

# **LEWIS COUNTY JEFFERSON COMMUNITY COLLEGE EDUCATIONAL CENTER PROJECT**



## **Bid Package #1: Site, Utilities, and Structural Supplemental Information to the Contract Documents**

**JUNE 22, 2018**



**Prepared By:**  
**C&S ENGINEERS, INC.**  
**499 Col. Eileen Collins Boulevard**  
**Syracuse, New York 13212**

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SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.



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# EMPIRE **GEO** SERVICES, INC.

A SUBSIDIARY OF SJB SERVICES, INC.

May 23, 2018  
Project No. BE-18-067

C&S Companies  
499 Col Eileen Collins Blvd.  
Syracuse, New York 13212

Attention: Chuck Brooks, P.E.

Re: Geotechnical Evaluation Report for  
Proposed Lewis County Jefferson Community College  
Educational Center Project  
Lowville, New York

Dear Mr. Brooks:

Empire Geo-Services, Inc. is pleased to submit two (2) copies of the enclosed Geotechnical Evaluation Report for the above referenced project. We have also e-mailed you an electronic copy (pdf file format) of this report, for your use and for distribution as appropriate.

Please contact me if you have any questions or would like to discuss the findings and recommendations presented in the report. Thank you for considering Empire for this work and we look forward to working with you on this project through its completion.

Sincerely,

EMPIRE GEO-SERVICES, INC.



Wanda M. Allen, P.E.  
Geotechnical Engineer

Enc.: Geotechnical Evaluation Report (2 Copies)

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**Geotechnical Evaluation Report for  
Proposed Lewis County Jefferson Community College  
Educational Center Project  
East Road  
Lowville, New York**

**Prepared For  
C&S Companies  
499 Col Eileen Collins Boulevard  
Syracuse, New York 13212**

**Prepared By  
Empire Geo-Services, Inc.  
5167 South Park Avenue  
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**Project No. BE-18-067  
May 2018**

MEMBER

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## **1.00 INTRODUCTION**

### **1.10 GENERAL**

This report presents the results of a subsurface exploration program and geotechnical engineering evaluation completed by Empire Geo-Services, Inc. (Empire) for the proposed Lewis County Jefferson Community College (JCC) Educational Center Project planned off of East Road in Lowville, New York.

C&S Companies (C&S) retained Empire to complete this work, which was done in accordance with our proposal dated April 27, 2018. SJB Services, Inc. (SJB), our affiliated drilling and testing company, completed the subsurface exploration program, which consisted of a total of six (6) test borings and one (1) infiltration test completed at the project site.

On this basis, Empire prepared this report, which summarizes the subsurface conditions encountered by the test borings and presents geotechnical recommendations for planning the foundations and slab-on-grade construction, as well as the associated site preparation work.

### **1.20 SITE AND PROJECT DESCRIPTION**

The proposed project site is located off the west side of East Road, north of Indian River Road (County Road 812) in Lowville, Lewis County, New York. The approximate location of the project site is shown on Figure 1.

The site consists generally of a cultivated field. The topography of the site appears to gradually slope downwards from the west to the east, towards East Road, based on the ground surface elevations (El.) obtained at the test boring locations, which range between El. 870.9 feet (B-1) and El. 860.7 feet (I-1). An aerial photograph of the project site area, along with the test boring locations is shown on Figure 2.

### **1.30 PROJECT DESCRIPTION**

Based on the information provided by C&S, two structures are planned to be constructed on the project site. The main educational building will consist of a single-story, steel framed structure covering approximately 22,500 square feet (150' x 150'). Preliminarily, the maximum interior and perimeter column loads are not expected to exceed about 125 kips and 75 kips, respectively. The finished floor elevation (El.) of the proposed building is currently planned at about 868.25 feet. It

is anticipated the existing site grades across the footprint of the proposed main building are within 2 to 3 feet of the final design floor grade.

The maintenance building, planned southwest of the main building, is expected to consist of a single story structure covering approximately 760 square feet (25' x 33'). The ground floor of the maintenance building is expected to be within 1 to 2 feet of the existing site grades at about El. 871 feet. Foundation loads for the storage building were not available at the time of this report; however, the loads are expected to be typical of a single story, steel, wood framed or masonry block structure.

Both buildings are planned to be supported on a shallow spread foundation system with at grade slab-on-grade floor construction. The buildings are also expected to be designed for seismic loads per the Building Code of New York State (IBC 2015).

## **2.00 SUBSURFACE EXPLORATION**

The subsurface exploration program consisted of six (6) test borings, designated as B-1, B-2, B-4 through B-6 and I-1, drilled by SJB between May 9<sup>th</sup> and 11<sup>th</sup>, 2018. One infiltration test was completed adjacent to test boring I-1, as discussed further below. The Northing and Easting coordinates for test borings B-1, B-2 and I-1, were provided on a site plan by C&S. SJB then staked the boring locations in the field using a hand held GPS device, based on the converted GPS coordinates. The remaining test boring locations were staked in the field by C&S. There is not a test boring B-3, as the infiltration test boring I-1, may have originally been designated as B-3. The approximate test boring locations are shown on Figure 2.

Optical survey level techniques were utilized to determine the existing ground surface elevations at all the test boring locations, using the "X" chiseled into the corner top of the concrete spillway structure as a benchmark (Benchmark BM-1, established by others). The approximate benchmark location is shown on Figure 2 and has a reported elevation of 872.33 feet.

Test borings B-1 and B-2 were located within the proposed maintenance building and main education building structures, respectively. Both test borings were advanced until auger refusal (top of bedrock) was encountered at depths of 14.0 feet and 4.0 feet, respectively. Test boring I-1 is the infiltration test boring, which was located east of the proposed building structures. Test boring I-1 was advanced in the overburden soils to a depth of 12 feet below the existing ground surface (bgs).

The remaining test borings were located along the west side of East Road to obtain the subsurface information with regard to installation of a gravity sanitary sewer line. Borings B-4 and B-5 were terminated at a depth of about 15 bgs, while test boring B-6 was terminated at a depth of 4 feet, where auger refusal (possible top of bedrock) was met.

SJB drilled the test borings using a Diedrich model D-50 all-terrain, rubber track mounted drill rig. The test borings were advanced using hollow stem auger and split spoon sampling techniques. Split spoon samples and Standard Penetration Tests (SPT) were taken continuously from the ground surface until sample spoon refusal was met at depths varying from 3.3 feet and 11.2 feet or until a depth of 12 feet and then in an interval of three feet, where the boring was then completed. The split spoon sampling and SPTs were completed in general accordance with *ASTM D 1586 - "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils"*.

The refusal material encountered in test borings B-1 and B-2 was cored using an NQ size double tube core barrel in accordance with *ASTM D 2113 - "Standard Practice for Rock core Drilling and Sampling of Rock for Site Investigation"*. The core sampling was advanced to five (5) feet into the bedrock at each of these locations.

SJB's geologist prepared the test boring logs based on visual observation of the recovered soil and rock samples and review of the driller's field notes. The soil samples were described based on a visual/manual estimation of the grain size distribution, along with characteristics such as color, relative density, consistency, moisture, etc. The recovered rock core samples from test borings B-1 and B-2 were also described, including characteristics such as color, rock type, hardness, weathering, bedding thickness, core recovery and rock quality designation (RQD). The test boring logs are presented in Appendix A, along with general information and a key of terms and symbols used to prepare the logs.

### **3.00 INFILTRATION TESTING**

One (1) infiltration test was completed at the proposed JCC Educational project site. The infiltration test was conducted in general conformance with the infiltration test procedure presented in the *NYSDEC Publication "Stormwater Management Design Manual – January 2015" – Appendix D: Infiltration Testing Requirements*.

Following completion of test boring I-1, the driller moved over slightly from the boring location and augered an infiltration test hole to a depth of about 8.7 bgs. A 4-inch diameter, PVC casing/riser pipe was then placed and set at the bottom of the test hole. The annulus space between the pipe and the borehole was then backfilled with the auger cuttings.

The driller then proceeded to fill the infiltration test pipe with pre-soak water to a depth of about 24-inches above the infiltration test hole bottom. The following day, SJB returned to the site to perform the infiltration testing, at which approximately, 12-inches of pre-soak water remained in the test hole. The infiltration tests included four runs measuring the water level drop, each over a 1-hour period. The casing pipe was re-filled with water to a depth of about 24-inches above the bottom of the test hole for the start of each test run. The average infiltration rate obtained at the test location is as follows:

| Infiltration Test Results Summary |                                             |                                    |
|-----------------------------------|---------------------------------------------|------------------------------------|
| Infiltration Test No.             | Average Infiltration Rate (Inches per Hour) | Soil Description and USCS Symbol   |
| IT-1                              | 0.51                                        | Gravelly Silty-Clayey SAND (SC-SM) |

Refer to the Infiltration Test Data Summary sheet included in Appendix B for more information.

#### **4.00 SUBSURFACE CONDITIONS**

##### **4.10 STRUCTURAL TEST BORINGS (B-1 and B-2)**

The general soil stratigraphy encountered by the test borings completed within the proposed buildings consisted of surface topsoil underlain by silty clay fill extending to a depth of about 2 feet, which is followed by indigenous sand soil deposits overlying Limestone bedrock.

Topsoil was encountered at the surface of both test borings. The thickness of the topsoil was about 12-inches to 18-inches. The topsoil thickness measurements are limited, widely spaced, are based on the driller's interpretation of topsoil, and are considered approximate. Accordingly, these measurements should not be relied on for estimating topsoil quantities present on the site.

Fill soils consisting of dark-brown, silty clay with some fine-coarse sand and trace amounts of organics were encountered beneath the topsoil at both test boring

locations. The fill soils are likely reworked/disturbed indigenous soils due to past agricultural uses of the site. The fill or reworked/disturbed indigenous soils were found to extend to a depth of about 2 feet bgs at these locations. It should be expected the depth of the fill or reworked soils will vary away from the test boring locations, and will be dependent upon the extent at which the site has been previously disturbed.

