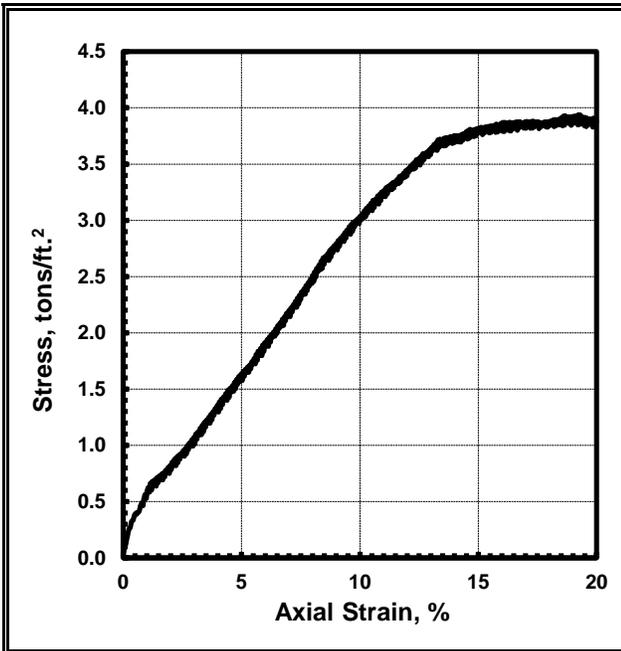
	Test Method	D 2850-15	Test Name	UU Test	
	Database:	D85514000\SQLXPRESS2019 \ Q1 2025	Test Date	8/28/2025	
	Site Reference		Borehole	SB-31 15-17 ft	
	Jobfile	03811526 Nowicki	Sample	Specimen 1	
	Client	Nowicki Park - Rochester Hills	Depth		
Operator	SS/RA	Checked	Hamza Saed	Approved	Karam Jaradat

Unconsolidated Undrained Triaxial Test ASTM D 2850

Test Date: **8/28/2025**

Project Name: Nowicki Park Improvement		Project Number: 3811526	
Boring Number: SB-31	Depth, feet: 15-17	Sample No./ID: Specimen 1	
Liquid Limit: 22	Plastic Limit: 12	Plasticity Index: 10	
Hand Pen: 1.25	% Passing 200: 61.00%	Specific Gravity (Assumed): 2.750	
Classification: Gray sandy LEAN CLAY - trace gravel		Sample Condition: Undisturbed	

Oven: 0381-30-GC		Scale: EP22001		Calipers: 381-CP-02		
Load Cell: STA-4-1500		Cell Pressure: MIS0021-PRO-C		Load Frame: N/A		
Sample Data		1	2	3	Average	Height/Dia. Ratio
Diameter (D), in.:		1.496	1.483	1.501	1.493	2.01
Height (H), in.:		3.013	3.009	2.992	3.004	
Area, ft ² :		0.012		Volume, ft ³ :	0.003	
				Piston Load, lbs:	5.86	
Moisture Data		Before (Trimings)	After Test (Middle)	Specimen	Before	After
Tare ID:		777	20B	Wet Weight, gms:	201.00	200.70
Tare Wt., gm:		23.05	31.26	Dry Weight, gms:	181.68	
Wet Wt.+Tare, gm:		172.27	231.25	Wet Unit Wt., pcf:	145.6	145.3
Dry Wt.+Tare, gm:		157.93	211.88	Dry Unit Wt, pcf:	131.6	131.3
Wt. of Water, gm:		14.34	19.37	Void Ratio, pcf:	0.304	0.307
Dry Soil Wt., gm:		134.88	180.62	Saturation, %:	96.1%	96.0%
Moisture:		10.6%	10.7%			



RESULTS	
Actual Strain Rate, (%/min.):	0.60
Average Confining Pressure, psi:	0.0
Failure Strain at Peak Stress, %:	19.23
Max. Deviator Stress ($\Delta\sigma$), tsf:	3.94
Minor Principle Stress (σ_3), tsf:	0.00
Major Principle Strs ($\sigma_1 = \Delta\sigma + \sigma_3$), tsf:	3.94
Undrained Shear Strength (tsf):	1.97
Failure Type:	Bulge W/ Fractures

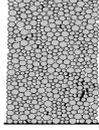
Remarks: Other tests may have been performed in accordance with ASTM D1140, ASTM D4318, ASTM D854			
Tested By:	RA/SS	Computed By:	SS
		Checked By:	KJ



Total Stress Triaxial Compression

Unconsolidated Undrained (Multiple Specimen)

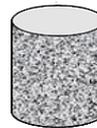
Summary Report

Sample Details	<i>sketch showing specimen location in original sample</i>			
Depth				
Description				
Type				
Initial Sample Length	H_i	(mm)	75.6	
Initial Sample Diameter	D_i	(mm)	39.1	
Initial Sample Weight	W_i	(gr)	202.6	
Bulk Density	ρ_0	(Mg/m ³)	2.23	
Particle Density	ρ_s	(Mg/m ³)	2.65	

Initial Conditions			
Specimen			
Initial Cell Pressure	σ_3	(kPa)	92
Shearing Rate (/min)	$\dot{\epsilon}_\%$	(%)	1.68
Membrane Thickness	t_m	(mm)	0.30
Initial Moisture	$\omega_i\%$	(%)	5.84
Initial Dry Density	ρ_{d0}	(Mg/m ³)	2.11
Initial Voids Ratio	e_0	.	0.26
Initial Degree of Saturation	S_o	(%)	29

Final Conditions			
Axial Strain At Failure	$\epsilon_f\%$	(%)	19.60
Major Principal Stress At Failure	$(\sigma_1 - \sigma_3)_f$	(kPa)	254.70
Minor Principal Stress at Failure	σ_3f	(kPa)	92.0
Undrained Compressive Strength	σ_{1f}	(kPa)	254.70
Final Moisture	$\omega_f\%$	(%)	13
Final Dry Density	ρ_{df}	(Mg/m ³)	1.97
Final Voids Ratio	e_f	.	0.35
Final Degree of Saturation	S_f	(%)	16.0

Notes



Failure Sketch
(surface inclination)

