CONSULTING GROUP

Report of Geotechnical Investigation

Ann Arbor Public Schools
Logan Elementary School
2685 Traver Boulevard
Ann Arbor,
Washtenaw County,
Michigan

Latitude: 42.31180° N
Longitude: 83.70658° W

Prepared for:

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

G2 Project No. 233472
September 20, 2023

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CONSULTING GROUP

September 20, 2023

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

Re: Report of Geotechnical Investigation
Ann Arbor Public Schools
Logan Elementary School
2685 Traver Boulevard
City of Ann Arbor, Washtenaw County, Michigan
G2 Project No. 233472

Dear Mr. Bing:

We have completed the geotechnical investigation associated with the proposed Logan Elementary School to be constructed within the campus of the existing Clague Middle School located in Ann Arbor, Michigan. This report presents the results of our field investigation, observations, analyses, and our recommendations for subgrade preparation, 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 you 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.

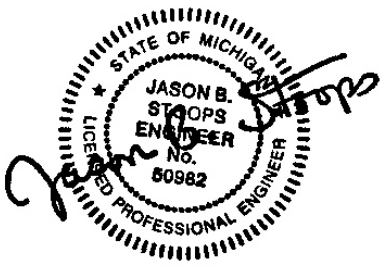
Sincerely,

G2 Consulting Group, LLC

Michael G. Dagher, P.E.
Project Engineer

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

MGD/JBS/jbs



EXECUTIVE SUMMARY

We understand the overall project includes the construction of a new school building located to the northwest of the Clague Middle School. The proposed school building will be constructed in the footprint of a former residential building that, based on aerial imagery, has been demolished sometime between May 2021 and July 2021. We understand the proposed building will be two stories without a basement. We understand isolated column foundations may be subjected to building loads as high as 350 kips and perimeter wall foundations will be subjected to loads as high as 9 kips per linear foot. 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.

Approximately 6 to 18 inches of topsoil are present at the ground surface of soil borings SB-01, SB-02, SB-04 through SB-09, SB-11, SB-12, and SB-16. Sandy clay fill is present at the ground surface of soil boring SB-03 extending to a depth of approximately 1 foot. Sandy clay fill with intermixed topsoil is present beneath the topsoil in soil boring SB-09, SB-10, and SB-14 through SB-16 extending to depths ranging from 3 to 6 feet. In soil boring SB-10, we encountered dark brown sandy clay, having the appearance of buried topsoil, extending between depths of 5-1/2 and 8 feet. The native soil conditions beneath the surficial fill soils consist predominantly of stiff to hard sandy clay; however, we encountered isolated areas of medium sandy clay in SB-01 beyond a depth of 34 feet and within SB-16 extending from a depth of 5-1/2 feet to a depth of 8 feet.

We did not observe measurable groundwater during the drilling operations. We observed the natural groundwater level at depths ranging from 13 to 31 feet, corresponding to elevations ranging from 882 to 903-1/2 feet in soil borings SB-05, SB-10, and SB-13 upon completion of the drilling operations.

In general, buried organic soils are not suitable for the support of foundations and can be considered marginally suitable for the support of floor slabs. If the risk of floor slab settlement can be tolerated, the existing buried organic soils may remain in place provided the subgrade above the buried organic soils passes a proof roll, and provided grades will not be raised by more than 1 to 2 feet. If the risk of floor slab settlement cannot be tolerated or if grades will be raised by more than 1 to 2 feet, the existing buried organic soils must be removed and replaced with engineered fill.

The buried organic soils extending to a depth of up to 8 feet near SB-10 are not suitable for the support of foundations. We recommend foundations for the proposed structure consist of shallow spread and/or strip footings, designed to extend through the upper stiff to hard sandy clay fill soils or buried organic soils, where present, bearing within the underlying native stiff to hard sandy clay. For foundations bearing within the native stiff to hard cohesive soils, we recommend a net allowable soil bearing pressure of 4,000 psf be used in design. Alternatively, the existing buried organic soils lying within the influence of the proposed building can be removed to expose the underlying native very stiff to hard cohesive soils and replaced with engineered fill during site preparation operations. We recommend that the engineered fill within the influence of the proposed foundations consist of dense-graded crushed limestone such that a net allowable soil bearing pressure 4,000 pounds per square foot can be used for design of foundations.

Where the existing buried organic soils are removed and replaced with engineered fill materials having at least 25 percent fines, we anticipate the foundation contractor will be able to mechanically trench the proposed foundations extending through the native cohesive soils.

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. 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.

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

We understand the overall project includes the construction of a new school building located to the northwest of the Clague Middle School. The proposed school building will be constructed in the footprint of a former residential building that, based on aerial imagery, has been demolished sometime between May 2021 and July 2021.

Based on the "Request for Proposal – Geotechnical Investigation" dated June 12, 2023 by SDI Structures, we understand the proposed building will be two stories without a basement. We understand isolated column foundations may be subjected to building loads as high as 350 kips and perimeter wall foundations will be subjected to loads as high as 9 kips per linear foot. 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.

Following the preliminary results of our geotechnical investigation, we identified the lack of suitable soils for infiltration due the presence of cohesive soils throughout the site. Based on our recommendations we understand representatives from Stantec determined that infiltration testing would not be required at this site. As such, the portion of work in our proposal related to the infiltration testing program has not been executed as part of this project.

Our understanding of the project is based on our email correspondence and our review of the document titled "Request for Proposal – Geotechnical Investigation" dated June 12, 2023 by SDI Structures and the document titled "AAPS Logan Elementary School – Boring Plan" dated June 12, 2023 by others. Once the finalized plans and specifications for the project become available, G2 Consulting Group, LLC (G2) should be notified so that we can review and modify the recommendations in this report, if necessary.

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. We performed our services 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 follow:

1. We performed a total of sixteen (16) soil borings throughout the proposed development areas. Soil borings SB-01, SB-02, SB,04, and SB-05 were each drilled to a depth of 35 feet below existing grade. Soil boring SB-03 was drilled to a depth of 60 feet and the remaining borings were drilled to a depth of 20 feet below existing grade.

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

3. We prepare this engineering report which includes our recommendations related to subgrade preparation, soil bearing capacity, site seismicity, estimated settlement, pavement design recommendations, and construction considerations as they relate to the project.

FIELD OPERATIONS

SDI Structures, in conjunction with G2 Consulting Group, LLC (G2), selected the number, depth, and location of the soil borings. We estimated the field locations of the proposed soil boring locations by fitting the scaled site plan, presented in the drawing titled "AAPS Logan Elementary School – Soil Boring Plan" dated June 12, 2023, to fixed reference points at the ground level and ultimately assigned latitude and longitude to the borings. We have assigned ground surface elevations to the boring locations by

interpolating topographic information presented in the drawing titled "AAPS – Clague Middle School – Updated Topographic Survey of Parcels of Land – Job No. 23032" dated March 23, 2023 by Midwestern Consulting.

