Supplement #8

Date of Issue: April 18, 2025

Project: Mowat Middle School Cafeteria and Administration Addition

Bid Package(s):

- 03A – Cast-in-Place Concrete
- 03B – Hollow Core Concrete
- **03C – Insulating Concrete Forming**
- 04A – Masonry
- 05A – Metals
- 06B – Interior Architectural Woodwork
- 07A – Roofing
- 07B – EIFS
- **07C – Foam Insulation**
- 08A – Doors, Frames, Hardware
- 08B – Glass & Glazing
- 09A – Framing & Drywall
- 09B – Acoustical
- 09C – Floor Covering
- **09D – Resinous Flooring**
- 09E – Painting
- 10A – Specialties
- 11A – Food Service Equipment
- 21A – Fire Protection
- 22A – Plumbing
- 23A – Mechanical
- 26A – Electrical & Low Voltage
- 31A – Sitework
- **31B – Soil Improvements**

Issued by: Culpepper Construction Company, Inc.

This supplement forms a part of the contract documents and supplements the conditions of contract dated May, 2024.

This supplement consists of 1 page of item 8.1, with attachments.

Item 8.1 This supplement contains the project Geotechnical Report, **10111-2021151 Mowat Middle School Improvements – Geotechnical Report 09-22-21**. This supplement and attachments forms a part of the contract documents.

End of Supplement #8

GEOTECHNICAL ENGINEERING REPORT

Mowat Middle School Improvements

Lynn Haven, Bay County, Florida

PREPARED FOR:
JRA Architects, Inc.
2211 Thomas Drive
Panama City Beach, Florida 32408

NOVA Project Number: 10111-2021151

Revised September 22, 2021

NOVA

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Revised September 22, 2021

JRA Architects, Inc.
2211 Thomas Drive
Panama City Beach, Florida 32408

Attention: Mr. Dave Vincent

Subject: Geotechnical Engineering Report
Mowat Middle School Improvements
Lynn Haven, Bay County, Florida
NOVA Project Number 10111-2021151

Dear Mr. Vincent,

NOVA Engineering and Environmental LLC (NOVA) has completed the authorized subsurface exploration and geotechnical engineering evaluation for the planned improvements to the Mowat Middle School campus in Lynn Haven, Bay County, Florida. The work was performed in general accordance with NOVA Proposal 011-20213356, dated May 27, 2021. This report briefly discusses our understanding of the project at the time of the subsurface exploration, describes the geotechnical consulting services provided by NOVA, and presents our findings, conclusions, and recommendations.

We appreciate your selection of NOVA and the opportunity to be of service on this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,
NOVA ENGINEERING AND ENVIRONMENTAL LLC

Digitally signed by Andre Kniazeff
DN: C=US,
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O="NOVA Engineering and
Environmental ", CN=Andre
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ANDRE KNIAZEFF
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STATE OF FLORIDA
PROFESSIONAL ENGINEER

Kyle Selle

Kyle Selle, E.I.
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Andre Kniazeff, P.E.
Senior Geotechnical Engineer
Florida Registration No. 81315

Copies Submitted: Addressee (electronic)

TABLE OF CONTENTS

1.0 SUMMARY

A brief summary of pertinent findings, conclusions, and recommendations is presented below. This information should not be utilized in design or construction without reading all of the recommendations presented in the text and Appendix of this report.

1.1 GENERAL

Our field exploration at the subject site included performing five (5) Standard Penetration Test (SPT) borings drilled within the footprint of the proposed structure and stormwater management system (SMS) area. Drilling, testing, and sampling operations were performed in general accordance with ASTM designations and other industry standards.

The test borings generally encountered loose to dense fine-grained sands to slightly silty fine-grained sands (USCS classifications of SP and SP-SM, respectively) with trace organics (organic silt) from the existing ground surface elevation to a depth of about 30 feet below existing grade (BEG). As an exception, a stratum of loose clayey sand (SC) was encountered in the test boring S-1 from about 13 feet to 15 feet BEG.

1.2 SITE PREPARATION

We recommend removing all topsoil and surficial vegetation, trees and associated root systems, and any other deleterious non-soil materials that are found to be present from within the planned construction limits. Exposed subgrade soils at the undercut elevations, as well as subsequent lifts of fill soils, should be compacted utilizing non-vibratory methods (given the presence of existing structures) to a minimum soil density of at least 95 percent of the maximum dry density as determined by the Modified Proctor test (ASTM D-1557). The top 12 inches of all footing excavations should be compacted to at least 98 percent.

A geotechnical engineer should carefully evaluate all subgrades prior to foundation and slab-on-grade construction to confirm compliance with this report; evaluate geotechnical sections of the plans and specifications for the overall project; and provide additional recommendations that may be required.

1.3 GROUNDWATER CONTROL

Groundwater was encountered in the SPT borings at depths ranging from about 3½ feet to 4½ feet BEG at the time of our subsurface exploration, which was performed on June 18, 2021, and occurred during a period of below normal seasonal rainfall.

On June 28, 2021, shortly following the passing of several significant rain events, NOVA personnel performed one (1) Double Ring Infiltrometer (DRI) test adjacent to the SPT boring S-1 and groundwater was encountered at a depth of about 2 feet BEG.

On September 14, 2021, NOVA personnel also performed four (4) hand augers at the test boring locations B-1 through B-4. Groundwater was encountered in these test borings at depths ranging from approximately 1½ feet to 2 feet BEG, which correspond to the estimated seasonal high groundwater (SHGW) table levels provided in NOVA Geotechnical Engineering Report dated June 30,2021.

Depending on fill heights, groundwater should be expected to impact the planned near surface construction, most especially during shallow foundation and subsurface utility installations. Contractors should be prepared to utilize a temporary dewatering system during construction to maintain separation between the groundwater level and the desired working platform for below-grade work in lower-lying areas of the site.

1.4 FOUNDATION RECOMMENDATIONS

After the recommended site/subgrade preparation and fill placement, we recommend that the proposed structure be supported on a conventional shallow foundation system bearing upon compacted native soils and/or compacted structural fill. Building foundations may be designed for a maximum soil bearing pressure of **2,000 pounds per square foot (psf)**.

We note that sufficient fill should be added to the site to provide a minimum separation of at least 1 foot between the seasonal high groundwater (SHGW) table, which is estimated to occur approximately at the groundwater levels measured at boring locations B-1 through B-4 during our September 14, 2021 field exploration, and the bottom-of-footing elevation for the lowest footings planned for the proposed structure.

1.5 STORMWATER MANAGEMENT SYSTEM RECOMMENDATIONS

NOVA understands that the desired stormwater management system (SMS) to treat and dispose of stormwater runoff associated with the planned site construction consists of one (1) conventional shallow dry retention pond. Based on the results of our field exploration, the subsurface conditions encountered in the SMS test boring generally appear to be poorly suited for employing this desired SMS due to the presence of relatively shallow groundwater table. We recommend that consideration should be given to employing alternate SMS design (e.g., designing the pond for wet detention).

2.0 INTRODUCTION

2.1 PROJECT INFORMATION

Our understanding of the proposed development is based on recent conversations and email exchanges with the Client, review of the provided site plan and aerial photography of the site via internet-based GIS software; our site reconnaissance activities; and our experience with similar geotechnical conditions in the near vicinity to this project site.

2.1.1 SITE PLANS AND DOCUMENTS

Architectural or structural plans were not provided to us. We were furnished with the following document:

- Document: Boring Location Plan
  Provided by: Client
  Dated: March 16, 2021

2.1.2 PROPOSED CONSTRUCTION

NOVA understands the planned development will consist of the construction of a new single-story cafeteria/administration building with a planned footprint of approximately 25,000 square feet and a stormwater management system (SMS) to treat and dispose of stormwater runoff from the proposed development. Final structural loadings were not available from the design team at the time of the issuance of this report; we have therefore assumed that maximum isolated interior column loads and continuous load bearing wall loads will not exceed 40 kips per column and 3 kips per linear foot, respectively, for the proposed structure.

2.1.3 SITE GRADING

We have assumed that finished site grades will not change greater than +/- 3 feet from existing grades in the proposed structure area.

2.2 SCOPE OF WORK

JRA Architects Inc. engaged NOVA to provide geotechnical engineering consulting services for the proposed **Mowat Middle School Improvements** project. This report briefly discusses our understanding of the project, describes our exploratory procedures, and presents our findings, conclusions, and recommendations.

