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Geotechnical Evaluation Report for The Resource Center Glenwood Avenue Silver Creek, New York

Prepared For:

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Prepared By:

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7/21/2020

Project No. WB-20-075
Ref. SJB Project No.: BE-20-075
July 2020

A Woman Owned Firm

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July 21, 2020
Project No.: WB-20-075
Ref. SJB Project No.: BE-20-075

Mr. Edmund M. Schober, Project Manager
LaBella Associates
500 East Sixth Street
Jamestown, New York

Re: Geotechnical Evaluation Report for
The Resource Center
Glenwood Avenue
Silver Creek, New York

Dear Mr. Schober,

This report summarizes the geotechnical evaluation completed by WMA Engineering, DPC dba Empire Geotechnical Engineering Services (Empire) with regard to the proposed development of The Resource Center building planned on a generally open site located off the south side of Glenwood Avenue, west of Old Main Road, in Silver Creek, New York. The approximate location of the project site is shown on Figure 1. One (1) hard copy of this report is submitted to LaBella Associates (LaBella). We have also e-mailed you, an electronic copy (pdf file format) of this report for your use and for distribution, as appropriate.

The geotechnical engineering evaluation was completed by Empire at the request of and as authorized by SJB Services, Inc. (SJB), our affiliated drilling and testing company, who was retained by LaBella to complete this work. Our evaluation and recommendations are based on three (3) test borings designated as borings B-1 through B-3 completed at the site by SJB. Test borings B-1 and B-2 were completed in the area of the proposed Resource Center building and boring B-3 was completed within the proposed access drive from Glenwood Avenue.

The approximate test boring locations are shown on Figures 2 and 3. The test boring logs are included with this report, as Appendix A.

PROPOSED PROJECT AND EXISTING SITE CONDITIONS

We understand the proposed Resource Center building project will include construction of an approximately 40 feet ± x 70 feet ± (2,800 square feet ±), single-story, wood frame building structure, with at grade slab-on-grade floor construction. The building is planned to be supported on a conventional spread footing type foundation system. No basement or depress structures are planned. The anticipated foundation loads were not available, at the time of this report. The building will also be designed for seismic conditions in accordance with the Building Code of New York State (IBC 2015).

The finished floor grade for the building is expected to be set near the existing site grades of elevation (El.) 100.3 feet to 101.5 feet, which were established by SJB during layout of the building area test borings. The elevations presented in this report are based on the benchmark used by SJB for the boring layout, which was established by others, as described below.

The building site currently consists of an open grass area. The site is relatively level within the proposed building area and then rises slightly to the northeast and Glenwood Avenue. Ground surface elevations at the test boring locations range between El. 100.3 feet (test boring B-2) and El. 103.1 feet (test boring B-3).

Figure 2, developed from a Google Earth™ aerial photograph of the site, shows the existing site conditions along with the approximate locations of the test borings. A topographic plan showing the proposed building and pavement areas, along with the approximate test boring locations, which was prepared by LaBella, is presented as Figure 3.

SUBSURFACE EXPLORATION

The subsurface exploration consisted of three (3) test borings. The test borings were drilled by SJB on June 8th and 9th, 2020. The test borings are designated as B-1 through B-3 and their approximate locations are shown on Figures 2 and 3.

The proposed test boring locations were established by LaBella on a site plan (Figure 3), which was provided to SJB. Using the site plan, SJB then established the GPS coordinates of the test borings using Google Earth™ and located / marked their locations in the field, using a hand held GPS instrument. These coordinates were recorded and were used to prepare Figure 2, where they are listed in tabular format.

Laser survey level measurements were utilized by SJB to determine the existing ground surface elevation at the test boring locations. The ground surface elevations were referenced to the top of the valve adjusting nut (benchmark) on the existing fire hydrant located along Glenwood Avenue near the northwest corner of the site, as shown on Figures 2 and 3. This benchmark has an elevation datum of El. 96.52 feet, as established by others, and shown on the site plan / topographic survey drawing provided to SJB by LaBella.