The indigenous soils encountered beneath the fill/disturbed soils at the test boring locations, consisted of gray, fine-coarse sand with varying amounts of silty clay and fine to coarse gravel. The indigenous soils are classified as a SC-SM group soil using the Unified Soil Classification System (ASTM D2488). The indigenous soils appear to extend to the top of bedrock.

Standard Penetration Test (SPT) “N” values obtained in the indigenous sand soils ranged from 13 to “REF” – Sample Spoon Refusal (i.e. 50 blows to advance the split spoon with 6-inches or less of penetration) indicating the relative density of the generally low to non-plastic soils varies from firm to very compact. The sample spoon refusal conditions can be an indication of very compact soils and/or the presence of cobbles and boulders. The driller did note augering through cobbles and boulders between depths of about 4.5 feet to 8.0 feet at test boring location B-1.

Auger refusal was met at depths of about 14.0 feet and 4.0 feet at test borings B-1 and B-2, corresponding to El. 856.9 feet and El. 864.8 feet. Bedrock core samples were obtained after reaching auger refusal at both locations. The bedrock cores recovered consisted of gray, hard, weathered to sound, thinly to thickly bedded Limestone Rock. Core recoveries were 65% and 100%. The rock quality designation (RQD) values were 55% and 78%, indicating the recovered rock cores have a fair and good rock mass quality, respectively.

Water level measurements were made in the test borings at the completion of overburden drilling, sampling and rock coring. Freestanding water was recorded at a depth of 7.0 feet at test boring location B-1 after water was added to the test hole to facilitate rock coring. No core water remained or was present in boring B-2 after coring operations. Either way, these measurements are not indicative of actual permanent groundwater conditions (i.e. groundwater table).

No freestanding water was present in either test boring immediately following the completion of overburden drilling and sampling, and prior to rock coring. Due to the relatively fine grained soils encountered, it is possible that groundwater, if present, did not have sufficient time to accumulate in the test holes prior to the

water level measurements. The installation of groundwater observation wells would help to better define the stabilized groundwater levels present on the site, as well as their potential fluctuations.

Some localized perched or trapped groundwater may be present at various times and locations in the fill and indigenous soils, which overlie less permeable soils or bedrock. Perched groundwater conditions can be particularly prevalent following heavy or extended periods of precipitation and during seasonally wet periods.

Groundwater conditions should be expected to vary with location and with changes in soil conditions, precipitation and seasonal conditions as well as fluctuations of the nearby Black River.

#### 4.20 UTILITY TEST BORINGS (B-4 through B-6)

The general soil stratigraphy encountered by the test borings completed along the west side of East Road consisted of man-placed fill and/or indigenous sand soil deposits overlying Limestone bedrock.

Fill soils consisting of dark-brown, fine-coarse gravel and fine-coarse sand was encountered at the surface of test boring location B-5. The gravel fill extended to a depth of about 4 feet bgs, where indigenous soil deposits were then encountered. At test boring location B-6, fill consisting of brown-gray to dark brown, intermixed sand, silty clay and gravel was encountered, which appears to extend to the possible top of bedrock present at a depth of about 4 feet. Trace amounts of organics were noted within the fill at both locations. Fill soils were not apparent at test boring location B-4. It should be expected the depth and composition of the fill will vary between and away from the test boring locations. The fill soils are expected to extend at least to the bottom of previous excavations for construction of the roadway and any utility structures.

The indigenous soils encountered at the ground surface of test boring B-4, and beneath the fill at the test boring location B-5, consisted of gray, fine-coarse sand with varying amounts of silty clay and fine to coarse gravel. The indigenous soils are classified as a SC-SM group soil using the Unified Soil Classification System (ASTM D2488). The indigenous soils extend to boring completion at both test boring locations. As mentioned above, indigenous soils were not encountered at test boring location B-6.

Standard Penetration Test (SPT) “N” values obtained in the indigenous sand soils ranged from 4 to 40 indicating the relative density of the generally low to non-plastic soils varies from loose to compact.

Auger refusal was met at a depth of about 4.0 feet, at test boring B-6, corresponding to El. 872.9 feet. The auger refusal conditions suggest the possible presence of bedrock. Rock coring, however, was not performed, therefore, the exact nature of the refusal material encountered was not definitively confirmed (i.e. bedrock or possible cobble/boulder obstruction).

No freestanding water was present in any of the utility test borings immediately following the completion of overburden drilling and sampling. It is possible that groundwater, if present, did not have sufficient time to accumulate in the test holes prior to the water level measurements.

Some localized perched or trapped groundwater may be present at various times and locations in the fill and indigenous soils, which overlie less permeable soils or bedrock.

## **5.00 GEOTECHNICAL CONSIDERATIONS AND RECOMMENDATIONS**

### **5.10 MAINTENANCE BUILDING (B-1)**

Spread foundations for the proposed Storage Building should bear on suitable, relatively undisturbed indigenous soil bearing grades or on Engineered Fill (i.e. compacted Structural Fill or suitable flowable backfill) following removal of all topsoil, fill and any unsuitable indigenous soils, which extend below the proposed footing. Suitable indigenous soil bearing grades should consist of indigenous, firm to very compact clayey-silty sand soils, which are free of fill, organics, soft, loose, wet or otherwise deleterious conditions.

The suitable indigenous soil bearing subgrades were encountered at a depth of about 3.0 feet (El. 867.9 feet) at test boring location B-1. Subsurface conditions may vary away from the exploration location and therefore could require adjustments in the suitable subgrade elevation based on actual conditions encountered at the time of construction. Accordingly, close inspection of the foundation bearing grades, by qualified geotechnical personnel, is recommended at the time of construction.

If necessary, the foundations can be constructed on Engineered Fill (i.e. compacted Structural Fill, or flowable backfill) placed over suitable, undisturbed, indigenous soil subgrades, following removal of any fill and any unsuitable indigenous soils, as noted above.

If Structural Fill is used as the Engineered Fill beneath spread foundations, it must be placed beyond the foundation limits a horizontal distance equal to at least 0.5 times the thickness of the Structural Fill layer beneath the foundation. Excavations, therefore, will need to be planned and sized accordingly. Recommendations for Structural Fill material along with its placement and compaction are presented in Appendix C.

Flowable backfill material, if used, should be a non-swelling type material and should have a minimum 28-day compressive strength (f'c) of 250 pounds per square inch (psi). The flowable backfill should extend at least 12 inches horizontally beyond the foundation limits for its entire depth.

Spread foundations constructed on suitable indigenous soil bearing grades or on properly constructed Engineered Fill materials placed over the suitable bearing grades can be sized based on a maximum net allowable bearing pressure of 2,500 pounds per square foot (psf).

Continuous wall foundations should be at least 2.0 feet in width and any column/individual foundations should be at least 3.0 feet in width. Any interior foundations should be embedded a minimum of 1.5 feet below the finished floor elevation to develop adequate bearing capacity. Exterior foundations should be embedded a minimum of 4.0 feet below finished exterior grades for frost protection. All foundations, however, must bear at or below the suitable bearing grades in accordance with the recommendations above.

It is estimated that spread foundations sized and properly constructed in accordance with these recommendations will undergo a total settlement of less than ½-inch.

#### 5.20 MAIN EDUCATIONAL BUILDING (B-2)

Based on the relatively shallow depth to bedrock, and the lack of suitable indigenous soils present at test boring location B-2, which is located in the main educational building, spread foundations are expected to bear directly on the existing bedrock surface. It is possible that some bedrock excavation may be required for construction of underground utilities and any required deeper

foundation elements. In general it appears it will be necessary to loosen the bedrock prior to excavation, using hydraulic/pneumatic breakers or rock grinders. The use of drilling and blasting methods to loosen the rock within the proposed building area is not recommended because it is possible that some uncontrolled rock heave or over-breakage may occur that could impact the integrity of the foundation bearing grades.

Spread foundations should bear directly on the Limestone bedrock, following excavation and removal of the fill and native overburden soils, which overlie the bedrock surface, and if necessary, any required bedrock excavation. It is recommended that the foundations for an individual structure do not bear partially on bedrock and partially on the indigenous soils due to the potential for differential settlement to occur. Therefore, all foundations should extend to the top of bedrock. Accordingly, the proposed foundations may need to be lowered in order to bear on the bedrock surface. Alternatively, a lean concrete fill ( $f'c > 1,000$  psi) could be placed over the bedrock and the foundation constructed on the lean concrete fill, at its planned bearing elevation.

It is noted that only one test boring was completed in the proposed main educational center building. Based on the conditions encountered at test boring B-2, the bedrock is present at about El. 864.8 feet. Bedrock was encountered at an elevation of 856.9 feet at test boring location B-1, which was completed in the proposed maintenance building. Therefore, the actual top of the bedrock surface across the footprint of the main building is unknown, and it appears the bedrock elevation drops down towards the west. It may be beneficial to perform several test pits within the footprint of the proposed building structure, especially on the western portion of the site, to determine the amount of undercutting that could become necessary to bear all foundations on the bedrock surface.

In all cases the bedrock bearing grade surfaces should be free of soil material and loose or fractured rock particles. It may also be desirable to level the bedrock bearing surface with a lean concrete “mud mat”, prior to construction of the foundations.

Spread foundations constructed on clean sound bedrock, can be sized based on a maximum net allowable bearing pressure in excess of 10 tons per square foot (tsf). Continuous wall footings should be at least 1.5 feet in width and individual column footings should be at least 2.0 feet in width. Based on the anticipated building loads, actual foundation bearing pressures are expected to be significantly less than 10 tsf.

The recommended foundation embedment for foundations bearing on soil is 4.0 feet below the finished exterior grades, for frost protection. Bearing the foundations directly on clean suitable bedrock or on a lean concrete “mud mat”, placed over clean sound bedrock with an embedment of less than 4.0 feet should be suitable for frost protection in this case. However, the local code enforcement official/building inspector (City of Lowville) should be consulted to confirm that additional embedment or rock anchoring is not necessary, if the resulting embedment depth is less than 4.0 feet with respect to the final site grades.

Foundations, which are sized and constructed in accordance with our recommendations, should undergo insignificant total settlement.