The primary objective of this study was to perform a geotechnical exploration within the proposed construction areas and to assess these findings as they relate to geotechnical aspects of the planned site improvements. The authorized geotechnical engineering services included a soil test boring and sampling program, laboratory testing, engineering evaluation of the field and laboratory data, and the preparation of this report. The services were performed substantially as outlined in our proposal number 011-20213356, dated May 27, 2021, and in general accordance with industry standards. As authorized per the above referenced proposal, this completed geotechnical report includes:

- A description of the site, fieldwork, laboratory testing and general soil conditions encountered, together with a Boring Location Plan, and individual Test Boring Records.
- Site preparation considerations that include geotechnical discussions regarding site stripping and subgrade preparation and engineered fill/backfill placement.
- Recommendations for controlling groundwater and/or run-off during construction and, the need for permanent dewatering systems based on the anticipated post construction groundwater levels.
- Foundation system recommendations for the proposed structure, as appropriate based on the boring results.
- Slab-on-grade construction considerations based on the geotechnical findings, including the need for a sub-slab vapor barrier or a capillary barrier.
- The measured apparent and estimated seasonal high groundwater levels at the boring locations.
- Recommended soil related design parameters for the SMS area.
- Suitability of on-site soils for re-use as structural fill and backfill. Additionally, the criteria for suitable fill materials will be provided.
- Recommended quality control measures (i.e., sampling, testing, and inspection requirements) for site grading and pavement section installation operations.

The assessment of site environmental conditions, including the presence of wetlands or detection of pollutants in the soil, rock or groundwater, laboratory testing of samples, or a site-specific seismic study was beyond the scope of this geotechnical study. If requested, NOVA can provide these services.

3.0 SITE DESCRIPTION

3.1 LOCATION AND LEGAL DESCRIPTION

Mowat Middle School is located at 1903 East Highway 390 in Lynn Haven, Florida.

3.2 SUBJECT PROPERTY GENERAL CHARACTERISTICS

At the time of our field exploration, the Subject Property was developed as the existing Mowat Middle School campus.

4.0 FIELD AND LABORATORY PROCEDURES

4.1 FIELD EXPLORATION

The test boring locations were established in the field by NOVA personnel using the provided site plan and a hand-held GPS unit. Consequently, referenced boring locations should be considered approximate. If the Client desires increased accuracy, NOVA recommends that the boring locations and elevations be surveyed.

Our field exploration included performing:

- Four (4) SPT borings, advanced to depths of approximately 15 feet to 30 feet BEG, within the proposed structure footprint.
- One (1) SPT boring, advanced to a depth of approximately 15 feet BEG, within the proposed SMS area.
- One (1) Double Ring Infiltrometer (DRI) test within the proposed SMS area. It should be noted that DRI test was terminated shortly after the testing beginning due to the presence of relatively shallow groundwater table and two (2) bulk samples were collected adjacent to the SMS boring location for laboratory indexing and permeability testing.

SPT Borings: The Standard Penetration Test borings were performed using the guidelines of ASTM Designation D-1586, "Penetration Test and Split-Barrel Sampling of Soils". A mud rotary drilling process was used to advance the borings. At regular intervals, soil samples were obtained with a standard 1.4-inch I.D., 2.0-inch O.D., split-tube sampler. The sampler was first seated six inches and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is designated the "Penetration Resistance". The penetration resistance, when properly interpreted, is an index to the soil strength and density. Representative portions of the soil samples, obtained from the sampler, were placed in sealed containers and transported to our laboratory for further evaluation and laboratory testing.

Test Boring Records in Appendix B present the soil conditions encountered in the borings. These records represent our interpretation of the subsurface conditions based on the field exploration data, visual examination of the recovered samples, laboratory test data, and generally accepted geotechnical engineering practices. The stratification lines and depth designations represent approximate boundaries between various subsurface strata. Actual transitions between materials may be gradual.

Double Ring Infiltration Testing: The Double Ring Infiltrometer (DRI) testing was performed in general accordance with ASTM D-3385. The DRI is used for determining water infiltration rates of soil within the retention area footprint. The rings are partially inserted into the soil and filled with water, after which the speed of infiltration is measured. Infiltration is the process of water penetrating the ground surface. The intensity of this process is called the infiltration rate and is expressed in terms of the volume of water per ground surface and per unit of time (inches/hour).

Groundwater Levels: The groundwater levels reported on the Test Boring Records represent measurements made at the completion of each test boring. The test borings were subsequently backfilled with the soil cuttings from the drilling process for safety concerns.

4.2 LABORATORY TESTING

A laboratory testing program was conducted to characterize materials existing at the site using split spoon and bulk/grab soil samples recovered from the borings. The laboratory test data are presented in the Appendix. Selected test data are presented on the Test Boring Records attached in the Appendix. The specific tests are briefly described below. Further laboratory testing was beyond the scope of this exploration. It should be noted that all soil samples will be properly disposed of 30 days following the submittal of this NOVA subsurface exploration report unless you request otherwise.

4.2.1 SOIL CLASSIFICATION

Soil classification provides a general guide to the engineering properties of various soil types and enable the engineer to apply past experience to current problems. In our explorations, samples obtained during drilling operations are observed in our laboratory and visually classified by an engineer. The soils are classified according to relative density (based on SPT N-values), color and texture. These classification descriptions are included on our Test Boring Records. The classification system discussed above is primarily qualitative; laboratory testing is generally required for detailed soil classification. Using the test results, the soils were visually/manually classified according to the Unified Soil Classification System. This classification system and the in-place physical soil properties provide an index for estimating the soil's behavior. The soil classification and physical properties obtained are presented in this report.

4.2.2 MOISTURE CONTENT

The moisture content is the ratio expressed as a percentage of the weight of water in a given mass of soil to the weight of the solid particles. This testing was conducted in general accordance with ASTM Designation D-2216. Five (5) moisture content tests were performed in this study.

4.2.3 FINES CONTENT

The percentage of fines passing through the No. 200 sieve is generally considered to represent the amount of silt and clay of the tested soil sample. The sieve analysis testing was conducted in general accordance with ASTM Designations D-6913 and D-1140. Five (5) fines content tests were performed in this study.

4.2.4 ORGANIC CONTENT

The organic content is the ratio expressed as a percentage of the weight of organic material in a given mass of soil to the weight of the solid particles. This testing was conducted in general accordance with ASTM D-2974. One (1) organic content test was performed in this study.

4.2.5 LABORATORY PERMEABILITY TEST

A remolded falling head permeability test (ASTM D-5084) is one of the standard test methods used to determine the hydraulic conductivity of saturated soils. The test involves the flow of water through a remolded, fully saturated soil sample inside a rigid- wall permeameter connected to a standpipe of constant diameter.

Before beginning the flow measurements, the soil sample is saturated, and the standpipe is filled with water to a given level. The test then starts by allowing the water to flow through the sample until the water in the standpipe reaches a lower limit. The time required for the water to flow from the upper to lower limit is recorded. Two (2) falling head permeability test were performed in this study.

5.0 SUBSURFACE CONDITIONS

5.1 GEOLOGY

The site is located in Bay County, Florida and according to the United States Geological Survey (USGS), is situated within the Gulf Coastal Plain, separated from the Florida Platform by geologic structures known as the Gulf Trough and Apalachicola Embayment. These structures formed a bathymetric and environmental barrier from the earliest Eocene or earliest Oligocene periods into the Miocene.

According to the "Text to Accompany the Geologic Map of Florida" by Scott, 2001, the site is generally underlain by sediments deposited during the Holocene period. These sediments typically consist of quartz sands, carbonate sands and muds, and organics.

Surficial soils in the region are primarily siliciclastic sediments deposited in response to the renewed uplift and erosion in the Appalachian highlands to the north and sea-level fluctuations. The extent and type of deposit is influenced by numerous factors, including mineral composition of the parent rock and meteorological events.

5.2 SOIL CONDITIONS

The following paragraph provides a generalized description of the subsurface profile and soil conditions encountered by the borings. The Test Boring Records provided in the Appendix should be reviewed to provide more detailed descriptions of the subsurface conditions encountered at the boring locations. Conditions may vary at other locations and times.

The test borings generally encountered loose to dense fine-grained sands to slightly silty fine-grained sands (USCS classifications of SP and SP-SM, respectively) with trace organics (organic silt) from the existing ground surface elevation to a depth of about 30 feet below existing grade (BEG). As an exception, a stratum of loose clayey sand (SC) was encountered in the test boring S-1 from about 13 feet to 15 feet BEG.