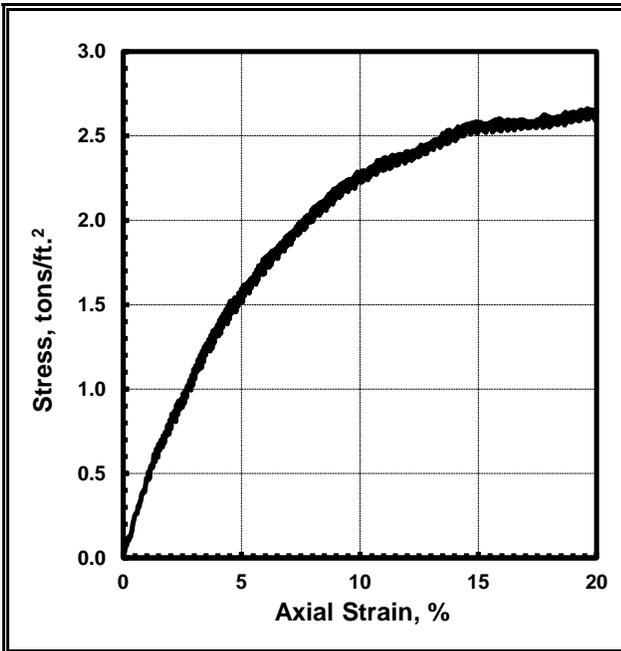
	Test Method	D 2850-15	Test Name	UU test	
	Database:	D85514000\SQLXPRESS2019 \ Q1 2025	Test Date	8/28/2025	
	Site Reference		Borehole	SB-31 15-17 ft	
	Jobfile	03811526 Nowicki	Sample	Specimen 2	
	Client	Nowicki Park - Rochester Hills	Depth		
Operator	SS/RA	Checked	Hamza Saed	Approved	Karam Jaradat

Unconsolidated Undrained Triaxial Test ASTM D 2850

Test Date: **8/28/2025**

Project Name: Nowicki Park Improvement		Project Number: 3811526	
Boring Number: SB-31	Depth, feet: 15-17	Sample No./ID: Specimen 2	
Liquid Limit: 22	Plastic Limit: 12	Plasticity Index: 10	
Hand Pen: 1.5	% Passing 200: 61.00%	Specific Gravity (Assumed): 2.750	
Classification: Gray sandy LEAN CLAY - trace gravel		Sample Condition: Undisturbed	

Oven: 0381-30-GC		Scale: EP22001		Calipers: 381-CP-02		
Load Cell: STA-4-1500		Cell Pressure: MIS0021-PRO-C		Load Frame: N/A		
Sample Data		1	2	3	Average	Height/Dia. Ratio
Diameter (D), in.:		1.534	1.541	1.544	1.540	1.62
Height (H), in.:		1.544	2.983	2.968	2.498	
Area, ft ² :		0.013		Volume, ft ³ :		0.003
				Piston Load, lbs:		5.86
Moisture Data		Before (Trimings)	After Test (Middle)	Specimen	Before	After
Tare ID:		11A	16	Wet Weight, gms:	202.60	201.50
Tare Wt., gm:		31.53	31.41	Dry Weight, gms:	181.01	
Wet Wt.+Tare, gm:		196.76	232.97	Wet Unit Wt., pcf:	165.9	165.0
Dry Wt.+Tare, gm:		179.15	211.88	Dry Unit Wt, pcf:	148.2	147.7
Wt. of Water, gm:		17.61	21.09	Void Ratio, pcf:	0.158	0.161
Dry Soil Wt., gm:		147.62	180.47	Saturation, %:	208.1%	199.0%
Moisture:		11.9%	11.7%			



RESULTS	
Actual Strain Rate, (%/min.):	0.59
Average Confining Pressure, psi:	13.3
Failure Strain at Peak Stress, %:	19.32
Max. Deviator Stress ($\Delta\sigma$), tsf:	2.65
Minor Principle Stress (σ_3), tsf:	0.96
Major Principle Strs ($\sigma_1 = \Delta\sigma + \sigma_3$), tsf:	3.61
Undrained Shear Strength (tsf):	1.33
Failure Type:	Bulge W/ Fractures

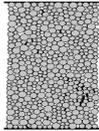
Remarks: Other tests may have been performed in accordance with ASTM D1140, ASTM D4318, ASTM D854			
Tested By:	RA/SS	Computed By:	SS
		Checked By:	K.J



Total Stress Triaxial Compression

Unconsolidated Undrained (Multiple Specimen)

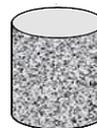
Summary Report

Sample Details	<i>sketch showing specimen location in original sample</i>			
Depth				
Description				
Type				
Initial Sample Length	H_i	(mm)	75.4	
Initial Sample Diameter	D_i	(mm)	38.3	
Initial Sample Weight	W_i	(gr)	206.6	
Bulk Density	ρ_0	(Mg/m ³)	2.37	
Particle Density	ρ_s	(Mg/m ³)	2.65	

Initial Conditions			
Specimen			
Initial Cell Pressure	σ_3	(kPa)	184
Shearing Rate (/min)	$\epsilon\%$	(%)	1.68
Membrane Thickness	t_m	(mm)	0.30
Initial Moisture	$\omega_i\%$	(%)	5.91
Initial Dry Density	ρ_{d0}	(Mg/m ³)	2.24
Initial Voids Ratio	e_0	.	0.18
Initial Degree of Saturation	S_o	(%)	45

Final Conditions			
Axial Strain At Failure	$\epsilon\%_f$	(%)	19.99
Major Principal Stress At Failure	$(\sigma_1 - \sigma_3)_f$	(kPa)	276.81
Minor Principal Stress at Failure	σ_3f	(kPa)	184.1
Undrained Compressive Strength	σ_{1f}	(kPa)	276.81
Final Moisture	$\omega_f\%$	(%)	13
Final Dry Density	ρ_{df}	(Mg/m ³)	2.09
Final Voids Ratio	e_f	.	0.26
Final Degree of Saturation	S_f	(%)	17.0

Notes



Failure Sketch
(surface inclination)

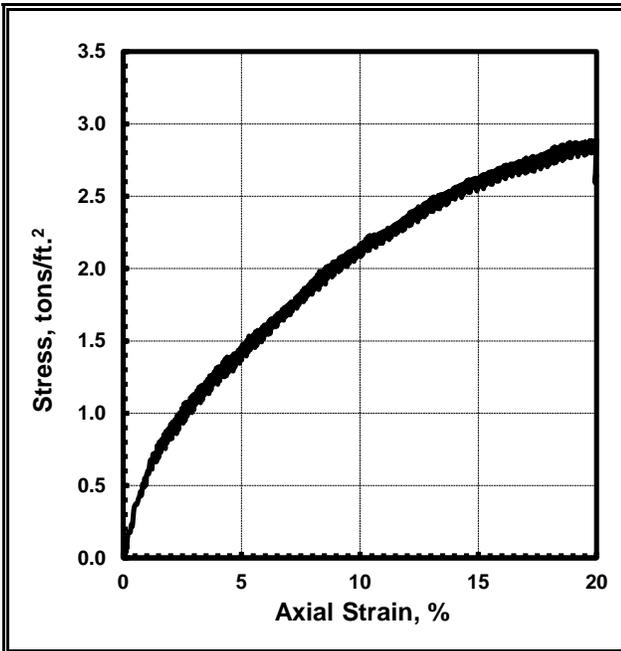
	Test Method	D 2850-15	Test Name	UU Test	
	Database:	D85514000\SQLXPRESS2019 \ Q1 2025	Test Date	8/28/2025	
	Site Reference		Borehole	SB-31 15-17 ft	
	Jobfile	03811526 Nowicki	Sample	Specimen 3	
	Client	Nowicki Park - Rochester Hills	Depth		
Operator	SS/RA	Checked	Hamza Saed	Approved	Karam Jaradat