#### 5.30 SLAB-ON-GRADE FLOOR DESIGN

The slab-on-grade floors for the proposed buildings can be constructed over the existing fill and indigenous soils following proper subgrade preparation as outlined in Section 5.50.3. It is noted the fill soils contained trace amounts of organics, and it should be anticipated that the upper near surface indigenous soils have been disturbed due to past agricultural uses of the site, and therefore, stripping of the site beyond the surface topsoil/organic soils may be necessary in some areas to remove all organics.

A minimum of 8-inches of Subbase Stone, as described in Appendix C, is recommended beneath lightly loaded floor slabs. A minimum of 12-inches of Subbase Stone is recommended beneath the heavily loaded floor slabs such as the garage floors, storage areas, mechanical rooms, etc.

Floor slabs constructed as slab-on-grade can be designed using a modulus of subgrade reaction of 150 pounds per cubic inch at the top of the Subbase Stone layer. It is recommended that the slab-on-grade be constructed such that it floats on the subbase and subgrades and is not structurally connected to, or resting directly on, perimeter walls or column footings in order to limit differential settlement effects, unless the interface connection is properly designed with appropriate reinforcing to limit such effects.

We note that the above subbase stone thicknesses are not designed for carrying construction vehicle loads. Therefore, it may be desirable for the Contractor to increase the Subbase thickness within the building pad areas to provide a suitable working surface to stage the construction, carry construction vehicle loads and protect the underlying subgrades. This will be particularly important if construction

proceeds during seasonally wet periods. The additional subbase stone material could then be removed in preparation for the actual floor construction and re-used as foundation backfill, pavement area subbase or as otherwise determined appropriate.

#### 5.40 SEISMIC DESIGN CONSIDERATIONS

Based on the subsurface conditions encountered in test borings completed within the proposed maintenance building and main educational center building, the project site can be classified as Seismic Site Class “B” in accordance with ASCE 7, Table 20.3-1, as referenced in the Building Code of New York State (IBC 2015). Therefore, seismic design can be based on this seismic site classification for these buildings only.

The spectral response accelerations in the area of the project site were obtained by Empire using the United States Geological Survey (USGS) web site application (<http://earthquake.usgs.gov/designmaps/us/application.php>). The accelerations are based on the 2008 USGS Seismic Hazard Data - Risk Targeted Maximum Considered Earthquake Ground Motion Response Acceleration Maps, as presented in the Building Code of New York State (IBC 2015).

The spectral response accelerations calculated from this application for Site Class “B” soils are 0.219g for the short period (0.2 second) response ( $S_S$ ) and 0.079g for the one second response ( $S_1$ ). Accordingly, the corresponding five percent damped design spectral response accelerations ( $S_{DS}$  and  $S_{D1}$ ) are as follows:

- $S_{DS}$  - 0.146g
- $S_{D1}$  - 0.053g

#### 5.50 SITE PREPARATION AND CONSTRUCTION

##### 5.50.1 Construction Dewatering

Based on the water level observations made in the test borings, it appears that a permanent general groundwater zone should not be encountered within the excavations for foundation or utility construction. It is possible, however, that some localized zones of groundwater could be present within the fill, indigenous soils and bedrock, at various times, locations and depths. Such localized conditions can

be particularly more prevalent following heavy or extended periods of precipitation and during seasonally wet periods, and therefore should be anticipated.

Accordingly, dewatering should be implemented, as necessary, in conjunction with excavation work such that the work generally proceeds in the dry. Groundwater levels should be maintained below the proposed excavation bottom. It is anticipated that diversion berms, proper site grading, cut-off trenches, and sump and pump methods of dewatering should be sufficient to control surface water and any localized groundwater conditions, should they be encountered. Surface water and groundwater dewatering plans should include implementation of measures to control erosion, sedimentation, and the migration of soil fines.

#### 5.50.2 Excavation and Foundation Construction

Excavation to the proposed bearing grades for the maintenance building foundation construction should be performed using a method which reduces disturbance to the bearing grade soils. All organic, fill, disturbed or otherwise unsuitable soil material should be removed in its entirety. The indigenous soil bearing grades should be observed and evaluated by a representative of Empire prior to placement of the foundation or engineered fill materials. Placement and compaction of Structural Fill beneath foundations should also be observed and tested by a representative of Empire.

Any required excavation of the bedrock for the main building, if necessary to establish foundation bearing grades or for utility construction, should be performed using methods, which minimize disturbance to the bedrock bearing grades. Therefore, it is recommended that bedrock excavation for proposed foundations be done using a pneumatic or hydraulic breaker or rock grinder, to loosen the bedrock for excavation.

All loose, disturbed soil and loose or fractured rock material should be removed from the foundation bearing grades. Following excavation and cleaning of the bedrock surface, the prepared bearing grades should be observed and evaluated by a representative of Empire. Placement of a lean concrete ( $f'c > 1,000$  psi) fill or "mud mat", following observation of the bearing grade may be desirable to level the bearing grade for foundation construction.

After completion of the foundation construction, the excavations should be backfilled as soon as possible and prior to construction of the superstructure. It is recommended that the foundation excavations, within slab-on-grade and pavement areas, be backfilled with a Structural Fill or Suitable Granular Fill, as recommended in

Appendix C. The backfill should be placed in lifts and properly compacted. Care must be exercised when placing and compacting the fill against the foundation walls so as not to induce unbalanced lateral loads on the walls.

#### 5.50.3 Subgrade Preparation for Slab-on-Grade Construction

The site preparation work should be performed during dry periods to minimize potential degradation of the subgrade soils and undercuts which may be required to establish and maintain a stable subgrade for construction. Construction during the early spring, late fall or winter months is not recommended. It should be understood that the existing subgrade soils will be sensitive and can be expected to degrade and lose strength when they are wet and disturbed by construction equipment traffic.

Accordingly, efforts should be made to maintain the subgrades in a dry and stable condition at all times, and minimize construction traffic directly over these soils. These efforts should include proper grading to divert surface runoff away from the construction areas, sloping of the subgrade and “sealing” of the surface, at the end of each day or when rain is anticipated, with a smooth drum roller to promote runoff, and restricting construction equipment traffic from traveling directly over the subgrade surfaces, especially when they are wet.

The contractor should take precautions to limit construction traffic over the subgrades. Any subgrades, including existing soil subgrades or new subbase, which become damaged, rutted or unstable should be undercut and repaired as necessary prior to placement of the subbase course or concrete.

All trees, vegetation, topsoil, organics, and any other deleterious materials within the proposed slab on grade areas should be removed. Following stripping of the surface materials and any required excavation to the proposed subgrade, the exposed subgrades should be proof-rolled. The proof-rolling should be performed prior to any fill placement, using a smooth drum roller weighing at least 10 tons. The roller should be operated in the static mode and complete at least two (2) passes over the exposed subgrades.

The subgrade proof-rolling should be done under the guidance of, and observed by, a representative of Empire. Any areas, which appear wet, loose, soft, unstable or otherwise unsuitable, should be undercut. As mentioned above, trace amounts of organics were noted within the upper subgrade soils at both building test boring locations. In addition, the upper subgrade soils present are of a loose relative

density. Therefore, undercutting to remove these organics and upper loose soil conditions should be anticipated. Over excavation, which may be required as the result of the proof-rolling, should be performed based on evaluation of the conditions by Empire.

The placement of an initial lift of oversized stone fill material (i.e. “surge stone”, No.3 & No.4 Stone, 6” crushed stone, etc.), possibly encased in stabilization geotextile top and bottom, may be necessary in some cases to help stabilize the subgrades prior to the subgrade fill placement, particularly if the existing subgrades are in a soft/wet condition.

Suitable Granular Fill or suitable on-site soil materials, as described in Appendix C can be used to raise existing site grades for building pad areas. All fill placement to raise existing site grades should be carefully monitored and tested as recommended in Appendix C. It is recommended that utility trenches located within slab on grade, driveway and road areas be backfilled with controlled Structural Fill.

#### 5.50.4 Utility Construction Considerations

The following geotechnical considerations are provided with respect to design and construction of the new gravity sanitary sewer line. These considerations are based on the conditions encountered in test borings B-4 through B-6 completed for this project.

1. The soil conditions encountered in borings B-4 and B-5 suggest that the utility line can be installed by conventional earth excavation and backfilling methods. However, auger refusal (anticipated bedrock) appears may have been encountered at a depth of about 4 feet at test boring B-6. It is anticipated that a pneumatic or hydraulic breaker or rock grinder will be necessary to loosen the bedrock for excavation.

Drilling and blasting methods may be acceptable for underground utility construction beyond existing building and structure foundation locations provided that it does not impact the foundation bearing grades or other adjacent existing structures/utilities. Accordingly, we would recommend drilling and blasting methods not be permitted within about 20 to 25 feet of these structures. Should it be necessary to consider drilling and blasting methods, it is recommended that it be done by an experienced and licensed blaster using procedures, which will prevent uncontrolled rock heave and/or degradation of the bedrock subgrades. In addition vibrations from blasting

must be controlled so as not to impact or damage nearby structures and utilities. The excavation effort required appears will be dependent on the actual location and design depth of the utility line.

2. In all cases, excavations must be properly sloped back, shored and/or dewatered as necessary to maintain stability and safety, in accordance with OSHA Standards. The contractor must confirm the OSHA soil classification and excavation requirements at the time of construction based on actual location and soil conditions present. The contractor shall be solely responsible for all excavation safety.
3. The use of a pre-fabricated shield/trench box system can be used in areas where the protection of adjacent existing structures, utilities and roadways is not critical and the short-term stability of the excavation slope can be achieved. Properly braced excavation shoring should be required at locations where existing structures, utilities, roadways, etc. must be protected from potential detrimental soil movement as the result of soil relaxation / stress relief.
4. The composition of the fill and indigenous soils encountered in boring B-5 are generally considered to be conducive for the use of standard pipe bedding materials and thicknesses. However, the loose soil conditions present in test boring B-4, including the trace amounts of organics noted within the fill at borings B-5 and B-6, could result in the placement of additional bedding material to establish suitable stable subgrades. Accordingly, conditions where undercutting may be necessary, would include areas where soft, loose, wet, organic or otherwise unsuitable subgrade soils are present or where the pipeline would cross or intercept the backfilled excavations of previously installed deeper utilities and structures.
5. Perched groundwater may also be present and should be anticipated in the bedding and backfill of existing underground utilities, which are surrounded by generally lower permeability soils. These conditions may be encountered where the new pipeline is adjacent to or crosses existing utility trenches. The amount of groundwater, which may be present, can vary depending on conditions such as soil permeability, precipitation and seasonal conditions. Therefore, it should be anticipated that some localized dewatering may be necessary to properly complete the pipe installation work.

