CONSULTING GROUP

Report of
Geotechnical Investigation

Dicken Elementary
2135 Runnymeade Blvd.
City of Ann Arbor
Washtenaw County, Michigan

Latitude : 42.26197˚ N
Longitude : 83.77636˚ W

Prepared for:

Ann Arbor Public Schools
2555 South State Street
Ann Arbor, Michigan 48104

G2 Project No. 233485
December 1, 2023

g2consultinggroup.com

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CONSULTING GROUP

December 1, 2023

Mr. Jason Bing, RA, LEED AP
Director, Capital Programs
Ann Arbor Public Schools
2555 South State Street
Ann Arbor, Michigan 48104

RE: Report of Geotechnical Investigation
Ann Arbor Public Schools
Dicken Elementary
2135 Runnymeade Boulevard
City of Ann Arbor, Washtenaw County, Michigan
G2 Project No. 233485

Dear Mr. Bing:

We have completed the geotechnical investigation related to the proposed site improvements at the Dicken Elementary Campus located at the above address in Ann Arbor, Michigan. This report presents the results of our observations, analysis, and recommendations for the earthwork operations, foundation design, pavement design, and construction considerations as they relate to the geotechnical conditions at the site.

We appreciate the opportunity to be of service to Ann Arbor Public Schools on this project and look forward to discussing the recommendations presented herein. In the meantime, if you have any questions regarding this report or any other matter pertaining to the project, please call us.

Sincerely,

G2 Consulting Group, LLC

Michael G. Dagher, P.E.
Project Engineer

Jason B. Stoops, P.E.
Office Manager / Associate

MGD/JBS/jbs

STATE OF MICHIGAN
JASON B. STOOPS
ENGINEER
No. 50982
LICENSED PROFESSIONAL ENGINEER

EXECUTIVE SUMMARY

The proposed project includes the construction of a new school located to the south of the existing Dicken Elementary School building. The new building will have an approximate footprint of 38,000 feet and will be oriented in the northwest-southeast direction. Proposed plans depicting the finished floor elevation for the proposed structure were not available to us at the time of this report; however, we anticipate the proposed building will be constructed at a similar finished floor elevation as compared to the existing building, whose finished floor elevation is approximately 967.3 feet. Based on the "Detail Requirements and Stipulations for Geotechnical Exploration, Investigation and Report" dated June 13, 2023, we understand the proposed foundations will experience column loads of up to 125 kips and wall loads of up to 15 kips per foot.

Approximately 3 to 12 inches of topsoil are present at the ground surface of the soil borings drilled in the undeveloped areas. We observed the pavement ranging in thickness from 3-1/4 to 5 inches and the aggregate base ranging from 6 to 10-3/4 inches in the borings conducted in the existing pavement areas. We observed fill consisting of mostly sandy clay beneath the topsoil within borings PG-06, SB-03, SB-05 through SB-07, SB-10, SB-11, SW-01 through SW-03, and U-01 extending to depths ranging from 5-1/2 to 12 feet. We observed highly compressible organic soils beneath the fill within soil borings SB-03 and SW-01 through SW-03 extending to depths ranging from 8 to 16-3/4 feet below existing grade. We observed predominantly stiff to hard native cohesive soils beneath the fill in the remaining borings and beneath the organic soils in borings SB-03 and SW-01 through SW-03 extending to the explored depths except in borings PG-05, PG-06, and SB-07, where the cohesive soils extend to depths ranging from 8 to 14-3/4 feet. The silty sand within soil boring SB-07 is underlain by native sandy clay extending to the explored depths and the granular soils in PG-05 and PG-06 extend to the explored depths.

We observed the presence of what we believe to be uncontrolled fill as well as organic silt within the Former Pond and Pond Fringe Borings. We do not know the precise lateral extent of these soils; however, a thorough review of the historical survey data at the site may assist in revealing their boundaries. In addition, additional soil borings can be performed to further delineate the limits of the unsuitable soils. Our estimate of the extent of the problematic soils is based on our review of historical aerial imagery at the site in conjunction with the results of our soil boring data and may not necessarily reflect the precision required to properly estimate the costs associated with improving the problematic soils.

For foundations constructed near SB-01, SB-02, SB-04, and SB-08, we recommend the proposed foundations be designed to bear within the underlying hard native cohesive soils. Foundations bearing on the hard native cohesive soils may be designed using a net allowable soil bearing pressure of 4,000 psf. We recommend soils east of a line projected between SB-10 and SB-11 be improved using rammed-aggregate piers. Specifications for construction as well as the design of RAPs are performed by specialty contractors. We recommend the design by the third-party for RAP systems provide an allowable bearing capacity of 4,000 psf.

We anticipate the subgrade soils to the east of a line projected between SB-10 and SB-11 will consist of uncontrolled fill/organic soils and subgrade soils to the west of this line will consist of native stiff to hard cohesive soils. The placement of up to 3-1/2 feet of engineered fill will cause the underlying fill soils/organic soils on the east side of the line to consolidate. We recommend that the proposed floor slab within the northern portion of the addition be supported on improved soil, consisting of rammed aggregate piers, as described in the Foundation Recommendations section of this report.

Do not consider this summary separate from the entire text of this report, with all the conclusions and qualifications mentioned herein. Details of our analysis and recommendations are discussed in the following sections and in the Appendix of this report.

PROJECT DESCRIPTION

The proposed project includes the construction of a new building located to the south of the existing Dicken Elementary School building. The new building will have an approximate footprint of 38,000 feet and will be oriented in the northwest-southeast direction. Proposed plans depicting the finished floor elevation for the proposed structure were not available to us at the time of this report; however, we anticipate the proposed building will be constructed at a similar finished floor elevation as compared to the existing building, whose finished floor elevation is approximately 967.3 feet.

Based on the "Detail Requirements and Stipulations for Geotechnical Exploration, Investigation and Report" dated June 13, 2023, we understand the proposed foundations will experience column loads of up to 125 kips, and wall loads of up to 15 kips per foot.

It should be noted that the geotechnical requirements for the project were issued prior to our discovery of organic soils on site, discussed later in this report. Following our discovery of the organic soils on site, the building orientation and footprint of the building were reconfigured by the design team. We anticipate the loading conditions for the re-configured building will generally be the same as the original building orientation and location. Limited information beyond the size of the structure and anticipated loading conditions were available for our review at the time of this report; however, we anticipate the overall project will include the construction of underground utilities, pavement areas, and stormwater management structures.

The purpose of our exploration is to determine and evaluate the general subsurface soil and groundwater conditions beneath the proposed addition and to develop recommendations for the earthwork, subgrade preparation, foundation design, bituminous pavement design, and construction considerations as they relate to the geotechnical conditions at the site. Once the finalized project plans become available, G2 Consulting Group, LLC (G2) should be notified so we can review the recommendations presented herein.

SCOPE OF SERVICES

The field operations, laboratory testing, and engineering report preparation were performed under the direction and supervision of a licensed professional engineer in the State of Michigan. Our services were performed according to generally accepted standards and procedures in the practice of geotechnical engineering in this area. Our scope of services for this project is as follows:

1. **Initial Mobilization:** We drilled a total of fifteen (15) soil borings throughout the proposed development areas. We drilled soil borings PC-01 and PC-02 within existing pavements extending to a depth of 5 feet, PG-01 through PG-05 within proposed playground areas extending to a depth of 10 feet, SB-01 through SB-04 within the proposed building footprint extending to a depth of 25 feet, SW-01 through SW-03 within the footprint of the proposed stormwater management basins extending to a depth of 15 feet, and U-01 within the alignment of a sanitary utility line extending to a depth of 20 feet.

2. **Supplemental Mobilization:** During our initial mobilization to the site, we identified the presence of organic soils within soil borings SB-03, SW-02, and SW-03 and presented our findings to the team in an email correspondence dated August 8, 2023. Following some discussion, we executed a supplemental investigation geared toward estimating the lateral extent of the encountered organic soils. We drilled a total of eight (8) supplemental borings toward the southeast of the site. Soil borings SB-05 through SB-11 were drilled in re-oriented building footprint extending to a depth of 20 feet and soil boring PG-06 was drilled along the alignment of proposed pavement to be constructed at the southeast corner of the building extending to a depth of 15 feet.

3. We performed laboratory testing on representative samples obtained from the soil borings. Laboratory testing included visual engineering classification, natural moisture content, organic matter content, Atterberg limit, and unconfined compressive strength determinations.

4. We prepared this engineering report which includes our recommendations for foundation design, site preparation, estimated settlement, and construction considerations as they relate to the geotechnical conditions at the site.

The recommendations we present in this report are based on our understanding of the project and the results of our field exploration, laboratory testing, engineering analyses, and our experience with similar subsurface soil conditions for similar projects. The recommendations contained in this report apply to the site-specific soil and groundwater conditions as they relate to the specific project discussed in this report. Therefore, any changes to the site layout, loading conditions, or proposed site grades should be provided to us so that we may review our recommendations presented in this report.

Our professional services have been performed with a degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has been prepared for Ann Arbor Public Schools and its approved design engineers, construction personnel, bidders, and contractors. The report has not been prepared for use by other parties or for other uses and may not contain sufficient information for purposes of other parties or other uses.

FIELD OPERATIONS

G2 Consulting Group, LLC (G2), in conjunction with DLR Group and Wightman, selected the number, depth, and location of the soil borings. We estimated the field position of the proposed soil borings by overlaying the scaled site plan on aerial imagery within Google Earth Pro. Using the scaled site plan, we targeted specific locations within the building footprint for the soil boring locations. We estimated ground surface elevations at the boring locations based on the drawing titled “Dicken Elementary - ALTA/NSPS Land Title Survey” dated March 16, 2023 by Midwestern Consulting. We present the positional information at the boring locations, including latitude, longitude, and elevation on the individual soil boring logs presented in this report. If you would like more accurate positional information at the boring locations, we recommend their locations be determined in the field using conventional surveying techniques.

The soil borings were drilled by Strata Drilling, Inc. using an all-terrain vehicle mounted rotary drilling rig. The driller used 2-1/4 inch inside diameter hollow-stem augers to advance the soil boring to the desired depths. We obtained soil samples at regular 2-1/2-foot intervals within the upper 10 feet and at intervals of 5 feet thereafter extending to the explored depths. The soil samples were obtained by the driller in general accordance with the Standard Penetration Test (SPT) method (ASTM D1586) which involves driving a 2-inch diameter split-spoon sampler into the ground with a 140-pound hammer falling 30 inches. The sampler is generally driven three successive 6-inch increments, with the number of blows for each increment recorded. The number of blows required to advance the sampler the last 12 inches is termed the Standard Penetration Resistance (N or N-Value). Blow counts for each six-inch increment and resulting N-values are presented on the individual soil boring logs at the depths they were determined.

The soil samples were placed in sealed containers in the field and brought to the laboratory for testing and classification. During the drilling operations, a G2 field representative maintained a log of the encountered subsurface soil and groundwater conditions to be used in conjunction with our analysis of the subsurface conditions. The final soil boring logs are based on the field logs and laboratory soil classification and testing. Upon completion of the drilling operations, the driller backfilled the resulting excavations using excavated soils. The driller restored the pavements at the borehole locations using cold-applied asphalt patch. We hired a subcontractor to restore the surface grade at the soil boring locations, limited to backfilling remaining excavations with Class II sand, placing topsoil, grass seed, and

hay over the disturbed area.

LABORATORY TESTING

We subjected representative soil samples to laboratory testing to determine soil parameters pertinent to foundation design and site preparation. An experienced geotechnical engineer classified the samples in accordance with the G2 General Note Terminology and applications of the Unified Soil Classification System (Visual-Manual). Laboratory testing on representative samples included:

- ASTM D2216 – Moisture Content
- ASTM D4318 – Atterberg Limits
- ASTM D2974 – Organic Matter Content
- ASTM D2166 – Unconfined Compressive Strength of Cohesive Soil

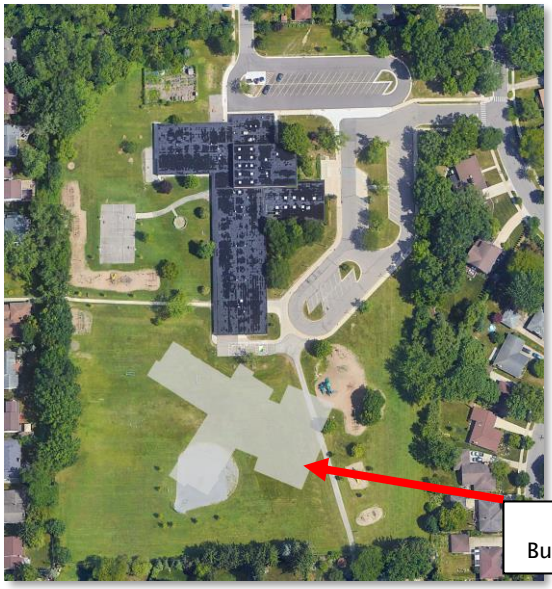
In addition, we estimated the unconfined compressive strength of cohesive soils using a spring-loaded hand penetrometer. The hand penetrometer estimates the unconfined compressive strength to a maximum of 4-1/2 tons per square foot (tsf) by measuring the resistance of the soil sample to the penetration of a spring-loaded cylinder. We also estimated the unconfined compressive strength of cohesive soils using a hand-held torvane. The hand-held torvane can be used to estimate the unconfined compressive strength of cohesive soils by measuring the resistance of the soil to the applied torque of a vane seated into the sample. The shear strength estimated by the hand-held torvane is multiplied by a factor of two and presented on the soil boring logs as an equivalent unconfined compressive strength.