Test borings B-1 and B-2 were located in the area of the proposed Resource Center building. These test borings were each advanced through fill, indigenous overburden soils and highly weathered Shale to depths of 10.3 feet and 14.7 feet, where auger refusal (bedrock refusal) was met. Test boring B-3 was located in the proposed driveway area and was also advanced through fill, indigenous overburden soils and into highly weathered Shale to a depth of 15.3 feet, where it was terminated after sample spoon refusal was met.

The test borings were made with a Diedrich model D-50 rubber track, all terrain vehicle mounted drill rig, and were advanced in the overburden soils using hollow stem auger and split spoon soil sampling techniques. Split spoon samples and Standard Penetration Tests (SPTs) were taken continuously in test borings B-1 and B-2 from the ground surface until auger refusal was met. Split spoon samples and SPTs were taken continuously in test boring B-3 from the ground surface to a depth of 12 feet and then again at 15 feet, where sample spoon refusal was met and the test boring terminated. The split spoon sampling and SPTs were completed in general accordance with *ASTM D1586 – "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils"*.

The auger refusal material (bedrock) 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 5 feet and 6 feet into the bedrock at these locations, respectively.

A geologist from SJB prepared the test boring logs based on visual observation of the recovered soil samples and bedrock core, along with 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 from test borings B-1 and B-2 was 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.

SUBSURFACE CONDITIONS

The general stratigraphy encountered by the test borings consisted of topsoil and or sand fill type soil at the surface, along with underlying brown and dark brown sand and gravel type man-placed fill, which contains varying amounts of intermixed silty clay and occasional inclusions of slag, metal and organics. The man-placed fill overlies brown and brown-gray stiff to medium consistency silty clay and loose silty clayey sand and gravel indigenous soil deposits, extending to highly weathered Shale bedrock. The highly weathered Shale bedrock was encountered in the test borings at depths ranging between about 8 feet (B-1) and 14 feet (B-3). The highly weathered Shale then grades to an apparent more competent Shale bedrock at depths of about 10.3 feet in boring B-1 and 14.7 feet in boring B-2, based on the auger refusal conditions, as well as the results of the bedrock coring completed in these two test borings. Test boring B-3 was terminated with sample spoon refusal within the highly weathered Shale at a depth of 15.3 feet. The soil and bedrock stratigraphy encountered, and the groundwater conditions observed, are described in more detail below and on the test boring logs in Appendix A

An approximately 3-inch thick sandy topsoil was noted by the driller to present at the surface of the test boring B-1. At test boring locations B-2 and B-3 a distinct topsoil layer was not apparent at the surface, as the driller noted the surface soil consisted of a sand fill type soil.

The surface soil type and thickness noted by the driller are at widely spaced locations and are subject to interpretation. Properly identifying and measuring topsoil thickness is difficult and can vary depending on the driller's interpretation of topsoil. In some cases, a distinct topsoil layer thickness (transition) is not easily discernible, particularly where the site has been disturbed by past uses, filling and and grading. In these cases underlying soils containing organics may also be present, which are not readily identifiable as distinct topsoil. The topsoil thickness can also be significantly greater where trees are present. Accordingly, topsoil stripping of the site beyond the surface topsoil may be necessary in some areas, particularly where trees are present, to remove all soils containing high concentrations of organics.

Therefore, such observations and measurements can be subject to interpretive disagreements and quantity disputes. We recommend the Contractor, and/or others, make their own observations and measurements, prior to bidding and construction, to determine the quantities, costs and efforts that will be required for topsoil and organic surface soil removal and any associated replacement with appropriate suitable fill materials.

The surface soils are followed by brown and dark brown sand and gravel type man-placed fill, which contains varying amounts of intermixed silty clay and occasional inclusions of slag, metal and organics. The varying composition and density of the fill indicates it was placed in a generally random and uncontrolled manner and was not densified in an engineered manner during its placement.