6. Generally it is expected that excavations which encounter groundwater conditions, where groundwater seepage is minor, can be dewatered with the use of conventional sump and pump methods of dewatering. In such cases, the groundwater should be depressed below the excavation bottom such that water does not accumulate on the excavation subgrades.

The borings are widely spaced and the subsurface conditions can vary between and away from the boring locations. Accordingly, variations and/or unforeseen conditions may be encountered during construction. Such conditions, if they occur, may require adjustments or modifications in the design, as well as changes to the means and methods of construction. Therefore, close inspection of the sewer installation excavations, by qualified personnel experienced in geotechnical and site work construction, is recommended at the time of construction.

## **6.00 CONCLUDING REMARKS**

This report was prepared to assist in planning the design and construction of the proposed Lewis County Jefferson Community College (JCC) Educational Center Project planned off of East Road in Lowville, New York. The report has been prepared for the exclusive use of C&S Companies and other members of the design team, for specific application to this site and this project only.

The recommendations were prepared based on Empire Geo-Services, Inc.'s understanding of the proposed project, as described herein, and through the application of generally accepted soils and foundation engineering practices. Empire Geo-Services, Inc. should be consulted with any questions regarding the interpretation of the findings of our work, and/or the geotechnical considerations and recommendations presented. In addition, the recommendations presented are provided as guidance to the designer and should not be considered a project specification. No warranties, expressed or implied are made by the conclusions, opinions, recommendations or services provided.

Empire Geo-Services, Inc. should be informed of any changes to the planned construction so that it may be determined if any changes to the recommendations presented in this report are necessary. Empire Geo-Services, Inc. should also be retained to review final plans and specifications and to monitor the foundation and site work construction to verify that the recommendations were properly interpreted and implemented, as appropriate.

Important information regarding the use and interpretation of this report is presented in Appendix D.

Respectfully Submitted:

EMPIRE GEO-SERVICES, INC.

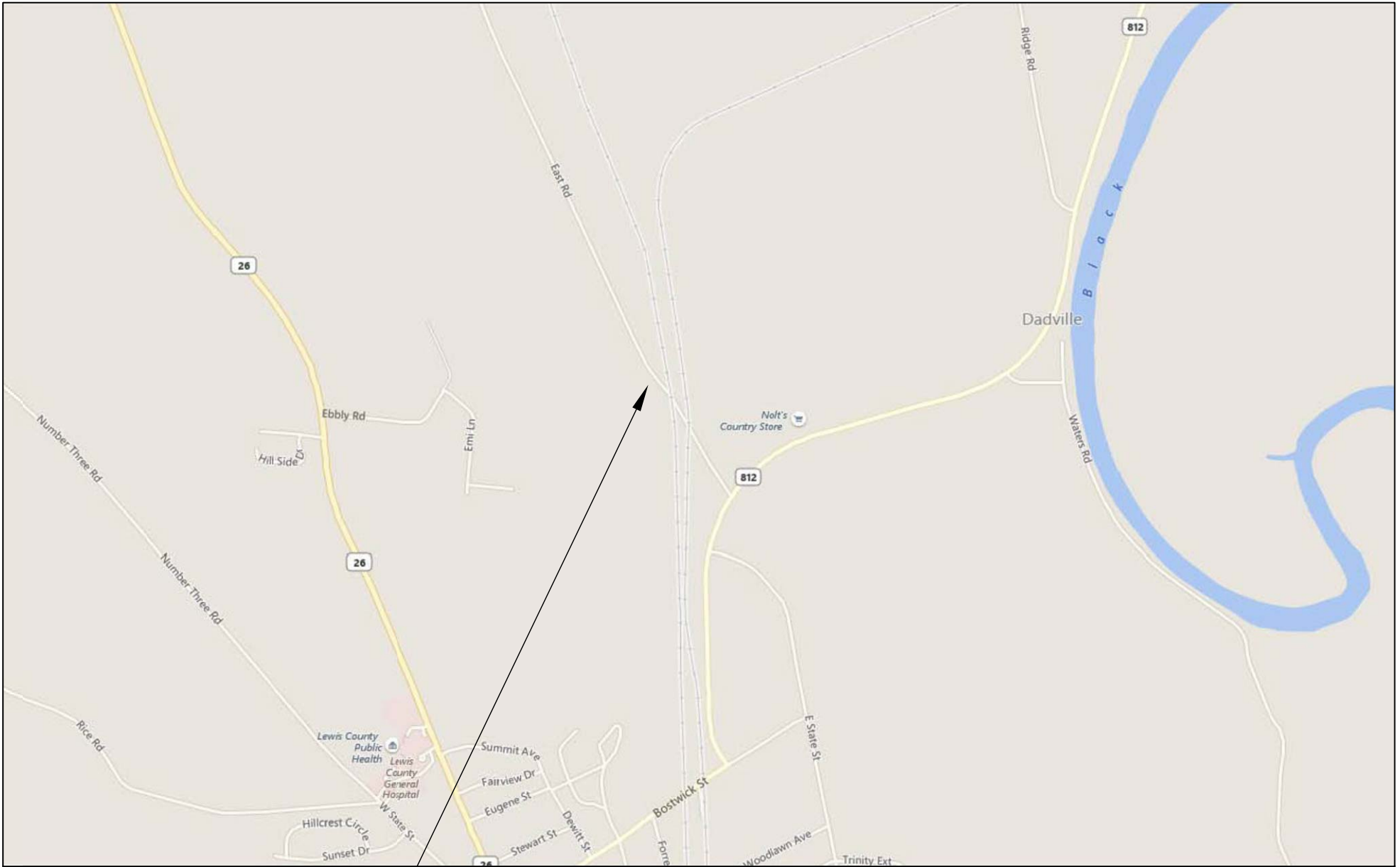


Wanda M. Allen, P.E.  
Geotechnical Engineer



John J. Danzer, P.E.  
Senior Geotechnical Engineer and  
Project Reviewer

## FIGURES



APPROXIMATE PROJECT SITE LOCATION



PROPOSED LEWIS COUNTY JEFFERSON COMMUNITY COLLEGE  
EDUCATIONAL CENTER PROJECT  
EAST ROAD  
LOWVILLE, NEW YORK

**NOTE:**

SITE LOCATION PLAN DEVELOPED FROM BING  
MAPS - MICROSOFT CORPORATION © 2018

SITE LOCATION PLAN

DR BY: WMA

SCALE: NTS

PROJECT NO.: BE-18-067

CHKD BY: JJD

DATE: 05/22/2018

FIGURE NO: 1



SUBSURFACE EXPLORATION PLAN

PROPOSED LEWIS COUNTY JEFFERSON COMMUNITY COLLEGE  
EDUCATIONAL CENTER PROJECT  
EAST ROAD  
LOWVILLE, NEW YORK

|              |                  |                        |
|--------------|------------------|------------------------|
| DR BY: WMA   | SCALE: 1" ~ 100' | PROJECT NO.: BE-18-067 |
| CHKD BY: JJD | DATE: 05/22/2018 | FIGURE NO: 2           |

**LEGEND:**

B-1

INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING.

I-1

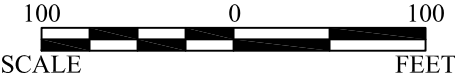
INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING WITH AN ADJACENT INFILTRATION TEST.

BM

BENCHMARK: "X" CHISELED IN CORNER TOP OF CONCRETE SPILLWAY STRUCTURE (BENCHMARK BM-1 AS DESIGNATED BY OTHERS). REPORTED ELEVATION = 872.33 FEET.

N

- NOTES:**
- FIGURE DEVELOPED FROM MAY 10, 2018 "BORING LOCATION PLAN", DRAWING C-101, PREPARED BY C&S COMPANIES.
  - TEST BORING B-3 DOES NOT EXIST



**APPENDIX A**  
**SUBSURFACE EXPLORATION LOGS**

## GENERAL INFORMATION & KEY TO SUBSURFACE LOGS

The Subsurface Logs attached to this report present the observations and mechanical data collected by the driller at the site, supplemented by classification of the material removed from the borings as determined through visual identification by technicians in the laboratory. It is cautioned that the materials removed from the borings represent only a fraction of the total volume of the deposits at the site and may not necessarily be representative of the subsurface condition between adjacent borings or between the sampled intervals. The data presented of the Subsurface Logs together with the recovered samples provide a basis for evaluating the character of the subsurface conditions relative to the project. The evaluation must consider all the recorded details and their procedures to more accurately evaluate the subsurface conditions. Any evaluation of the contents of this report and recovered samples must be performed by qualified professionals. The following information defines some of the procedures and terms used of the Subsurface Logs to describe the conditions encountered, consistent with the numbered identifiers shown on the Key opposite this page.