The soil borings were drilled by Strata Drilling, Inc. using a track-mounted rotary drilling rig. The driller used 2-1/4 inch inside diameter hollow-stem augers to advance the soil borings to the desired depths. Within each soil boring, 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 depth. We obtained the soil samples in general accordance with the Standard Penetration Test (SPT) method (ASTM D1586) which involves driving a 2-inch diameter split-spoon sample 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 driller placed the obtained samples in sealed containers and transported the samples to our Ann Arbor laboratory for testing and classification. During the drilling operations, a G2 representative maintained a log of the encountered subsurface soil and groundwater conditions to be used in conjunction with our analysis of the site. The final soil boring logs are based on the field and laboratory soil classification and testing. Upon completion of the drilling operations, the boreholes were backfilled with excavated soil and capped with asphalt patch, as necessary.

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 soil samples in general accordance with the G2 General Notes Terminology. Laboratory testing on representative soil samples included:

- ASTM D2216 – Moisture Content
- ASTM D2974 – Organic Matter Content (Loss-on-Ignition)
- ASTM D2166 – Unconfined Compression of Cohesive Soil
- ASTM D4318 – Atterberg Limits

In addition, we estimated the unconfined compressive strengths of cohesive soil 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 by measuring the resistance of the soil sample to the penetration of a spring-loaded cylinder.

The results of the moisture content, organic matter content, Atterberg limits, and unconfined compressive strength determinations are shown on the individual soil boring logs at the depths the samples were taken. The results of the unconfined compression tests in accordance with ASTM D2166 are presented on Figure No. 17 in the Appendix. We will hold the soil samples from our current investigation 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

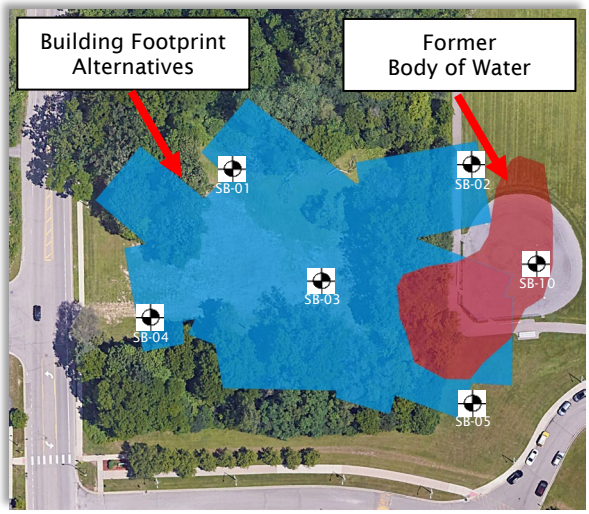
The Clague Middle School campus is located to the east of Nixon Road approximately 1,900 feet to the south of the roundabout located at the intersection of Dhu Varren Road, Nixon Road, and Green Road. Traver Boulevard terminates at the intersection with Nixon Road across the street from the footprint of the proposed Logan Elementary School.

Clague Street, which enters the site from Nixon Road, divides the parcel in approximately two equal parts. The portion of the site to the north of Clague Street remains undeveloped whereas the portion to

the south of Clague Street is home to Clague Middle School. The proposed Logan Elementary School will be constructed in the west portion of the northern half of the site in a former residential lot.

We have reviewed historical aerial imagery available on the Washtenaw County GIS website extending back to 1940. Sometime between 1940 and 1966, a residence and associated detached structures appear to have been constructed in the lot having the address of 2700 Nixon Road. In addition to the structures in the residential parcel, we note what appears to be the footprint of a body of water. Sometime between 1966 and 1979 the Clague Middle School was constructed. We do not observe the body of water in aerial imagery available after 1979; however, we anticipate the former body of water has been buried sometime around the construction of the school.

DTE Historical Aerial (1961)



Google Earth Imagery (2022)

We encountered buried sandy clay having the appearance of topsoil extending from a depth of 5-1/2 feet to 8 feet in soil boring SB-10. In general, we anticipate buried organic soil associated with the former pond will be encountered within portions of the footprint of the proposed building layouts. At a minimum, we anticipate buried organic soils will be encountered within the red shaded area depicted above. Furthermore, we do not know if the former structures had basements, whether the former structure was properly demolished, or if the utilities servicing the former residence have been properly decommissioned.

Site grades are generally the lowest adjacent to Nixon Road. Site grades slope upward to the area of the proposed Logan Elementary School where site grades in the footprint of the proposed elementary school range in elevation from 915 to 916 feet. Site grades generally slope downward toward the perimeter of the proposed school where site grades are 1 to 2 feet lower. Site grades slope downward to the perimeter of the lot associated with 2700 Nixon Road. Site grades slope upward to the east of the residential lot to a high elevation of approximately 925 feet near the northeast corner of the existing athletic fields. Site grades rise from the area of the former residential parcel leading up to the existing Clague Middle School whose finished floor rests at elevations ranging from approximately 924 to 927-1/2 feet.

SOIL AND GROUNDWATER CONDITIONS

Approximately 6 to 18 inches of topsoil are present at the ground surface of soil borings SB-01, SB-02, SB-04 through SB-09, SB-11, SB-12, and SB-16. Sandy clay fill is present at the ground surface of soil boring SB-03 extending to a depth of approximately 1 foot. Sports aggregate is present at the ground surface of soil boring SB-10 and is underlain by a layer of buried topsoil approximately 1-foot thick. Bituminous concrete is present at the ground surface of soil borings SB-13 and SB-15 and is underlain by

aggregate base having an approximate thickness of 4 inches. Sandy clay fill with intermixed topsoil is present beneath the topsoil in soil boring SB-09, SB-10, and SB-14 through SB-16 extending to depths ranging from 3 to 6 feet. In soil boring SB-10, we encountered dark brown sandy clay, having the appearance of buried topsoil, extending between depths of 5-1/2 and 8 feet. Native cohesive soils consisting sandy clay, silty clay, and/or clayey silt are present beneath the topsoil, fill, and buried organic soils at each of the borings extending to the explored depths except at soil boring SB-04 where the native cohesive soils extend to a depth of approximately 31-3/4 feet. The native cohesive soils in soil boring SB-04 are underlain by gravelly sand extending to the explored depths. We observed an isolated layer of clayey sand within soil boring SB-01 beginning at a depth of approximately 8 feet extending to a depth of approximately 11 feet.

The sandy clay fill is medium to hard in consistency having natural moisture contents ranging from 7 to 30 percent. The sandy clay fill having the appearance of buried topsoil is stiff in consistency having a natural moisture content of 33 percent, an organic matter content of 6 percent, and an unconfined compressive strength of 3,000 psf. The native clayey sand is medium compact having a Standard Penetration Test (SPT) N-value of 14 blows per foot. The on-site native cohesive soils are predominantly stiff to hard in consistency with natural moisture contents ranging from 7 to 30 percent, unconfined compressive strengths ranging from 2,500 psf to more than 9,000 psf, a liquid limit of 35, and a plasticity index of 18. We encountered isolated layers of native medium cohesive soils in soil borings SB-01 beyond a depth of 34 feet and within SB-16 extending from a depth of 5-1/2 feet to a depth of 8 feet having natural moisture contents ranging from 15 to 30 percent, and unconfined compressive strengths ranging from 1,000 to 2,000 psf.