The fill soils were found to extend to the following depths and elevations at the test boring locations.

B-1: 2 feet ± / El. 99.5 feet ±
B-2: 7 feet ± / El. 93.3 feet ±
B-3: 4 feet ± / El. 99.1 feet ±

It should be expected that the nature and depth of the fill will vary between and away from the exploration locations and will be dependent on the original native site topography, as well as the extent to which the site has been previously disturbed by past uses. In addition, it can be expected that fill soils will also be present, and will extend at least to the bottom of previous excavations made for any previous building foundations, utilities and other below grade type structures, which may have once occupied the site, or which still may still be present in a buried state.

The indigenous soils encountered beneath the fill consist of brown and brown-gray stiff to medium consistency silty clay and loose silty clayey sand and gravel indigenous soil deposits, extending to highly weathered Shale bedrock.. The indigenous soils are classified as CL, SC-SM, and GC-GM group soils using the Unified Soil Classification System (ASTM D2488).

The Standard Penetration Test (SPT) “N” values obtained in the indigenous soils ranged between 4 and 9. The SPT “N” values indicate the consistency of the fine grained silty clay soils vary from medium to stiff, while the relative density of the more granular silty clayey gravel and sand soils is loose,

Beneath the indigenous soils, highly weathered Shale bedrock was encountered in the test borings at depths ranging between about 8 feet in boring B-1 and 14 feet in boring B-3. It was possible to advance the test borings several feet into the weathered Shale before encountering auger refusal conditions.

Auger refusal was encountered in test borings B-1 and B-2 at depths of 10.3 feet (El. 91.2 feet) and 14.7 feet (El. 85.6 feet), respectively. Test boring B-3 was terminated with sample spoon refusal within the highly weathered Shale at a depth of 15.3 feet. The auger refusal suggests the apparent presence of more competent Shale bedrock.

Following encountering auger refusal in borings B-1 and B-2, five (5) feet and six (6) feet of rock coring was completed in these test borings, respectively. The recovered bedrock core is described as gray, soft, weathered to sound, laminated to thickly bedded, Shale rock, with occasional mechanical and natural fractures. The core recoveries ranged between 98% and 79% and the rock quality designation (RQD) values ranged between 97% and 63%, indicating the recovered rock core has an "excellent" to "fair' rock mass quality. Geologic maps indicate the uppermost bedrock formation in the Glenwood Avenue area of Silver Creek is the upper Devonian period Hanover Shale formation of the Java Geologic Group.

Water level observations / measurements were made in the test borings at the completion of drilling and soil sampling, and following rock coring in test borings B-1 and B-2, and are noted on the test boring logs. Freestanding water was not observed in the test borings following the completion of drilling and soil sampling. It appears groundwater may not have had sufficient time to accumulate and stabilize in the boring holes within the time period that had elapsed from the completion of soil sampling and the time of these measurements.

Following rock coring in borings B-1 and B-2, water was recorded at depths of 4.0 feet and 1.9 feet, respectively. These water level measurements may also not be indicative of fully stabilized groundwater levels, as water was added to the test boring to facilitate the rock coring.

Some “moist to wet” soil was encountered within test borings B-1 and B-3, at and below a depth of about 4 to 5 feet which suggests that groundwater may be present at and below this depth. It should be expected that both permanent and localized perched groundwater conditions can vary with location and with changes in soil conditions, precipitation and seasonal conditions, as well as depending on site drainage conditions.

The installation of a groundwater observation well would help to better define the stabilized groundwater level within the site area. It should be expected that groundwater conditions can vary with changes in soil conditions, precipitation and seasonal conditions, as well as depending on site drainage conditions.