1. The figures in the Depth column define the scale of the Subsurface Log.
2. The Samples column shows, graphically, the depth range from which a sample was recovered. See Table I for descriptions of the symbols used to represent the various types of samples.
3. The Sample No. is used for identification on sample containers and/or Laboratory Test Reports.
4. Blows on Sampler – shows the results of the “Penetration Test”, recording the number of blows required to drive a split spoon sampler into the soil. The number of blows required for each six inches is recorded. The first 6 inches of penetration is considered a seating drive. The number of blows required for the second and third 6 inches of penetration is termed the penetration resistance,  $N$ .
5. Blows on Casing – Shows the number of blows required to advance the casing a distance of 12 inches. The casing size, hammer weight, and length of drop are noted at the bottom of the Subsurface Log. If the casing is advanced by means other than driving, the method of advancement will be indicated in the Notes column or under the Method of Investigation at the bottom of the Subsurface Log. Alternatively, sample recovery may be shown in this column or other data consistent with the column heading.
6. All recovered soil samples are reviewed in the laboratory by an engineering technician, geologist, or geotechnical engineer, unless noted otherwise. Visual descriptions are made on the basis of a combination of the driller's field descriptions and noted observations together with the sample as received in the laboratory. The method of visual classification is based primarily on the Unified Soil Classification System (ASTM D 2487) with regard to the particle size and plasticity (See Table No. II), and the Unified Soil Classification System group symbols for the soil types are sometimes included with the soil classification. Additionally, the relative portion, by weight, of two or more soil types is described for granular soils in accordance with “Suggested Methods of Test for Identification of Soils” by D.M. Burmister, ASTM Special Technical Publication 479, June 1970. (See Table No. III). Description of the relative soil density or consistency is based upon the penetration records as defined in Table No. IV. The description of the soil moisture is based upon the relative wetness of the soil as recovered and is described as dry, moist, wet, and saturated. Water introduced into the boring either naturally or during drilling may have affected the moisture condition of the recovered sample. Special terms are used as required to describe soil deposition in greater detail; several such terms are listed in Table V. When sampling gravelly soils with a standard two inch diameter split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter. The presence of boulders and large gravel is sometimes, but not necessarily, detected by an evaluation of the casing and sampler blows or through the “action” of the drill rig as reported by the driller.
7. Rock description is based on review of the recovered rock core and the driller's notes. Frequently used rock classification terms are included in Table VI.
8. The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Solid stratification lines delineate apparent changes in soil type, based upon review of recovered soil samples and the driller's notes. Dashed lines convey a lesser degree of certainty with respect to either a change in soil type or where such change may occur.
9. Miscellaneous observations and procedures noted by the driller are shown in this column, including water level observations. It is important to realize the reliability of the water level observations depends upon the soil type (water does not readily stabilize in a hole through fine grained soils), and that any drill water used to advance the boring may have influenced the observations. The ground water level will fluctuate seasonally, typically. One or more perched or trapped water levels may exist in the ground seasonally. All the available readings should be evaluated. If definite conclusions cannot be made, it is often prudent to examine the conditions more thoroughly through test pit excavations or groundwater observation wells.
10. The length of core run is defined as the length of penetration of the core barrel. Core recovery is the length of core recovered divided by the core run. The RQD (Rock Quality Designation) is the total length of pieces of NX core exceeding 4 inches divided by the core run. The size core barrel used is also noted in the Method of Investigation at the bottom of the Subsurface Log.

DATE \_\_\_\_\_

STARTED \_\_\_\_\_

FINISHED \_\_\_\_\_

SHEET \_\_\_\_\_ OF \_\_\_\_\_



# SJB SERVICES, INC. SUBSURFACE LOG

PROJ. No. \_\_\_\_\_

HOLE No. \_\_\_\_\_

SURF. ELEV. \_\_\_\_\_

G.W. DEPTH \_\_\_\_\_

PROJECT \_\_\_\_\_ LOCATION \_\_\_\_\_

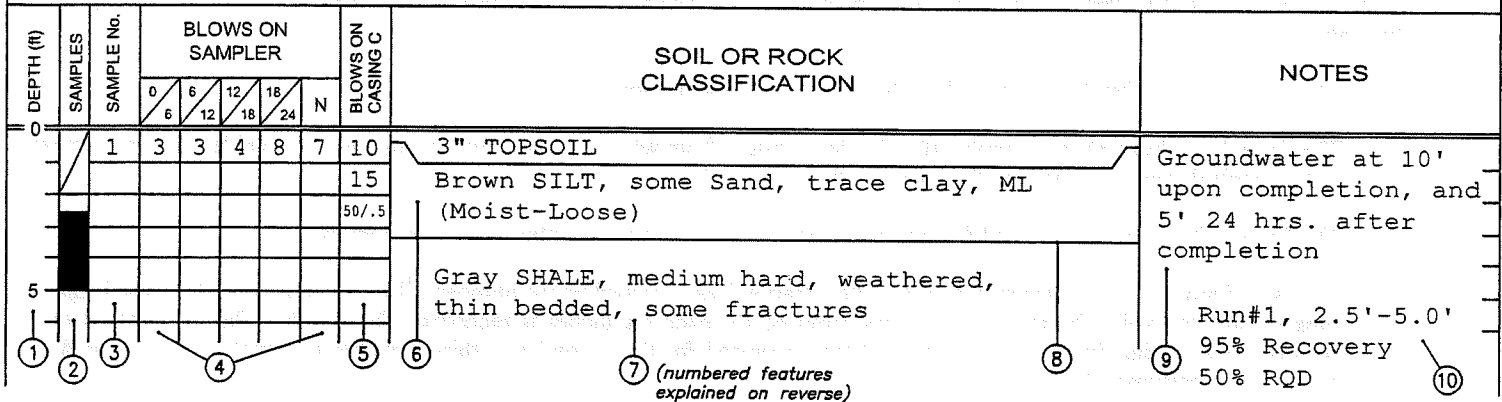


TABLE I

|  |                          |
|--|--------------------------|
|  | Split Spoon Sample       |
|  | Shelby Tube Sample       |
|  | Geoprobe Macro-Core      |
|  | Auger or Test Pit Sample |
|  | Rock Core                |

TABLE II

| Identification of soil type is made on basis of an estimate of particle sizes, and in the case of fine grained soils also on basis of plasticity. |                    |                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------|
| Soil Type                                                                                                                                         | Soil Particle Size |                           |
| Boulder                                                                                                                                           | >12"               |                           |
| Cobble                                                                                                                                            | 3" - 12"           |                           |
| Gravel - Coarse                                                                                                                                   | 3" - 3/4"          | Coarse Grained (Granular) |
| - Fine                                                                                                                                            | 3/4" - #4          |                           |
| Sand - Coarse                                                                                                                                     | #4 - #10           |                           |
| - Medium                                                                                                                                          | #10 - #40          |                           |
| - Fine                                                                                                                                            | #40 - #200         |                           |
| Silt - Non Plastic (Granular)                                                                                                                     | <#200              | Fine Grained              |
| Clay - Plastic (Cohesive)                                                                                                                         |                    |                           |

TABLE III

The following terms are used in classifying soils consisting of mixtures of two or more soil types. The estimate is based on weight of total sample.

| Term     | Percent of Total Sample |
|----------|-------------------------|
| "and"    | 35 - 50                 |
| "some"   | 20 - 35                 |
| "little" | 10 - 20                 |
| "trace"  | less than 10            |

(When sampling gravelly soils with a standard split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter.)

TABLE IV

The relative compactness or consistency is described in accordance with the following terms:

| Granular Soils |                   | Cohesive Soils |                   |
|----------------|-------------------|----------------|-------------------|
| Term           | Blows per Foot, N | Term           | Blows per Foot, N |
| Loose          | 0 - 4             | Very Soft      | 0 - 2             |
| Loose          | 4 - 10            | Soft           | 2 - 4             |
| Firm           | 10 - 30           | Medium         | 4 - 8             |
| Compact        | 30 - 50           | Stiff          | 8 - 15            |
| Very Compact   | >50               | Very Stiff     | 15 - 30           |
|                |                   | Hard           | >30               |

(Large particles in the soils will often significantly influence the blows per foot recorded during the penetration test)

TABLE V

|                  |                                                                 |
|------------------|-----------------------------------------------------------------|
| <b>Varved</b>    | Horizontal uniform layers or seams of soil(s).                  |
| <b>Layer</b>     | Soil deposit more than 6" thick.                                |
| <b>Seam</b>      | Soil deposit less than 6" thick.                                |
| <b>Parting</b>   | Soil deposit less than 1/8" thick.                              |
| <b>Laminated</b> | Irregular, horizontal and angled seams and partings of soil(s). |

TABLE VI

| Rock Classification Term | Meaning                                                                                                                             | Rock Classification Term | Meaning                                                                                                               |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Hardness                 | - Soft<br>- Medium Hard<br>- Hard<br>- Very Hard                                                                                    | Bedding                  | - Laminated (<1")<br>- Thin Bedded (1" - 4")<br>- Bedded (4" - 12")<br>- Thick Bedded (12" - 36")<br>- Massive (>36") |
| Weathering               | - Very Weathered<br>- Weathered<br>- Sound                                                                                          |                          | Natural breaks in Rock Layers                                                                                         |
|                          | Scratched by fingernail<br>Scratched easily by penknife<br>Scratched with difficulty by penknife<br>Cannot be scratched by penknife |                          | (Fracturing refers to natural breaks in the rock oriented at some angle to the rock layers)                           |
|                          | Judged from the relative amounts of disintegration, iron staining, core recovery, clay seams, etc.                                  |                          |                                                                                                                       |

|                                                                                       |  |                                                    |  |                                                                                    |  |                                                                                    |  |
|---------------------------------------------------------------------------------------|--|----------------------------------------------------|--|------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------|--|
| DATE<br>START <u>5/9/2018</u><br>FINISH <u>5/9/2018</u><br>SHEET <u>1</u> OF <u>1</u> |  | <b>SJB SERVICES, INC.</b><br><b>SUBSURFACE LOG</b> |  |  |  | HOLE NO. <u>B-1</u><br>SURF. ELEV <u>870.9' +/-</u><br>G.W. DEPTH <u>See Notes</u> |  |
| PROJECT: <u>PROPOSED JCC EDUCATION CENTER</u>                                         |  | LOCATION: <u>EAST ROAD</u>                         |  |                                                                                    |  |                                                                                    |  |
| PROJ. NO.: <u>BE-18-067</u>                                                           |  | <u>LOWVILLE, NEW YORK</u>                          |  |                                                                                    |  |                                                                                    |  |