5.3 GROUNDWATER CONDITIONS

5.3.1 GENERAL

Groundwater in the Gulf Coastal Plain typically occurs as an unconfined aquifer condition. Recharge is provided by the infiltration of rainfall and surface water through the soil overburden. More permeable zones in the soil matrix can affect groundwater conditions. The groundwater table is expected to be a subdued replica of the original surface topography.

5.3.2 SOIL TEST BORING GROUNDWATER CONDITIONS

Groundwater was encountered in the SPT borings at depths ranging from about 3½ feet to 4½ feet BEG at the time of our subsurface exploration, which was performed on June 18, 2021, and occurred during a period of below normal seasonal rainfall.

On June 28, 2021, shortly following the passing of several significant rain events, NOVA personnel performed one (1) Double Ring Infiltrometer (DRI) test adjacent to the SPT boring S-1 and groundwater was encountered at a depth of about 2 feet BEG.

On September 14, 2021, NOVA personnel also performed four (4) hand augers at the test boring locations B-1 through B-4. Groundwater was encountered in these test borings at depths ranging from approximately 1½ feet to 2 feet BEG.

Based on our review of the subsurface conditions encountered in the test borings, we estimate that the normal permanent seasonal high groundwater (SHGW) table for this property will occur approximately at the groundwater levels measured at boring locations B-1 through B-4 on September 14, 2021, and approximately within ½ foot above the groundwater level measured at the boring location S-1 on June 28, 2021.

Groundwater levels vary with changes in season and rainfall, construction activity, surface water runoff and other site-specific factors. Groundwater levels in the Bay County area are typically lowest in the late spring and the late fall and highest in the summer with annual groundwater fluctuations by seasonal rainfall; consequently, the water table may vary at times.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on our understanding of the proposed construction, our site observations, our evaluation and interpretation of the field and laboratory data obtained during this exploration, our experience with similar subsurface conditions, and generally accepted geotechnical engineering principles and practices.

Subsurface conditions in unexplored locations or at other times may vary from those encountered at specific boring locations. If such variations are noted during construction, or if project development plans are changed, we request the opportunity to review the changes and amend our recommendations, if necessary.

As previously noted, the client selected boring locations were established in the field with a hand-held GPS unit. If increased accuracy is desired by the client, we recommend that the boring locations and elevations be surveyed.

6.1 SITE PREPARATION

We recommend removing all topsoil and surficial vegetation, trees and associated root systems, and any other deleterious non-soil materials that are found to be present from within the planned construction limits. Exposed subgrade soils at the undercut elevations should be compacted utilizing non-vibratory methods (given the presence of existing structures) to a minimum soil density of at least 95 percent of the maximum dry density as determined by the Modified Proctor test (ASTM D-1557).

A geotechnical engineer should carefully evaluate all subgrades prior to foundation and slab-on-grade construction to confirm compliance with this report; evaluate geotechnical sections of the plans and specifications for the overall project; and provide additional recommendations that may be required.

6.2 FILL PLACEMENT

6.2.1 FILL SUITABILITY

Fill materials should be relatively clean sands with less than 12 percent fines (material passing the No. 200 sieve), and free of non-soil materials and rock fragments larger than 3 inches in diameter. On-site near surface soils that are categorized as fine-grained sands and slightly silty fine-grained sands (SP, SP-SM) based on the Unified Soil Classification System (USCS) are considered suitable for the use of structural fill in the building and pavement areas, provided that the materials are free of rubble, clay, rock, roots and organics.

All materials to be used for backfill or compacted fill construction should be evaluated and, if necessary, tested by NOVA prior to placement to determine if they are suitable for their intended use. Any off-site materials used as fill should be approved by NOVA prior to acquisition. Organic and/or debris-laden material is not suitable for re-use as structural fill.

6.2.2 SOIL COMPACTION

Fill should be placed in thin, horizontal loose lifts (maximum 12-inch depth) and compacted to a minimum soil density of at least 95 percent of the Modified Proctor maximum dry density (ASTM D-1557). The upper 12 inches of soil beneath the bottoms of all shallow foundation footings should be compacted to at least 98 percent. In confined areas, such as utility trenches, portable compaction equipment and thinner fill lifts (3 to 4 inches) may be necessary. Fill materials used in structural areas should have a target maximum dry density of at least 100 pounds per cubic foot (pcf). If lighter weight fill materials are used, the NOVA geotechnical engineer should be consulted to assess the impact on design recommendations.

Soil moisture content should be maintained within 3 percent of the optimum moisture content. We recommend that the grading contractor have equipment on site during earthwork for both drying and wetting fill soils. Moisture control may be difficult during rainy weather. ***Soils excavated from below the groundwater table will likely require significant efforts to achieve acceptable moisture contents prior to their re-use as fill materials***.

Filling operations should be observed by a NOVA soils technician, who can confirm suitability of material used and uniformity and appropriateness of compaction efforts. He/she can also document compliance with the specifications by performing field density tests using thin-walled tube, nuclear, or sand cone testing methods (ASTM D-2937, D-6938, or D-1556, respectively). One test per 2,000 square feet in structure areas should be performed in each lift of fill, with test locations well distributed throughout the fill mass. When filling in small areas, at least one test per day per area should be performed. One (1) test at conventional spread foundations, one (1) test per lift at each planned column footing area, and one (1) test per 75 linear feet at continuous strip foundations are also recommended.

6.3 GROUNDWATER CONTROL

Groundwater was encountered in the SPT borings at depths ranging from about 3½ feet to 4½ feet BEG at the time of our subsurface exploration, which was performed on June 18, 2021, and occurred during a period of below normal seasonal rainfall.

On June 28, 2021, shortly following the passing of several significant rain events, NOVA personnel performed one (1) Double Ring Infiltrometer (DRI) test adjacent to the SPT boring S-1 and groundwater was encountered at a depth of about 2 feet BEG.

On September 14, 2021, NOVA personnel also performed four (4) hand augers at the test boring locations B-1 through B-4. Groundwater was encountered in these test borings at depths ranging from approximately 1½ feet to 2 feet BEG.

Depending on fill heights, groundwater should be expected to impact the planned near surface construction, most especially during shallow foundation and subsurface utility installations. Contractors should be prepared to utilize a temporary dewatering system during construction to maintain separation between the groundwater level and the desired working platform for below-grade work.

The dewatering system should be capable of lowering the groundwater elevation to a minimum of 2 feet below the desired working platform elevation(s). A local contractor familiar with similar site conditions common to the Bay County area should be able to determine an adequate dewatering method for the subject property. Common local dewatering methods include, but are not limited to, dewatering by the use of temporary well points and installing temporary construction sumps and/or trench drain systems.

6.4 FOUNDATION RECOMMENDATIONS

6.4.1 GENERAL

NOVA understands the planned development will consist of the construction of a new single-story cafeteria/administration building with a planned footprint of approximately 25,000 square feet Final structural loadings were not available from the design team at the time of the issuance of this report; we have therefore assumed that maximum isolated interior column loads and continuous load bearing wall loads will not exceed 40 kips per column and 3 kips per linear foot, respectively, for the proposed structure.

6.4.2 SHALLOW FOUNDATION SYSTEMS

Design: After the recommended site and subgrade preparation and fill placement, we recommend that a conventional shallow foundation system be used to support the proposed structure. Foundations bearing on densified existing soils and/or compacted structural fill, as recommended in this report, may be designed for a maximum allowable bearing pressure of **2,000 pounds per square foot (psf)**.

We note that sufficient fill should be added to the site to provide a minimum separation of at least 1 foot between the seasonal high groundwater (SHGW) table, which is estimated to occur approximately at the groundwater levels measured at boring locations B-1 through B-4 during our September 14, 2021 field exploration, and the bottom-of-footing elevation for the lowest footings planned for the proposed structure.

We recommend minimum footing widths of 18 inches for ease of construction and to reduce the possibility of localized shear failures. Exterior and interior footing bottoms should be established at least 18 inches below finished surrounding exterior grades.

Settlement: Settlements for spread foundations bearing on compacted native or approved fill materials were assessed using SPT values to estimate elastic modulus, based on published correlations and previous NOVA experience. We note that the settlements presented are based on the results of the SPT borings. Conditions may be better or worse in other areas, however, we believe the estimated settlements are reasonably conservative.

Based on the soil bearing capacity provided above, and the presumed foundation elevations as discussed above, we expect primary total settlement beneath individual foundations to be on the order of 1 inch or less. The amount of differential settlement is difficult to predict because the subsurface and foundation loading conditions can vary considerably across the site. However, we anticipate differential settlement between adjacent foundations will be on the order of ½ inch or less. The final deflected shape of the structure will be dependent on actual foundation locations and loading.