We did not observe measurable groundwater during the drilling operations. We observed the natural groundwater level at depths ranging from 13 to 31 feet, corresponding to elevations ranging from 882 to 903-1/2 feet in soil borings SB-05, SB-10, and SB-13 upon completion of the drilling operations.

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.

We present the Soil Boring Location Plan, Plate No. 1, the Soil Boring Logs, Figure Nos. 1 through 16, the Unconfined Compressive Strength Test results, Figure No. 17, and the Atterberg Limit Results, Figure No. 18, in the Appendix. General Notes Terminology defining the nomenclature on the soil boring logs and elsewhere in this report is presented on Figure No. 19.

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 throughout the explored depths. 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 = 0.093 g	S_1 = 0.047 g
Adjusted Maximum Considered Earthquake	S_{MS} = 0.149 g	S_{M1} = 0.114 g
Five Percent Damped Design	S_{DS} = 0.099 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

We encountered buried organic soils at soil boring SB-10 extending from 5-1/2 to 8 feet below existing grade. We anticipate the fill material placed above the buried organic soils has induced some degree of consolidation settlement; however, due to the elevated organic matter content and the high moisture content of the encountered soils, we anticipate some degree of further settlement can be anticipated for the organic soils.

In general, buried organic soils are not suitable for the support of foundations and can be considered marginally suitable for the support of floor slabs. If the risk of floor slab settlement can be tolerated, the existing buried organic soils may remain in place provided the subgrade above the buried organic soils passes a proof roll, and provided grades will not be raised by more than 1 to 2 feet. If the risk of floor slab settlement cannot be tolerated or if grades will be raised by more than 1 to 2 feet, the existing buried organic soils must be removed and replaced with engineered fill.

We do not know the lateral extent of the buried organic soils; however, we estimate that their extent generally conforms to the former boundaries of covered body-of-water. We estimate their lateral extent within the Site Conditions section of this report. To minimize risk associated with the buried organic soils, we recommend additional mechanically advanced soil borings be extended through the proposed building footprint. Alternatively, the orientation of the building footprint could be reconfigured to avoid the area of the former body-of-water.

We do not know if the former residence had a basement, whether the former foundations have been properly demolished, or whether utilities servicing the former residence have been properly decommissioned. As such, we recommend the earthwork operations in the vicinity of the former residence/detached structures be carefully monitored in the field by a qualified G2 geotechnical engineer or technician.

On the basis of the available information, we anticipate the proposed Logan Elementary School will be constructed at or near the existing ground surface in the footprint(s) of the proposed school corresponding to an elevation of approximately 915-1/2 feet. As such, we anticipate the earthwork operations in the building footprint will require 1 to 2 feet of grade adjustment.

We anticipate the earthwork operations at the site will entail demolishing remaining portions of the former residence, detached buildings, abandoned foundations, and utilities, if present, removing the existing topsoil, trees, and vegetation, excavating to the proposed subgrade elevation, proof-rolling the exposed subgrade, improving the exposed subgrade soils as necessary, placing and compacting engineered fill, and preparing the site for the support of floor slabs and pavements. We recommend all earthwork operations be performed in accordance with comprehensive specifications and be properly monitored in the field by qualified personnel under the direction of a licensed professional engineer.

At the start of earthwork operations, existing structures and foundations should be completely demolished and removed from within the proposed building area. Any resulting excavations should be backfilled with engineered fill. Within proposed pavement areas, any existing structures should be removed to a minimum of 2 feet below finished grade and the resulting excavations should be backfilled with engineered fill. Any abandoned utilities around the new structures should be removed and replaced with engineered fill. Abandoned utilities outside the proposed structure should be completely filled with cementitious grout.

Following the removal of the pavements, topsoil, trees, vegetation, abandoned utilities, and otherwise unsuitable soils, we anticipate the exposed subgrade will consist of predominantly cohesive soils. We recommend proof-rolling the exposed subgrade with a fully-loaded tandem axle dump truck. During the proof-rolling operations, we recommend the exposed subgrade be visually evaluated for stability prior to the placement of engineered fill. Unstable or otherwise unsuitable soils should be improved with additional compaction or be undercut to expose stable soils. Resulting excavations should be backfilled with engineered fill placed and compacted in controlled lifts. The existing fill soil lying outside of the proposed building footprints may remain in place provided it passes the proof-rolling operations.

Engineered fill should be free of organic matter, frozen soil, clay clods, or other harmful material. We recommend that engineered fill within the influence of the proposed foundations consist of dense-graded crushed limestone. The fill should be placed in uniform horizontal layers, having a consistent soil type, 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. We recommend in-situ density tests be performed on applicable engineered fill soils to verify they have been placed at the optimal moisture and compacted to their density in general accordance with ASTM D6938. Engineered fill placed on slopes should be keyed into the slope compacted in loose lifts not to exceed 9 inches.

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 (Borings SB-01 through SB-05 and SB-10)

We emphasize that we encountered buried organic soils lying outside the footprint of the proposed school; however, we anticipate buried organic soils may be encountered in at least a portion of the proposed building configurations. In general, the buried organic soils are not suitable for the support of

foundations. It should be noted that we observed the buried organic soils extending to a depth of 8 feet corresponding to an elevation of approximately 909 feet in soil boring SB-10.

We anticipate the proposed Logan Elementary School will have a first-floor finished elevation of approximately 915-1/2 feet. We recommend foundations for the proposed structure consist of shallow spread and/or strip footings, designed to extend through the upper stiff to hard cohesive or buried organic soils where present, bearing within the underlying stiff to hard cohesive soils. For foundations bearing within the native stiff to hard cohesive soils, we recommend a net allowable soil bearing pressure of 4,000 psf be used in design.

The buried organic soils extending to a depth of up to 8 feet near SB-10 are not suitable for the support of foundations. We recommend foundations for the proposed structure consist of shallow spread and/or strip footings, designed to extend through the upper stiff to hard sandy clay fill soils or buried organic soils, where present, bearing within the underlying native stiff to hard sandy clay. Alternatively, the existing buried organic soils lying within the influence of the proposed building can be removed to expose the underlying native very stiff to hard cohesive soils and replaced with engineered fill during site preparation operations. We recommend that the engineered fill within the influence of the proposed foundations consist of dense-graded crushed limestone such that a net allowable soil bearing pressure 4,000 pounds per square foot can be used for design of foundations. Soils within the influence of the proposed foundations should considered as extending at a 1:1 angle from the edge of the footing.

Exterior foundations must bear at a minimum depth of 3-1/2 feet below finished grade for protection against frost heave. Interior footings may bear at shallower depths provided suitable bearing materials are available for support and provided the foundations soils are continuously protected from frost penetration during construction.

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 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 G2 be on site during construction to observe the foundations excavations and verify the adequacy of the bearing soils.