The results of the moisture content, organic matter content, and unconfined compressive strength test determinations are shown on the individual soil boring logs at the depths the samples were taken. We present the graphical results of our unconfined compressive strength tests, performed in accordance with ASTM D2166, as Figure No. 24 in the Appendix. We will retain the soil samples for a period of 60-days following the issuance of this report after which they will be discarded. If you would like to have the soil samples, please let us know.

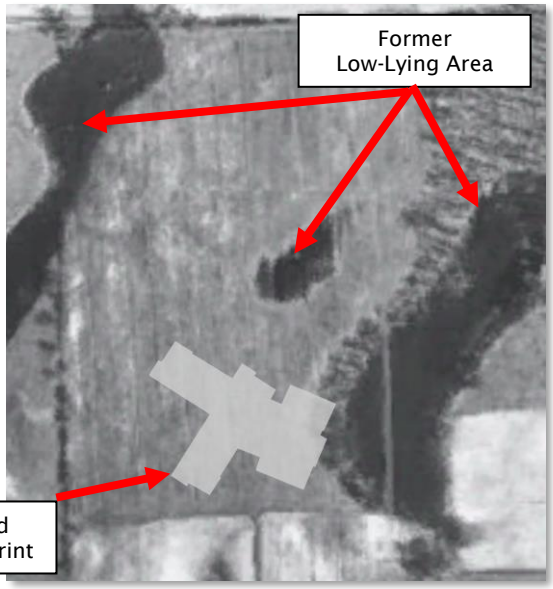
SITE CONDITIONS

The Dicken Elementary campus is located to the south of Carol Drive and to the west of Runnymeade Boulevard in Ann Arbor, Michigan. Wimpole Drive enters the site from Runnymeade Boulevard and serves as a bus-loop located immediately to the east of the existing structure. The bus-loop pavements are isolated from a parking area located to the north of the existing building. The overall site can be divided into two sections; where the north half of the site contains the building and parking lot areas and the south of the site is open and grassy. On the east quarter of the lower-half of the site lie several existing playground structures.

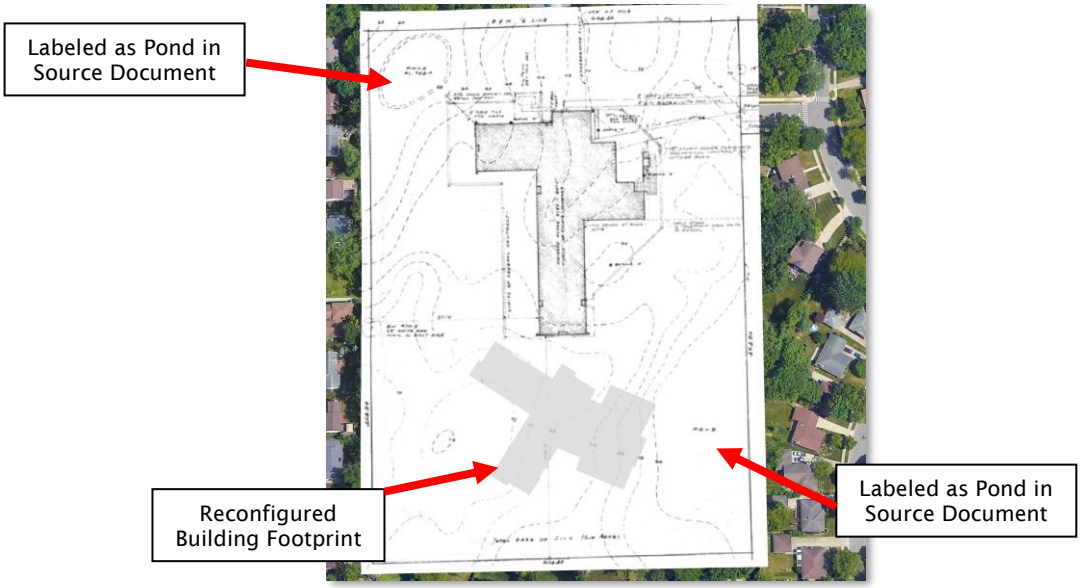
We have reviewed historical aerial imagery at the site, available on the Washtenaw GIS website, extending to a point prior to the construction of the existing Dicken Elementary School. Based on the contrast of the aerial imagery in conjunction with our review of historical site plans, we surmise prior earthwork operations at the site have included covering a historical low-lying area that has previously identified as a “pond” by others. Please refer to Plate No. 1 and Plate No. 2 in the Appendix for higher-resolution maps depicting our estimate of the historical low-lying area.



Google Earth Pro Imagery (2022)



Washtenaw GIS (1947)



Source Document Provided by Ann Arbor Public Schools (August 2023)

Based on the drawing titled "Dicken Elementary - ALTA/NSPS Land Title Survey" dated March 16, 2023 by Midwestern Consulting we observe the existing building has a finished floor elevation of approximately 967.3 feet. Site grades immediately surrounding the existing building are relatively flat within elevations of 1 to 2 feet of the existing finished floor elevation. The flat area to the south of the existing building slopes downward to the east, roughly corresponding with the former low-lying area to a low elevation of approximately 958 feet at the east property boundary. Site grades to the north of the building gently slope downward toward the northwest corner of the site, roughly corresponding with the former low-lying area to an elevation of approximately 960 feet. The proposed building will be constructed in an area where the existing site grades range from 967 feet near the southwest corner of the building to an elevation of approximately 963-1/2 feet near the northeast corner of the building.

SOIL AND GROUNDWATER CONDITIONS

Former Pond and Pond Fringe Borings (SB-03, SW-01 through SW-03, SB-05 through SB-07, SB-10, SB-11)

Approximately 3 to 12 inches of topsoil are present at the ground surface of the soil boring locations; except for SB-05, where approximately 6 inches of playground mulch are present at the ground surface. The topsoil is underlain by fill comprised of silty clay or sandy clay extending to depths ranging from 5-1/2 to 12 feet. The fill at boring locations SB-03, SW-01, SW-02, and SW-03, is underlain by highly compressible organic silt extending to depths ranging from 8 to 16-3/4 feet. The native soil conditions beneath the organic silt consist of native sandy or silty clay extending to the explored depths; however, isolated layers or native granular soils deposits are present near the boring termination depth of PG-06 and within the deeper native cohesive soil layer in soil boring SB-07 extending from 13-1/2 to 14-3/4 feet. We anticipate the cohesive fill soil overlying the native cohesive soils as well as the organic soil deposits has been placed in an uncontrolled manner.

The upper cohesive fill soil is mostly stiff to hard in consistency with moisture contents ranging from 13 to 24 percent, organic matter contents ranging from 2 to 4 percent, and unconfined compressive strengths ranging from 2,500 to more than 9,000 psf. We observed isolated layers of medium cohesive fill soils within borings PG-06, SB-05, and SB-07 having moisture contents ranging from 15 to 36 percent, organic matter contents of up to 5 percent, and unconfined compressive strengths ranging from 1,000 to 2,000 psf. The organic silt identified within soil borings SB-03 and SW-01 through SW-03 is very soft in consistency having moisture contents ranging from 62 to 307 percent and organic matter contents ranging from 6 to 63 percent. The native cohesive soils immediately underlying the organic soils is soft to medium in consistency with natural moisture contents ranging from 20 to 23 and unconfined compressive strengths ranging from 1,400 to 1,810 psf; however, transitions to very stiff beyond a depth of 21-3/4 feet in soil boring SB-03 having a moisture content of 16 percent and an unconfined compressive strength of 6,110 psf. The native cohesive soils underlying the fill in the remaining borings is stiff to hard in consistency with natural moisture contents ranging from 12 to 28 percent and unconfined compressive strengths ranging from 3,000 to more than 9,000 psf; except for SB-07 where the final sample in the boring is medium in consistency having a moisture content of 17 percent and an unconfined compressive strength of 1,920 psf.

Outside of Pond Fringe (PC-01, PC-02, PG-01 through PG-05, SB-01, SB-02, SB-04, SB-08, SB-09, U-01)

Approximately 3-1/4 to 5 inches of bituminous concrete are present at the surface of borings PC-01 and PC-02, respectively, and are underlain by gravelly sand aggregate base ranging in thickness from 10-3/4 to 6 inches, respectively. The aggregate base in the pavement borings is underlain by loose sand extending to a depth of approximately 3 feet. Approximately 3 to 9 inches of topsoil are present at the ground surface of the remaining borings. The topsoil in soil boring U-01 is underlain by hard cohesive fill having moisture contents ranging from 11 to 22 percent and unconfined compressive strengths of more than 9,000 psf. Elsewhere, the topsoil is underlain by native cohesive soils consisting of stiff to hard sandy clay or silty clay having natural moisture contents ranging from 10 to 25 percent and unconfined compressive strengths ranging from 3,000 to 17,860 psf. We observed an isolated layer of very loose silty sand beneath the upper native cohesive soils in PG-05 extending from a depth of 8 feet to the explored depth.

Groundwater Observations

We observed the natural groundwater level within soil boring SB-07 during drilling operations at a depth of approximately 16 feet. After approximately 3 hours following the drilling operations at SB-07, we observed the natural groundwater level rise to a depth of 8 feet below existing grade. We did not observe groundwater during the drilling operations in the remaining borings; however, we observed the natural groundwater levels at depths ranging from 2 to 11 feet within borings PC-02, SW-01 through SW-03, SB-03, SB-06, SB-07, and PG-05 upon completion of the drilling operations. In general, we anticipate

the groundwater level observed in PC-02 is perched above the underlying cohesive soils.

General

The stratification depths shown on the soil boring logs represent the soil conditions at the boring locations. Variations will occur away from the boring locations. Additionally, the stratigraphic lines represent the approximate boundary between soil types. The transition may be more gradual than what is shown. We have prepared the soil boring logs based on the field logs of encountered soil conditions supplemented by laboratory classification and testing.

Fluctuations in perched and long-term groundwater levels should be anticipated due to seasonal variations and following periods of prolonged precipitation. It should also be noted that groundwater observations made during drilling operations in cohesive soils are not necessarily indicative of the static groundwater level. This is due to the low permeability of such soils and the tendency of drilling operations to seal off the natural paths of groundwater flow.

The Soil Boring Location Plan, Plate No. 1, the Soil Boring Logs, Figure Nos. 1 through 23, the Unconfined Compressive Strength Test Results, Figure No. 24, the Atterberg Limit Results, Figure No. 25, and Soil Boring Profiles, Figure Nos. 26 through 29, are presented in the Appendix. We present General Notes Terminology, defining the nomenclature used on the soil boring logs and elsewhere in this report, as Figure No. 30 in the Appendix.

SITE SEISMICITY

The geology in Washtenaw County can be separated into two major groups, unconsolidated glacial deposits, and bedrock. The bedrock is composed of sedimentary rocks ranging in thickness from 4,000 to 7,000 feet underlain by Precambrian igneous rocks. According to quaternary geology maps, the deposits near the site consist of end moraine comprised of medium-textured till. The moraines are composed of clay, silt, sand, and gravel mixtures. Based on the publication titled “Geology and Hydrology for Environmental Planning in Washtenaw County, Michigan” dated 1980 by the United States Department of the Interior Geological Survey and our experience in Ann Arbor, we estimate the depth to bedrock to be anywhere from 250 to 300 feet below existing site grades.

Washtenaw County, Michigan lies in a stable tectonic region of the country, characterized by a relatively low expected magnitude of ground accelerations in the event of an earthquake. Based on the blow counts, the observed soils beneath the project site generally consist of stiff to hard cohesive soils and isolated layers of loose granular soils. Based on the subsurface soil conditions, we recommend a seismic site classification of D be used in design.

Spectral Response Category	Response Acceleration at Short Periods	Response Acceleration at One Second Period
Maximum Considered Earthquake	S_S = 0.094 g	S_1 = 0.048 g
Adjusted Maximum Considered Earthquake	S_{MS} = 0.151 g	S_{M1} = 0.115 g
Five Percent Damped Design	S_{DS} = 0.101 g	S_{D1} = 0.076 g

Notes:
1. Source: ATC Hazards Council (https://hazards.atcouncil.org/)
2. Based on “Minimum Design Loads and Associated Criteria for Buildings and Other Structures” (ASCE 7-10).

Given the site is in an area of a low probability for seismic activity, we believe the risk for liquefaction at this site is also low.

SITE PREPARATION RECOMMENDATIONS

Grading plans for the proposed site improvements were not available for us at the time of this report; however, we anticipate the proposed finished floor elevation for the new building will be constructed at an elevation roughly corresponding to the finished floor elevation of the existing building at an elevation of 967.3 feet. Considering that site grades around the proposed building range from 967 feet near the southwest of the building and 963-1/2 feet near the northeast corner of the building, we anticipate up to 3-1/2 feet of engineered fill will be required to raise grades in the proposed building area.

The addition of engineered fill will load the underlying organic soils and uncontrolled fill deposits. Unaddressed, the proposed floor slab and foundations will experience differential settlement following the placement of engineered fill.

The most invasive option to mitigate the potential for differential settlement would be to remove and replace the existing fill soils with engineered fill; however, we anticipate these operations would be cost-prohibitive for the project. In order to mitigate the risk of floor slab settlement in this aera, we recommend that the proposed floor slab be supported on improved soil, such as rammed aggregate piers, as described in the Foundation Recommendations section of this report. Alternatively. we recommend the proposed building be shifted to the northwest, beyond borings SB-10 and SB-11, to minimize issues associated with the problematic soils.