Foundation support conditions are highly erratic and may vary dramatically in short horizontal distances. It is anticipated that the geotechnical engineer may recommend a different bearing capacity upon examination of the actual foundation subgrade at numerous locations.

To reduce the differential settlement if lower consistency materials are encountered, a lower bearing capacity should be used, or the foundations should be extended to more competent materials. We anticipate that timely communication between the geotechnical engineer and the structural engineer, as well as other design and construction team members, will be required.

Construction: Foundation excavations should be evaluated by the NOVA geotechnical engineer prior to reinforcing steel placement to observe foundation subgrade preparation and confirm bearing pressure capacity. Foundation excavations should be level and free of debris, ponded water, mud, and loose, frozen, or water-softened soils. Concrete should be placed as soon as is practical after the foundation is excavated, and the subgrade evaluated. Foundation concrete should not be placed on frozen or saturated soil.

If a foundation excavation remains open overnight, or if rain or snow is imminent, a 3 to 4-inch thick "mud mat" of lean concrete should be placed in the bottom of the excavation to protect the bearing soils until reinforcing steel and concrete can be placed.

6.5 SLAB-ON-GRADE

The conditions exposed at subgrade levels will vary across the site and may include structural fill or densified in-situ soils. The slab-on-grade may be adequately supported on these subgrade conditions subject to the recommendations in this report. The slab-on-grade should be jointed around columns and along walls to reduce cracking due to differential movement. <u>We note that sufficient fill should be added, or underdrain systems will be necessary beneath the impacted slab, to provide a minimum separation of at least 2 feet between the bottom-of-slab elevation(s) and the post development seasonal high groundwater level.</u> An impermeable vapor barrier is recommended beneath finished spaces to reduce dampness. Once grading is completed, the subgrade can be exposed to adverse construction activities and weather conditions during the period of sub-slab utility installation. The subgrade should be well drained to prevent the accumulation of water. If the exposed subgrade becomes unstable, excessively wet or exhibits excessive rutting or pumping, the geotechnical engineer should be consulted.

6.6 STORMWATER MANAGEMENT SYSTEM RECOMMENDATIONS

NOVA understands that the desired stormwater management system (SMS) to treat and dispose of stormwater runoff associated with the planned site construction consists of one (1) conventional shallow dry retention pond. Based on the results of our field exploration, the subsurface conditions encountered in the SMS test boring generally appear to be poorly suited for employing this desired SMS due to the presence of relatively shallow groundwater table. We recommend that consideration should be given to employing alternate SMS design (e.g., designing the pond for wet detention).

WET SMS SOIL DESIGN PARAMETERS	
Corresponding Soil Boring Test Location	S-1
Approximate Depth of Confining Layer, BEG	13 ft.
Estimated Average Depth to Normal Permanent SHWT	± 1½ ft.
Estimated Average Depth to Normal Permanent SLWT	±4 ft.

The estimated normal permanent seasonal high groundwater (SHGW) and seasonal low groundwater (SLGW) levels provided in the table above are based on our experience with projects in this locale; the soil strata encountered in our borings; the groundwater levels measured at the site; and the published information by the "Web Soil Survey" National database, NRCS division of the United States Department of Agriculture (USDA).

7.0 CONSTRUCTION OBSERVATIONS

7.1 SUBGRADE

Once site grading is completed, the subgrade may be exposed to adverse construction activities and weather conditions. The subgrade should be well-drained to prevent the accumulation of water. If the exposed subgrade becomes saturated or frozen, the NOVA geotechnical engineer should be consulted.

7.2 SHALLOW FOUNDATIONS

Foundation excavations should be level and free of debris, ponded water, mud, and loose, frozen or water-softened soils. All foundation excavations should be evaluated by a NOVA geotechnical engineer prior to reinforcing steel placement to observe foundation subgrade preparation and assess bearing pressure capacity. Due to variable site subsurface and construction conditions, some adjustments in isolated foundation bearing pressures, depth of foundations or undercutting and replacement with controlled structural fill may be necessary.

APPENDIX A
Figures and Maps

Base map provided by ***Google Earth***

Scale: Not To Scale
Date Drawn: June 21, 2021
Drawn By: D. Ritzel
Checked By: A. Kniazeff

NOVA

17612 Ashley Drive
Panama City Beach, Florida 32413
850.249.6682 ♦ 850.249.6683

PROJECT LOCATION MAP

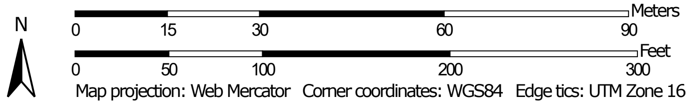
Mowat Middle School Improvements

Lynn Haven, Bay County, Florida

NOVA Project Number 10111-2021151

Soil Map—Bay County, Florida
(Mowat Middle School Improvements, 10111-2021151)

Map Scale: 1:1,230 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bay County, Florida
Survey Area Data: Version 20, Jun 10, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

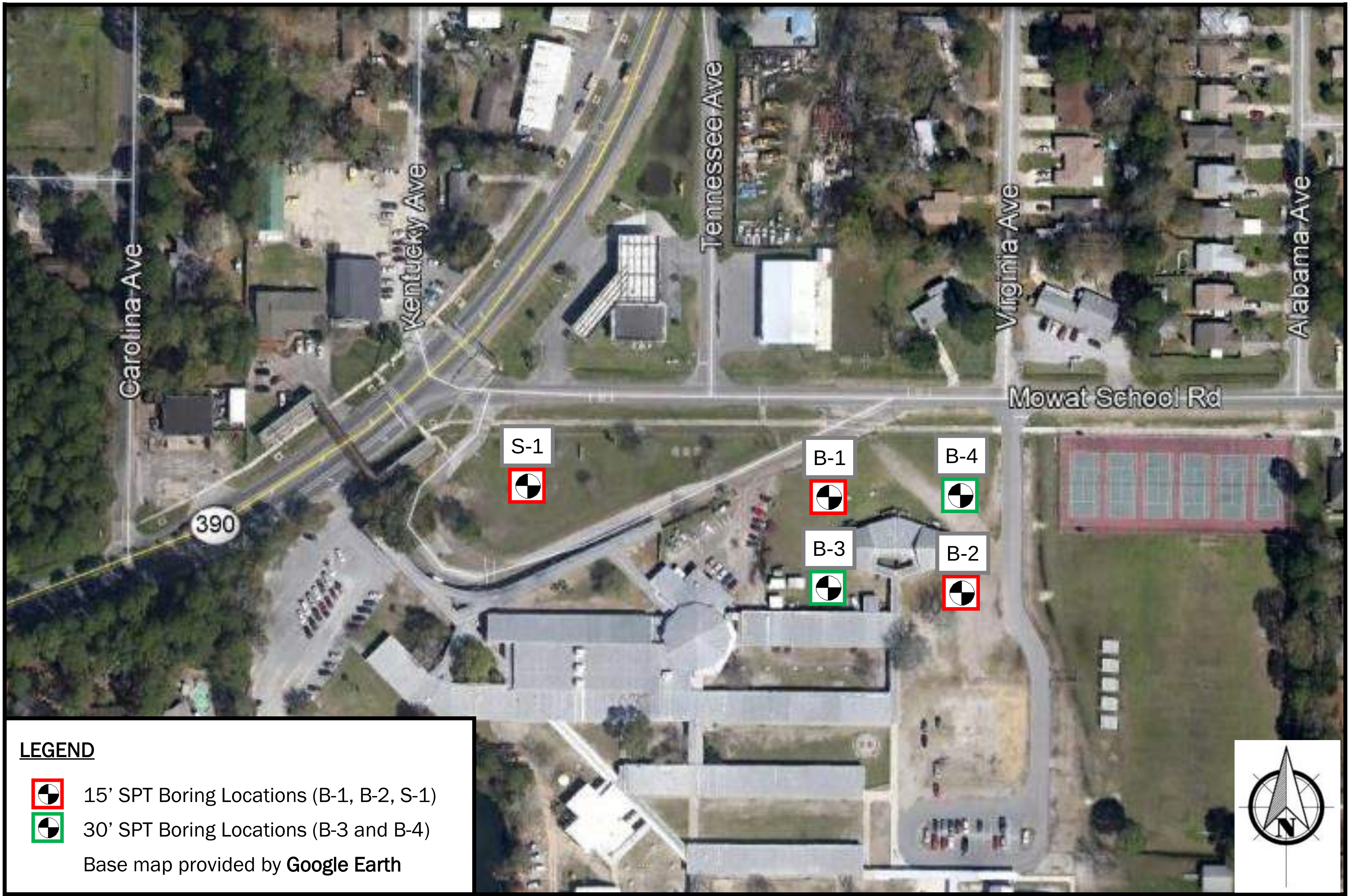
Date(s) aerial images were photographed: Jan 18, 2015—Mar 7, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13	Leon sand, 0 to 2 percent slopes	0.1	1.9%
31	Osier fine sand	4.4	98.1%
Totals for Area of Interest		**4.4**	**100.0%**