If the recommendations outlined in this report are adhered to, total and differential settlements for the completed structure should be within 1 inch and 1/2 inch, respectively. We expect settlements of these magnitudes are within tolerable limits for the type of structures proposed. We recommend all foundations be suitably reinforced to minimize the effects of differential settlements associated with local variations in subsoil conditions.

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, below-grade wall foundations must bear on the native stiff to hard cohesive soils or on engineered fill placed above these soils. For foundations bearing within the stiff to hard cohesive soils or engineered fill placed above the very stiff to hard cohesive soils, we recommend retaining wall foundations be designed using a net allowable soil bearing pressure of 3,000 psf. Any 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.

FLOOR SLAB RECOMMENDATIONS

As previously noted, the existing fill soils should be considered marginal for the support of floor slabs and may remain in place, provided the materials pass a proof-roll. We believe the risk for excessive settlement is low provided the fill soils pass a proof-roll evaluation, and provided grades are not raised more than 1 to 2 feet. In no case, should uncontrolled fill remain within the influence of proposed foundations. Following the satisfactory completion of the subgrade preparation recommendations, we anticipate the resulting subgrade will consist of native granular soils or engineered fill placed above these materials. A subgrade modulus (k) of 100 pounds per cubic inch (pci) may be used in the design of floor slabs supported on these soils.

We recommend at least 4 inches of clean coarse sand or 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 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 stiff to hard cohesive soils or improved soils above the native stiff to hard cohesive soils. Based on the anticipated subgrade soils, we have assigned an effective subgrade resilient modulus of 6,500 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	1-1/2	0.42	0.63
MDOT 3C	2	0.42	0.84
MDOT 21AA Limestone	8	0.14	1.12
		Total SN →	2.59

Heavy Duty Bituminous Concrete Pavement Section			
Material Type	**Material Thickness (in)**	**Structural Coefficient**	**Structural Number**
MDOT 5EML	1-1/2	0.42	0.63
MDOT 3C	3	0.42	1.26
MDOT 21AA Limestone	10	0.14	1.40
		Total SN →	3.29

Our analyses indicate the proposed Standard Duty Bituminous Concrete can service a total of approximately 120,000 equivalent single-axle loads (ESALs) over a 20-year design life. The Heavy Duty Bituminous Concrete can service a total of approximately 530,000 ESALs over a 20-year design life, corresponding to approximately 36 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.

CONSTRUCTION CONSIDERATIONS

Where the existing buried organic soils are removed and replaced with engineered fill materials having at least 25 percent fines, we anticipate the foundation contractor will be able to mechanically trench the proposed foundations extending through the native cohesive soils. Engineered fill materials having less than 25 percent fines may cave or slough during the foundation excavation operations. As such, we recommend the foundation contractor come to the site prepared to over excavate and form foundations where engineered fill materials have fewer than 25 percent fines. The sides of the foundation excavations must be straight and vertical. If earth-formed footings are attempted, we recommend foundation excavation and concrete placement operations be conducted on the same day to minimize potential for cave-ins or surface run-off into the open excavations.

All excavations must be safely shored or sloped in accordance with MI-OSHA requirements. If material is stored or equipment is operated near an excavation, lower angle slopes or stronger shoring must be used to resist the extra pressure due to the superimposed loads. Care should be exercised when excavating near existing roadways or utilities to avoid undermining.

We recommend maximum slope inclinations of 3/4 horizontal units to 1 vertical unit (3/4H:1V) within the very stiff to hard cohesive soils and 1H:1V within the medium to stiff cohesive soils. Where granular soils are used to raise grades, we recommend maximum slope inclinations of 1-1/2H:1V for excavations extending through the granular 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. All excavations should be safely sheeted, shored, sloped, or braced in accordance with MI-OSHA requirements. If material is stored or equipment is operated near an excavation, lower angle slopes or stronger shoring must be used to resist the extra pressure due to the superimposed loads.

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.

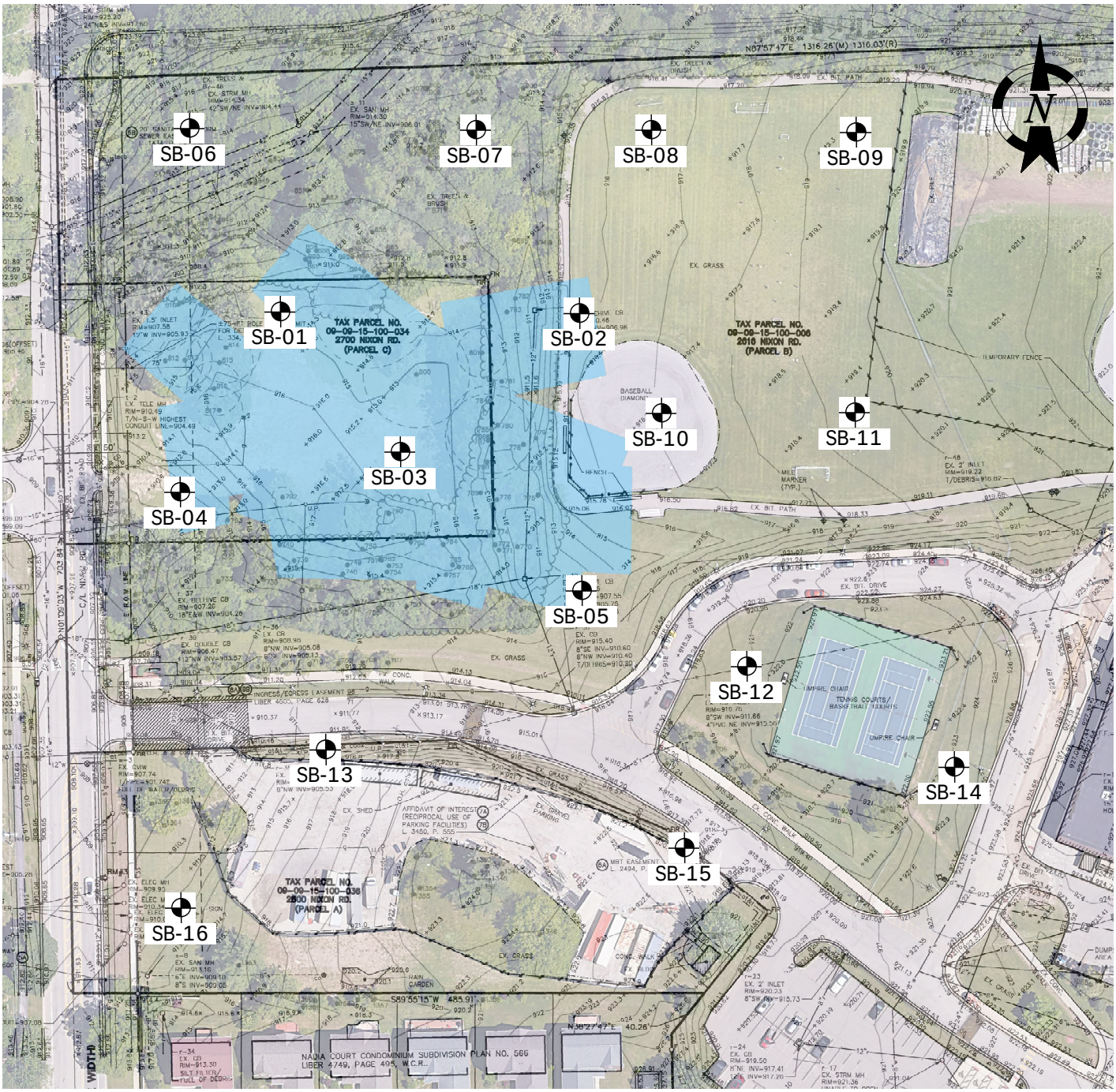
The scope of the present investigation was limited to evaluation of subsurface conditions for the support of proposed building and other related aspects of the development. No chemical, environmental or hydrogeological testing or analyses were included in the scope of this investigation.