| DEPTH<br>FT. | SMPL<br>NO. | BLOWS ON SAMPLER |        |       |     |  | SOIL OR ROCK<br>CLASSIFICATION                                                                                     | NOTES                                                                    |
|--------------|-------------|------------------|--------|-------|-----|--|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
|              |             | 0/6              | 6/12   | 12/18 | N   |  |                                                                                                                    |                                                                          |
|              | 1           | 1                | 3      |       |     |  | TOPSOIL<br>Dark Brown Silty CLAY, some f-c Sand, tr.organics (moist, FILL)                                         | Driller noted approx. 12" of Topsoil at the surface                      |
|              |             | 3                | 5      |       | 6   |  |                                                                                                                    |                                                                          |
|              | 2           | 3                | 5      |       |     |  | Gray f-c SAND and Silty Clay, little fine Gravel (moist-wet, firm, SC-SM)                                          |                                                                          |
| 5            |             | 8                | 10     |       | 13  |  |                                                                                                                    | REF = Sample Spoon Refusal                                               |
|              | 3           | 8                | 50/0.4 |       | REF |  | Contains some f-c Gravel<br>Contains some Silty Clay                                                               |                                                                          |
|              |             |                  |        |       |     |  |                                                                                                                    |                                                                          |
| 10           | 4           | 10               | 16     |       |     |  | Contains little fine Gravel (compact)                                                                              | Driller augered through cobbles and boulders from 4.5' to 8.0'           |
|              |             | 19               | 20     |       | 35  |  |                                                                                                                    |                                                                          |
|              | 5           | 25               | 24     |       |     |  | Contains some f-c Gravel (v.compact)                                                                               |                                                                          |
|              |             | 50/0.2           |        |       | REF |  |                                                                                                                    | No Free Standing Water encountered before Coring                         |
|              |             |                  |        |       |     |  |                                                                                                                    |                                                                          |
|              |             |                  |        |       |     |  |                                                                                                                    |                                                                          |
| 15           |             |                  |        |       |     |  | Gray LIMESTONE Rock, hard, weathered to sound, thinly to thickly bedded, highly weathered seam from 14.5' to 14.9' | Free Standing Water recorded at 7' after Coring<br>NQ '2' Size Rock Core |
|              |             |                  |        |       |     |  |                                                                                                                    |                                                                          |
|              |             |                  |        |       |     |  |                                                                                                                    |                                                                          |
| 20           |             |                  |        |       |     |  | Boring Complete at 19.0'                                                                                           |                                                                          |
|              |             |                  |        |       |     |  |                                                                                                                    |                                                                          |
|              |             |                  |        |       |     |  |                                                                                                                    |                                                                          |

|                                                                                                 |                                      |                                 |
|-------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------|
| N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW |                                      | CLASSIFIED BY: <u>Geologist</u> |
| DRILLER: <u>B. DELUDE</u>                                                                       | DRILL RIG TYPE: <u>DIEDRICH D-50</u> |                                 |
| METHOD OF INVESTIGATION <u>ASTM D-1586 USING HOLLOW STEM AUGERS</u>                             |                                      |                                 |

|        |                  |
|--------|------------------|
| START  | <u>5/10/2018</u> |
| FINISH | <u>5/11/2018</u> |
| SHEET  | 1 OF 1           |



|            |                   |
|------------|-------------------|
| HOLE NO.   | <u>B-2</u>        |
| SURF. ELEV | <u>868.8' +/-</u> |
| G.W. DEPTH | See Notes         |

| DEPTH<br>FT. |                                                                                   | SMPL<br>NO. | BLOWS ON SAMPLER |      |       |     |                                                            | SOIL OR ROCK<br>CLASSIFICATION                                                                          | NOTES                                                   |
|--------------|-----------------------------------------------------------------------------------|-------------|------------------|------|-------|-----|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
|              |                                                                                   |             | 0/6              | 6/12 | 12/18 | N   |                                                            |                                                                                                         |                                                         |
| 5            |  | 1           | 1                | 3    |       |     |                                                            | Dark Brown Silty CLAY, some f-c Sand, tr.organics (moist, FILL)                                         | Driller noted approx. 18" of Topsoil at the surface     |
|              |                                                                                   |             | 4                | 5    |       | 7   |                                                            |                                                                                                         |                                                         |
|              |                                                                                   | 2           | 2                | 6    |       |     |                                                            | Gray f-c SAND and Silty Clay, little fine Gravel (moist-wet, SC-SM)                                     | REF = Sample Spoon Refusal<br><br>NQ '2' Size Rock Core |
|              |                                                                                   |             | 50/0.3           |      |       | REF |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     | Gray LIMESTONE Rock, hard, sound, thinly to thickly bedded | RUN #1: 4.0' - 9.0'<br>REC = 100%<br>RQD = 78%                                                          |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
| 10           |                                                                                   |             |                  |      |       |     | Boring Complete at 9.0'                                    | No Free Standing Water encountered before Coring<br><br>No Free Standing Water encountered after Coring |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
| 15           |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
|              |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |
| 20           |                                                                                   |             |                  |      |       |     |                                                            |                                                                                                         |                                                         |

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist  
 DRILLER: B. DELUDE DRILL RIG TYPE : DIEDRICH D-50  
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

|                                                                                         |  |                                                    |  |                                                                                    |  |                                                                                    |  |
|-----------------------------------------------------------------------------------------|--|----------------------------------------------------|--|------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------|--|
| DATE<br>START <u>5/11/2018</u><br>FINISH <u>5/11/2018</u><br>SHEET <u>1</u> OF <u>1</u> |  | <b>SJB SERVICES, INC.</b><br><b>SUBSURFACE LOG</b> |  |  |  | HOLE NO. <u>B-4</u><br>SURF. ELEV <u>837.5' +/-</u><br>G.W. DEPTH <u>See Notes</u> |  |
| PROJECT: <u>PROPOSED JCC EDUCATION CENTER</u>                                           |  | LOCATION: <u>EAST ROAD</u>                         |  |                                                                                    |  |                                                                                    |  |
| PROJ. NO.: <u>BE-18-067</u>                                                             |  | <u>LOWVILLE, NEW YORK</u>                          |  |                                                                                    |  |                                                                                    |  |

| DEPTH<br>FT. | SMPL<br>NO. | BLOWS ON SAMPLER |      |       |    |   | SOIL OR ROCK<br>CLASSIFICATION                                                | NOTES                                                         |  |
|--------------|-------------|------------------|------|-------|----|---|-------------------------------------------------------------------------------|---------------------------------------------------------------|--|
|              |             | 0/6              | 6/12 | 12/18 | N  |   |                                                                               |                                                               |  |
| 5            | 1           | 2                | 2    |       |    |   | Gray f-c SAND and Silty Clay, little fine Gravel<br>(moist-wet, loose, SC-SM) |                                                               |  |
|              |             |                  | 3    | 2     |    | 5 |                                                                               |                                                               |  |
|              | 2           | 1                | 2    |       |    |   |                                                                               |                                                               |  |
|              |             | 2                | 3    |       | 4  |   |                                                                               |                                                               |  |
|              | 3           | 1                | 1    |       |    |   |                                                                               |                                                               |  |
|              |             | 3                | 3    |       | 4  |   |                                                                               |                                                               |  |
|              | 4           | 2                | 3    |       |    |   |                                                                               |                                                               |  |
|              |             | 4                | 4    |       | 7  |   |                                                                               |                                                               |  |
|              | 5           | 3                | 5    |       |    |   |                                                                               |                                                               |  |
|              |             | 4                | 5    |       | 9  |   |                                                                               |                                                               |  |
| 10           | 6           | 7                | 10   |       |    |   | Contains some f-c Gravel<br>Contains some Silty Clay (firm)                   |                                                               |  |
|              |             | 18               | 22   |       | 28 |   |                                                                               |                                                               |  |
|              |             |                  |      |       |    |   |                                                                               |                                                               |  |
|              | 7           | 14               | 17   |       |    |   |                                                                               |                                                               |  |
| 15           |             | 23               | 20   |       | 40 |   | (compact)                                                                     |                                                               |  |
|              |             |                  |      |       |    |   |                                                                               |                                                               |  |
|              |             |                  |      |       |    |   |                                                                               |                                                               |  |
| 20           |             |                  |      |       |    |   | Boring Complete at 15.0'                                                      | No Free Standing<br>Water encountered at<br>Boring Completion |  |
|              |             |                  |      |       |    |   |                                                                               |                                                               |  |
|              |             |                  |      |       |    |   |                                                                               |                                                               |  |
|              |             |                  |      |       |    |   |                                                                               |                                                               |  |
|              |             |                  |      |       |    |   |                                                                               |                                                               |  |

|                                                                                                 |                                       |                                 |
|-------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------|
| N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW |                                       | CLASSIFIED BY: <u>Geologist</u> |
| DRILLER: <u>B. DELUDE</u>                                                                       | DRILL RIG TYPE : <u>DIEDRICH D-50</u> |                                 |
| METHOD OF INVESTIGATION <u>ASTM D-1586 USING HOLLOW STEM AUGERS</u>                             |                                       |                                 |

|                                                                                         |  |                                                    |  |                                                                                    |  |                                                                                    |  |
|-----------------------------------------------------------------------------------------|--|----------------------------------------------------|--|------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------|--|
| DATE<br>START <u>5/11/2018</u><br>FINISH <u>5/11/2018</u><br>SHEET <u>1</u> OF <u>1</u> |  | <b>SJB SERVICES, INC.</b><br><b>SUBSURFACE LOG</b> |  |  |  | HOLE NO. <u>B-5</u><br>SURF. ELEV <u>843.8' +/-</u><br>G.W. DEPTH <u>See Notes</u> |  |
| PROJECT: <u>PROPOSED JCC EDUCATION CENTER</u>                                           |  | LOCATION: <u>EAST ROAD</u>                         |  |                                                                                    |  |                                                                                    |  |
| PROJ. NO.: <u>BE-18-067</u>                                                             |  | <u>LOWVILLE, NEW YORK</u>                          |  |                                                                                    |  |                                                                                    |  |