APPENDIX B
Subsurface Data



LEGEND

🟥 15’ SPT Boring Locations (B-1, B-2, S-1)

🟩 30’ SPT Boring Locations (B-3 and B-4)

Base map provided by **Google Earth**

Scale: Not To Scale
Date Drawn: June 21, 2021
Drawn By: D. Ritzel
Checked By: A. Kniazeff

NOVA
17612 Ashley Drive
Panama City Beach, Florida 32413
850.249.NOVA(6682) ♦ 850.249.6683

BORING LOCATION PLAN

Mowat Middle School Improvements
Lynn Haven, Bay County, Florida
NOVA Project Number 10111-2021151

KEY TO BORING LOGS

SYMBOLS AND ABBREVIATIONS

SYMBOL	DESCRIPTION
N-Value	No. of Blows of a 140-lb. Weight Falling 30 Inches Required to Drive a Standard Spoon 1 Foot
WOR	Weight of Drill Rods
WOH	Weight of Drill Rods and Hammer
◨	Sample from Auger Cuttings
◪	Standard Penetration Test Sample
▯	Thin-wall Shelby Tube Sample (Undisturbed Sampler Used)
% REC	Percent Core Recovery from Rock Core Drilling
RQD	Rock Quality Designation
▼	Stabilized Groundwater Level
⧨	Seasonal High Groundwater Level (also referred to as the W.S.W.T.)
NE	Not Encountered
GNE	Groundwater Not Encountered
BT	Boring Terminated
-200 (%)	Fines Content or % Passing No. 200 Sieve
MC (%)	Moisture Content
LL	Liquid Limit (Atterberg Limits Test)
PI	Plasticity Index (Atterberg Limits Test)
K	Coefficient of Permeability
Org. Cont.	Organic Content
G.S. Elevation	Ground Surface Elevation

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS More than 50% retained on the the No. 200 sieve*	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES	GM	Silty gravels and gravel-sand-silt mixtures
			GC	Clayey gravels and gravel-sand-clay mixtures
	SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS 5% or less passing No. 200 sieve	SW**	Well-graded sands and gravelly sands, little or no fines
			SP**	Poorly graded sands and gravelly sands, little or no fines
		SANDS with 12% or more passing No. 200 sieve	SM**	Silty sands, sand-silt mixtures
			SC**	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS 50% or more passes the No. 200 sieve*	SILTS AND CLAYS Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diamicaceous fine sands or silts, elastic silts
			CH	Inorganic clays or clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
			PT	Peat, muck and other highly organic soils

*Based on the material passing the 3-inch (75 mm) sieve

** Use dual symbol (such as SP-SM and SP-SC) for soils with more than 5% but less than 12% passing the No. 200 sieve

RELATIVE DENSITY

(Sands and Gravels)

Very loose – Less than 4 Blow/Foot
Loose – 4 to 10 Blows/Foot
Medium Dense – 11 to 30 Blows/Foot
Dense – 31 to 50 Blows/Foot
Very Dense – More than 50 Blows/Foot

CONSISTENCY

(Silts and Clays)

Very Soft – Less than 2 Blows/Foot
Soft – 2 to 4 Blows/Foot
Medium Stiff – 5 to 8 Blows/Foot
Stiff – 9 to 15 Blows/Foot
Very Stiff – 16 to 30 Blows/Foot
Hard – More than 30 Blows/Foot

RELATIVE HARDNESS

(Limestone)

Soft – 100 Blows for more than 2 Inches
Hard – 100 Blows for less than 2 Inches

MODIFIERS

These modifiers Provide Our Estimate of the Amount of Minor Constituents (Silt or Clay Size Particles) in the Soil Sample

Trace – 5% or less
With Silt or With Clay – 6% to 11%
Silty or Clayey – 12% to 30%
Very Silty or Very Clayey – 31% to 50%

These Modifiers Provide Our Estimate of the Amount of Organic Components in the Soil Sample

Trace – Less than 3%
Few – 3% to 4%
Some – 5% to 8%
Many – Greater than 8%

These Modifiers Provide Our Estimate of the Amount of Other Components (Shell, Gravel, Etc.) in the Soil Sample

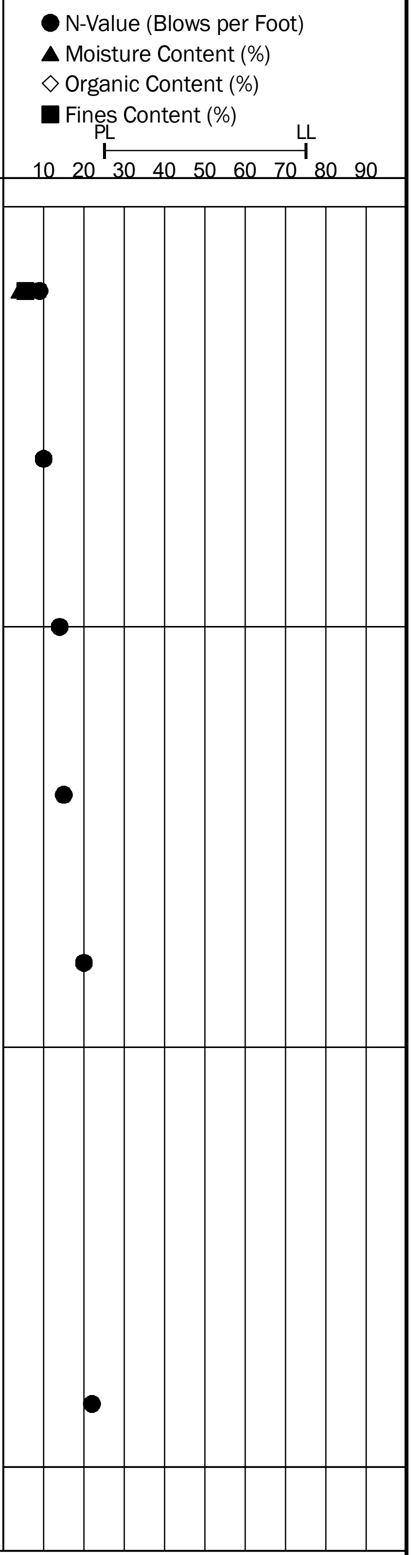
Trace – 5% or less
Few – 6% to 12%
Some – 13% to 30%
Many – 31% to 50%

NOVA

TEST BORING RECORD
B-1

PROJECT NAME: Mowat Middle School Improvements **DATE:** 6/18/2021
PROJECT NO.: 2021151 **CLIENT:** JRA Architects, Inc.
PROJECT LOCATION: Lynn Haven, Bay County, Florida
LOCATION: See Boring Location Plan **ELEVATION:** Existing Grade
DRILLED BY: L. Griffin **LOGGED BY:** K. Selle
DRILLING METHOD: Mud Rotary **HAMMER:**
INITIAL GW DEPTH: ▼ 3.5 feet **FINAL GW DEPTH:** ▽ 1.5 feet

Depth (feet)	Elevation	Material Description	Graphic	Groundwater	Sample Type	N-Value
0						
		Loose grey/light grey to grey/brown slightly silty fine-grained SAND (SP-SM)				9
				▽		
				▼		10
5		Medium dense grey/light grey to grey/brown fine-grained SAND (SP)				14
						15
						20
10						
						22
15		Boring Terminated at 15 feet				