We anticipate earthwork operations for the proposed building will consist of stripping the development area of topsoil, trees, or other vegetation, removing the existing playground and baseball field materials, removing the existing pavement system, placing and compacting engineered fill to the proposed subgrade elevation, performing soil improvement (rammed aggregate piers), excavating for new utilities and foundations, and preparing the site for the receipt of floor slab and pavement materials. In general, we recommend the earthwork operations be monitored in the field by qualified personnel under the direction and supervision of a licensed professional geotechnical engineer.

At the start of the earthwork operations, the existing topsoil, tree, vegetation, playground, and baseball field materials, as well as existing pavements should be completely removed from within the influence of the proposed building and pavement areas. We anticipate the exposed subgrade will consist of both native and fill cohesive soils. The cohesive subgrade should be thoroughly proof-rolled with a fully loaded tandem axle dump truck or equivalent and visually evaluated by a qualified G2 representative. Soils exhibiting instability, such as severe rutting, should be improved with additional compaction or undercut to expose stable soils. Resulting excavations should be backfilled with engineered fill.

Engineered fill should be free of organic matter, frozen soil, clods, or other harmful material. The fill should be placed in uniform horizontal layers, not more than 9 inches in loose thickness. The engineered fill should be compacted to achieve a density of at least 95 percent of the maximum dry density as determined by the Modified Proctor compaction test (ASTM D1557). All engineered fill material should be placed and compacted at approximately the optimum moisture content.

To economically conduct earthwork operations at the site, engineered fill, adhering to the above requirements, should consist of low plasticity clays or well-graded aggregates. Low plasticity clays, having a plasticity index less than 20 percent, should be placed within +3 or -1 percent of the optimum moisture content as determined by the Modified Proctor Test (ASTM D1557). For well-graded aggregates, such as MDOT Class II Sand, we recommend the engineered fill be placed at ±2 percent of the optimum moisture content as determined by ASTM D1557. In no case should high-plasticity clays (fat clays) be used as engineered fill.

We recommend the use of free-draining granular soils, such as MDOT Class II sand, within utility trenches, and during earthwork operations conducted in wintry months. We recommend the use of engineered fill with a sufficient amount of fines (material passing the No. 200 sieve) in order to facilitate

trenching and excavation techniques for strip and spread footing foundations.

FOUNDATION RECOMMENDATIONS

Shallow Foundations

As previously mentioned, we observed the presence of what we believe to be uncontrolled fill as well as organic silt within the Former Pond and Pond Fringe Borings. We do not know the precise lateral extent of these soils; however, a thorough review of the historical survey data at the site may assist in revealing their boundaries. Our estimate of the extent of the problematic soils is based on our review of historical aerial imagery at the site in conjunction with the results of our soil boring data and may not necessarily reflect the precision required to properly estimate the costs associated with improving the problematic soils.

Without improvement, the organic soil by itself and the soils above the organic soils should be considered unsuitable for the support of foundations and floor slabs. The uncontrolled fill directly overlying the native cohesive soils should also be considered marginally suitable for the support of floor slabs and unsuitable for the support of foundations. Options to mitigate issues that may arise from the organic soils/uncontrolled fill include, relocating the building to the northwest, removing and replacing the uncontrolled fill/organic soils with engineered fill, or improving the support characteristics of these soils with rammed aggregate piers (RAP).

We anticipate the proposed building will be constructed having a finished floor elevation roughly corresponding to the finished floor elevation of the existing building (967.3 feet). As such, we anticipate conventionally constructed shallow spread and or strip footings will be constructed at or near an elevation of 963-3/4 feet. For foundations constructed near SB-01, SB-02, SB-04, and SB-08, we recommend the proposed foundations be designed to bear within the underlying hard native cohesive soils. Foundations bearing on the hard native cohesive soils may be designed using a net allowable soil bearing pressure of 4,000 psf. Please note, we observed stiff cohesive soils extending to an elevation of approximately 962-1/4 feet in soil boring SB-04. Foundations should be stepped down to the hard cohesive soils in this area to achieve an allowable bearing pressure of 4,000 psf.

At soil borings SB-10 and SB-11 we observed fill extending to depths of 5-1/2 and 6 feet corresponding to elevations ranging from 959-1/2 to 956-1/2 feet. In general, we recommend that the existing fill soils in this area be undercut to expose the underlying hard cohesive soils and be replaced with engineered fill. Foundations bearing on engineered fill placed atop the underlying hard cohesive soils may be designed using a net allowable soil bearing pressure of 4,000 psf. To avoid costs associated with undercutting the upper fill soils, we recommend consideration be given to relocating the proposed building such that the southeast building line will be constructed at a point to the west of a line projected between SB-10 and SB-11.

Exterior foundations must bear at a minimum depth of 3-1/2 feet below finished grade for protection against frost heave. Interior foundations can be constructed at shallower depths provided suitable bearing soils are present and they are protected from frost penetration during construction. Continuous wall or strip footings should be at least 12 inches in width and isolated spread footings should be at least 30 inches in their least dimension. To achieve a change in the level of a strip footing, the footing should be gradually stepped at a grade no steeper than two units horizontal to one unit vertical. If required to construct foundations at different levels, adjacent spread footing foundations should be designed and constructed so the least lateral distance between the foundations is equivalent to or more than the difference in their bearing levels. We recommend all foundations be suitably reinforced to minimize the effects of differential settlements associated with local variations in soil conditions.

If the recommendations outlined in this report are adhered to, total and differential settlements for the completed structures support on shallow spread footings should be within 1 inch and 1/2 inch, respectively. We expect settlements of these magnitudes are within tolerable limits for the type of

building proposed.

Foundations Bearing on Improved Soils

In soil borings SB-05, SB-06, and SB-07, we observed unsuitable fill and organic soils extending to depths ranging from 8 to 12 feet. We anticipate undercutting these soils will be cost prohibitive both from the perspective of earthwork as well as dewatering. As an alternate to undercutting the problematic soils in these borings, we recommend soils east of a line projected between SB-10 and SB-11 be improved using rammed-aggregate piers (also referred to as Geopiers or compacted stone columns). Rammed-aggregate piers (RAP) typically consist of a 30 inch column of stone extending to depths of up to 30 feet. The shaft is excavated to a target depth after which crushed-rock is lowered to the base of the excavation and subsequently compacted with a beveled ram delivering 1 to 2 million ft-lbs of energy to the ram at approximately 400 blows per minute. The high frequency ramming action embeds each lift of the crushed rock into and compacts the bottom of the drilled shaft. Once the bottom of the drilled shaft is filled, the equipment rams and embeds subsequent lifts of crushed rock into the sides of the drilled shaft radially into the adjacent soil. The net effect of these operations is an increase in strength and stiffness of the soil mass up to one RAP diameter from the edge of the drilled shaft. The resulting improved soil can provide bearing capacities ranging from two to four times the allowable bearing pressure of the unimproved soil.

Shallow foundations constructed within the influence of the uncontrolled fill should be constructed on improved ground, consisting of rammed-aggregate piers (RAPs). Specifications for construction as well as the design of RAPs are performed by specialty contractors. We recommend the design by the third-party for RAP systems provide an allowable bearing capacity of 4,000 psf. Based on our experience with RAP construction, qualified contractors to perform this work in this area include Tensar (Geopiers), Menard USA, and Nicholson.

FLOOR SLAB RECOMMENDATIONS

We anticipate the subgrade soils to the west of a line projected between SB-10 and SB-11 will consist of native stiff to hard cohesive soils or engineered fill placed above these materials. We anticipate the subgrade soils at SB-10 and SB-11 and to the east of a line projected between SB-10 and SB-11 will consist of uncontrolled fill overlying the native cohesive soils or uncontrolled fill over lying the organic soil deposits. The placement of up to 3-1/2 feet of engineered fill will cause the underlying fill soils/organic soils to consolidate. We recommend that the proposed floor slab within the uncontrolled fill/organic soils be supported on improved soil, such as rammed aggregate piers, as described in the Foundation Recommendations section of this report.

Following satisfactory completion of the subgrade preparation recommendations presented in this report, we anticipate the exposed subgrade will consist of existing fill soils, native granular soils, rammed aggregate piers improved soil, or engineered fill. A subgrade modulus (k) of 125 pounds per cubic inch (pci) may be used in the design of floor slabs supported on the above-mentioned soils.

We recommend at least 4 inches of clean coarse sand or pea gravel be placed between the subgrade and the bottom of the floor slab for use as a capillary break to reduce moisture transmission through the concrete floors and to reduce the potential for concrete curling. If moisture sensitive floor coverings are planned or if greater protection against vapor transmission is desired, a vapor barrier consisting of 10-mil plastic sheeting, or equivalent, may be placed on the sand or pea gravel layer beneath floor slabs. However, additional floor slab curing techniques will be required especially if floor slab placement occurs in the winter months to prevent floor slab curling. The floor slab should be isolated from the foundation system to allow for independent movement.

PAVEMENT RECOMMENDATIONS

We anticipate the proposed pavement cross sections will generally support car, bus, and the occasional

delivery or refuse truck traffic. Information regarding the number of bus trips anticipated for the new access drives or parking lots were not available to us at the time of this report. In general, we recommend two pavement cross sections: a light-duty pavement to be used where the pavements will be subject to passenger vehicles and a heavy-duty pavement to be used where truck/bus traffic is planned. We anticipate the proposed pavements at the site will be supported by the native cohesive soils and/or the uncontrolled cohesive fill soils. Based on the anticipated subgrade soils, we have assigned an effective subgrade resilient modulus of 7,500 psi.

We have analyzed the proposed pavement cross sections in accordance with the "1993 AASHTO Guide for Design of Pavement Structures". For the pavement design, we have assumed a serviceability loss of 2.0, a standard of deviation of 0.49, and a reliability of 0.90. The proposed pavement design cross sections are presented below:

Standard Duty Bituminous Concrete Pavement Section			
Material Type	**Material Thickness (in)**	**Structural Coefficient**	**Structural Number**
MDOT 5EML	2	0.42	0.84
MDOT 3C	2	0.42	0.84
MDOT 21AA Limestone	8	0.14	1.12
		Total SN →	2.80

Heavy Duty Bituminous Concrete Pavement Section			
Material Type	**Material Thickness (in)**	**Structural Coefficient**	**Structural Number**
MDOT 5EML	2	0.42	0.84
MDOT 3C	3	0.42	1.26
MDOT 21AA Limestone	10	0.14	1.40
		Total SN →	3.50

Our analyses indicate the proposed Standard Duty Bituminous Concrete can service a total of approximately 160,000 equivalent single-axle loads (ESALs) over a 20-year design life. The Heavy Duty Bituminous Concrete can service a total of approximately 750,000 ESALs over a 20-year design life, corresponding to approximately 74 truck passes per day. If actual traffic volume information becomes available, G2 Consulting Group, LLC, should be notified so we can reevaluate our analyses of the proposed pavement section.

Large front-loading refuse trucks can impose significant concentrated wheel loads within trash dumpster pick-up areas. This type of loading can result in rutting of asphalt pavements and ultimately in failure. Therefore, we recommend non-reinforced concrete pavement at least 8 inches in thickness be used in these areas. The concrete pad should be large enough to support the entire refuse truck during pick-up operations.

All pavement materials are specified within the 2020 Standard Specifications for Construction from the Michigan Department of Transportation. The aggregate materials for the subbase and concrete are described in Section 902. The Portland cement concrete pavement materials are described in Section 601. The bituminous pavement materials are described in Section 501 and can be assigned a structural coefficient number of 0.42.

We recommend regular timely maintenance be performed on the bituminous pavements to reduce the potential deterioration associated with moisture infiltration through surface cracks. The owner should be prepared to seal the cracks with a hot-applied elastic crack filler as soon as possible after cracking develops and as often as necessary to block the passage of water to the subgrade soils.

BELOW-GRADE WALL RECOMMENDATIONS

General

Project plans depicting the alignment, top of wall, and bottom of wall were not available for our review at the time of this report. When project plans depicting this information about the proposed retaining walls become available, please let us know so that can modify the recommendations in this report, if necessary.

Foundations

In general, retaining wall foundation must bear on the native stiff to hard cohesive soils or engineered fill placed above the soils. For foundations bearing within these soils, we recommend retaining wall foundations be conservatively designed using a net allowable soil bearing pressure of 4,000 psf. Uncontrolled fill soils encountered at the foundation subgrade elevation should be removed in their entirety from within the influence of the proposed foundation and replaced with engineered fill.

The retaining wall foundation will be subject to a moment in addition to the vertical loads imposed by the retained soils, and the distribution of pressured by the foundation on the soil will not be uniform. We recommend the maximum toe pressure be limited to 1.3 times the allowable bearing pressure. We also recommend the foundation be designed such that the foundation does not experience any tensile forces where it is in contact with the bearing soils. An allowable friction resistance factor of 0.4 may be used along the bottoms of shallow spread footings.

The foundations must bear at a minimum depth of 3-1/2 feet below finished grade for protection against frost. To achieve a change in the level of a strip foundation, the foundation should be gradually stepped at a grade not steeper than two units horizontal to one unit vertical. We recommend G2 representatives be on site during construction to observe the foundation excavations and perform an evaluation of the exposed subgrade.