GEOTECHNICAL CONSIDERATIONS AND RECOMMENDATIONS

General

Spread foundation (footing) support of the proposed Resource Center building will be impacted by amount of existing fill encountered in test boring B-2, and the medium consistency silty clay and loose silty clayey sand and gravel indigenous soils present, along with the potential to encounter groundwater conditions within the foundation excavations. These conditions will require a modest net allowable bearing capacity be used for the foundation design, in conjunction with implementing special bearing subgrade preparation procedures. Settlement of spread foundations constructed directly on the existing fill or on the medium / loose indigenous soils could be potentially excessive and intolerable, particularly if the foundations would be heavily loaded.

Based on the relatively lightly loaded condition of the planned wood frame building structure, it is recommended to construct the spread foundations on an Engineered Fill layer, which is placed beneath the foundations and which bears on a suitable indigenous soil subgrade. The Engineered Fill layer will: provide a more uniform and stable subgrade surface for constructing the foundations; reduce the foundation stresses acting on the indigenous soils; and will aid with construction dewatering if groundwater conditions or seepage is encountered.

Accordingly, we recommend the foundations for the building structure be constructed over an Engineered Fill layer consisting of a minimum 18-inch thick layer of Drainage Stone Material or compacted Structural Fill; or on a minimum 12-inch thick layer of suitable flowable backfill, which is placed over a suitable indigenous soil subgrade, as described further below.

In addition to the above foundation bearing subgrade preparation, we recommend the foundations be designed for a modest net allowable bearing capacity of 1,500 pounds per square foot (psf), in accordance with the recommendations discussed further below.

Also, we recommend that the proposed building floor grade be set as high as possible to limit potential excavation depths below the groundwater conditions. Groundwater conditions are expected to fluctuate seasonally and as such are often generally highest around early spring and lowest around mid to late summer, although this could vary depending on actual precipitation conditions and site drainage conditions.

The site preparation work should also be performed during seasonal dry periods to minimize potential degradation of the subgrade soils and undercuts which may be required to establish a stable base for construction. It should be understood that the loose sand and gravel and medium silty clay subgrade soils that will be exposed are highly 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 not permit construction traffic directly over these soils. In addition, procedures to improve site drainage should be implemented prior to commencing the site stripping and subgrade preparation work.

Measures necessary to control surface water and groundwater, in conjunction with site preparation, should include installation of drainage swales and underdrains (i.e. “French drains”) to intercept and divert surface runoff and groundwater away from the construction and foundation excavation areas, sloping of the subgrade and “sealing” of the surface 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. Additionally, the placement of a suitable base material and underlying stabilization geotextile, in the building pad area, beneath construction roads, and in construction staging areas, will help to protect the subgrades and minimize problems associated with subgrade degradation.

The on-site soils have the potential for localized variations and deficiencies within a compacted fill matrix, if not thoroughly and uniformly compacted and /or if compacted with zones of wet or unstable material. Also, because of their inherent the high moisture content (i.e. generally above the recommended moisture content range for compaction), the on-site soils are expected to require drying efforts for proper compaction.

Accordingly, the use of the on-site soils for site filling is expected be difficult to work with (i.e. dry for proper compaction), particularly during wet weather and seasonally inclement conditions. As such construction scheduling delays can be expected.

Based on the above considerations, the use of the on-site soils is not recommended for constructing subgrade fills necessary for the building structure pad. Suitable Granular Fill or Structural Fill as described below, or other suitable approved imported granular type fill, is therefore recommended for any fill necessary to raise the site grades for the building pad area.

Use of the on-site soils can be acceptable for constructing the fills for establishing the pavement area subgrades, provided they are properly placed and compacted in a stringently controlled manner, in accordance with our recommendations.

More detailed recommendations to assist in planning for site development and design of building foundations, floor slabs and pavements are provided in the following report sections.