| DEPTH<br>FT. | SMPL<br>NO. | BLOWS ON SAMPLER |      |       |    | SOIL OR ROCK<br>CLASSIFICATION                                               | NOTES                 |                                                         |
|--------------|-------------|------------------|------|-------|----|------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------|
|              |             | 0/6              | 6/12 | 12/18 | N  |                                                                              |                       |                                                         |
| 5            | 1           | 1                | 3    |       |    | Dark Brown f-c GRAVEL and f-c Sand, tr.silty clay, tr.organics (moist, FILL) | No Recovery Sample #2 |                                                         |
|              |             | 8                | 7    |       | 11 |                                                                              |                       |                                                         |
|              | 2           | 9                | 10   |       |    |                                                                              |                       |                                                         |
|              |             | 9                | 10   |       | 19 |                                                                              |                       |                                                         |
| 10           | 3           | 3                | 7    |       |    | Gray f-c SAND and Silty Clay, little fine Gravel (moist-wet, firm, SC-SM)    |                       |                                                         |
|              |             | 8                | 12   |       | 15 |                                                                              |                       |                                                         |
|              | 4           | 6                | 8    |       |    |                                                                              |                       |                                                         |
|              |             | 14               | 9    |       | 22 |                                                                              |                       |                                                         |
| 15           | 5           | 3                | 3    |       |    | Contains some Silty Clay<br>Contains some f-c Gravel (compact)               |                       |                                                         |
|              |             | 5                | 10   |       | 8  |                                                                              |                       |                                                         |
|              | 6           | 8                | 10   |       |    |                                                                              |                       |                                                         |
|              |             | 19               | 27   |       | 29 |                                                                              |                       |                                                         |
| 20           | 7           | 13               | 18   |       |    | Boring Complete at 15.0'                                                     |                       | No Free Standing Water encountered at Boring Completion |
|              |             | 22               | 24   |       | 40 |                                                                              |                       |                                                         |
|              |             |                  |      |       |    |                                                                              |                       |                                                         |
|              |             |                  |      |       |    |                                                                              |                       |                                                         |

|                                                                                                 |                                       |                                 |
|-------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------|
| N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW |                                       | CLASSIFIED BY: <u>Geologist</u> |
| DRILLER: <u>B. DELUDE</u>                                                                       | DRILL RIG TYPE : <u>DIEDRICH D-50</u> |                                 |
| METHOD OF INVESTIGATION <u>ASTM D-1586 USING HOLLOW STEM AUGERS</u>                             |                                       |                                 |

|                                                                                         |  |                                                    |  |                                                                                    |  |                                                                                    |  |
|-----------------------------------------------------------------------------------------|--|----------------------------------------------------|--|------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------|--|
| DATE<br>START <u>5/11/2018</u><br>FINISH <u>5/11/2018</u><br>SHEET <u>1</u> OF <u>1</u> |  | <b>SJB SERVICES, INC.</b><br><b>SUBSURFACE LOG</b> |  |  |  | HOLE NO. <u>B-6</u><br>SURF. ELEV <u>876.9' +/-</u><br>G.W. DEPTH <u>See Notes</u> |  |
| PROJECT: <u>PROPOSED JCC EDUCATION CENTER</u>                                           |  | LOCATION: <u>EAST ROAD</u>                         |  |                                                                                    |  |                                                                                    |  |
| PROJ. NO.: <u>BE-18-067</u>                                                             |  | <u>LOWVILLE, NEW YORK</u>                          |  |                                                                                    |  |                                                                                    |  |

| DEPTH<br>FT. | SMPL<br>NO. | BLOWS ON SAMPLER |        |       |   |  | SOIL OR ROCK<br>CLASSIFICATION                                                       | NOTES                                                   |
|--------------|-------------|------------------|--------|-------|---|--|--------------------------------------------------------------------------------------|---------------------------------------------------------|
|              |             | 0/6              | 6/12   | 12/18 | N |  |                                                                                      |                                                         |
| 1            | 1           | 1                | 3      |       |   |  | Brown and Gray f-c SAND, some Silty Clay, little fine Gravel (moist, FILL)           |                                                         |
|              |             | 6                | 5      |       | 9 |  |                                                                                      |                                                         |
| 2            | 2           | 6                | 4      |       |   |  | Dark Brown Silty CLAY, some f-c Sand, some f-c Gravel, tr.organics (moist-wet, FILL) |                                                         |
|              |             | 3                | 50/0.4 |       | 7 |  |                                                                                      |                                                         |
| 5            |             |                  |        |       |   |  | Boring Complete with Auger Refusal at 4.0'                                           | No Free Standing Water encountered at Boring Completion |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
| 10           |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
| 15           |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
|              |             |                  |        |       |   |  |                                                                                      |                                                         |
| 20           |             |                  |        |       |   |  |                                                                                      |                                                         |

|                                                                                                 |                                      |                                 |
|-------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------|
| N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW |                                      | CLASSIFIED BY: <u>Geologist</u> |
| DRILLER: <u>B. DELUDE</u>                                                                       | DRILL RIG TYPE: <u>DIEDRICH D-50</u> |                                 |
| METHOD OF INVESTIGATION <u>ASTM D-1586 USING HOLLOW STEM AUGERS</u>                             |                                      |                                 |

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist  
 DRILLER: B. DELUDE DRILL RIG TYPE : DIEDRICH D-50  
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

## **APPENDIX B**

### **INFILTRATION TEST DATA SUMMARY REPORT**



## INFILTRATION TEST DATA SUMMARY

PROJECT: JCC Education Center  
 LOCATION: Lowville, New York  
 PROJECT NO.: BE-18-067

### INFILTRATION

TEST POINT: I-1  
 PRESOAK DATE: 5/10/2018

### TEST DATA

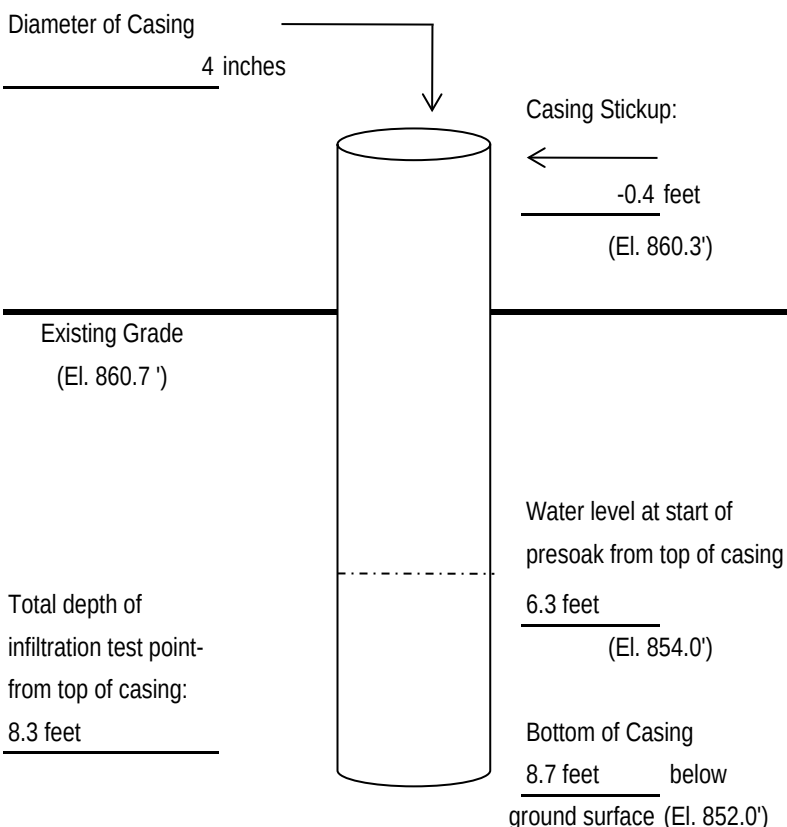
TEST DATE: 5/11/2018  
 START OF TEST TIME: 9:38

IS THERE PRESOAK WATER IN TEST CASING?

YES

IF YES, WHAT DEPTH:

7.3 FEET FROM TOP OF CASING.  
 (El. 853.0')



| RUN NUMBER | START TIME (HOURS) | END TIME (HOURS) | ELAPSED TIME (MIN) | DROP IN WATER LEVEL DURING TEST RUN (FEET) | REFILLED WITH WATER, LEVEL FROM TOP OF CASING (FEET) |
|------------|--------------------|------------------|--------------------|--------------------------------------------|------------------------------------------------------|
| START      |                    |                  |                    |                                            | 6.30                                                 |
| RUN #1     | 9:38am             | 10:38am          | 60                 | 0.08                                       | 6.30                                                 |
| RUN #2     | 10:38am            | 11:38am          | 60                 | 0.05                                       | 6.30                                                 |
| RUN #3     | 11:38am            | 12:38pm          | 60                 | 0.02                                       | 6.30                                                 |
| RUN #4     | 12:38pm            | 1:38pm           | 60                 | 0.02                                       |                                                      |

AVERAGE INFILTRATION RATE 0.0425 FEET PER HOUR  
 AVERAGE INFILTRATION RATE 0.51 INCHES PER HOUR

TESTED BY: M.Billy

**APPENDIX C**

**FILL MATERIAL AND  
EARTHWORK RECOMMENDATIONS**

## APPENDIX C

### FILL MATERIAL AND EARTHWORK RECOMMENDATIONS

#### I. Material Recommendations

##### A. Structural Fill

Structural Fill should consist of a crusher run stone or crushed gravel and sand, free of clay, organics and friable or deleterious particles. As a minimum, the crusher run stone or crushed gravel and sand should meet the requirements of New York State Department of Transportation, Standard Specifications, Item 304.14 – Type 4 Subbase, with the condition that if a gravel and sand product is used (vs. a crusher run stone), the gravel should be a crushed gravel material. Accordingly, the Structural Fill should have the following gradation requirements.

| <u>Sieve Size</u><br><u>Distribution</u> | <u>Percent Finer</u><br><u>by Weight</u> |
|------------------------------------------|------------------------------------------|
| 2 inch                                   | 100                                      |
| ¾ inch                                   | 30-65                                    |
| No. 40                                   | 5-40                                     |
| No. 200                                  | 0-10                                     |

##### B. Subbase Stone

The subbase stone course placed as the aggregate course beneath the slab-on-grade and pavement construction should conform to the same material requirements as Structural Fill, as stated above.