Lateral Earth Loads

Below-grade walls considered to be free at the top should be designed based on active earth pressures corresponding to an equivalent fluid pressure of 35 pounds per square foot per foot of depth for drained granular backfill soil.

Lateral earth pressures can be significantly influenced by the type and intensity of backfill compaction. We recommend thin lifts, approximately 6 inches in thickness, be placed and relatively small compaction equipment be used to compact backfill placed against below-grade walls.

Drainage

Below-grade wall backfill should consist of free-draining aggregates, having less than 5 percent passing the No. 200 sieve, to minimize the potential for the development of hydrostatic pressure and to allow for proper compaction in confined spaces. The existing fill soils may be used as engineered fill provided they meet the requirements for engineered fill in this report. The engineered fill should be placed and compacted to within 95 percent of the maximum dry density as determined by the Modified Proctor Compaction Test (ASTM D1557).

We recommend a foundation drain system or weep holes be incorporated to maintain drained soil conditions. To prevent the development of hydrostatic pressures on below-grade walls, a sub drain system should be installed at the foundation level. The perforated or slotted sub drains should be encased with at least 12 inches of clean gravel or pea gravel, and the gravel and pipe together should be wrapped with a suitable non-woven filter fabric, such as Mirafi 140N, to prevent the migration of surrounding soil fines into the gravel and drain-pipe. The sub drain system should outlet water to a nearby catch basin.

CONSTRUCTION CONSIDERATIONS

We anticipate shallow foundation excavations will extending through the existing native cohesive soils or engineered fill placed above these soils. Provided that the engineered fill material placed at the site consists of at least 15 percent fines, we anticipate foundations extending through the engineered fill and native cohesive soils can be excavated using conventional trenching techniques. The sides of shallow foundation excavations must be straight and vertical. Furthermore, we recommend foundation excavation and concrete placement operations be conducted on the same day to minimize the potential for surface run-off into the open excavations.

We anticipate minor accumulations of groundwater will be present within the utility and/or foundation excavations at the site. In general, we anticipate groundwater accumulations within open excavations can be controlled with pumping from properly constructed sumps.

We recommend maximum slope inclinations of 3/4H:1V (Horizontal units to vertical units) within the hard cohesive soils and 1H:1V within the medium to stiff cohesive soils and 2H:1V with the existing fill soils. Where seepage from excavation cuts is observed, the slopes will need to be flattened sufficiently to achieve stability, but in no case left steeper than 3H:1V at and below the seepage level. If material is stored or equipment is operated near an excavation, stronger shoring must be used to resist the extra pressure due to the superimposed loads.

Care should always be exercised when excavating near existing roadways, structures, or utilities to avoid undermining. In no case should excavations extend below the level of adjacent foundations and utilities unless an earth retention system is in place.

GENERAL COMMENTS

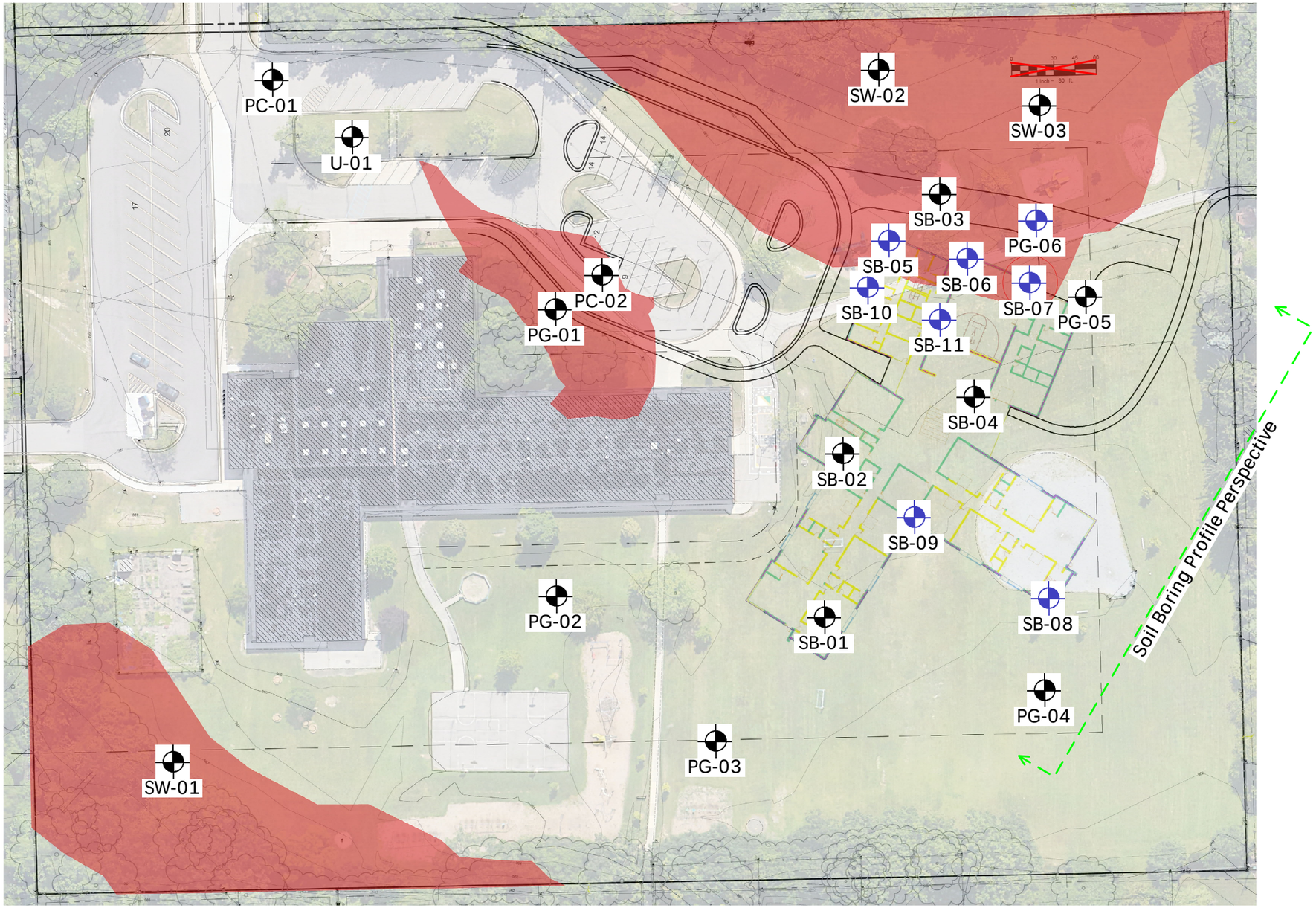
We have formulated the evaluations and recommendations presented in this report relative to site preparation and foundations based on data provided to us relating to the location, type, and grade for the proposed site. Any significant change in this data should be brought to our attention for review and evaluation with respect to the prevailing subsurface conditions. Furthermore, if changes occur in the design, location, or concept of the project, the conclusions and recommendations contained in this report are not valid unless G2 Consulting Group, LLC reviews the changes. G2 Consulting Group, LLC will then confirm the recommendations presented herein or make changes in writing.

The scope of the present investigation was limited to evaluation of subsurface conditions for the support of proposed structures and other related aspects of the development. No chemical, environmental or hydrogeological testing or analyses were included in the scope of this investigation.

We base the analyses and recommendations submitted in this report upon the data from the soil borings at the approximate locations depicted on the Soil Boring Location Plan, Plate No.1, in the Appendix. This report does not reflect variations that may occur away from the actual boring locations. The nature and extent of any such variations may not become clear until the time of construction. If significant variations then become evident, it may be necessary for us to re-evaluate our report recommendations. Accordingly, we recommend G2 Consulting Group, LLC observe all geotechnical related work, including foundation construction, subgrade preparation, and engineered fill placement. G2 Consulting Group, LLC will perform the appropriate testing to confirm the geotechnical conditions given in the report are found during construction.

APPENDIX

Soil Boring Location Plan	Plate No. 1
Soil Boring Location Plan (Historical Imagery)	Plate No. 2
Soil Boring Logs	Figure Nos. 1 through 23
Unconfined Compressive Strength Test	Figure No. 24
Atterberg Limit Results	Figure No. 25
Soil Boring Profiles	Figure Nos. 26 through 29
G2 General Notes Terminology	Figure No. 30

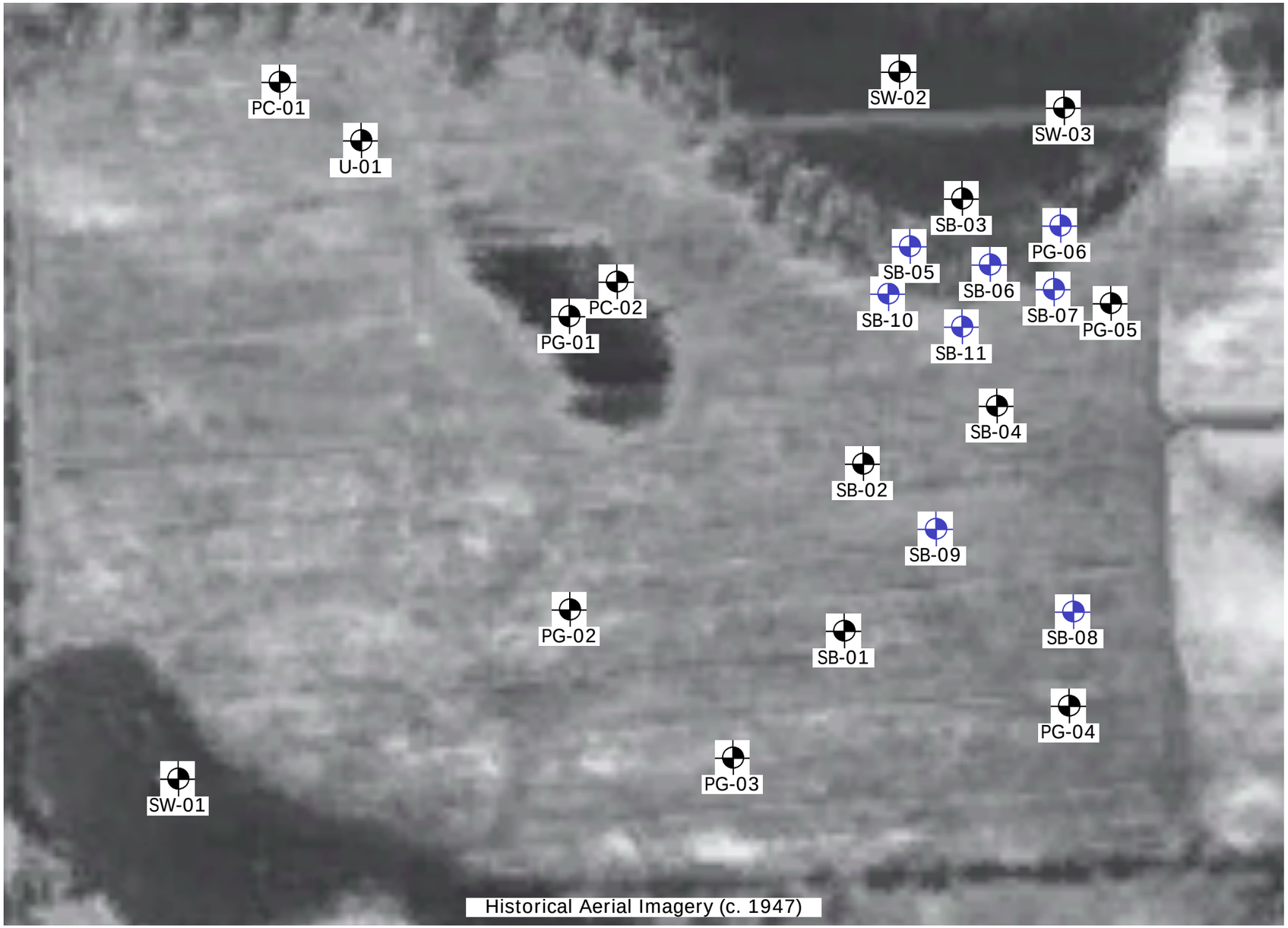


Legend

- Soil borings drilled by Strata Drilling, Inc. on August 2 and 3, 2023.
- Soil borings drilled by Strata Drilling, Inc. on October 13, 2023.
- Estimated Boundaries of Historical Low-Lying Area

Base Drawing Credit: Wightman / Google Earth Pro

Soil Boring Location Plan		
Dicken Elementary 2135 Runnymeade Boulevard Ann Arbor, Washtenaw County, Michigan		
2G CONSULTING GROUP	Project No.: 233485	
	Drawn by: MGD	
	Date: 11/1/23	Plate No. 1
	Scale: NTS	



Legend

Soil borings drilled by Strata Drilling, Inc. on August 2 and 3, 2023.

Soil borings drilled by Strata Drilling, Inc. on October 13, 2023.