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



Base Drawing Credit: Midwestern Consulting

Legend

Soil borings drilled between July 27th and August 1, 2023 by Strata Drilling, Inc.

Approximated Building Footprint Alternatives

Soil Boring Location Plan

Logan Elementary School
2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

2G CONSULTING GROUP

Project No. 233472	
Drawn by: M. Dagher, PE	
Date: 9/6/23	Plate No. 1
Scale: NTS	

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31209669° Longitude: -83.70692508°

Soil Boring No. SB-01

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 914.0 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		S-01	3 2 2	4	16.8		4000*
909.0		Stiff Brown Sandy Clay with trace gravel	5	S-02	1 2 2	4	16.4		4000*
		5.5		S-03	1 3 5	8	15.7		4000*
		Stiff Mottled Brown and Gray Sandy Clay with trace gravel 8.0							
904.0		Medium Compact Mottled Brown and Gray Clayey Sand with trace gravel	10	S-04	6 6 8	14			
		11.8		S-05	4 8 4	12	15.6		2000*
899.0		Stiff Brown Sandy Clay with trace gravel (Wet Gravelly Sand Seam)	15						
		16.8		S-06	5 6 9	15	12.0		8000*
894.0			20						
				S-07	3 5 6	11	11.7		4000*
889.0		Stiff to Very Stiff Gray Sandy Clay with trace gravel	25						
				S-08	4 9 11	20	24.4		3000*
884.0			30						
		34.0		S-09A	9 7		16.5		6500*
879.0		Medium Gray Silty Clay with trace sand 35.0	35	S-09B	8	15	16.6		1500*
		End of Boring @ 35 ft							

Total Depth: 35 ft
Drilling Date: July 31, 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. 1

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31209627° Longitude: -83.70607024°

Soil Boring No. SB-02

G2 CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 916.0 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 (14 inches) 1.2		S-01	5 8 7	15	12.7		9000*
911.0		Very Stiff to Hard Brown Sandy Clay with trace gravel	5	S-02	4 5 5	10	13.2		8000*
		5.5		S-03	3 3 4	7	24.6		4500*
906.0		Very Stiff Mottled Gray and Brown Sandy Clay with trace gravel (Wet Sand Seam)	10	S-04	7 6 8	14	13.9		7500*
		11.8 (Wet Sand Seam)							
901.0			15	S-05	4 5 4	9	12.7		4500*
896.0		Stiff to Very Stiff Gray Sandy Clay with trace silt and gravel (Wet Sand Seam)	20	S-06	5 7 9	16	17.5		3000*
		21.8		S-07	5 7 10	17	13.3		7000*
891.0			25						
886.0		Very Stiff Gray Silty Clay with trace sand and gravel	30	S-08	5 9 11	20	14.2		5000*
881.0		35.0	35	S-09	8 9 13	22	15.5		5500*
		End of Boring @ 35 ft							

Total Depth: 35 ft
Drilling Date: July 28, 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. 2

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31180316° Longitude: -83.70658187°

Soil Boring No. SB-03

G2 CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 915.5 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Fill: Dark Brown Sandy Clay with trace gravel (12 inches) 1.0							
		Very Stiff Brown Sandy Clay with trace gravel 3.0		S-01	3 7 8	15	12.9	119	7700
910.5		(Sand Seams)	5	S-02	3 3 4	7	14.9		6000*
		Very Stiff to Hard Mottled Brown and Gray Sandy Clay with trace gravel		S-03	8 14 17	31	22.7		9000*
905.5			10	S-04	8 14 15	29	12.7		9000*
		11.8							
900.5		Stiff Gray Sandy Clay with trace gravel	15	S-05	4 6 8	14	15.9		3500*
		16.8							
895.5			20	S-06	3 5 6	11	12.6		5000*
890.5			25	S-07	5 7 9	16	13.9		4000*
		Very Stiff to Hard Gray Sandy Clay with trace gravel and silt							
885.5		(Sand Seams)	30	S-08	3 6 7	13	14.1		5500*
880.5		(Sand Seams)	35	S-09	4 9 10	19	17.0		5000*

Total Depth: 60 ft
Drilling Date: August 1, 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. 3a

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31180316° Longitude: -83.70658187°

Soil Boring No. SB-03

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 915.5 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
875.5			40	S-10	11 13 10	23	8.4		9000*
870.5			45	S-11	6 10 12	22	8.8		9000*
865.5		Very Stiff to Hard Gray Sandy Clay with trace gravel and silt *(continued)*	50	S-12	3 7 9	16	10.1		8500*
860.5			55	S-13	10 16 23	39	9.1		9000*
		56.8							
855.5		Hard Gray Silty Clay with trace sand	60	S-14	12 23 34	57	19.4		8000*
		60.0							
850.5		End of Boring @ 60 ft	65						
845.5			70						

Total Depth: 60 ft
Drilling Date: August 1, 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. 3b

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.3117177° Longitude: -83.70720876°

Soil Boring No. SB-04

G2 CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 911.5 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 (12 inches) 1.0							
		Very Stiff Brown Sandy Clay with trace gravel 3.0		S-01	3 4 5	9	25.7		5000*
906.5			5	S-02	5 7 11	18	19.7		9000*
		Hard Mottled Brown and Gray Sandy Clay with trace gravel (Wet Sand Seams)		S-03	4 7 10	17	13.0		9000*
		8.0							
901.5			10	S-04	6 9 11	20	13.6		9000*
896.5		Hard Grayish Brown Sandy Clay with trace gravel	15	S-05	4 7 9	16	11.5		9000*
891.5		(Poor Recovery)	20	S-06	3 5 9	14	18.3		
		21.8							
		(Wet Sand Seams)							
886.5			25	S-07	3 5 8	13	14.5		3500*
881.5		Stiff to Very Stiff Gray Sandy Clay with trace gravel	30	S-08	4 5 11	16	15.7		4000*
		31.8							
876.5		Loose Gray Gravelly Sand with trace clay 35.0	35	S-09	12 13 11	24			
		End of Boring @ 35 ft							

Total Depth: 35 ft
Drilling Date: July 31, 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 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31150994° Longitude: -83.70606605°