Unconsolidated Undrained Triaxial Test ASTM D 2850

Test Date: **8/28/2025**

Project Name: Nowicki Park Improvement		Project Number: 3811526	
Boring Number: SB-31	Depth, feet: 15-17	Sample No./ID: Specimen 3	
Liquid Limit: 22	Plastic Limit: 12	Plasticity Index: 10	
Hand Pen: 1.5	% Passing 200: 61.00%	Specific Gravity (Assumed): 2.750	
Classification: Gray sandy LEAN CLAY - trace gravel		Sample Condition: Undisturbed	

Oven: 0381-30-GC		Scale: EP22001		Calipers: 381-CP-02		
Load Cell: STA-4-1500		Cell Pressure: MIS0021-PRO-C		Load Frame: N/A		
Sample Data		1	2	3	Average	Height/Dia. Ratio
Diameter (D), in.:		1.493	1.503	1.531	1.509	1.97
Height (H), in.:		2.982	2.963	2.965	2.970	
Area, ft ² :		0.012		Volume, ft ³ :	0.003	
				Piston Load, lbs:	5.86	
Moisture Data	Before (Trimings)	After Test (Middle)	Specimen	Before	After	
Tare ID:	14	310	Wet Weight, gms:	206.60	205.90	
Tare Wt., gm:	31.39	23.48	Dry Weight, gms:	185.47		
Wet Wt.+Tare, gm:	212.74	229.4	Wet Unit Wt., pcf:	148.2	147.7	
Dry Wt.+Tare, gm:	194.19	209.12	Dry Unit Wt, pcf:	133.0	133.1	
Wt. of Water, gm:	18.55	20.28	Void Ratio, pcf:	0.290	0.289	
Dry Soil Wt., gm:	162.8	185.64	Saturation, %:	108.0%	103.9%	
Moisture:	11.4%	10.9%				



RESULTS	
Actual Strain Rate, (%/min.):	0.59
Average Confining Pressure, psi:	26.7
Failure Strain at Peak Stress, %:	19.52
Max. Deviator Stress ($\Delta\sigma$), tsf:	2.87
Minor Principle Stress (σ_3), tsf:	1.92
Major Principle Strs ($\sigma_1 = \Delta\sigma + \sigma_3$), tsf:	4.80
Undrained Shear Strength (tsf):	1.44
Failure Type:	Bulge W/ Fractures

Remarks: Other tests may have been performed in accordance with ASTM D1140, ASTM D4318, ASTM D854			
Tested By:	RA/SS	Computed By:	SS
		Checked By:	K.J



ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-33
Sample No.: SS3
Sample Depth: 6.0' - 7.5'
Date: 8/12/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 26.60%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

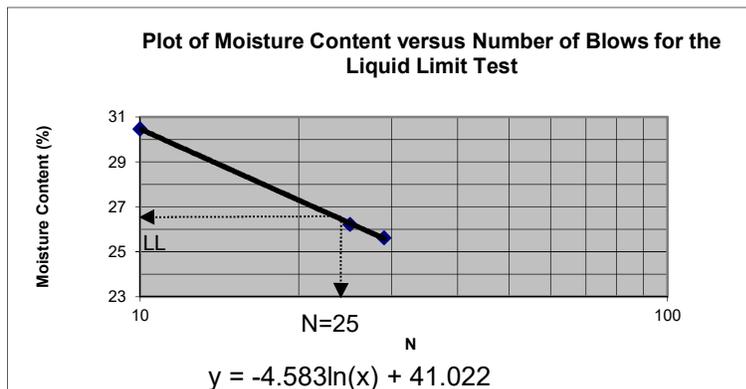
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
349	11.74	21.20	19.27	29	25.6
158	12.39	21.20	19.37	25	26.2
170	12.50	21.02	19.03	10	30.5

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
5	11.10	18.83	17.82	15.0
359	11.65	18.67	17.77	14.7

14.9



Liquid Limit (LL) = **26**
 Plastic Limit (PL) = **15**
 Plasticity Index (PI) = **11**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-33 (Shelby)
Project Number:	03811526	Sample Number:	SS5a
Sample Date:	7/24/2025	Sample Depth:	15.0' - 17.0'
Test Date:	8/20/2025	Tested By:	Rabia Azam
		Checked By:	

Sample Description: **Gray LEAN CLAY - with sand, trace gravel**

Tare Number / Tare Weight (g):	233.14
Dry Weight of Sample and Tare before Wash (g):	488.59
Dry Weight of Sample and Tare after Wash (g):	297.73
Loss By Wash (g):	190.9
% Loss By Wash:	74.7%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-33 (Shelby)
Sample No.: SS5a
Sample Depth: 15.0' - 17.0'
Date: 8/21/2025
Tested by: Rabia Azam

Checked by:
Estimated % Soil retained on No. 40: 25.83% **Air-dried Sample**

Sample Description: Gray LEAN CLAY - with sand, trace gravel

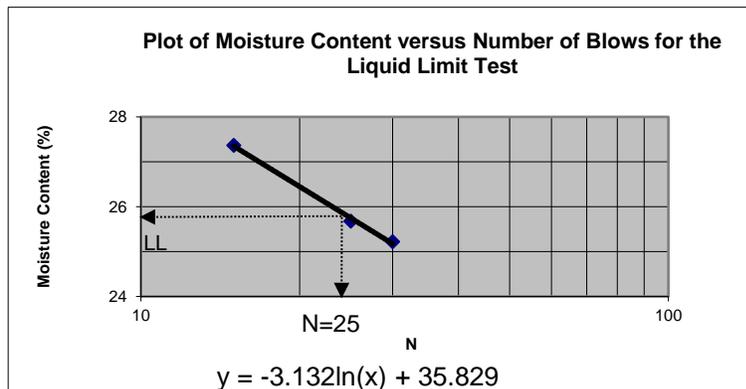
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
378	11.60	18.55	17.15	30	25.2
116	12.39	22.57	20.49	25	25.7
175	12.33	22.43	20.26	15	27.4

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
391	11.41	18.92	17.89	15.9
207	12.44	18.46	17.64	15.8

15.8



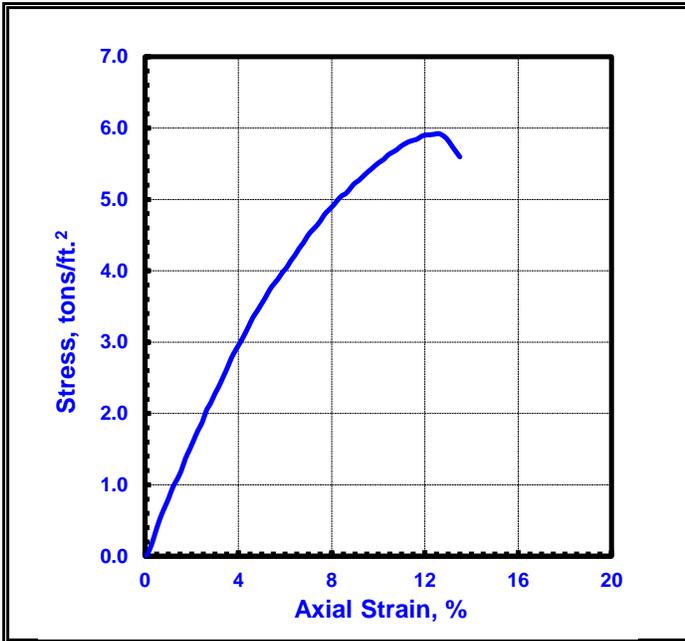
Liquid Limit (LL) = **26**
 Plastic Limit (PL) = **16**
 Plasticity Index (PI) = **10**
 PI = LL - PL