Base Drawing Credit: Washtenaw County | MapWashtenaw

Soil Boring Location Plan		
Dicken Elementary 2135 Runnymeade Boulevard Ann Arbor, Washtenaw County, Michigan		
2G CONSULTING GROUP	Project No.: 233485	
	Drawn by: MGD	
	Date: 11/1/23	Plate No. 1
	Scale: NTS	

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26324° Longitude: -83.77543°

Soil Boring No. PC-01

CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 968.4 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Bituminous Concrete (3-1/4 inches) 0.3							
		Aggregate Base: Light Gray Gravelly Sand with trace silt (10-3/4 inches) 1.2							
		Loose Brown Sand with trace clay and gravel		S-01	7 5 4	9			
		3.0							
963.4		Hard Mottled Gray and Brown Sandy Clay with trace gravel 5.0	5	S-02	6 11 12	23	12.3		9000*
		End of Boring @ 5 ft							
958.4			10						
953.4			15						
948.4			20						
943.4			25						

Total Depth: 5 ft
Drilling Date: August 2, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings; asphalt patch

Figure No. 1

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26260° Longitude: -83.77595°

Soil Boring No. PC-02

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 965.2 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Bituminous Concrete (5 inches) 0.4							
		Aggregate Base: Light Gray Gravelly Sand with trace silt (6 inches) 0.9							
		Loose Light Brown Sand with trace clay		S-01	6 6 4	10			
		3.0							
960.2		Stiff Mottled Gray and Brown Sandy Clay (LL = 42; PI = 22) 5.0	5	S-02	2 3 5	8	24.8		4000*
		End of Boring @ 5 ft							
955.2			10						
950.2			15						
945.2			20						
940.2			25						

Total Depth: 5 ft
Drilling Date: August 2, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during drilling, 2 feet upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings; asphalt patch

Figure No. 2

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26270° Longitude: -83.77604°

Soil Boring No. PG-01

CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 966.0 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace gravel (4 inches) 0.3							
		Very Stiff to Hard Brown Sandy Clay with trace gravel		S-01	4 6 7	13	14.3		9000*
961.0			5	S-02	6 5 4	9	9.9		6000*
		5.5 Very Stiff Mottled Gray and Brown Sandy Clay with trace gravel		S-03	2 3 5	8	19.0		5000*
		8.0 Hard Mottled Brown and Gray Sandy Clay with trace gravel 10.0		S-04	5 8 10	18	14.4		9000*
956.0			10						
		End of Boring @ 10 ft							
951.0			15						
946.0			20						
941.0			25						

Total Depth: 10 ft
Drilling Date: August 2, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 3

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26269° Longitude: -83.77679°

Soil Boring No. PG-02

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 966.2 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace gravel (6 inches) 0.5							
		Stiff Mottled Brown and Gray Sandy Clay with trace gravel 3.0		S-01	2 2 4	6	18.5		3000*
961.2			5	S-02	4 7 10	17	13.4		9000*
		Hard Mottled Brown and Gray Sandy Clay with trace gravel		S-03	6 10 12	22	13.0		9000*
956.2		10.0	10	S-04	7 13 18	31	12.5		9000*
		End of Boring @ 10 ft							
951.2			15						
946.2			20						
941.2			25						

Total Depth: 10 ft
Drilling Date: August 3, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 4

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26238° Longitude: -83.77718°

Soil Boring No. PG-03

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 966.7 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace gravel (5 inches) 0.4							
		Stiff Brown Sandy Clay with trace gravel 3.0		S-01	2 3 5	8	20.0		3000*
961.7		Hard Mottled Brown and Gray Sandy Clay with trace gravel	5	S-02	5 10 12	22	12.2		9000*
		8.0		S-03	5 11 15	26	13.0		9000*
956.7		Hard Brown Sandy Clay with trace gravel 10.0	10	S-04	7 11 14	25	12.3		9000*
		End of Boring @ 10 ft							
951.7			15						
946.7			20						
941.7			25						

Total Depth: 10 ft
Drilling Date: August 2, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 5

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26174° Longitude: -83.77704°

Soil Boring No. PG-04

CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 967.3 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace gravel (5 inches) 0.4							
		Hard Brown Sandy Clay with trace gravel 3.0		S-01	3 5 7	12	13.0		9000*
962.3		Hard Mottled Brown and Gray Sandy Clay with trace gravel	5	S-02	5 12 12	24	13.2		9000*
		8.0		S-03	8 13 18	31	13.7		9000*
957.3		Very Stiff Gray Sandy Clay with trace gravel 10.0	10	S-04	6 11 12	23	12.8		6000*
		End of Boring @ 10 ft							
952.3			15						
947.3			20						
942.3			25						

Total Depth: 10 ft
Drilling Date: August 3, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 6

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26166° Longitude: -83.77601°

Soil Boring No. PG-05

CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 964.2 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace gravel (8 inches) 0.7							
		Very Stiff Brown Sandy Clay with trace gravel		S-01	2 2 4	6	13.7		5000*
959.2		(Sand Seam) 5.5	5	S-02	2 3 4	7	16.2		6000*
		Hard Mottled Gray and Brown Sandy Clay with trace gravel 8.0		S-03	4 5 6	11	17.2		9000*
954.2		Very Loose Brown Silty Sand with trace clay 10.0	10	S-04	2 2 3	5			
		End of Boring @ 10 ft							
949.2			15						
944.2			20						
939.2			25						

Total Depth: 10 ft
Drilling Date: August 2, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during drilling, 8 feet upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 7

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.261758° Longitude: -83.775808°

Soil Boring No. PG-06

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 963.0 ft ±

ELEV. (ft)	PRO-FILE	Description	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace silt and gravel (7 inches) 0.6							
		Fill: Very Stiff Brown Sandy Clay with trace silt and gravel		S-01	2 2 3	5	17.0		5000*
958.0		(Organic Matter Content = 5.1%) 4.5	5	S-02	2 3 2	5	35.5		1000*
		Fill: Medium Brownish Gray Silty Clay with trace sand; debris 5.5							
		Stiff Mottled Brown and Gray Silty Clay with trace sand		S-03	1 2 4	6	28.2		4000*
		8.0							
953.0			10	S-04	3 6 7	13	17.6		9000*
		Very Stiff to Hard Mottled Brown and Gray Silty Clay with trace sand and gravel							
		14.0							
		Very Loose Gray Silty Sand, Wet 14.8							
948.0		Very Loose Gray Sandy Silt 15.0	15	S-05	2 1 1	2			
		End of Boring @ 15 ft							
943.0			20						
938.0			25						

Total Depth: 15 ft
Drilling Date: October 13, 2023
Inspector: K. Lawson
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
Borehole collapsed at 5 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 8

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26217° Longitude: -83.77685°

Soil Boring No. SB-01

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 966.2 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace gravel (4 inches) 0.3							
		Hard Brown Sandy Clay with trace gravel		S-01	3 5 7	12	12.5		9000*
961.2			5	S-02	5 9 15	24	13.6		9000*
		5.5		S-03	5 13 21	34	13.2		9000*
956.2			10	S-04	7 11 15	26	12.9		8000*
		Very Stiff to Hard Mottled Brown and Gray Sandy Clay with trace gravel							
951.2			15	S-05	6 8 11	19	14.1		7000*
		16.8							
946.2			20	S-06	4 4 5	9	16.3		3500*
		Stiff Gray Sandy Clay with trace gravel							
941.2		25.0	25	S-07	4 5 5	10	14.0		3500*
		End of Boring @ 25 ft							

Total Depth: 25 ft
Drilling Date: August 3, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 9

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26214° Longitude: -83.77642°

Soil Boring No. SB-02

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 965.3 ft ±

ELEV. (ft)	PRO-FILE	SUBSURFACE PROFILE	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace gravel (4 inches) 0.4							
		Hard Brown Sandy Clay with trace gravel		S-01	5 6 10	16	11.7		9000*
960.3			5	S-02	7 12 14	26	12.8		9000*
		5.5 Hard Mottled Brown and Gray Sandy Clay with trace gravel		S-03	7 13 19	32	13.6		9000*
		8.0 Hard Brown Sandy Clay with trace gravel							
955.3			10	S-04	8 13 17	30	13.7		9000*
		11.8							
950.3			15	S-05	4 5 8	13	14.9		5000*
		(Possible Boulder) Stiff to Very Stiff Gray Sandy Clay with trace gravel							
945.3			20	S-06	4 9 11	20	13.2		4500*
940.3		25.0	25	S-07	4 5 7	12	17.4		3500*
		End of Boring @ 25 ft							

Total Depth: 25 ft
Drilling Date: August 2, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 10

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26195° Longitude: -83.77574°

Soil Boring No. SB-03

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 961.5 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace gravel (10 inches) 0.8							
		Fill: Stiff to Very Stiff Grayish Brown Sandy Clay with trace gravel		S-01	2 2 3	5	19.1		2500*
956.5			5	S-02	0 2 2	4	17.5		8000*
		5.5 (Organic Matter Content = 27.1%)		S-03	1 2 1	3	140.3		
951.5		(Organic Matter Content = 11.0%)	10	S-04	1 0 1	1	78.4		
		Very Soft Very Dark Brown Organic Silt							
946.5		(Organic Matter Content = 5.8%)	15	S-05	0 1 1	2	66.1		
		16.8 Medium Gray Sandy Clay with trace gravel							
941.5			20	S-06	1 3 3	6	23.3	120	1810
		21.8 Very Stiff Gray Sandy Clay with trace gravel							
936.5		25.0	25	S-07	4 7 9	16	16.3	118	6110
		End of Boring @ 25 ft							

Total Depth: 25 ft
Drilling Date: August 2, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during drilling, 11 feet upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 11

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26188° Longitude: -83.77627°

Soil Boring No. SB-04

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 965.2 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace gravel (4 inches) 0.3							
		Stiff Mottled Brown and Gray Sandy Clay with trace gravel 3.0		S-01	2 3 5	8	16.7		3000*
960.2		Hard Mottled Brown and Gray Sandy Clay with trace gravel	5	S-02	7 10 14	24	11.8		9000*
		8.0		S-03	5 12 18	30	13.2		9000*
955.2		Hard Mottled Brown Sandy Clay with trace gravel 11.8	10	S-04	5 10 16	26	13.7		9000*
950.2		Stiff to Very Stiff Gray Sandy Clay with trace gravel	15	S-05	5 6 8	14	14.3		7500*
945.2			20	S-06	3 5 8	13	16.7		2200**
940.2		25.0	25	S-07	3 3 4	7	16.1		3500*
		End of Boring @ 25 ft							

Total Depth: 25 ft
Drilling Date: August 2, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer
** Torvane

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 12

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.262047° Longitude: -83.775863°

Soil Boring No. SB-05

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 964.0 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Playground Mulch (6 inches) 0.5							
		Fill: Very Stiff Brown Sandy Clay with trace silt and gravel		S-01	2 2 3	5	17.2		4000*
959.0			5	S-02	2 2 3	5	17.0		
		6.8		S-03	2 3 3	6	21.5		3000*
		Fill: Medium to Stiff Stiff Mottled Dark Gray and Greenish Gray Sandy Clay with trace silt and organics (Organic Matter Content = 4.4%) 9.0		S-04A	5		26.9		2000*
954.0		Hard Mottled Brown and Gray Sandy Clay with trace silt and gravel	10	S-04B	10 18	28	14.2		9000*
		11.8							
949.0		Hard Brownish Gray Sandy Clay with trace silt and gravel	15	S-05	7 10 12	22	12.2	123	8620
944.0		20.0	20	S-06	4 5 8	13	22.0		8000*
		End of Boring @ 20 ft							
939.0			25						

Total Depth: 20 ft
Drilling Date: October 13, 2023
Inspector: K. Lawson
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 13

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.261892° Longitude: -83.775909°

Soil Boring No. SB-06

CONSULTING GROUP

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 964.0 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)
		Topsoil: Dark Brown Sandy Clay with trace silt and gravel (8 inches) — 0.7	
		Fill: Hard Brown Sandy Clay with trace silt and gravel — 3.0	
959.0		Fill: Stiff Brown Sandy Clay with trace silt (Organic Matter Content = 2.2%) — 5.5	5
		Fill: Stiff Mottled Brown and Gray Sandy Clay with trace silt, gravel, and organic matter (Organic Matter Content = 1.9%) — 8.0	
954.0		(Organic Matter Content = 2.4%) Fill: Very Stiff Brown Sandy Clay with trace silt, gravel, and organic matter; occasional silty sand seams — 12.0	10
949.0		Very Stiff Brownish Gray Sandy Clay with trace silt — 14.5	15
944.0		Stiff to Very Stiff Brownish Gray Sandy Clay with trace silt and gravel — 20.0	20
939.0		End of Boring @ 20 ft	25

SOIL SAMPLE DATA

SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
S-01	3 3 4	7	12.9		9000*
S-02	1 2 2	4	23.5		2000*
S-03	1 1 2	3	20.3		3000*
S-04	1 2 3	5	26.4		4000*
S-05	2 2 4	6	13.1	120	6290
S-06	3 5 8	13	14.9	119	4210

Total Depth: 20 ft
Drilling Date: October 13, 2023
Inspector: K. Lawson
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during, 8 feet upon completion (5 hours)

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 14

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.261771° Longitude: -83.775970°

Soil Boring No. SB-07

CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 964.0 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace silt and gravel (8 inches) 0.7							
		Fill: Very Stiff Brown Sandy Clay with trace silt and gravel		S-01	2 3 4	7	15.4		8000*
959.0		5.0	5	S-02	2 3 3	6	16.8		6000*
		Fill: Medium Light Brown and Reddish Brown Sandy Clay with trace silt and gravel; occassional silty sand seams (Organic Matter Content = 1.6%)		S-03	3 2 3	5	22.1		2000*
		8.5							
954.0		Medium Brown Silty Clay with trace sand and gravel; occasional silt and sand seams	10	S-04	1 2 2	4	23.1	101	1170
		13.5							
		Loose Brown Silty Sand with occasional clay seams							
949.0		14.8	15	S-05	3 5 5	10			3000*
		Medium to Stiff Gray Sandy Clay with trace silt							
944.0		20.0	20	S-06	2 3 4	7	17.3	113	1920
		End of Boring @ 20 ft							
939.0			25						