Soil Boring No. SB-05

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 913.0 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 (8 inches) 0.7							
		Hard Brown Sandy Clay with trace gravel 3.0		S-01	6 5 7	12	17.6		9000*
908.0		Very Stiff Mottled Brown and Gray Sandy Clay with trace gravel	5	S-02	3 4 4	8	18.8	113	4100
				S-03	3 5 7	12	15.7	122	6130
		8.0							
903.0		Very Stiff Gray Sandy Clay with trace gravel	10	S-04	3 4 6	10	12.2		4500*
		11.8							
		(Wet Sand Seams)							
898.0		Stiff Brown Sandy Clay with trace gravel	15	S-05	4 4 7	11	15.8		3500*
		16.8							
893.0			20	S-06	3 5 7	12	17.3		3500*
888.0		Stiff to Very Stiff Gray Sandy Clay with trace gravel	25	S-07	4 7 8	15	16.5		3000*
883.0			30	S-08	4 7 11	18	20.5		7000*
		31.8							
878.0		Very Stiff Gray Clayey Silt with trace sand and gravel 35.0	35	S-09	11 17 12	29	9.4		5000*
		End of Boring @ 35 ft							

Total Depth: 35 ft
Drilling Date: July 27, 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 operations; 31 feet upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 5

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31248432° Longitude: -83.70718393°

Soil Boring No. SB-06

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 914.5 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 (13 inches)							
		1.5		S-01	5 6 9	15	21.6		9000*
		Hard Light Brown Sandy Clay with trace gravel							
		3.0		S-02	5 5 7	12	7.2		5000*
909.5		Very Stiff Light Brown Sandy Clay with trace silt and gravel	5						
		5.5		S-03	4 11 11	22	12.4		9000*
		Hard Mottled Brown and Gray Sandy Clay with trace gravel							
		8.0		S-04	6 9 12	21	15.8		9000*
904.5		Hard Brown Sandy Clay with trace silt and gravel	10						
		11.8		S-05	5 6 9	15	11.0		7000*
899.5			15						
		Very Stiff Gray Sandy Clay with trace gravel		S-06	5 7 9	16	12.5		7000*
894.5		20.0	20						
		End of Boring @ 20 ft							
889.5			25						
884.5			30						
879.5			35						

Total Depth: 20 ft
Drilling Date: July 31, 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 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31248033° Longitude: -83.70636506°

Soil Boring No. SB-07

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 913.5 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 (6 inches) 0.5							
		Hard Light Brown Sandy Clay with trace gravel		S-01	4 4 4	8	12.3		9000*
		3.0							
908.5		Stiff Light Brown Sandy Clay with trace gravel	5	S-02	3 4 3	7	13.2		3000*
		5.5		S-03	5 5 6	11	30.1		6500*
903.5		Hard to Very Stiff Mottled Brown and Gray Sandy Clay with trace silt and gravel	10	S-04	5 6 8	14	11.9		9000*
		11.8							
898.5			15	S-05	6 9 12	21	13.9		9000*
		Hard Gray Sandy Clay with trace silt and gravel							
893.5		20.0	20	S-06	5 7 9	16	11.0		9000*
		End of Boring @ 20 ft							
888.5			25						
883.5			30						
878.5			35						

Total Depth: 20 ft
Drilling Date: August 1, 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. 7

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31248032° Longitude: -83.705863°

Soil Boring No. SB-08

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 916.5 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 (14 inches) 1.2		S-01	2 5 6	11	12.2		9000*
		(LL = 35; PI = 18) Very Stiff to Hard Mottled Brown and Gray Sandy Clay with trace gravel							
911.5			5	S-02	2 3 5	8	16.5		5000*
		6.0		S-03	2 3 5	8	23.6		3500*
906.5			10	S-04	3 5 5	10	15.1		2500*
		Stiff to Very Stiff Mottled Gray and Brown Sandy Clay with trace gravel							
901.5			15	S-05	7 8 8	16	11.0		5000*
		16.8							
		Very Stiff Gray Sandy Clay with trace gravel							
896.5		(Vertical Fissures of Brown Sandy Clay) 20.0	20	S-06	4 7 9	16	13.4		6500*
		End of Boring @ 20 ft							
891.5			25						
886.5			30						
881.5			35						

Total Depth: 20 ft
Drilling Date: July 27, 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. 8

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31247622° Longitude: -83.70528145°

Soil Boring No. SB-09

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 919.5 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 (18 inches) 1.5							
		Fill: Hard Brown Sandy Clay with trace gravel; intermixed topsoil 3.0		S-01	4 6 8	14	10.2		8000*
914.5			5	S-02	8 10 12	22	11.1		9000*
		Hard Mottled Brown and Gray Sandy Clay with trace gravel		S-03	6 9 9	18	12.3		9000*
909.5			10	S-04	4 8 10	18	11.6		9000*
		11.8							
904.5			15	S-05	4 5 6	11	11.3		5000*
		Very Stiff Gray Sandy Clay with trace gravel							
899.5		20.0	20	S-06	4 5 7	12	11.8		5000*
		End of Boring @ 20 ft							
894.5			25						
889.5			30						
884.5			35						

Total Depth: 20 ft
Drilling Date: July 27, 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 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31188228° Longitude: -83.70583528°

Soil Boring No. SB-10

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 917.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Sports Aggregate: Light Gray Sand with trace silt (4 inches) 0.3							
		Buried Topsoil: Dark Brown Sandy Clay with trace gravel 1.3		S-01	5 4 4	8	16.4		6000*
912.0		Fill: Very Stiff to Hard Brown Sandy Clay with trace gravel	5	S-02	4 5 6	11	7.7		9000*
		5.5							
		Stiff Dark Brown Sandy Clay with trace gravel (Buried Topsoil) (Organic Matter Content = 5.8%)		S-03	1 3 4	7	32.5		3000*
		8.0							
907.0		Very Stiff Mottled Brown and Gray Sandy Clay	10	S-04	4 5 8	13	15.9		6000*
		11.8							
902.0			15	S-05	4 7 9	16	14.0		7000*
		Very Stiff Grayish Brown Sandy Clay with trace gravel (Wet sand seam) ▼							
897.0		20.0	20	S-06	5 7 9	16	10.1		4500*
		End of Boring @ 20 ft							
892.0			25						
887.0			30						
882.0			35						

Total Depth: 20 ft
Drilling Date: July 27, 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 operations; 16-1/2 feet upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 10

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31188681° Longitude: -83.70528623°

Soil Boring No. SB-11

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 919.5 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 (7 inches) 0.6							
		Very Stiff Brown Sandy Clay with trace gravel 3.0		S-01	6 12 13	25	10.9		5000*
914.5			5	S-02	8 11 16	27	11.7		9000*
		Hard Light Brown Sandy Clay with trace gravel		S-03	7 13 14	27	13.0		9000*
		8.0							
909.5			10	S-04	5 6 8	14	11.4		5000*
		Stiff to Very Stiff Gray Sandy Clay with trace gravel (Poor Recovery)		S-05	3 5 7	12	11.6		3000*
904.5			15						
				S-06	4 6 9	15	11.8		4000*
899.5		20.0	20						
		End of Boring @ 20 ft							
894.5			25						
889.5			30						
884.5			35						