Unconfined Compression Test ASTM D 2166

Test Date: **8/20/2025**

Project Name: Nowicki Park Improvements		Project Number: 3811526	
Boring Number: SB-33	Depth, feet: 15 - 17'	Sample No./ID: SS5a	
Liquid Limit: 26	Plastic Limit: 16	Plasticity Index: 10	
Hand Pen/Torvane: 0.25 tsf		% Passing 200: 75%	Specific Gravity (Assumed): 2.800
Classification: Gray LEAN CLAY - with sand, trace gravel		Sample Condition: Undisturbed	

Oven: 0381-30-GC	Scale: EP22001		Calipers: 381-CP-02		
Load Cell: 1519			Load Frame: 10		
Sample Data	1	2	3	Average	Height/Dia. Ratio
Diameter (D), in.:	2.841	2.860	2.868	2.856	1.97
Height (H), in.:	5.627	5.625	5.636	5.629	
Area, ft ² :	0.044	Volume, ft ³ :		0.021	Seating:
Moisture Data	Before (Trimmings)	After Test (Middle)	Specimen	Before	After
Tare ID:	125	373	Wet Weight, gms:	1314.30	1312.20
Tare Wt., gm:	11.63	11.63	Dry Weight, gms:	1124.59	
Wet Wt.+Tare, gm:	73.44	71.29	Moisture, %:	14.0%	14.0%
Dry Wt.+Tare, gm:	52.52	62.76	Wet Unit Wt., pcf:	138.9	138.6
Wt. of Water, gm:	7.57	8.53	Dry Unit Wt., pcf:	121.9	121.7
Dry Soil Wt., gm:	54.24	51.13	Void Ratio, pcf:	0.434	0.436
Moisture:	14.0%	16.7%	Saturation, %:	90.1%	89.6%



RESULTS	
Actual Strain Rate, (%/min.):	0.62
Failure Strain at Peak Stress, %:	12.59
Max. Compressive Stress, tsf:	5.92
Undrained Shear Strength (tsf):	2.96
Failure Type:	Multiple Shear Planes

Remarks: Other tests may have been performed in accordance with ASTM D1140, ASTM D4318, ASTM D854		
Tested By: RA	Computed By: SS	Checked By: K. Jaradat

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-33
Sample No.: SS6
Sample Depth: 18.5' - 20.0'
Date: 8/12/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 24.03%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

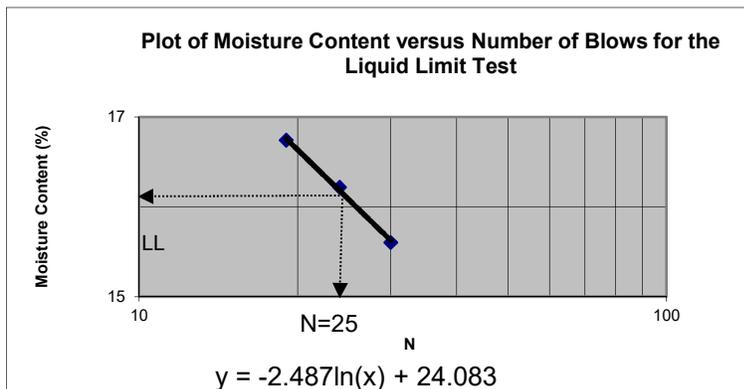
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
29	11.11	23.63	21.94	30	15.6
114	12.35	24.03	22.40	24	16.2
466	11.49	21.88	20.39	19	16.7

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
471	11.57	25.49	24.10	11.1
399	11.50	23.02	21.86	11.2

11.1



Liquid Limit (LL) = **16**
 Plastic Limit (PL) = **11**
 Plasticity Index (PI) = **5**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-33
Project Number:	03811526	Sample Number:	SS7
Sample Date:	7/24/2025	Sample Depth:	23.5' - 25.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray SANDY LEAN CLAY with Silt, trace Gravel**

Tare Number / Tare Weight (g):	224.07
Dry Weight of Sample and Tare before Wash (g):	374.67
Dry Weight of Sample and Tare after Wash (g):	289.99
Loss By Wash (g):	84.7
% Loss By Wash:	56.2%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-34
Sample No.: SS03
Sample Depth: 6.0' - 7.5'
Date: 8/12/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 27.45%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

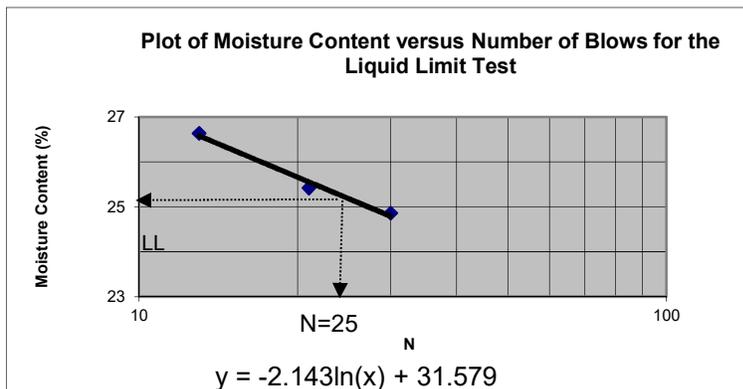
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
203	12.44	20.25	18.72	30	24.4
70	11.11	19.33	17.69	21	24.9
63	11.06	18.83	17.22	13	26.1

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
438	11.54	22.85	21.41	14.6
406	11.47	23.88	22.33	14.3

14.4



Liquid Limit (LL) = 25
 Plastic Limit (PL) = 14
 Plasticity Index (PI) = 11
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-34
Sample No.: SS5
Sample Depth: 13.5' - 15.0'
Date: 8/13/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 28.79%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