Total Depth: 20 ft
Drilling Date: October 13, 2023
Inspector: K. Lawson
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
16 feet during drilling, 8 feet upon completion (3 hours)

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 15

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.261734° Longitude: -83.776799°

Soil Boring No. SB-08

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 967.0 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace silt and gravel (4 inches) 0.3							
				S-01	4 6 10	16	13.6		9000*
962.0		Hard Mottled Brown and Gray Sandy Clay with trace silt and gravel; occasional silty sand partings	5	S-02	6 12 15	27	13.1		9000*
				S-03	6 11 19	30	13.0	120	11060
957.0		10.0	10	S-04	5 9 12	21	12.7		9000*
		Hard Brownish Gray Sandy Clay with trace silt and gravel							
952.0			15	S-05	3 6 10	16	14.5		8000*
		17.0							
		Hard Gray Sandy Clay with trace silt and gravel							
947.0		20.0	20	S-06	6 9 12	21	13.2		8000*
		End of Boring @ 20 ft							
942.0			25						

Total Depth: 20 ft
Drilling Date: October 13, 2023
Inspector: K. Lawson
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 16

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.261997° Longitude: -83.776587°

Soil Boring No. SB-09

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 965.5 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace silt and gravel (9 inches) 0.8							
				S-01	3 6 8	14	13.4		9000*
		Hard Brown Sandy Clay with trace silt and gravel							
960.5			5	S-02	9 12 16	28	12.3	124	17860
		5.5							
				S-03	7 19 24	43	13.4		9000*
955.5		(Occassional Cobbles)	10	S-04	7 9 14	23	13.0		9000*
		Hard Brownish Gray Sandy Clay with trace silt and gravel							
950.5		(Occassional Cobbles)	15	S-05	7 9 12	21	16.5		8000*
		18.0							
945.5		Stiff Gray Silty Clay with trace sand and gravel 20.0	20	S-06	3 4 6	10	25.1		4000*
		End of Boring @ 20 ft							
940.5			25						

Total Depth: 20 ft
Drilling Date: October 13, 2023
Inspector: K. Lawson
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 17

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26209° Longitude: -83.77598°

Soil Boring No. SB-10

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 965.0 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace silt and gravel (12 inches) 1.0							
				S-01	2 3 3	6	18.2		4000*
		Fill: Stiff to Very Stiff Brown Sandy Clay with trace silt (Wet Sand Seam @ 3-1/2 feet)							
960.0			5	S-02	1 2 3	5	24.1		5000*
		5.5							
				S-03	3 5 10	15	13.4		9000*
		Hard Mottled Brown and Gray Sandy Clay with trace silt and gravel							
955.0			10	S-04	5 11 13	24	14.6		9000*
		12.0							
950.0			15	S-05	5 9 13	22	13.2		9000*
		Hard Gray Sandy Clay with trace silt and gravel							
945.0		20.0	20	S-06	8 10 12	22	12.2		9000*
		End of Boring @ 20 ft							
940.0			25						

Total Depth: 20 ft
Drilling Date: October 13, 2023
Inspector: K. Lawson
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 18

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26194° Longitude: -83.77606°

Soil Boring No. SB-11

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 962.5 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace silt and gravel (10 inches) 0.8							
				S-01	3 3 4	7	18.0		4000*
		Fill: Very Stiff Brown Sandy Clay with trace silt and gravel							
957.5			5	S-02	2 4 5	9	20.8		7000*
		6.0							
				S-03	3 7 11	18	22.1		9000*
952.5			10	S-04	7 11 16	27	13.3		9000*
		Hard Mottled Brown and Gray Sandy Clay with trace silt and gravel							
947.5			15	S-05	4 8 12	20	12.4		9000*
		18.0							
		Very Stiff Gray Silty Clay with trace sand 20.0							
942.5			20	S-06	6 8 8	16	17.4		7000*
		End of Boring @ 20 ft							
937.5			25						

Total Depth: 20 ft
Drilling Date: October 13, 2023
Inspector: K. Lawson
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during and upon completion

Notes:
Borehole collapsed at 5 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 19

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26344° Longitude: -83.77723°

Soil Boring No. SW-01

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 962.5 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace gravel (4 inches) 0.3							
		Fill: Very Stiff Mottled Brown and Gray Sandy Clay with trace gravel		S-01	2 4 4	8	13.4		6000*
957.5			5	S-02	2 3 3	6	15.4		5500*
		5.5							
		(Organic Matter Content = 51.8%)		S-03	1 1 2	3	235.9		
		Very Soft Very Dark Brown Organic Silt							
952.5		(Organic Matter Content = 16.4%)	10	S-04	0 1 1	2	198.7		
		11.8							
		Medium Gray Sandy Clay with trace silt and gravel							
947.5		15.0	15	S-05	2 3 5	8	20.3		1400**
		End of Boring @ 15 ft							
942.5			20						
937.5			25						

Total Depth: 15 ft
Drilling Date: August 2, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during drilling, 6-1/2 feet upon completion

Notes:
* Calibrated Hand Penetrometer
** Torvane

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 20

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26207° Longitude: -83.77541°

Soil Boring No. SW-02

G2 CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 958.5 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace gravel (3 inches) 0.3							
		Fill: Medium Mottled Brown and Gray Sandy Clay with trace gravel		S-01	2 3 3	6	15.0		800**
953.5			5	S-02	2 2 3	5	21.1		2000*
		5.5 Very Soft Very Dark Brown Organic Silt (Organic Matter Content = 62.9%)		S-03	1 1 1	2	307.1		
		9.0 Very Soft Gray Sandy Clay with trace gravel 9.5		S-04A	0 1		28.5		
948.5			10	S-04B	1	2			
		Very Soft Very Dark Brown Organic Silt							
		14.0 Soft Gray Sandy Clay with trace silt and gravel 15.0	15	S-05	0 2 3	5	22.0		2000*
		End of Boring @ 15 ft							
938.5			20						
933.5			25						

Total Depth: 15 ft
Drilling Date: August 2, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during drilling, 8 feet upon completion

Notes:
* Calibrated Hand Penetrometer
** Torvane

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 21

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26175° Longitude: -83.77551°

Soil Boring No. SW-03

G2 CONSULTING GROUP

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 960.0 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)
		Topsoil: Dark Brown Sandy Clay with trace gravel (4 inches) 0.3	
955.0		Fill: Very Stiff Mottled Brown and Gray Sandy Clay with trace gravel 5.5	5
950.0		Very Soft Very Dark Brown Organic Silt (Organic Matter Content = 14.1%) 8.0	10
945.0		Soft Gray Sandy Clay with trace gravel 15.0	15
940.0		End of Boring @ 15 ft	20
935.0			25

SOIL SAMPLE DATA

SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
S-01	2 3 4	7	13.1		5000*
S-02	3 2 3	5	14.7		5000*
S-03	2 2 3	5	61.9		
S-04	5 5 2	7	17.0		1000*
S-05	2 3 5	8	18.9		1000*

Total Depth: 15 ft
Drilling Date: August 3, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

Water Level Observation:
Dry during drilling, 9 feet upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 22

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No. 233485

Latitude: 42.26309° Longitude: -83.77559°

Soil Boring No. U-01

CONSULTING GROUP

SUBSURFACE PROFILE / SOIL SAMPLE DATA

GROUND SURFACE ELEVATION: 966.3 ft ±

ELEV. (ft)	PRO-FILE		DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay with trace gravel (3 inches) 0.3							
		Fill: Hard Brown Sandy Clay with trace gravel (Organic Matter Content = 3.8%) 3.0		S-01	4 9 10	19	11.4		9000*
961.3		Fill: Hard Dark Brown Sandy Clay with trace gravel 5.5	5	S-02	7 7 9	16	22.2		9000*
				S-03	3 6 8	14	16.3		8000*
956.3			10	S-04	5 6 9	15	16.4		9000*
		Very Stiff to Hard Mottled Brown and Gray Sandy Clay with trace gravel							
951.3			15	S-05	5 10 11	21	13.2		6000*
		16.8							
		Very Stiff Gray Sandy Clay with trace gravel							
946.3		20.0	20	S-06	3 5 6	11	15.3		6500*
		End of Boring @ 20 ft							
941.3			25						

Total Depth: 20 ft
Drilling Date: August 2, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem augers

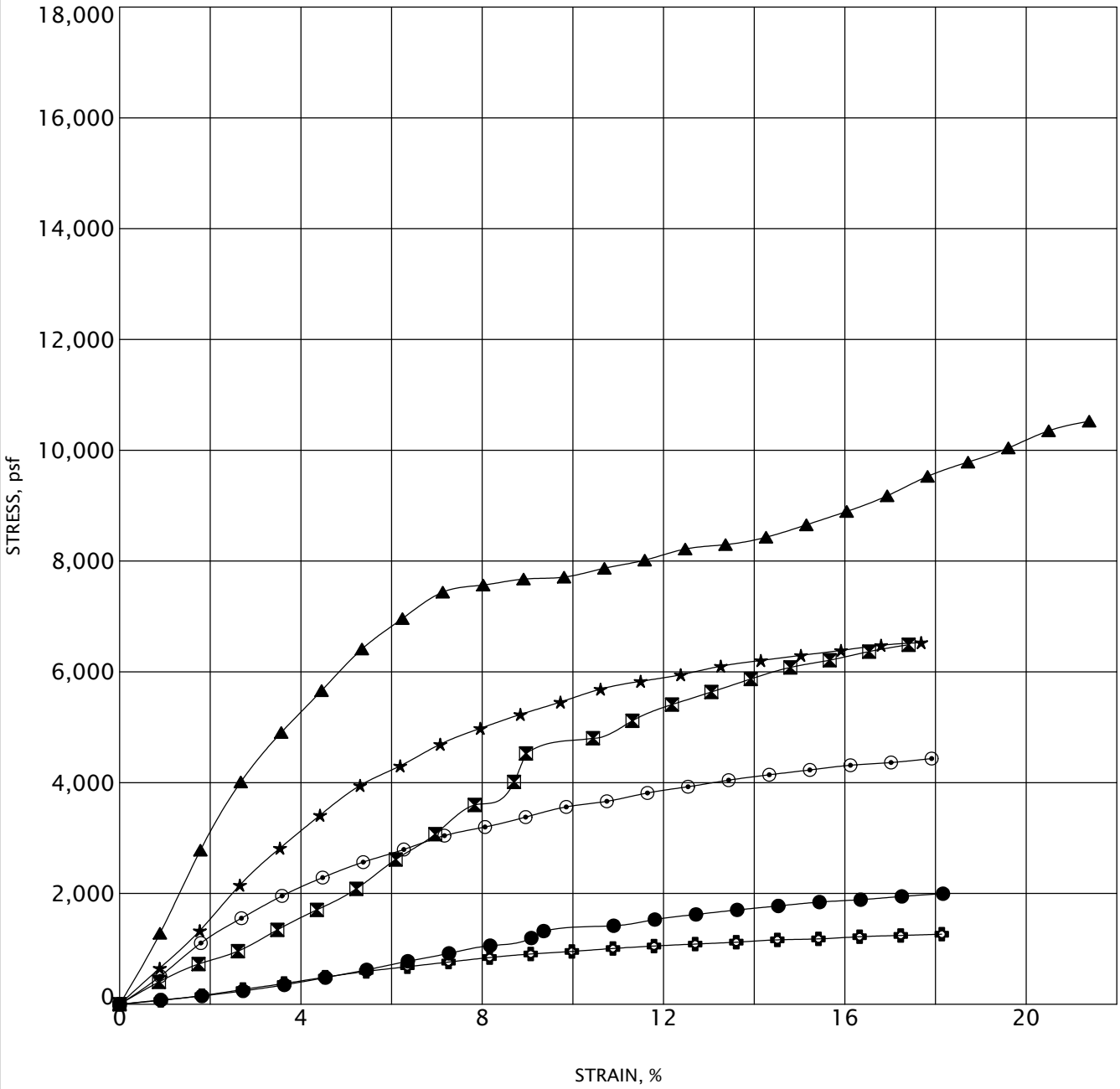
Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 23

SOIL / PAVEMENT BORING 233485.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23



Specimen		Classification	MC%	γ_d	UC
●	SB-03 S-06	Gray Sandy Clay	23	120	1810
⊠	SB-03 S-07	Gray Sandy Clay	16	118	6110
▲	SB-05 S-05	Gray Sandy Clay	12	123	8620
★	SB-06 S-05	Gray Sandy Clay	13	120	6290
⊙	SB-06 S-06	Gray Sandy Clay	15	119	4210
✿	SB-07 S-04	Brown Silty Clay	23	101	1170