Total Depth: 20 ft
Drilling Date: July 27, 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. 11

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31135229° Longitude: -83.70559232°

Soil Boring No. SB-12

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 920.5 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 (7 inches) 0.7							
		(LL = 31; PI = 13)		S-01	4 5 7	12	11.5		9000*
915.5			5	S-02	4 5 8	13	12.9		9000*
				S-03	8 13 16	29	12.4		9000*
		Hard Mottled Brown and Gray Sandy Clay with trace gravel							
910.5			10	S-04	7 13 20	33	12.1		9000*
905.5			15	S-05	9 13 15	28	11.6		9000*
		16.8							
		Hard Grayish Brown Sandy Clay with trace silt and gravel							
900.5		20.0	20	S-06	5 9 12	21	12.3		9000*
		End of Boring @ 20 ft							
895.5			25						
890.5			30						
885.5			35						

Total Depth: 20 ft
Drilling Date: July 28, 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. 12

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31117427° Longitude: -83.70679189°

Soil Boring No. SB-13

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 916.5 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Bituminous Concrete (4 inches) 0.3							
		Aggregate Base: Light Gray Gravelly Sand with trace silt (4 inches) 0.7		S-01	6 4 3	7	14.0		9000*
911.5		(Wet Sand Seams) Hard Brown Sandy Clay with trace gravel	5	S-02	4 6 11	17	12.0		8000*
		5.5 Hard Grayish Brown Sandy Clay with trace gravel		S-03	6 13 15	28	10.9		9000*
906.5		8.0 (Wet Sand Seams) Very Stiff Gray Sandy Clay with trace gravel	10	S-04	4 9 10	19	12.1		7000*
901.5		11.8 ▼	15	S-05	2 5 6	11	14.1		4000*
896.5		Stiff Gray Sandy Clay with trace gravel and silt 20.0	20	S-06	4 7 9	16	15.3		3500*
891.5		End of Boring @ 20 ft	25						
886.5			30						
881.5			35						

Total Depth: 20 ft
Drilling Date: July 28, 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 operations; 13 feet upon completion

Notes:
Offset 12 feet south to asphalt; utility line
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings; asphalt patch

Figure No. 13

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31113764° Longitude: -83.70499911°

Soil Boring No. SB-14

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 923.5 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							
		Fill: Hard Brown Sandy Clay with trace gravel; disturbed appearance 3.0		S-01	4 9 8	17	8.9		9000*
918.5			5	S-02	4 5 7	12	13.2		9000*
		Hard Mottled Brown and Gray Sandy Clay with trace gravel		S-03	8 9 14	23	13.1		9000*
913.5			10	S-04	5 11 14	25	12.4		9000*
		11.8 (Wet Sand Seams)							
908.5			15	S-05	4 8 8	16	11.2		9000*
		Hard Gray Sandy Clay with trace gravel							
903.5		20.0	20	S-06	4 6 7	13	11.8		8000*
		End of Boring @ 20 ft							
898.5			25						
893.5			30						
888.5			35						

Total Depth: 20 ft
Drilling Date: July 28, 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. 14

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31096761° Longitude: -83.70577064°

Soil Boring No. SB-15

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 920.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Bituminous Concrete (4 inches) 0.3							
		Aggregate Base: Light Gray Gravelly Sand with trace silt (4 inches) 0.7		S-01	5 4 6	10	11.5		9000*
		Fill: Hard Mottled Brown and Gray Sandy Clay with trace silt and gravel 3.0							
915.0		Fill: Medium Mottled Gray and Brown Sandy Clay with trace silt and gravel	5	S-02	2 3 5	8	30.2		2000*
		6.0		S-03	6 9 11	20	14.0		9000*
910.0		Very Stiff to Hard Mottled Brown and Gray Sandy Clay with trace gravel	10	S-04	6 10 11	21	15.4		8000*
		11.8							
905.0			15	S-05	4 8 12	20	12.1		9000*
		Very Stiff to Hard Gray Brown Sandy Clay with trace gravel							
900.0		20.0	20	S-06	4 6 9	15	12.2		4000*
		End of Boring @ 20 ft							
895.0			25						
890.0			30						
885.0			35						

Total Depth: 20 ft
Drilling Date: July 28, 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:
Offset 12 feet north to asphalt; utility line
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings; asphalt patch

Figure No. 15

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 233472

Latitude: 42.31084147° Longitude: -83.70720734°

Soil Boring No. SB-16

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 912.5 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 (8 inches) 0.3							
		Fill: Hard Brown Sandy Clay with trace gravel 2.5		S-01	4 6 5	11	12.8		9000*
907.5		Fill: Stiff Dark Brown Sandy Clay with trace silt	5	S-02	2 1 2	3	19.2		3000*
		5.5							
		Soft Mottled Brown and Gray Sandy Clay with trace silt and gravel		S-03	0 1 2	3	20.9		1000*
		8.0							
902.5		Soft Mottled Brown and Gray Clayey Silt with trace sand and gravel	10	S-04	0 0 4	4	15.5		1000*
		11.8							
897.5		Very Stiff Mottled Brown and Gray Sandy Clay with trace gravel	15	S-05	9 9 8	17	11.5		6000*
		16.8							
892.5		Hard Gray Sandy Clay with trace silt 20.0	20	S-06	7 14 19	33	17.8		9000*
		End of Boring @ 20 ft							
887.5			25						
882.5			30						
877.5			35						

Total Depth: 20 ft
Drilling Date: July 31, 2023
Inspector: G. Jere
Contractor: Strata Drilling, Inc.
Driller: B. Sienkiewicz