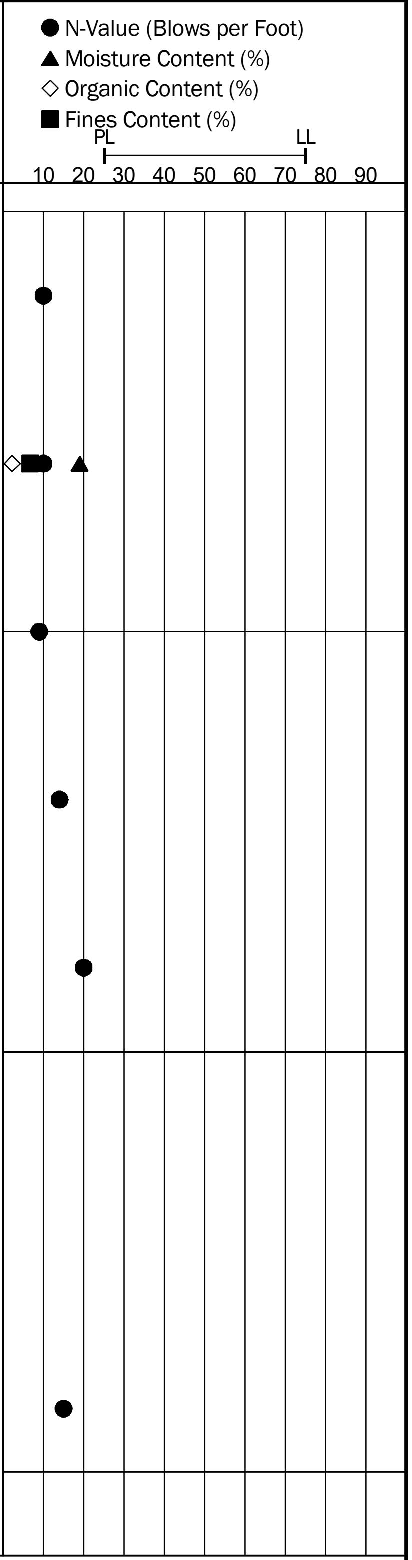


Note:

TEST BORING RECORD
B-2

PROJECT NAME: Mowat Middle School Improvements **DATE:** 6/18/2021
PROJECT NO.: 2021151 **CLIENT:** JRA Architects, Inc.
PROJECT LOCATION: Lynn Haven, Bay County, Florida
LOCATION: See Boring Location Plan **ELEVATION:** Existing Grade
DRILLED BY: L. Griffin **LOGGED BY:** K. Selle
DRILLING METHOD: Mud Rotary **HAMMER:**
INITIAL GW DEPTH: ▼ 4.0 feet **FINAL GW DEPTH:** ▽ 2.0 feet

Depth (feet)	Elevation	Material Description	Graphic	Groundwater	Sample Type	N-Value
0						
		Loose grey/light brown slightly silty fine-grained SAND (SP-SM)				10
		Loose dark grey slightly silty fine-grained SAND with trace organics - organic silt (SP-SM)		▽		10
		Loose to medium dense grey/brown to grey/light grey fine-grained SAND (SP)		▼		
5						9
						14
						20
10						
						15
15		Boring Terminated at 15 feet				



This information pertains only to this boring and should not be interpreted as being indicative of the site.

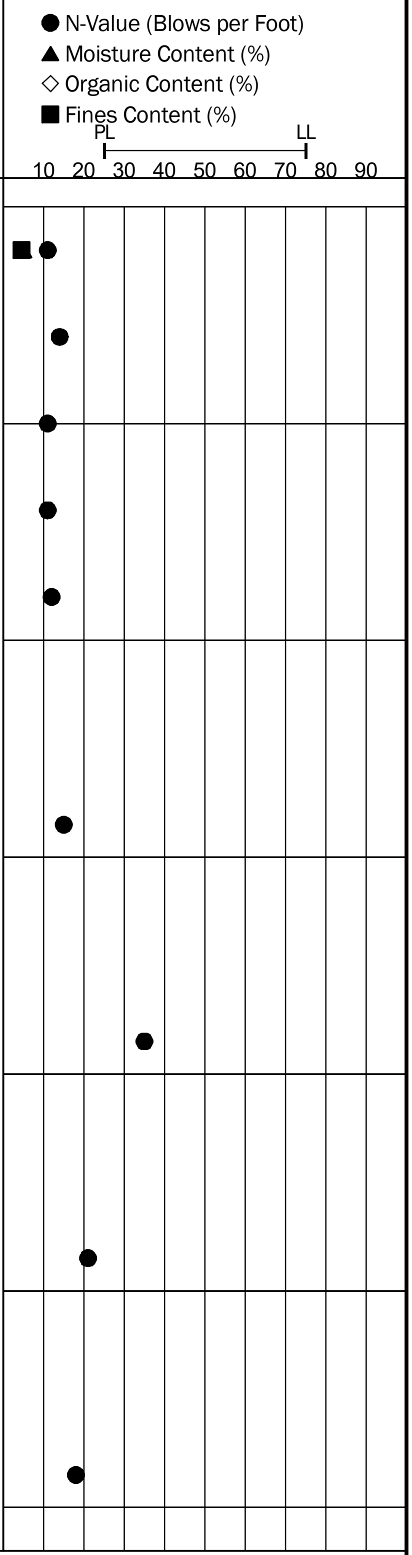
Note:

NOVA

TEST BORING RECORD
B-3

PROJECT NAME: Mowat Middle School Improvements
DATE: 6/18/2021
PROJECT NO.: 2021151
CLIENT: JRA Architects, Inc.
PROJECT LOCATION: Lynn Haven, Bay County, Florida
LOCATION: See Boring Location Plan
ELEVATION: Existing Grade
DRILLED BY: L. Griffin
LOGGED BY: K. Selle
DRILLING METHOD: Mud Rotary
HAMMER:
INITIAL GW DEPTH: ▼ 3.5 feet
FINAL GW DEPTH: ▽ 1.7 feet

Depth (feet)	Elevation	Material Description	Graphic	Groundwater	Sample Type	N-Value
0						
		Medium dense grey/dark grey fine-grained SAND (SP)		▽		11
		Medium dense grey slightly silty fine-grained SAND (SP-SM)		▼		14
5		Medium dense to dense grey/brown to light grey/light brown fine-grained SAND (SP)				11
						11
						12
10						
15						15
20						35
25						21
30						18
		Boring Terminated at 30 feet				



Note:

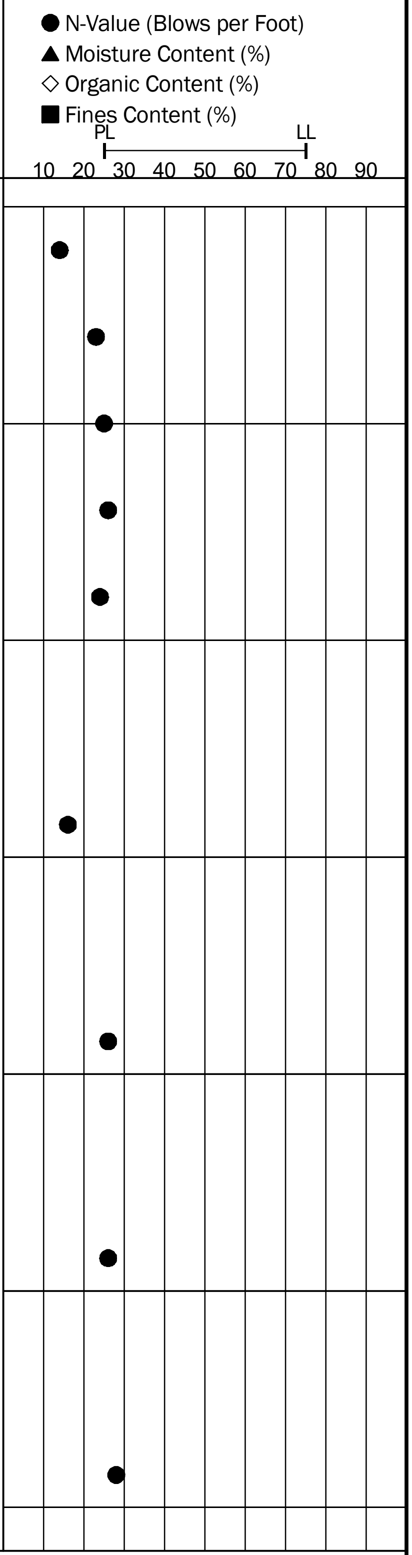
This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA

TEST BORING RECORD
B-4

PROJECT NAME: Mowat Middle School Improvements **DATE:** 6/18/2021
PROJECT NO.: 2021151 **CLIENT:** JRA Architects, Inc.
PROJECT LOCATION: Lynn Haven, Bay County, Florida
LOCATION: See Boring Location Plan **ELEVATION:** Existing Grade
DRILLED BY: L. Griffin **LOGGED BY:** K. Selle
DRILLING METHOD: Mud Rotary **HAMMER:**
INITIAL GW DEPTH: ▼ 4.5 feet **FINAL GW DEPTH:** ▽ 2.0 feet

Depth (feet)	Elevation	Material Description	Graphic	Groundwater	Sample Type	N-Value
0						
		Medium dense light brown/grey slightly silty fine-grained SAND (SP-SM)		▽		14
		Medium dense dark grey slightly silty fine-grained SAND with trace organics - organic silt (SP-SM)				23
5		Medium dense grey/brown to light grey/light brown fine-grained SAND (SP)		▼		25
						26
						24
10						
15						16
20						26
25						26
30						28
		Boring Terminated at 30 feet				



This information pertains only to this boring and should not be interpreted as being indicative of the site.