G2 CONSULTING GROUP

UNCONFINED COMPRESSIVE STRENGTH TEST

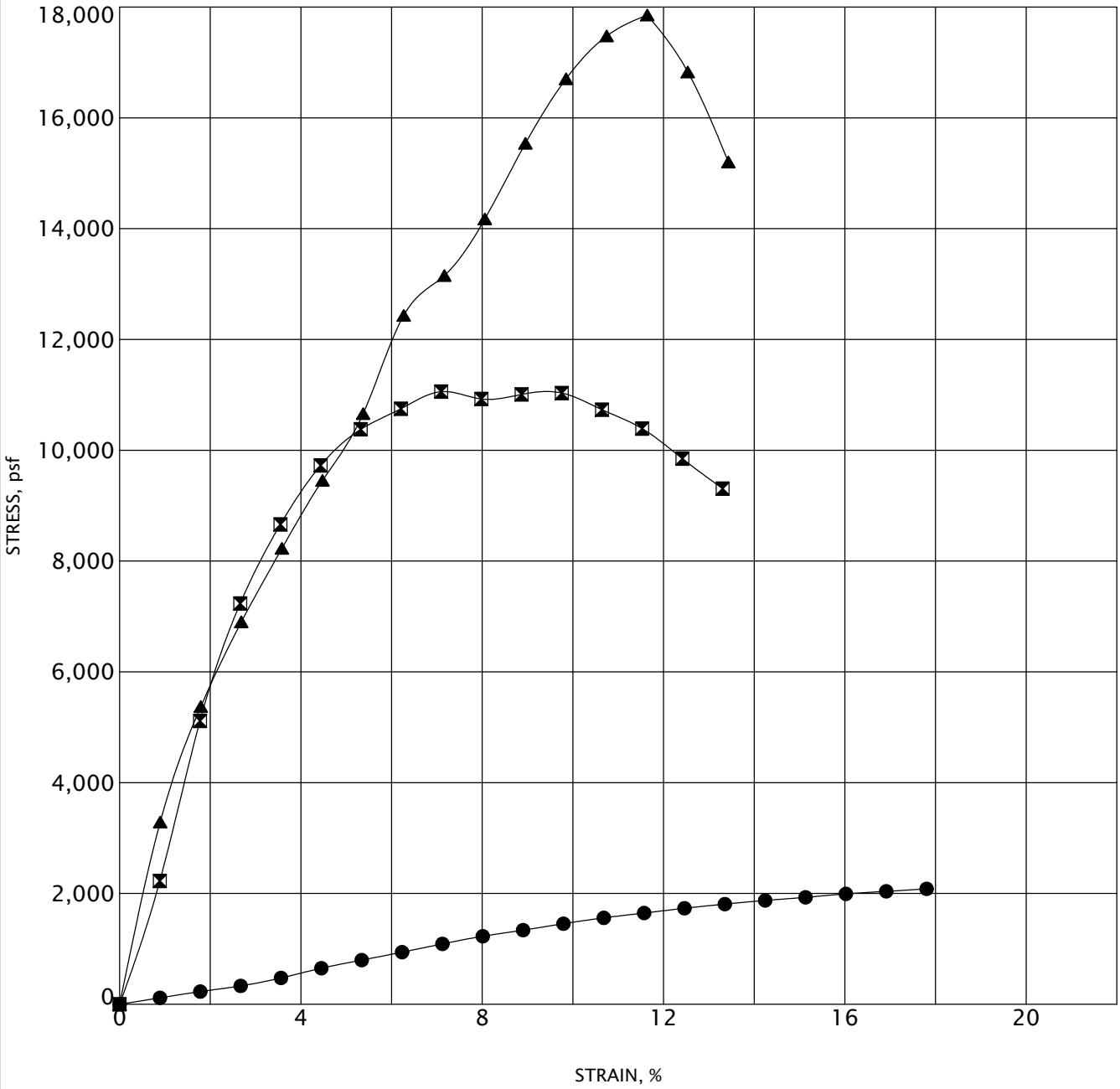
Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No.: 233485

Figure No. 24

US_UNCONFINED 233485.GPJ 20140820 G2 CONSULTING DATA TEMPLATE.GDT 10/31/23



Specimen		Classification	MC%	γ_d	UC
●	SB-07 S-06	Gray Sandy Clay	17	113	1920
⊠	SB-08 S-03	Mottled Brown and Gray Sandy Clay	13	120	11060
▲	SB-09 S-02	Brown Sandy Clay	12	124	17860

G2 CONSULTING GROUP

UNCONFINED COMPRESSIVE STRENGTH TEST

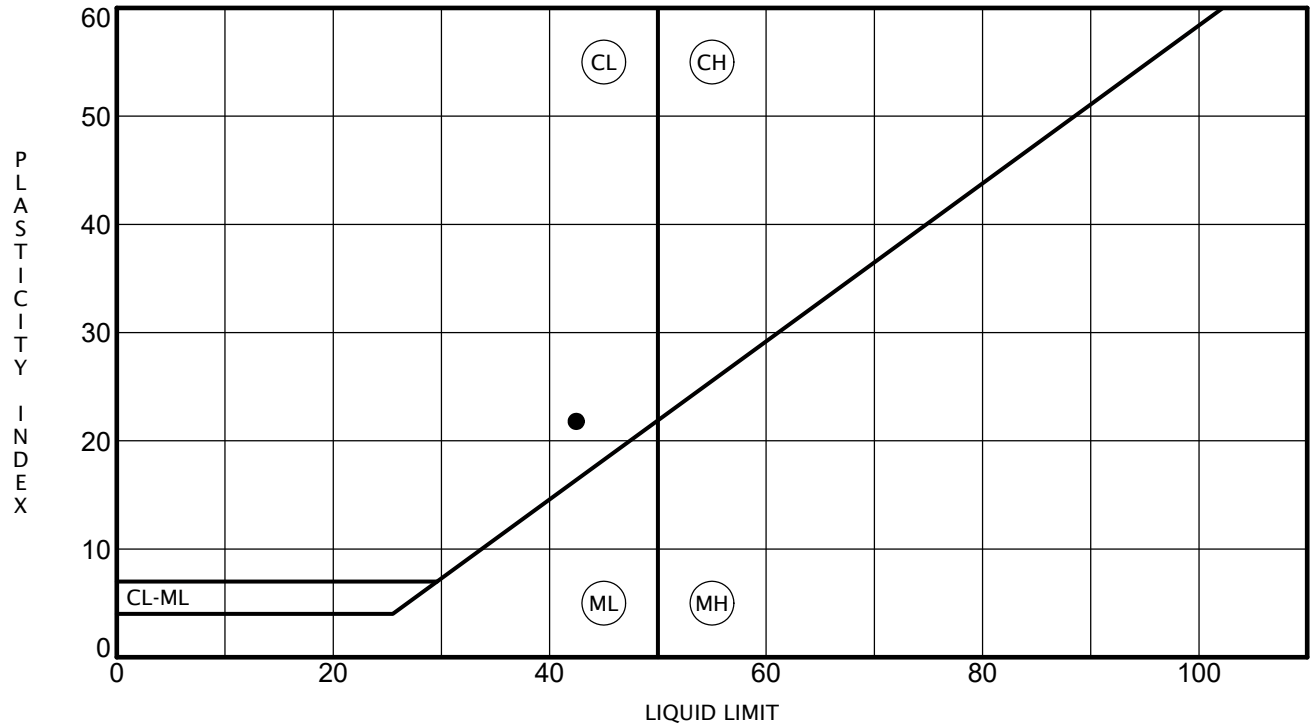
Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No.: 233485

Figure No. 25

US_UNCONFINED 233485.GPJ 20140820 G2 CONSULTING DATA TEMPLATE.GDT 10/31/23



	Specimen Identification		LL	PL	PI	Fines	M %	Classification
●	PC-02	S-02	42	21	21		25	Brown and Gray Sandy Clay

CONSULTING GROUP

ATTERBERG LIMITS RESULTS

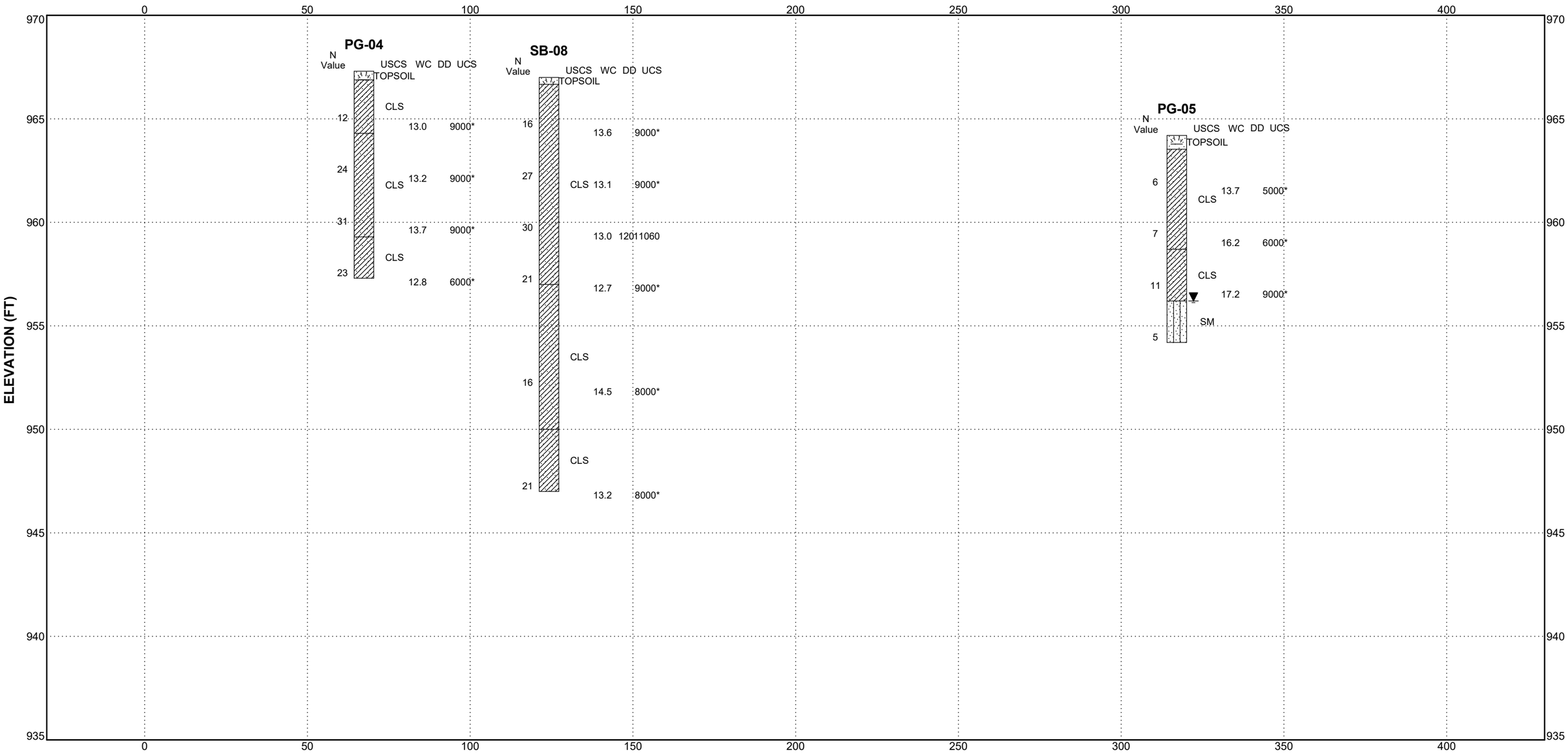
Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No.: 233485

Figure No. 25

US_ATTERBERG_LIMITS 233485.GPJ 20140820 G2 CONSULTING DATA TEMPLATE.GDT 11/15/23



Legend

▽ Encountered Groundwater Level

▼ Groundwater Level at Completion

CONSULTING GROUP

SOIL BORING PROFILE

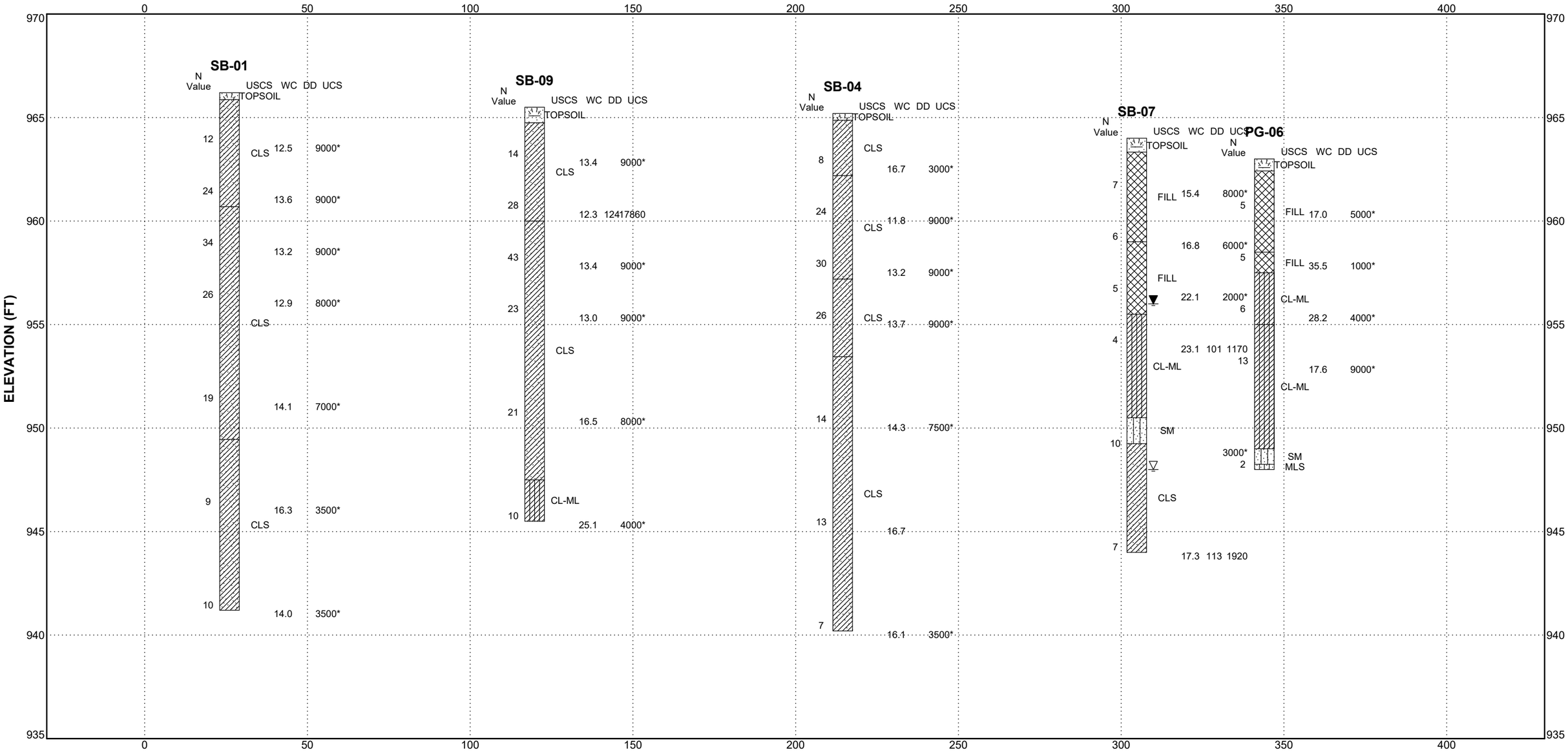
Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No.: 233485