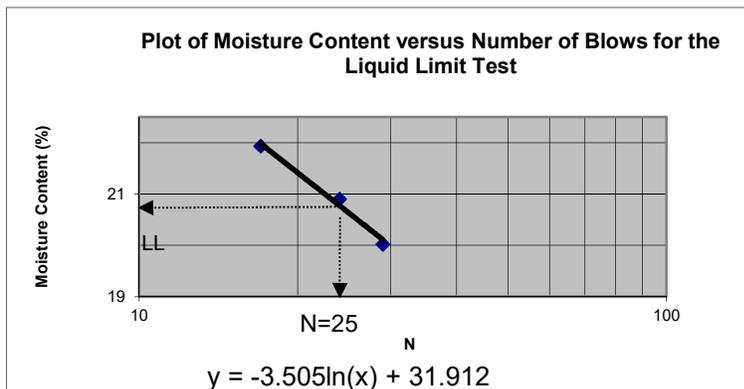
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
345	11.60	21.91	20.19	29	20.0
473	11.60	21.49	19.78	24	20.9
404	11.58	21.92	20.06	17	21.9

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
31	11.18	25.48	24.00	11.5
46	11.17	26.05	24.51	11.5

11.5



Liquid Limit (LL) = **21**
 Plastic Limit (PL) = **12**
 Plasticity Index (PI) = **9**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-34
Project Number:	03811526	Sample Number:	SS6
Sample Date:	7/21/2025	Sample Depth:	18.5' - 20.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	222.87
Dry Weight of Sample and Tare before Wash (g):	440.28
Dry Weight of Sample and Tare after Wash (g):	339.66
Loss By Wash (g):	100.6
% Loss By Wash:	46.3%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-34
Sample No.: SS7
Sample Depth: 23.5' - 25.0'
Date: 8/14/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 25.65%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

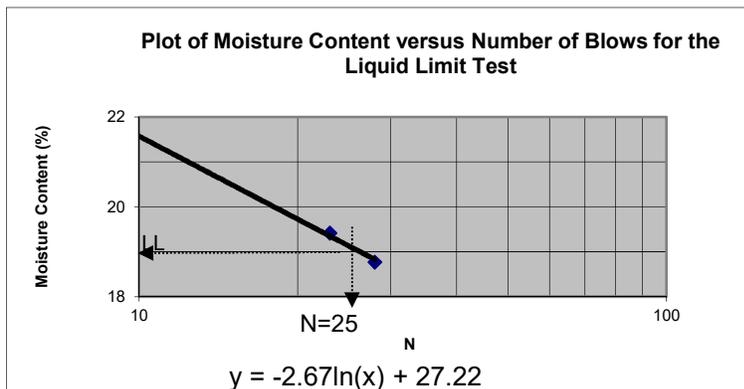
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
432	11.45	21.55	19.99	28	18.3
68	11.66	20.46	19.06	23	18.9
167	12.36	21.40	19.81	9	21.3

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
186	12.45	24.08	22.92	11.1
333	11.66	24.29	23.01	11.3

11.2



Liquid Limit (LL) = **19**
 Plastic Limit (PL) = **11**
 Plasticity Index (PI) = **8**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-35
Sample No.: SS3
Sample Depth: 6.0' - 7.5'
Date: 8/12/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 16.62%

Air-dried Sample

Sample Description: Brown SILTY LEAN CLAY with fine Sand, trace Gravel

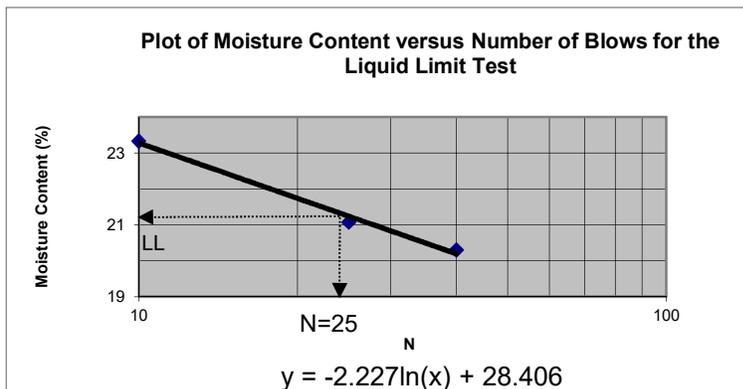
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
368	11.60	19.66	18.30	40	20.3
26	10.73	19.06	17.61	25	21.1
14	11.04	21.77	19.74	10	23.3

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
461	11.79	25.42	23.91	12.5
451	11.80	24.30	22.89	12.7

12.6



Liquid Limit (LL) = **21**
 Plastic Limit (PL) = **13**
 Plasticity Index (PI) = **8**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-35
Sample No.: SS5
Sample Depth: 13.5' - 15.0'
Date: 8/12/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 8.95%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

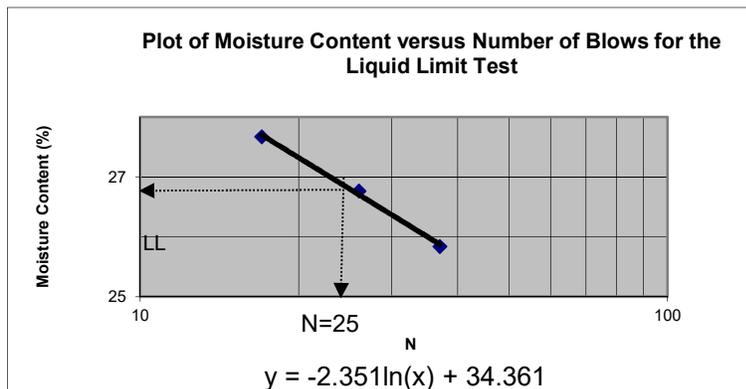
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
112	12.43	21.44	19.59	37	25.8
347	11.55	20.88	18.91	26	26.8
397	11.78	20.50	18.61	17	27.7

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
476	11.51	24.00	22.30	15.8
424	11.56	23.43	21.81	15.8

15.8



Liquid Limit (LL) = **27**
 Plastic Limit (PL) = **16**
 Plasticity Index (PI) = **11**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-35
Project Number:	03811526	Sample Number:	SS6
Sample Date:	7/28/2025	Sample Depth:	18.5' - 20.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	223.04
Dry Weight of Sample and Tare before Wash (g):	423.75
Dry Weight of Sample and Tare after Wash (g):	332.93
Loss By Wash (g):	90.8
% Loss By Wash:	45.2%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-35
Project Number:	03811526	Sample Number:	SS7
Sample Date:	7/28/2025	Sample Depth:	23.5' - 25.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	222.5
Dry Weight of Sample and Tare before Wash (g):	409.20
Dry Weight of Sample and Tare after Wash (g):	320.4
Loss By Wash (g):	88.8
% Loss By Wash:	47.6%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-36
Sample No.: SS3
Sample Depth: 6.0' - 7.5'
Date: 8/22/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 35.56% **Air-dried Sample**
Sample Description: Yellow mottled brown SILTY LEAN CLAY with Sand, trace Gravel