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

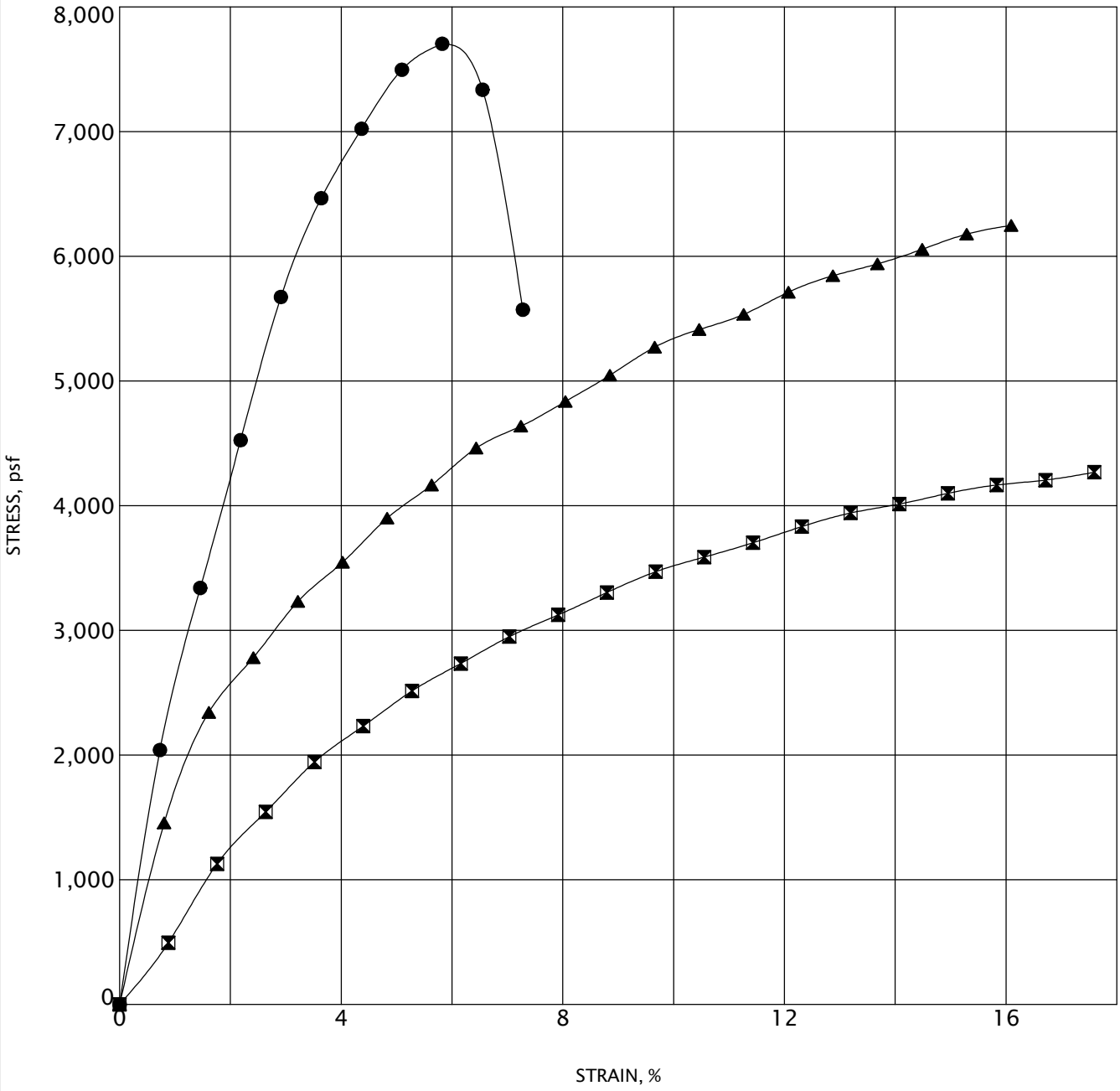
Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 16

SOIL / PAVEMENT BORING 233472.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 9/19/23



Specimen		Classification	MC%	γ_d	UC
●	SB-03 S-01	Brown Sandy Clay	13	119	7700
⊠	SB-05 S-02	Mottled Brown and Gray Sandy Clay	19	113	4100
▲	SB-05 S-03	Mottled Brown and Gray Sandy Clay	16	122	6130

CONSULTING GROUP

UNCONFINED COMPRESSIVE STRENGTH TEST

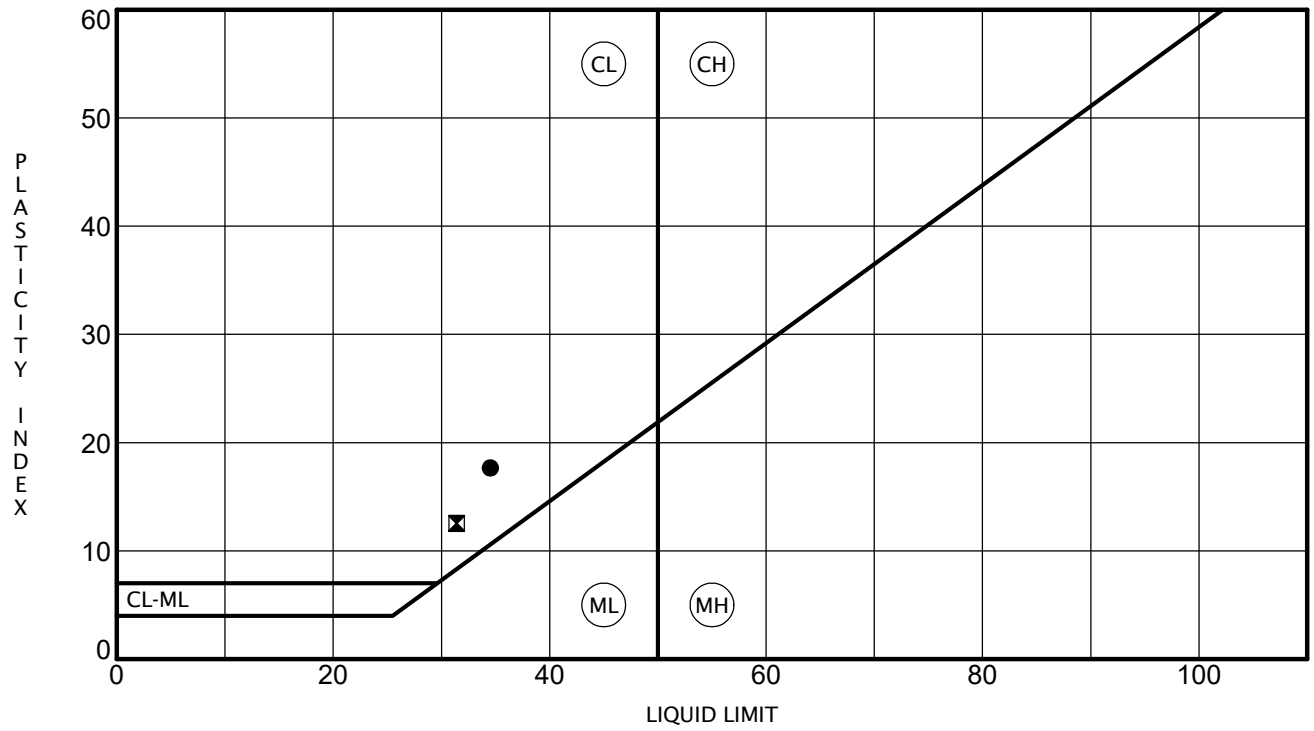
Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No.: 233472

Figure No. 1

US_UNCONFINED 233472.GPJ 20140820 G2 CONSULTING DATA TEMPLATE.GDT 9/6/23



	Specimen Identification		LL	PL	PI	Fines	M %	Classification
●	SB-08	S-01	35	17	18		12	Mottled Brown and Gray Sandy Clay
⊠	SB-12	S-01	31	19	12		12	Mottled Brown and Gray Sandy Clay

CONSULTING GROUP

ATTERBERG LIMITS RESULTS

Project Name: Ann Arbor Public Schools - Logan Elementary School

Project Location: 2685 Traver Boulevard
Ann Arbor, Washtenaw County, Michigan

G2 Project No.: 233472

Figure No. 18

US_ATTERBERG_LIMITS 233472.GPJ 20140820 G2 CONSULTING DATA TEMPLATE.GDT 9/6/23

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).