Spread Foundation Design

Spread foundations (footings) for the building structure should bear on Engineered Fill (i.e. a Drainage Stone layer, compacted Structural Fill or suitable flowable backfill material), which is placed on the indigenous soil subgrades, following excavation and removal of existing fill soils and materials, any existing structures, utilities and any unsuitable indigenous soils (i.e. organics, wet or “mucky” soils, etc.,) which are present and extend below the design footing grades of the proposed building structure. Apparent indigenous soil subgrade depths/elevations encountered at the building area test boring locations are presented on the following table.

Recommended Suitable Subgrade Depth and Elevation for Engineered Fill		
Boring No.	Ground Surface Elevation (feet)	Suitable Subgrade Depth / Elevation (feet)
B-1	101.5	2.5 / 99.0
B-2	100.3	7.0 / 426.2

The foundations should bear on Engineered Fill, which is placed following excavation to these grades. Subsurface conditions can be expected to vary between and away from the exploration locations and therefore will require adjustments in the suitable subgrade elevation based on actual conditions encountered at the time of construction. Accordingly, close full time inspection of the foundation bearing subgrades, by a representative of Empire or qualified geotechnical personnel, is recommended as the excavations are made at the time of construction.

Where groundwater or wet soil subgrades are present, we recommend the placement of a minimum 18-inch thick crushed stone working surface / Drainage Stone layer beneath the foundations, in order to provide a more uniform and stable bearing subgrade, and to aid in dewatering. The crushed stone working surface / drainage layer material can be placed and compacted over a suitable, undisturbed indigenous soil subgrade using the following procedure.

- Undercut the foundation subgrade a minimum of 18-inches below the design bottom of the foundation (footing) and extending out a minimum of 12-inches beyond the foundation limits, or at least 0.5 times the thickness of the Drainage Stone layer beneath the foundation, whichever is greater. The foundation excavation, therefore, will have to be sized accordingly.

- Place a stabilization/drainage geotextile (Mirafi 160 N or suitable equivalent) over the exposed soil subgrade, which should then be carefully wrapped around the drainage stone to completely encapsulate it from the surrounding soils.

- Place a minimum 18-inch thick layer of NYSDOT Standard Specifications Section 703-02, Size Designation No. 2, washed, crushed coarse aggregate. Following placement, the stone should be compacted with a vibratory plate tamper to a visually dense and stable matrix.

In all cases, we recommend the undercut be backfilled immediately as the excavation work proceeds. If groundwater or wet subgrades are not encountered within the foundation excavation, it may be possible to substitute a minimum 18-inch thick compacted crusher run stone Structural Fill material or a minimum 12-inch thick suitable flowable backfill material in place of the Drainage Stone material.

If Structural Fill is placed beneath the foundations, it should 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. A suitable stabilization/separation geotextile, such as Mirafi 500X, should be placed over the indigenous soil subgrade, prior to placing the compacted Structural Fill layer. Recommendations for Structural Fill material are presented near the end of this report.

Flowable backfill material, if used, should be a non-swelling cement / fine aggregate type material and should have a minimum 28-day compressive strength (f'c) of around 150 to 250 pounds per square inch (psi). The flowable backfill should extend at least 12 inches horizontally beyond the foundation limits for its entire depth.

Undercut excavations, therefore, will need to be planned and sized accordingly.

Where flowable backfill is placed, it should be placed in lifts not exceeding about 3 to 4 feet in thickness. Subsequent lifts can be placed after the underlying lift has been allowed to cure and set-up for about 24 hours

Foundations constructed on Engineered Fill, which is properly placed over the suitable bearing subgrades, as discussed above, should be sized based on a maximum net allowable bearing pressure not exceeding 1,500 pounds per square foot (psf).

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

Provided these recommendations are followed, we estimate the foundations should undergo total settlement of less than 1-inch.

Floor Slab Construction

The at grade floors of the building can be constructed as slab-on-grade following proper subgrade preparation. Following removal of the surface materials and any required excavation / backfilling for the slab-on-grade construction, the exposed subgrades should be proof-rolled and evaluated in accordance with our recommendations as outlined below. Any unsuitable soils present at the subgrade elevation, should be further undercut and removed and replaced with additional Structural Fill (Subbase Stone), as described below.