##### C. Suitable Granular Fill

Suitable soil material, well graded from coarse to fine and classified as GW, GP, GM, SW, SP and SM soils using the Unified Soil Classification System (ASTM D-2487) and having no more than 85 percent by weight material passing the No. 4 sieve, no more than 20 percent by weight material passing the No. 200 sieve and which is generally free of particles greater than 6 inches, will be acceptable as Suitable Granular Fill. It should also be free of topsoil, asphalt, concrete rubble, wood, debris, clay and other deleterious materials. Suitable Granular Fill can be used as foundation backfill and as subgrade fill to raise site grades beneath slab-on-grade and pavement construction.

Material meeting the requirements of New York State Department of Transportation, Standard Specifications, Item 203.07 – Select Granular Fill or Item 203.20 Select Granular Subgrade is acceptable for use as Suitable Granular Fill.

## II. Placement and Compaction Requirements

All controlled fill placed beneath foundations, slab-on-grade and pavement construction and beneath utilities should be compacted to a minimum of 95 percent of the maximum dry density as measured by the modified Proctor test (ASTM D1557). Fill placed in non-loaded grass areas can be compacted to a minimum of 90 percent of the maximum dry density (ASTM D1557).

Placement of fill should not exceed a maximum loose lift thickness of 6 to 9 inches with the exception of subbase courses beneath slab-on-grade and pavement construction, which can be placed in a single lift not exceeding 12 inches. The loose lift thickness should be reduced in conjunction with the compaction equipment used so that the required density is attained.

Fill should have a moisture content within two percent of the optimum moisture content prior to compaction. Subgrades should be properly drained and protected from moisture and frost. Placement of fill on frozen subgrades is not acceptable. It is recommended that all fill placement and compaction be monitored and tested by a representative of Empire Geo-Services, Inc.

## III. Quality Assurance Testing

The following minimum laboratory and field quality assurance testing frequencies are recommended to confirm fill material quality and post placement and compaction conditions. These minimum frequencies are based on generally uniform material properties and placement conditions. Should material properties vary, or conditions at the time of placement vary (i.e. moisture content, placement and compaction, procedures or equipment, etc.) then additional testing is recommended. Additional testing, which may be necessary, should be determined by qualified geotechnical personnel, based on evaluation of the actual fill material and construction conditions.

### A. Laboratory Testing of Material Properties

- Moisture content (ASTM D-2216) - 1 test per 2,500 cubic yards or no less than 2 tests per each material type.
- Grain Size Analysis (ASTM D-422) - 1 test per 2,500 cubic yards or no less than 2 tests per each material type.
- Liquid and Plastic Limits (ASTM D-4318) 1 test per 2,500 cubic yards or no less than 2 tests per each material type. Liquid and Plastic Limit testing is necessary only if appropriate, based on material composition (i.e. clayey or silty soils).

- Modified Proctor Moisture Density Relationship (ASTM D-1557) 1 test per 4,000 cubic yards or no less than 1 test per each material type. A maximum/minimum density relationship (ASTM D-4253 and ASTM D-4254) may be an appropriate substitute for ASTM D-1557 depending on material gradation.

B. Field In-Place Moisture/Density Testing (ASTM D-3017 and ASTM D-2922)

- Backfilling along trenches and foundation walls - 1 test per 50 lineal feet per lift.
- Backfilling Isolated Excavations (i.e. column foundations, manholes, etc.) 1 test per lift.
- Filling in open areas for slab-on-grade and pavement construction - 1 test per 2,500 square feet per lift.

**APPENDIX D**

**INFORMATION REGARDING THIS  
GEOTECHNICAL ENGINEERING REPORT**

## GEOTECHNICAL REPORT LIMITATIONS

Empire Geo-Services, Inc. (Empire) has endeavored to meet the generally accepted standard of care for the services completed, and in doing so is obliged to advise the geotechnical report user of our report limitations. Empire believes that providing information about the report preparation and limitations is essential to help the user reduce geotechnical-related delays, cost over-runs, and other problems that can develop during the design and construction process. Empire would be pleased to answer any questions regarding the following limitations and use of our report to assist the user in assessing risks and planning for site development and construction.

**PROJECT SPECIFIC FACTORS:** The conclusions and recommendations provided in our geotechnical report were prepared based on project specific factors described in the report, such as size, loading, and intended use of structures; general configuration of structures, roadways, and parking lots; existing and proposed site grading; and any other pertinent project information. Changes to the project details may alter the factors considered in development of the report conclusions and recommendations. *Accordingly, Empire cannot accept responsibility for problems which may develop if we are not consulted regarding any changes to the project specific factors that were assumed during the report preparation.*

**SUBSURFACE CONDITIONS:** The site exploration investigated subsurface conditions only at discrete test locations. Empire has used judgement to infer subsurface conditions between the discrete test locations, and on this basis the conclusions and recommendations in our geotechnical report were developed. It should be understood that the overall subsurface conditions inferred by Empire may vary from those revealed during construction, and these variations may impact on the assumptions made in developing the report conclusions and recommendations. *For this reason, Empire should be retained during construction to confirm that conditions are as expected, and to refine our conclusions and recommendations in the event that conditions are encountered that were not disclosed during the site exploration program.*

**USE OF GEOTECHNICAL REPORT:** Unless indicated otherwise, our geotechnical report has been prepared for the use of our client for specific application to the site and project conditions described in the report. *Without consulting with Empire, our geotechnical report should not be applied by any party to other sites or for any uses other than those originally intended.*

**CHANGES IN SITE CONDITIONS:** Surface and subsurface conditions are subject to change at a project site subsequent to preparation of the geotechnical report. Changes may include, but are not limited to, floods, earthquakes, groundwater fluctuations, and construction activities at the site and/or adjoining properties. *Empire should be informed of any such changes to determine if additional investigative and/or evaluation work is warranted.*

**MISINTERPRETATION OF REPORT:** The conclusions and recommendations contained in our geotechnical report are subject to misinterpretation. *To limit this possibility, Empire should review project plans and specifications relative to geotechnical issues to confirm that the recommendations contained in our report have been properly interpreted and applied.*

Subsurface exploration logs and other report data are also subject to misinterpretation by others if they are separated from the geotechnical report. This often occurs when copies of logs are given to contractors during the bid preparation process. *To minimize the potential for misinterpretation, the subsurface logs should not be separated from our geotechnical report and the use of excerpted or incomplete portions of the report should be avoided.*

**OTHER LIMITATIONS:** Geotechnical engineering is less exact than other design disciplines, as it is based partly on judgement and opinion. For this reason, our geotechnical report may include clauses that identify the limits of Empire's responsibility, or that may describe other limitations specific to a project. These clauses are intended to help all parties recognize their responsibilities and to assist them in assessing risks and decision making. Empire would be pleased to discuss these clauses and to answer any questions that may arise.

## **TEST PIT RECORDS**

To supplement the information found in the Geotechnical Report, Lewis County conducted some supplementary site exploration by digging a series of test pits. C&S Engineers was present on sit at the time to record the results. The following is a record of that site exploration.



Jun 20, 2018 - 11:58am  
C:\Project\2018 - LEWIS COUNTY\64412201 - Lewis-JCC Educational Center\Drawn\CD\Sheet Files\Civil\Being Location Plans\64412201 Test Pit Plan.dwg



A1 TEST PIT PLAN  
SCALE: 1" = 60'



C&S Engineers, Inc.  
499 Col. Eileen Collins Blvd.  
Syracuse, New York 13212  
Phone: 315-455-2000  
Fax: 315-455-9667  
www.cscos.com



LEWIS - JCC EDUCATIONAL CENTER  
CORNELL COOPERATIVE OUTREACH  
EAST ROAD LOWVILLE, NY 13367

| MARK                                                                                                                      | DATE | DESCRIPTION |
|---------------------------------------------------------------------------------------------------------------------------|------|-------------|
| REVISIONS                                                                                                                 |      |             |
| PROJECT NO: 564.012.001                                                                                                   |      |             |
| DATE: JUNE 22, 2018                                                                                                       |      |             |
| DRAWN BY: K. MAGILL-JONES                                                                                                 |      |             |
| DESIGNED BY: D. WETHEY, P.E.                                                                                              |      |             |
| CHECKED BY: -                                                                                                             |      |             |
| NO ALTERATION PERMITTED HEREON<br>EXCEPT AS PROVIDED UNDER SECTION<br>7209 SUBDIVISION 2 OF THE NEW YORK<br>EDUCATION LAW |      |             |

CIVIL

TEST  
PIT  
PLAN

TP-100



LEWIS CO-JCC

EDUCATIONAL CENTER

Test Pit Logs

**564.012.001**

| TEST PIT NUMBER | ANTICIPATED DEPTH | ROCK ENCOUNTERED | DEPTH OF ROCK | DEPTH OF EXCAVATION | COMMENTS                                             |
|-----------------|-------------------|------------------|---------------|---------------------|------------------------------------------------------|
| TP-1            | 8'-0"             | YES              | 3'-6"         | 3'-6"               | ROCK ENCOUNTERED AT 3'-6"                            |
| TP-2            | 8'-0"             | YES              | 7'-6"         | 7'-6"               | ROCK ENCOUNTERED AT 7'-6"                            |
| TP-3            | 8'-0"             | NO               | -             | 8'-0"               | GROUND WATER AT 5'-0", COBBLES AT 3'-0", NO ROCK     |
| TP-5            | 8'-0"             | NO               | -             | 8'-0"               | NO ROCK ENCOUNTERED                                  |
| TP-6            | 8'-0"             | NO               | -             | 8'-0"               | NO ROCK ENCOUNTERED                                  |
| TP-7            | 8'-0"             | NO               | -             | 8'-0"               | NO ROCK ENCOUNTERED                                  |
| TP-8            | 8'-0"             | YES              | 4'-0"         | 4'-0"               | ROCK ENCOUNTERED AT 4'-0"                            |
| TP-9            | 8'-0"             | YES              | 3'-0"         | 3'-6"               | GROUND WATER & ROCK AT 3'-0", ABLE TO RIP 6" OF ROCK |
| TP-10           | 8'-0"             | YES              | 6'-0"         | 6'-0"               | ROCK ENCOUNTERED AT 6'-0"                            |
| TP-11           | 8'-0"             | NO               | -             | 8'-0"               | NO ROCK ENCOUNTERED                                  |