Note:

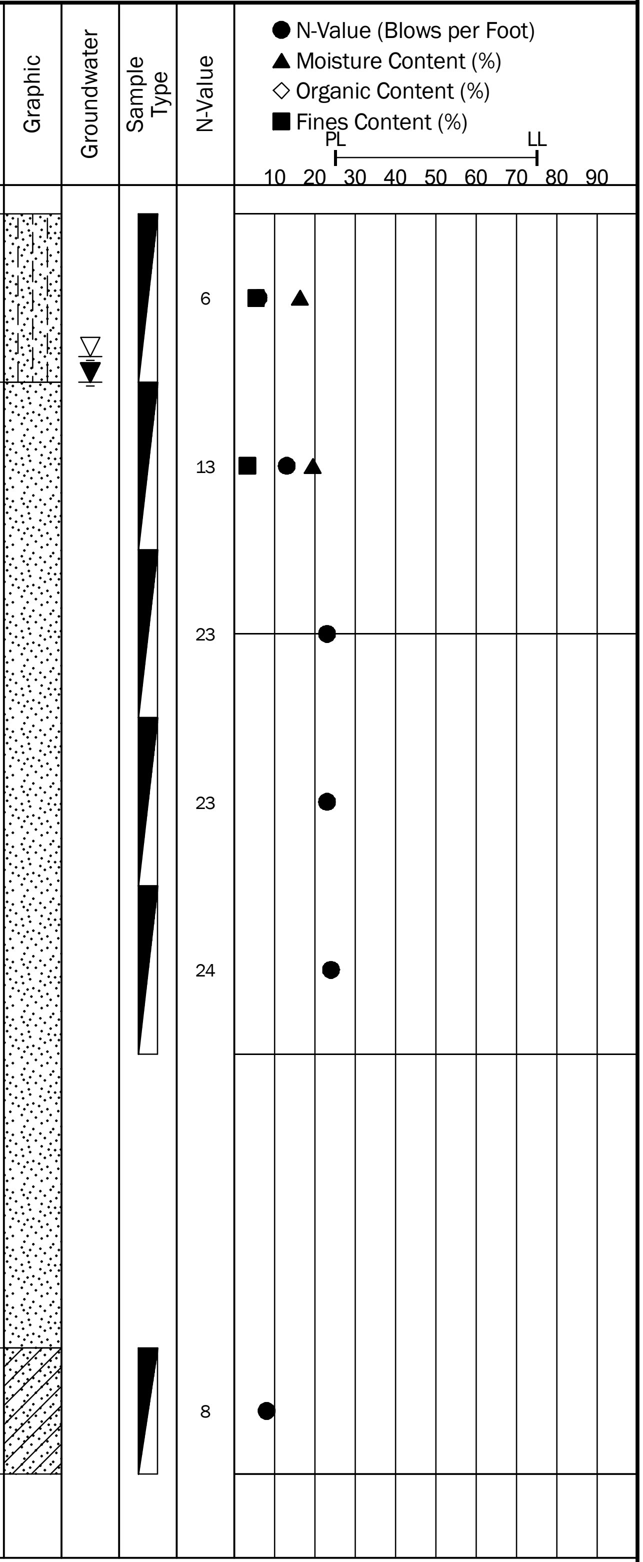
NOVA

TEST BORING RECORD
S-1

PROJECT NAME: Mowat Middle School Improvements DATE: 6/18/2021
PROJECT NO.: 2021151 CLIENT: JRA Architects, Inc.
PROJECT LOCATION: Lynn Haven, Bay County, Florida
LOCATION: See Boring Location Plan ELEVATION: Existing Grade
DRILLED BY: L. Griffin LOGGED BY: K. Selle
DRILLING METHOD: Mud Rotary HAMMER:
INITIAL GW DEPTH: ▼ 2.0 feet FINAL GW DEPTH: ▽ 1.7 feet

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation	Material Description	Graphic	Groundwater	Sample Type	N-Value
0						
		Loose grey/light grey slightly silty fine-grained SAND (SP-SM)		▽ ▼		6
		Medium dense light grey to grey/brown fine-grained SAND (SP)				13
5						23
						23
						24
10						
		Loose grey very clayey fine-grained SAND (SC)				8
15		Boring Terminated at 15 feet				



Note:

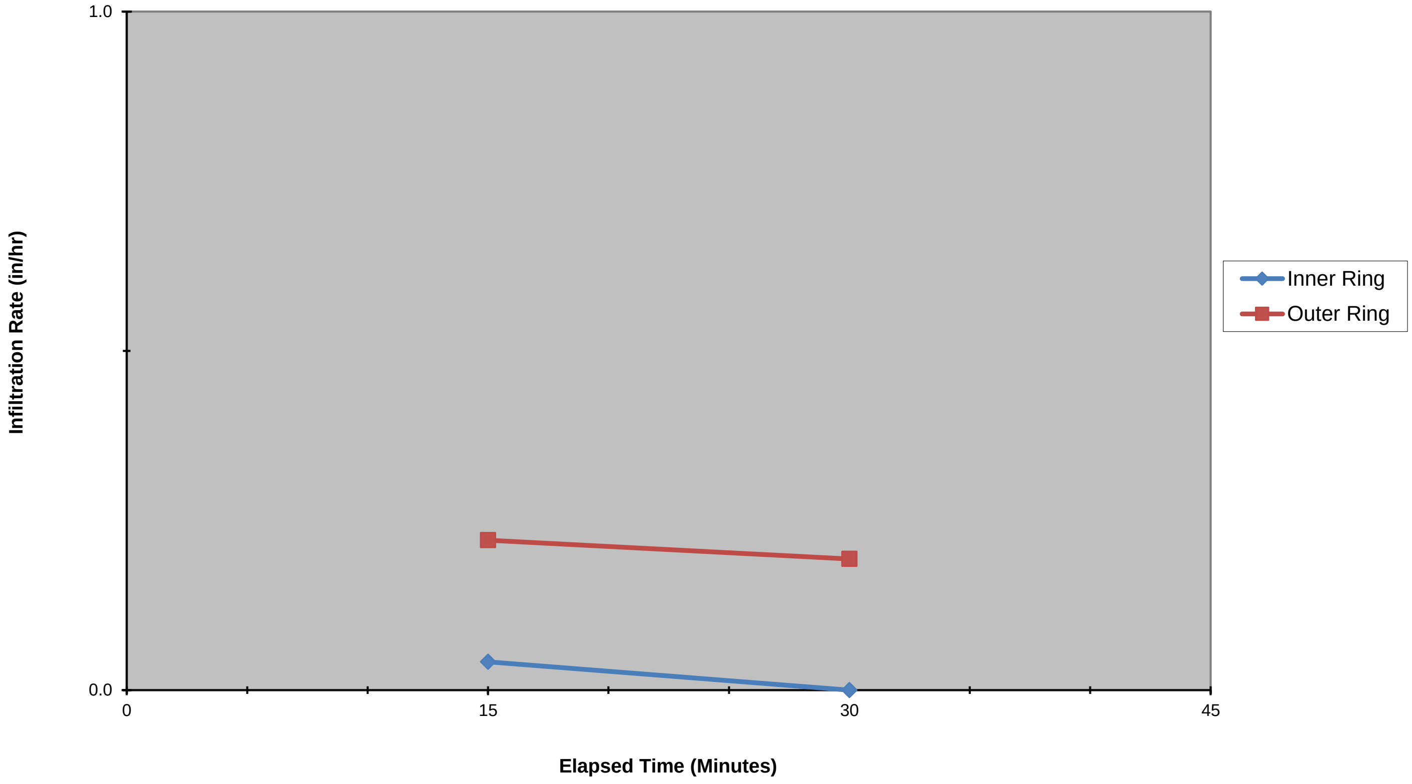
Project:	**Mowat Middle School Improvements**	**Report of DRI-1**
Project Location:	**Lynn Haven, Bay County, Florida**	
Project Number:	**10111-2021151**	