A minimum of 12-inches of Structural Fill (Subbase Stone) is recommended beneath the anticipated lightly loaded floor slabs. A suitable stabilization/separation geotextile, such as Mirafi 500X, should be placed over the final prepared subgrade, prior to placing the compacted Subbase Stone layer.

The above subbase stone thicknesses is not designed for carrying construction vehicle loads. Therefore, it may be desirable for the Contractor to temporarily increase the Subbase Stone thickness within the building pad area 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 can then be removed and regraded in preparation for the actual floor construction and re-used as foundation backfill, or as otherwise determined appropriate.

The floor slab(s) can be designed in accordance with procedures recommended by the Portland Cement Association or the American Concrete Institute, using a modulus of subgrade reaction of 150 pounds per cubic inch at the top of the subbase layer.

It is understood the finished floor grade will be established above the surrounding exterior grades. Therefore, the use of a moisture barrier does not appear warranted, unless otherwise recommended by the finished flooring manufacturer. It is recommended that the slab-on-grade floors be constructed such that they float on the subbase and subgrades and are not structurally connected to, or resting directly on, perimeter walls or column footings in order to limit potential differential settlement effects, unless the slab / wall or column interface is designed with sufficient reinforcement to bridge potential differential settlement effects at these interfaces.

Seismic Design Criteria

Based on the subsurface conditions encountered in the test borings and our knowledge of the regional geology, the project site can be classified as Seismic Site Class “C” 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 and the seismic design criteria presented herein.

The spectral response accelerations in the area of the project site (off Glenwood Avenue in Silver Creek, New York) were obtained by Empire using the using the SEAOC / OSHPD web site application (https://seismicmaps.org/) as presented in the United States Geological Survey (USGS) web site (https://earthquake.usgs.gov/hazards/designmaps/designmaps-gone.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 0.164g for the short period (0.2 second) response (S_S) and 0.054g for the one second response (S_1). For design purposes, these spectral response accelerations were then adjusted for the Seismic Site Class “C” soil profile determined for the project site.

Accordingly, the adjusted spectral response accelerations (S_{MS} and S_{M1}) for Site Class “C” are as follows:

- Short Period Response (S_{MS}) - 0.197g
- 1 Second Period Response (S_{M1}) - 0.092g

The corresponding five percent damped design spectral response accelerations (S_{DS} and S_{D1}) are as follows:

- S_{DS} - 0.131g
- S_{D1} - 0.061g

Pavement Design:

The following pavement design recommendations are provided for a Commercial Duty asphalt concrete pavement section. The Commercial Duty section is recommended for use in the access drive and parking lot area which is expected to be subject to predominately automobile/SUV type traffic, with occasional light delivery trucks.

The pavement section recommended is based on the upper subsurface conditions encountered in the test borings, which were found to be in a generally loose / medium consistency condition. In addition, it is recommended that the subgrades be prepared as discussed below.

The loose / medium existing subgrade soils may require some localized undercutting to prepare suitable firm and stable subgrades for the pavement construction. Accordingly, we recommend that the existing soil subgrades be proof-rolled and evaluated prior to the placement of the subbase course for the pavement structure construction. A stabilization/separation geotextile is recommended beneath the subbase course of the pavement section.

<u>Recommended Commercial Duty Asphalt Concrete Pavement:</u>

- 1.5 inches - Top Course
- 2.0 inches - Binder Course
- 15 inches - Subbase Course*
- Stabilization / Separation Geotextile

*It may be necessary to increase the subbase thickness in some areas to improve subgrade conditions and to promote drainage to underdrains as discussed below.

Materials for the above pavement structure components should consist of the following:

A. Asphalt Concrete Top Course - NYSDOT Standard Specifications, Hot Mix Asphalt, 9.5 F3 Top Course.

B. Asphalt Concrete Binder Course - NYSDOT Standard Specifications, Hot Mix Asphalt, 19 F9 Binder Course (*Binder Course for Light Duty Asphalt Pavement Section*).