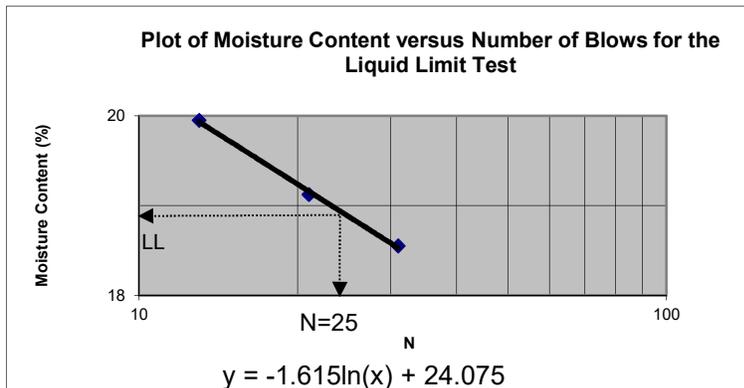
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
4	11.03	31.80	28.55	31	18.6
25	11.08	31.95	28.60	21	19.1
398	11.63	30.75	27.57	13	19.9

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
199	12.42	29.43	27.63	11.8
43a	10.97	29.81	27.82	11.8

11.8



Liquid Limit (LL) = **19**
 Plastic Limit (PL) = **12**
 Plasticity Index (PI) = **7**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-36
Sample No.: SS5
Sample Depth: 13.5' - 15.0'
Date: 8/22/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 28.75%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

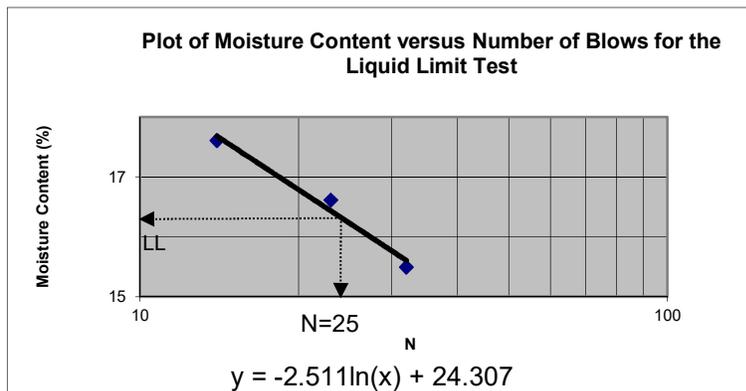
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
2a	10.96	30.33	27.43	14	17.6
376	11.48	29.59	27.01	23	16.6
15	10.93	28.52	26.16	32	15.5

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
28ab	10.93	24.81	23.52	10.2
128	12.25	28.36	26.87	10.2

10.2



Liquid Limit (LL) = **17**
 Plastic Limit (PL) = **10**
 Plasticity Index (PI) = **7**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-36
Sample No.: SS7
Sample Depth: 23.5' - 25.0'
Date: 8/22/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 29.01%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

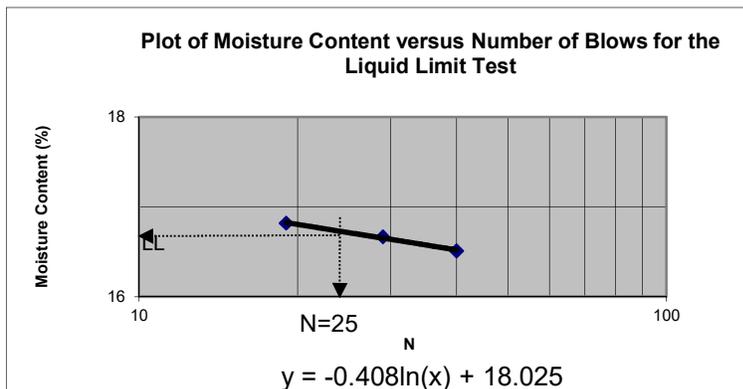
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
423	11.57	20.60	19.30	19	16.8
106	12.24	24.07	22.38	29	16.7
138	12.46	23.75	22.15	40	16.5

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
45-2	11.21	29.24	27.40	11.4
350	11.52	21.66	20.65	11.1

11.2



Liquid Limit (LL) = **17**
 Plastic Limit (PL) = **11**
 Plasticity Index (PI) = **6**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-37
Project Number:	03811526	Sample Number:	SS2
Sample Date:	7/18/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	221.82
Dry Weight of Sample and Tare before Wash (g):	402.57
Dry Weight of Sample and Tare after Wash (g):	326.38
Loss By Wash (g):	76.2
% Loss By Wash:	42.2%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-38
Project Number:	03811526	Sample Number:	SS2
Sample Date:	8/21/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/23/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray mottled brown fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	222.05
Dry Weight of Sample and Tare before Wash (g):	387.98
Dry Weight of Sample and Tare after Wash (g):	320.99
Loss By Wash (g):	67.0
% Loss By Wash:	40.4%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-42
Project Number:	03811526	Sample Number:	SS2
Sample Date:	7/17/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/1/2025	Tested By:	Isabela Tatem
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	222.58
Dry Weight of Sample and Tare before Wash (g):	405.96
Dry Weight of Sample and Tare after Wash (g):	341.19
Loss By Wash (g):	64.8
% Loss By Wash:	35.3%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-45 (redrilled)
Project Number:	03811526	Sample Number:	SS2
Sample Date:	8/21/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/23/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY to CLAYEY SAND, trace Gravel**

Tare Number / Tare Weight (g):	239.55
Dry Weight of Sample and Tare before Wash (g):	382.29
Dry Weight of Sample and Tare after Wash (g):	337.57
Loss By Wash (g):	44.7
% Loss By Wash:	31.3%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-45
Project Number:	03811526	Sample Number:	SS2
Sample Date:	7/21/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/1/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Brown fine to coarse SILTY SAND, trace Gravel**

Tare Number / Tare Weight (g):	222.65
Dry Weight of Sample and Tare before Wash (g):	421.15
Dry Weight of Sample and Tare after Wash (g):	388.9
Loss By Wash (g):	32.3
% Loss By Wash:	16.2%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-45
Sample No.: SS4
Sample Depth: 8.5' - 10.0'
Date: 8/13/2025
Tested by: Isabela Tatem
Checked by: TK
Estimated % Soil retained on No. 40: 33.68%

Air-dried Sample

Sample Description: Brown SANDY LEAN CLAY with Silt, trace Gravel

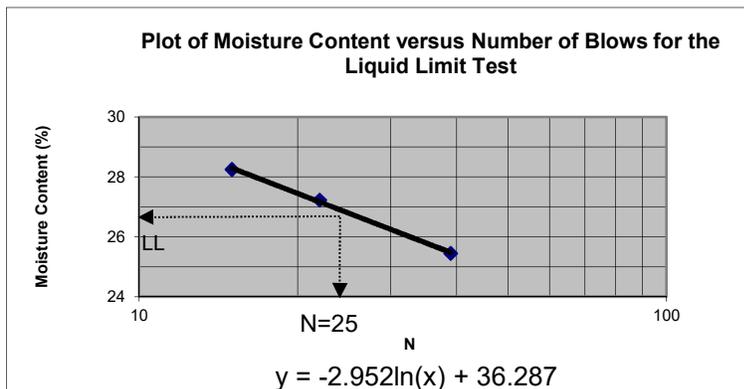
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
440	11.79	26.58	23.58	39	25.4
467	11.54	27.24	23.88	22	27.2
199	12.44	29.69	25.89	15	28.3