Date(s) of Test	**June 28, 2021**	Logged by	**D. Ritzel**	Checked by	**A. Kniazeff**
Test Method	**ASTM D 3385**	Weather	**Cloudy**	Type of liquid	**Municipal Water**
Area Inner Ring	**110.75 sq. in.**	Technician(s)	**D. Ritzel**	Liquid Temperature	**Ambient**
Area Outer Ring	**447.69 sq. in.**	See Attached Auger Boring Record for Soil Profile		Soil Temperature	**Ambient**
Area Annular Space	**334.59 sq. in.**	Approx. Elev. / Location	**2.0' Below Grade/ See Boring Location Plan**		

INCREMENTAL INFILTRATION RATE vs. TOTAL ELAPSED TIME

		Inner Ring		**Annular Ring**		
Time	**Elapsed Time (minutes)**	**Volume (Gal)**	**Infiltration Rate (In/hr)**	**Volume (Gal)**	**Infiltration Rate (In/hr)**	**Comments**
9:56:00 AM	0	---	---	---	---	Infiltration data collected after 30 minute saturation period. Testing terminated early due to extremely low permeability.
10:11:00 AM	15	0.01	0.0	0.080	0.221	
10:26:00 AM	30	0.00	0.0	0.070	0.193	

Infiltration Rate vs Elapsed Time



NOVA ENGINEERING AND ENVIRONMENTAL

Infiltration Rate: 0.0 Inches Per Hour

APPENDIX C
Laboratory Data

SUMMARY OF CLASSIFICATION & INDEX TESTING

Mowat Middle School Improvements
Lynn Haven, Bay County, Florida
NOVA Project Number 10111-2021151

Boring Number	Sample Depth (ft)	Natural Moisture (%)	Percent (%) Passing Sieve #200	Organic Content (%)	USCS Soil Classification
B-1	0.0 - 2.0	4	5.5	—	SP-SM
B-2	2.0 - 4.0	19	6.8	2.3	SP-SM
B-3	0.0 - 2.0	5	4.5	—	SP
S-1	0.0 – 2.0	16	5.4	—	SP-SM
S-1	2.0 - 4.0	19	3.2	—	SP

NOVA

PERMEABILITY, -200 SIEVE WASH, AND MOISTURE CONTENT

PROJECT: Mowat Middle School Improvements

NOVA PROJECT #: 10111-2021151

DATE: 6/29/2021

ASSIGNED BY: A. Kniazeff

TESTED BY: D. Ritzel

Sample LOCATION / BORING NO.	S-1
Sample NUMBER / DEPTH	0.0' - 2.0'

PERMEABILITY TESTING SUMMARY			
PERMEABILITY (K_V)	→	**2.3**	**ft/day**
Corresponding K_h	→	**3.4**	**ft/day**
DRY DENSITY	→	**85.4**	**lbs/ft^3**
MOISTURE CONTENT	→	**16.3**	**%**
-200 FINES CONTENT	→	**5.4**	**%**

FALLING HEAD PERMEABILITY (ASTM D 5084)			
No. of LAYERS:	**3**	**Wt. of MOLD (lbs):**	**9.80**
BLOWS/LAYER:	**15**	**Wt. of MOLD/SOIL (lbs):**	**13.11**
HEIGHT (FT)	**TRIAL #1 (SEC)**	**TRIAL #2 (SEC)**	**PERMEABILITY**
5	**0.0**	**0.0**	
4	**45.3**	**49.2**	8.41E-04
3	**69.9**	**65.4**	7.57E-04
2	**91.2**	**92.0**	7.88E-04
1	**136.3**	**156.6**	8.43E-04
Average Permeability		**8.1E-04**	**cm/sec**

NUMBER OF INCHES MOLD WAS SHORT? **0.000** **INCHES**

PERMEABILITY CONSTANT USED WAS → **0.41** **(Includes 1/2"ID tubing)**

(ZERO INCHES IS DEFAULT)

MOISTURE CONTENT (ASTM D 2216)	
Pan NUMBER	**26**
Wt. of WET SOIL & PAN (g)	**199.0**
Wt. of DRY SOIL & PAN (g)	**178.4**
Wt. of PAN (g)	**51.7**
Wt. of Water (g)	20.7
Wt. of Dry Soil (g)	126.6
MOISTURE CONTENT (%)	**16.3**

-200 SIEVE WASH (ASTM D 1140)	
Pan NUMBER	**26**
Wt. of DRY SOIL & PAN (g)	**156.4**
Wt. of WASH SOIL & PAN (g)	**150.8**
Wt. of PAN (g)	**51.7**
Wt. of Original Dry Sample (g)	104.7
Wt. of -200 Material (g)	5.7
Wt. of Washed Dry Sample (g)	99.0
-200 FINES CONTENT (%)	**5.4**

PERMEABILITY, -200 SIEVE WASH, AND MOISTURE CONTENT

PROJECT: Mowat Middle School Improvements **NOVA PROJECT #:** 10111-2021151

DATE: 6/29/2021 **ASSIGNED BY:** A. Kniazeff **TESTED BY:** D. Ritzel

Sample LOCATION / BORING NO.	S-1
Sample NUMBER / DEPTH	2.0' - 4.0'

PERMEABILITY TESTING SUMMARY			
PERMEABILITY (K_V)	⟶	**4.7**	**ft/day**
Corresponding K_h	⟶	**7.0**	**ft/day**
DRY DENSITY	⟶	**94.9**	**lbs/ft^3**
MOISTURE CONTENT	⟶	**19.5**	**%**
-200 FINES CONTENT	⟶	**3.2**	**%**

FALLING HEAD PERMEABILITY (ASTM D 5084)

No. of LAYERS:	**3**	**Wt. of MOLD (lbs):**	**9.80**
BLOWS/LAYER:	**15**	**Wt. of MOLD/SOIL (lbs):**	**13.58**

HEIGHT (FT)	**TRIAL #1 (SEC)**	**TRIAL #2 (SEC)**	**PERMEABILITY**
5	**0.0**	**0.0**	
4	**24.0**	**22.5**	1.71E-03
3	**32.0**	**30.0**	1.65E-03
2	**47.4**	**44.1**	1.58E-03
1	**84.6**	**67.0**	1.63E-03
Average Permeability		**1.6E-03**	**cm/sec**

NUMBER OF INCHES MOLD WAS SHORT? **0.000** **INCHES**

PERMEABILITY CONSTANT USED WAS ⟶ **0.41** **(Includes 1/2"ID tubing)**

(ZERO INCHES IS DEFAULT)

MOISTURE CONTENT (ASTM D 2216)	
Pan NUMBER	**26**
Wt. of WET SOIL & PAN (g)	**195.4**
Wt. of DRY SOIL & PAN (g)	**171.8**
Wt. of PAN (g)	**50.9**
Wt. of Water (g)	23.6
Wt. of Dry Soil (g)	120.9
MOISTURE CONTENT (%)	**19.5**

-200 SIEVE WASH (ASTM D 1140)	
Pan NUMBER	**26**
Wt. of DRY SOIL & PAN (g)	**152.7**
Wt. of WASH SOIL & PAN (g)	**149.4**
Wt. of PAN (g)	**50.9**
Wt. of Original Dry Sample (g)	101.8
Wt. of -200 Material (g)	3.3
Wt. of Washed Dry Sample (g)	98.5
-200 FINES CONTENT (%)	**3.2**

APPENDIX D
Support Documents

QUALIFICATIONS OF RECOMMENDATIONS

The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the study, and our previous experience. If additional information becomes available which might impact our geotechnical opinions, it will be necessary for NOVA to review the information, re-assess the potential concerns, and re-evaluate our conclusions and recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between borings may differ from those encountered at specific boring locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process has altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

The professional opinions presented in this report are not final. Field observations and foundation installation monitoring by the geotechnical engineer, as well as soil density testing and other quality assurance functions associated with site earthwork and foundation construction, are an extension of this report. Therefore, NOVA should be retained by the owner to observe all earthwork and foundation construction to confirm that the conditions anticipated in this study actually exist and to finalize or amend our conclusions and recommendations. NOVA is not responsible or liable for the conclusions and recommendations presented in this report if NOVA does not perform these observation and testing services.

This report is intended for the sole use of **JRA Architects, Inc.** only. The scope of work performed during this study was developed for purposes specifically intended by **JRA Architects, Inc.** only and may not satisfy other users' requirements. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. NOVA is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations, or opinions.

Our professional services have been performed, our findings obtained, our conclusions derived, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices in the State of Florida. This warranty is in lieu of all other statements or warranties, either expressed or implied.

Important Information about This
Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GBC GEOTECHNICAL
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