C. Subbase Course – Should comply with NYSDOT Standard Specifications, Item No. 304.12 - Type 2 Subbase.

D. Stabilization / Separation Geotextile - Woven polypropylene stabilization/separation geotextile (i.e. Mirafi 600X or approved suitable equivalent).

E. Prepared Subgrade – As recommended below.

The installation of underdrains and/or edge drains is recommended to drain the pavement subbase course and subgrades in order to limit the potential for frost action and improve pavement structure performance and design life. Alternatively, the pavement subbase course can also be allowed to daylight/drain to an adjacent perimeter drainage swale.

Underdrains should include a geotextile (i.e. Mirafi 160N or suitable equivalent), selected considering drainage and filtration, installed around drainage stone surrounding a slotted or perforated drain pipe. The drainage stone should be sized in accordance with the pipe slotting or perforations. A crushed aggregate conforming to NYSDOT Standard Specifications Section 703-02, Size Designation No. 1 (½-inch washed gravel or stone) is generally acceptable for slotted underdrain pipe. The underdrain pipes should be set below the top of the soil subgrade elevation. The drainage stone and surrounding geotextile should extend above the underdrain pipe and into the subbase layer. Underdrain pipes should be connected to the site storm water drainage system.

Proper grading of the pavement structure subgrades is also recommended to help limit potential frost action and improve pavement structure life and performance. Accumulation of water on pavement subgrades should be avoided by grading the subgrade to a slope of at least 2 percent to allow drainage to the underdrains and/or edge drains or drainage swale.

SITE PREPARATION AND CONSTRUCTION

Excavation and Foundation Construction:

Excavation to the proposed bearing grades for the foundation construction should be performed using a method, which reduces disturbance to the bearing grade soils, such as a backhoe / excavator equipped with a smooth blade bucket. All existing structures, utilities, fill, organic soils, and/or any other underlying unsuitable deleterious soil material, beneath the proposed foundation bearing grades, should be removed. All resulting over-excavations should be backfilled with Engineered Fill, as discussed above.

The indigenous soil bearing grades should be observed and evaluated by a representative of Empire, prior to placement of Engineered Fill and/or the foundation structure. Placement and compaction of Structural Fill beneath foundations should also be observed and tested by a representative of Empire.

Dewatering should be implemented in conjunction with the excavation work such that the work generally proceeds in the dry. As discussed above, groundwater may be present and encountered in the foundation and utility excavations.

Groundwater, if encountered, should be intercepted and maintained at least 1 to 2 feet below the proposed excavation bottom. It is anticipated that the use of diversion berms, proper site grading, cut-off trenches, drainage stone layers, underdrains, in conjunction with conventional sump and pump methods of dewatering, should generally be sufficient to control surface water and groundwater conditions, should they be encountered.

If the foundation bearing grades are not protected and they degrade, they should be undercut/removed accordingly. All soil bearing grades for foundation construction should be protected from precipitation and surface water. 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 described below.

Subgrade Preparation for Slab-On-Grade and Pavement Construction:

The site preparation work to establish the building pad and pavement areas should be performed during seasonal dry periods to minimize potential degradation of the subgrade soils and undercuts which may be required to establish a stable base for construction. It should be understood that the subgrade soils, which will be exposed, are sensitive and may degrade and lose strength when they are wet and disturbed by construction equipment traffic.

All existing vegetation, trees, stumps, and topsoil, along with any structures/utilities within the proposed building (slab-on-grade) area, as well as in the proposed pavement areas, should be removed.