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
143	12.47	21.91	20.69	14.8
28	11.09	18.14	17.23	14.8

14.8



Liquid Limit (LL) = **27**
 Plastic Limit (PL) = **15**
 Plasticity Index (PI) = **12**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-45
Sample No.: SS5
Sample Depth: 13.5' - 15.0'
Date: 8/13/2025
Tested by: Rabia Azam
Checked by: TK
Estimated % Soil retained on No. 40: 39.47%

Air-dried Sample

Sample Description: Gray SANDY LEAN CLAY with Silt, trace Gravel

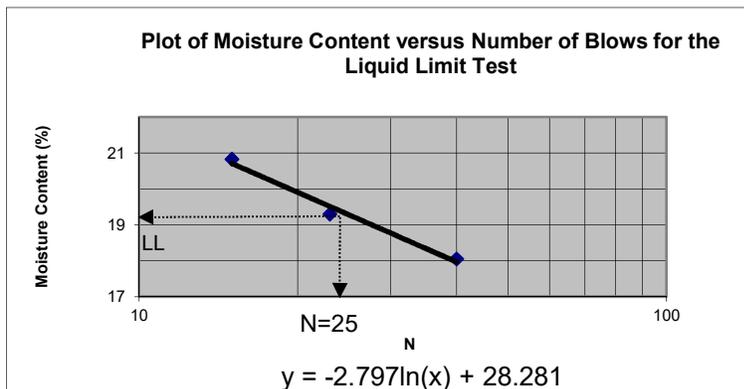
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
24	11.01	26.05	23.75	40	18.1
8	10.99	26.38	23.89	23	19.3
127	12.42	27.97	25.29	15	20.8

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
128	12.25	19.51	18.76	11.5
72	11.18	19.57	18.7	11.6

11.5



Liquid Limit (LL) = **19**
 Plastic Limit (PL) = **12**
 Plasticity Index (PI) = **7**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-45 (re-drilled)
Project Number:	03811526	Sample Number:	SS7
Sample Date:	8/21/2025	Sample Depth:	23.5' - 25.0'
Test Date:	8/22/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray fine to coarse SILTY to CLAYEY SAND with Gravel**

Tare Number / Tare Weight (g):	216.15
Dry Weight of Sample and Tare before Wash (g):	422.63
Dry Weight of Sample and Tare after Wash (g):	335.37
Loss By Wash (g):	87.3
% Loss By Wash:	42.3%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-45 (redrilled)
Sample No.: SS4
Sample Depth: 8.5' - 10.0'
Date: 8/27/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 29.47%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

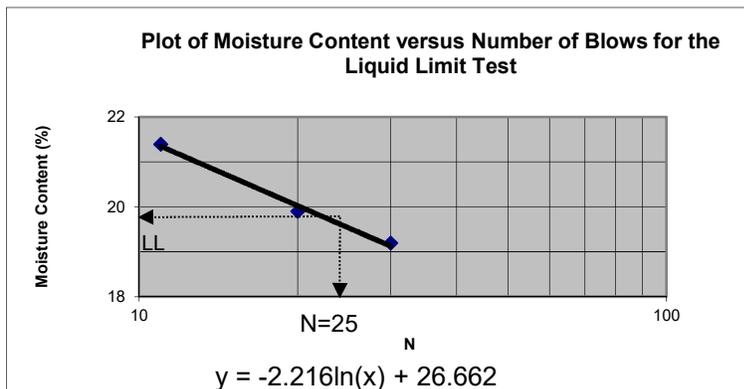
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
157	12.38	22.99	21.12	11	21.4
147	12.44	22.20	20.58	20	19.9
35ab	11.02	21.39	19.72	30	19.2

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
428	11.64	23.86	22.60	11.5
131	12.38	27.50	25.94	11.5

11.5



Liquid Limit (LL) = **20**
 Plastic Limit (PL) = **12**
 Plasticity Index (PI) = **8**
 PI = LL - PL

ATTERBERG LIMITS (ASTM D4318)

Client: City of Rochester Hills
Project Name: Nowicki Park Improvements
Project No.: 03811526
Location: City of Rochester Hills, Michigan
Source: SB-45 (redrilled)
Sample No.: SS6
Sample Depth: 18.5' - 20.0'
Date: 8/27/2025
Tested by: Saifulrahman Saif
Checked by: TK
Estimated % Soil retained on No. 40: 32.70%

Air-dried Sample

Sample Description: Gray SILTY LEAN CLAY with fine Sand, trace Gravel

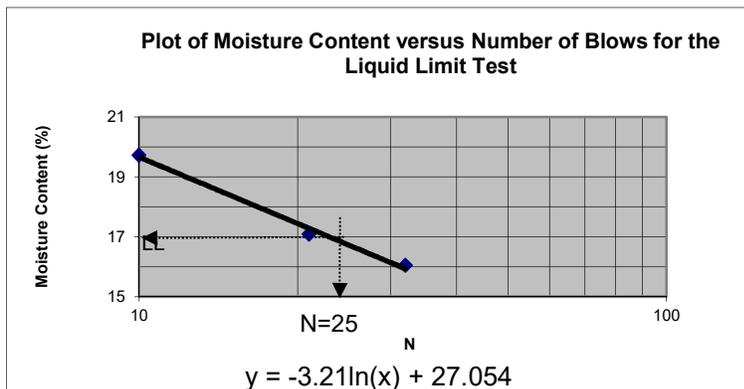
LIQUID LIMIT TEST (Method A)

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Number of Blows (N)	Moisture Content w (%)
448	11.51	22.79	21.23	32	16.0
37	11.00	21.62	20.07	21	17.1
207	12.44	23.12	21.36	10	19.7

PLASTIC LIMIT TEST

Can No.	Weight of Can W ₁ (g)	Weight of Can + Wet Soil W ₂ (g)	Weight of Can + Dry Soil W ₃ (g)	Plastic Limit w (%)
391	11.41	28.57	26.96	10.4
152	12.43	26.14	24.87	10.2

10.3



Liquid Limit (LL) = **17**
 Plastic Limit (PL) = **10**
 Plasticity Index (PI) = **7**
 PI = LL - PL



Materials in Solid Finer than the No. 200 Sieve
(ASTM D1140)

Project Name:	Nowicki Park Improvement	Boring Number:	SB-46
Project Number:	03811526	Sample Number:	SS2
Sample Date:	8/21/2025	Sample Depth:	3.5' - 5.0'
Test Date:	8/23/2025	Tested By:	Rabia Azam
		Checked By:	TK

Sample Description: **Gray fine to coarse POORLY GRADED SAND with Silt and Gravel**

Tare Number / Tare Weight (g):	224.07
Dry Weight of Sample and Tare before Wash (g):	363.83
Dry Weight of Sample and Tare after Wash (g):	350.58
Loss By Wash (g):	13.3
% Loss By Wash:	9.5%

The specimen was soaked for: 3 hrs.