Figure No. 26

SOIL BORING PROFILE WITH WATER LEVELS 233485.GPJ 20140820 G2 CONSULTING DATA TEMPLATE.GDT 10/31/23



Legend

▽ Encountered Groundwater Level

▼ Groundwater Level at Completion

CONSULTING GROUP

SOIL BORING PROFILE

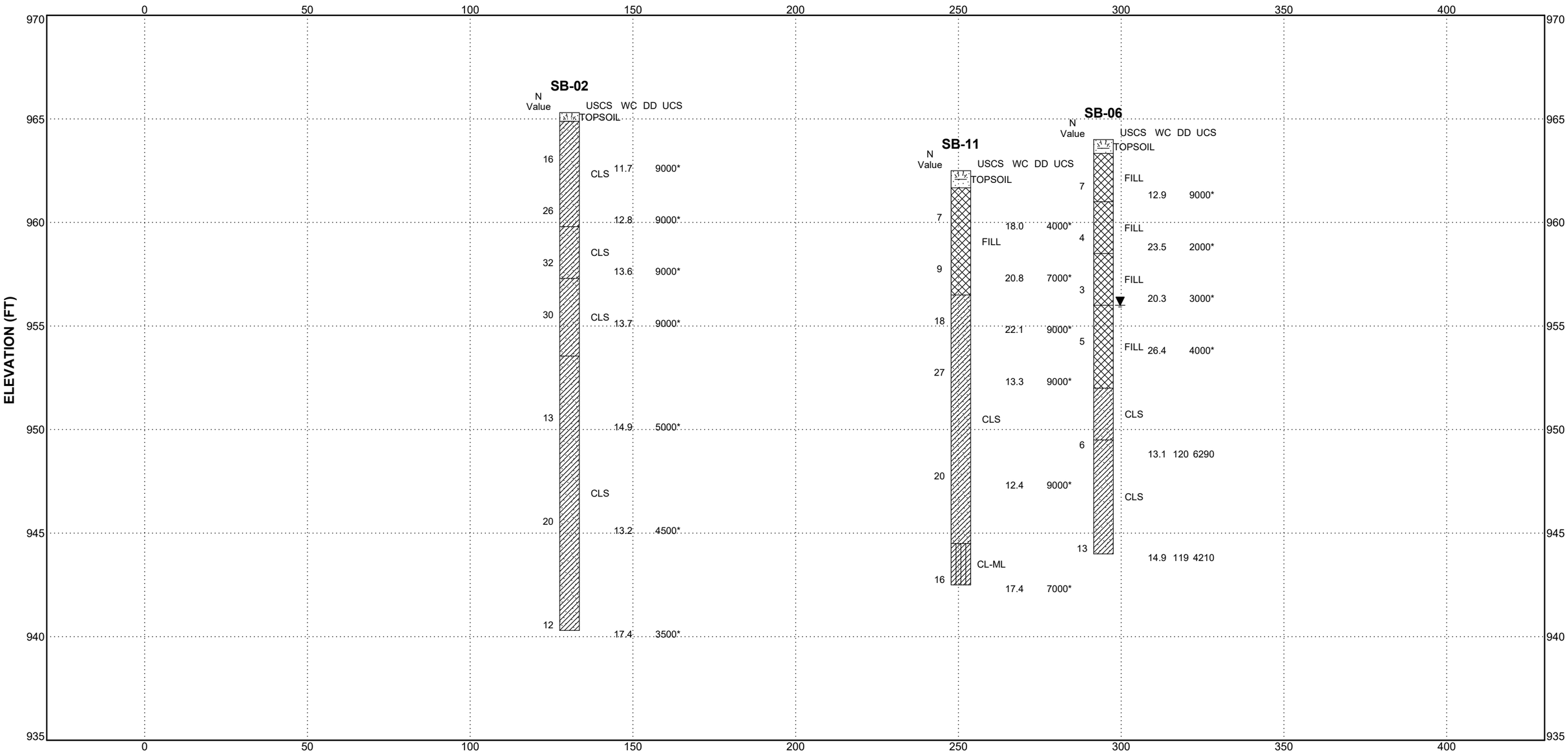
Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No.: 233485

Figure No. 27

SOIL BORING PROFILE WITH WATER LEVELS 233485.GPJ 20140820 G2 CONSULTING DATA TEMPLATE.GDT 10/31/23



Legend

▽ Encountered Groundwater Level

▼ Groundwater Level at Completion

CONSULTING GROUP

SOIL BORING PROFILE

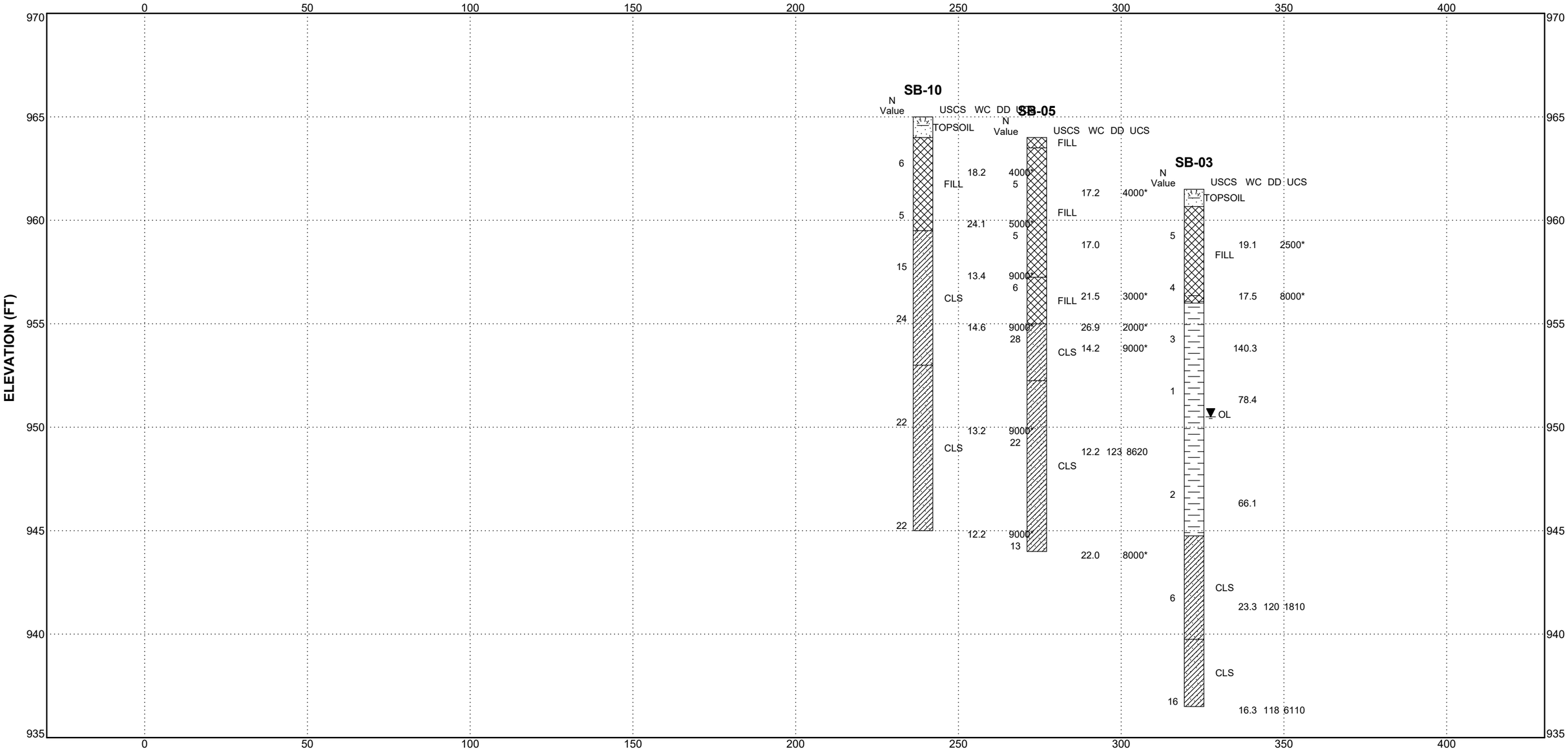
Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No.: 233485

Figure No. 28

SOIL BORING PROFILE WITH WATER LEVELS 233485.GPJ 20140820 G2 CONSULTING DATA TEMPLATE.GDT 10/31/23



Legend

- Encountered Groundwater Level
- Groundwater Level at Completion

CONSULTING GROUP

SOIL BORING PROFILE

Project Name: Dicken Elementary

Project Location: 2135 Runnymede Boulevard
Ann Arbor, Michigan

G2 Project No.: 233485

Figure No. 29

SOIL BORING PROFILE WITH WATER LEVELS 233485.GPJ 20140820 G2 CONSULTING DATA TEMPLATE.GDT 10/31/23

GENERAL NOTES TERMINOLOGY

Unless otherwise noted, all terms herein refer to the Standard Definitions presented in ASTM 653.

PARTICLE SIZE

Boulders		- greater than 12 inches
Cobbles		- 3 inches to 12 inches
Gravel	- Coarse	- 3/4 inches to 3 inches
	- Fine	- No. 4 to 3/4 inches
Sand	- Coarse	- No. 10 to No. 4
	- Medium	- No. 40 to No. 10
	- Fine	- No. 200 to No. 40
Silt		- 0.005mm to 0.074mm
Clay		- Less than 0.005mm

CLASSIFICATION

The major soil constituent is the principal noun, i.e. clay, silt, sand, gravel. The second major soil constituent and other minor constituents are reported as follows:

Second Major Constituent (percent by weight)	Minor Constituent (percent by weight)
Trace - 1 to 12%	Trace - 1 to 12%
Adjective - 12 to 35%	Little - 12 to 23%
And - over 35%	Some - 23 to 33%

COHESIVE SOILS

If clay content is sufficient so that clay dominates soil properties, clay becomes the principal noun with the other major soil constituent as modifier, i.e. sandy clay. Other minor soil constituents may be included in accordance with the classification breakdown for cohesionless soils, i.e. silty clay, trace sand, little gravel.

Consistency	Unconfined Compressive Strength (psf)	Approximate Range of (N)
Very Soft	Below 500	0 - 2
Soft	500 - 1,000	3 - 4
Medium	1,000 - 2,000	5 - 8
Stiff	2,000 - 4,000	9 - 15
Very Stiff	4,000 - 8,000	16 - 30
Hard	8,000 - 16,000	31 - 50
Very Hard	Over 16,000	Over 50

Consistency of cohesive soils is based upon an evaluation of the observed resistance to deformation under load and not upon the Standard Penetration Resistance (N).

COHESIONLESS SOILS

Density Classification	Relative Density %	Approximate Range of (N)
Very Loose	0 - 15	0 - 4
Loose	16 - 35	5 - 10
Medium Compact	36 - 65	11 - 30
Compact	66 - 85	31 - 50
Very Compact	86 - 100	Over 50

Relative Density of cohesionless soils is based upon the evaluation of the Standard Penetration Resistance (N), modified as required for depth effects, sampling effects, etc.

SAMPLE DESIGNATIONS

AS - Auger Sample – Cuttings directly from auger flight
BS - Bottle or Bag Samples
S - Split Spoon Sample - ASTM D 1586
LS - Liner Sample with liner insert 3 inches in length
ST - Shelby Tube sample - 3 inch diameter unless otherwise noted
PS - Piston Sample - 3 inch diameter unless otherwise noted
RC - Rock Core - NX core unless otherwise noted

STANDARD PENETRATION TEST (ASTM D 1586) - A 2.0 inch outside-diameter, 1-3/8 inch inside-diameter split barrel sampler is driven into undisturbed soil by means of a 140-pound weight falling freely through a vertical distance of 30 inches. The sampler is normally driven three successive 6-inch increments. The total number of blows required for the final 12 inches of penetration is the Standard Penetration Resistance (N).