- Oven: 381-OV-01
- 381-OV-02
- Scale 381-PS-05
- 381-PS-02
- Sieve: 381-SV-15

Important Information About Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.



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Intertek

For more than 135 years, companies around the world have depended on Intertek to help ensure the quality and safety of their products, processes and systems.

We go beyond testing, inspecting and certifying products; we are a Total Quality Assurance provider to industries worldwide. Through our global network of state-of-the-art facilities and industry-leading technical expertise we provide innovative and bespoke Assurance, Testing, Inspection and Certification services to customers. We provide a systemic approach to supporting our customers' Quality Assurance efforts in each of the areas of their operations including R&D, raw materials sourcing, components suppliers, manufacturing, transportation, distribution and retail channels, and consumer management.

Intertek is an industry leader with more than 42,000 employees in 1,000 locations in over 100 countries. We deliver Quality Assurance expertise 24 hours a day, 7 days a week with our industry-winning processes and customer-centric culture. Whether your business is local or global, we can help to ensure that your products meet quality, health, environmental, safety, and social accountability standards for virtually any market around the world. We hold extensive global accreditations, recognitions, and agreements, and our knowledge of and expertise in overcoming regulatory, market, and supply chain hurdles is unrivaled.

Our Mission
To exceed our customers' expectations with innovative and bespoke Assurance, Testing, Inspection and Certification services for their operations and supply chain. Globally. 24/7.

Intertek can sharpen your competitive edge

- With reliable testing and certification for faster regulatory approval
- Through rapid, efficient entry to virtually any market in the world
- With Total Quality Assurance across your supply chain
- Through innovative leadership in meeting social accountability standards
- By reducing cost and minimizing health, safety, and security risks
- By becoming a TRUSTED BRAND



PSI

Professional Service Industries, Inc. (PSI), an Intertek company, nationally recognized consulting engineering and testing firm providing integrated services in several disciplines, including environmental consulting, building envelope consulting and testing, geotechnical engineering, construction materials testing and engineering, asbestos management and facilities engineering and consulting. We are recognized as one of the largest engineering design consulting companies in the US. We have been providing engineering consulting services to Fortune 500 clients and governmental agencies for over 100 years. However, our proudest accomplishment is the large number of clients that we have serviced for many years that keep coming back because of our responsiveness, commitment to listening to our clients, and consistent quality of service.

PSI has been providing business and industry with objective, accurate and useful information for more than 100 years. Today, we employ approximately 2,300 skilled personnel in 100 offices nationwide.

Distinguished as both a local and a national leader in engineering and environmental services, PSI is recognized in several disciplines including the following:

- Geotechnical Engineering
- Construction Materials Testing and Special Inspection
- Environmental Consulting
- Industrial Hygiene
- Nondestructive Examination
- Pavement Evaluation Services
- Building Science Solutions
 - Building Envelope
 - Curtainwall
 - Acoustic
 - Fire/Life Safety
 - Technology
 - Roof Consulting

PSI can provide outstanding consulting engineering and testing services; however, most of all we desire to demonstrate our commitment to excellence.

PSI provides its clients with ***Information To Build On*** in making knowledgeable, cost-effective business decisions that help their clients reduce expenses, improve quality and decrease liabilities.

A Commitment To Excellence

PSI maintains the highest professional and ethical standards, which include an economic awareness to provide the highest quality of personnel and service at a reasonable cost to our clients. Our unique combination of local, independent offices and nationwide resources means our project managers have the full responsibility for managing your local projects, and also have the national resources to handle the most challenging and complex projects, regardless of size.

While PSI's growth has been notable, even more impressive has been our ability to grow without sacrificing our technical knowledge or personalized attention to our clients. Recognition of the importance of our clients and repeat business has been a key factor in PSI's success. PSI will not sacrifice quality, value, or service to our clients.

A Commitment To Excellence (continued)

Our staff of professionals consists of the following:

- Professional Engineers (PE/PEng)
- Registered Roof Consultants (RRC)
- Registered Architects (AIA)
- Certified Industrial Hygienists (CIH)
- Registered Soil Scientists
- Engineers-In-Training (EIT)
- Registered Geologists

Our field and laboratory technicians are trained in-house and at special schools and seminars. Our project managers and technicians are certified by associations such as the following and also work with other specialized organizations within each discipline.

- Roofing Industry Educational Institute (RIEI)
- Roof Consultants Institute (RCI)
- American Concrete Institute (ACI)
- National Institute for the Certification of Engineering Technicians (NICET)
- American Welding Society (AWS)
- International Code Council (ICC)
- International Fire Council (IFC)

Since our founding, we have dedicated ourselves to excellence both in our technical expertise and in customer service. It is this principal upon which we have based our organization and established a national reputation as a leader in the field of professional engineering, testing and consulting services.

PSI's Vision... is to be the most trusted, integrated provider of "Information To Build On" for clients that buy, sell, design, construct, develop, finance and manage properties and infrastructure. By being safe 24/7/365, hiring and retaining the best employees, efficiently managing projects, and building close client relationships, we will be successful in growing PSI and in balancing the needs of our employees, clients and investors.



Project Name: Nowicki Park - Rochester Hills									
Project Number: 03811526									
Test Location: INF-1						(Inner) Pipe I.D. (in):		4"	
Tested By: Z. Simpson						(Outer) Pipe I.D. (in):			
Temperature (F): Start: 75		End: 75				Test Interval Based on Pre-Soak Results (min)		30	
Surface Elevation (ft): 969									
Test Elevation (ft):								Test Date: September 2, 2025	
Trial Number	Start/End	Time	Inner Ring			Outer Ring			
			Water Level (WL) Reading (in) ⁽²⁾	WL Difference (in)	Infiltration Rate (in/hr)	Water Level (WL) Reading (in)	WL Difference (in)	Infiltration Rate (in/hr)	
Pre-Soak	Start Test:								
Pre-Soak Timed	Start Test:	3:00 PM	6	-0.25					
	End Test:	3:30 PM	5.75						
1	Start Test:	3:30 PM	5.5	0	0				
	End Test:	4:00 PM	5.5						
2	Start Test:	4:00 PM	5.5	0	0				
	End Test:	4:30 PM	5.5						
3	Start Test:								
	End Test:								
4	Start Test:								
	End Test:								
5	Start Test:								
	End Test:								
6	Start Test:								
	End Test:								
7	Start Test:								
	End Test:								
8	Start Test:								
	End Test:								
						Value (in/hour):		0	
NOTES: (1) Casing had a stick-up length of 6" and was filled in water. Water Level Reading above the ground surface (2) Water Level Reads the Height of Water Above Ground									
SOIL DESCRIPTION: 0 - 7.0" Topsoil 7.0" - 6.0' Brown LEAN CLAY - with sand, trace gravel, moist, stiff to very stiff 6.0' - 10.0' Yellow mottled brown LEAN CLAY - trace gravel, moist, stiff to very stiff									