Following removal of the surface materials and any required excavation, the exposed existing soil subgrades should be carefully inspected and proof-rolled. The proof-rolling should be performed, prior to any subgrade fill placement or the slab-on-grade / pavement Subbase Stone placement, using a smooth drum roller weighing at least 7 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. Over excavation, which may be required as the result of the proof-rolling, should be performed based on evaluation of the conditions by Empire. Resulting over-excavations should be backfilled with controlled Structural Fill (Subbase Stone) as recommended below. It is recommended that any utility trenches located within the building and pavement areas also be backfilled with Structural Fill.

Suitable Granular Fill or Structural Fill as described below, or other suitable imported granular soil materials, can also be used as subgrade fill to raise the existing site grades for the slab-on-grade floor construction (i.e. building pad area). Empire, however, should be consulted regarding the acceptability of any materials, which do not meet the requirements stated below for Suitable Granular Fill or Structural Fill. Fill containing topsoil, organics, man-made rubble constituents, high concentrations of silt and clay, and otherwise unsuitable soils should not be used for subgrade fill within the pavement areas. All fill placement and compaction should be closely monitored and tested on a “full-time” basis by a representative of Empire.

During construction the contractor should take precautions to limit construction traffic over the soil subgrades for the building addition construction. Any subgrades, including existing soil subgrades or fill subgrades, which become damaged, rutted or unstable should be undercut and repaired as necessary prior to placement of the of the overlying fill material or structural element.

Pavement Construction:

Placement of the pavement Subbase course can proceed, following proper subgrade preparation and subgrade filling as described above. Installation of adjacent geotextile panels should have minimum overlap of 12 to 18 inches. The Subbase Stone should be placed and compacted in accordance with the recommendations presented below. Construction of the Asphalt Concrete Pavement should be performed in accordance with NYSDOT Standard Specification Section 400. The Binder and Top Course compaction / evaluation should comply with NYSDOT Standard Specifications – 80 Series Compaction procedures, as a minimum. In addition, placement of asphalt concrete courses should not be permitted on wet or snow-covered surfaces or when the subgrade surface is less than 40° F.

Structural Fill:

<u>Structural Fill (Subbase Stone):</u>

Structural Fill / Subbase Stone placed beneath foundations, and as the subbase course beneath slab-on-grade and pavement construction, or as foundation or utility backfill, should consist of crusher run stone, which should be free of clay, organics and friable or deleterious particles. As a minimum, the crusher stone should meet the requirements of New York State Department of Transportation, Standard

Specifications, Item 304.12 – Type 2 Subbase, with the following gradation requirements.

Sieve Size Distribution	Percent Finer by Weight
2 inch	100
¼ inch	25-60
No. 40	5-40
No. 200	0-10

The crusher run stone Structural Fill / Subbase Stone should be compacted to dense stable matrix and to a minimum of 95 percent of the maximum dry density as measured by the modified Proctor test (ASTM D1557). Placement of the fill should not exceed a maximum loose lift thickness of 6 to 9 inches, with the exception of the subbase course beneath the slab-on-grade and pavement construction, which can be placed in lifts not exceeding 12-inches. It however will be necessary to reduce the loose lift thickness, as appropriate, depending on the type of compaction equipment used so that the required density is attained. The crusher run stone should have a moisture content within two percent of the optimum moisture content at the time of compaction.

Suitable Granular Fill Material:

Suitable, well graded from coarse to fine, soil material 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 4-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 is acceptable for use as Suitable Granular Fill. The Suitable Granular Fill should be placed and compacted in accordance with the requirements stated above for the Structural Fill.

CONCLUDING REMARKS

This report was prepared to assist in planning the design and construction of the The Resource Center building facility planned off Glenwood Avenue, in Silver Creek, New York. The report has been prepared for the exclusive use of LaBella

Associates; The Resource Center; and other members of the design team, for specific application to this site and this project only.

The site information and recommendations were prepared based on Empire's understanding of the proposed project, as described herein, and through the application of generally accepted soils and foundation engineering practices. Empire 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 should be informed of any changes to the planned building development so that it may be determined if any modifications to the information presented in this report are necessary. Empire and / or its designated representative 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.

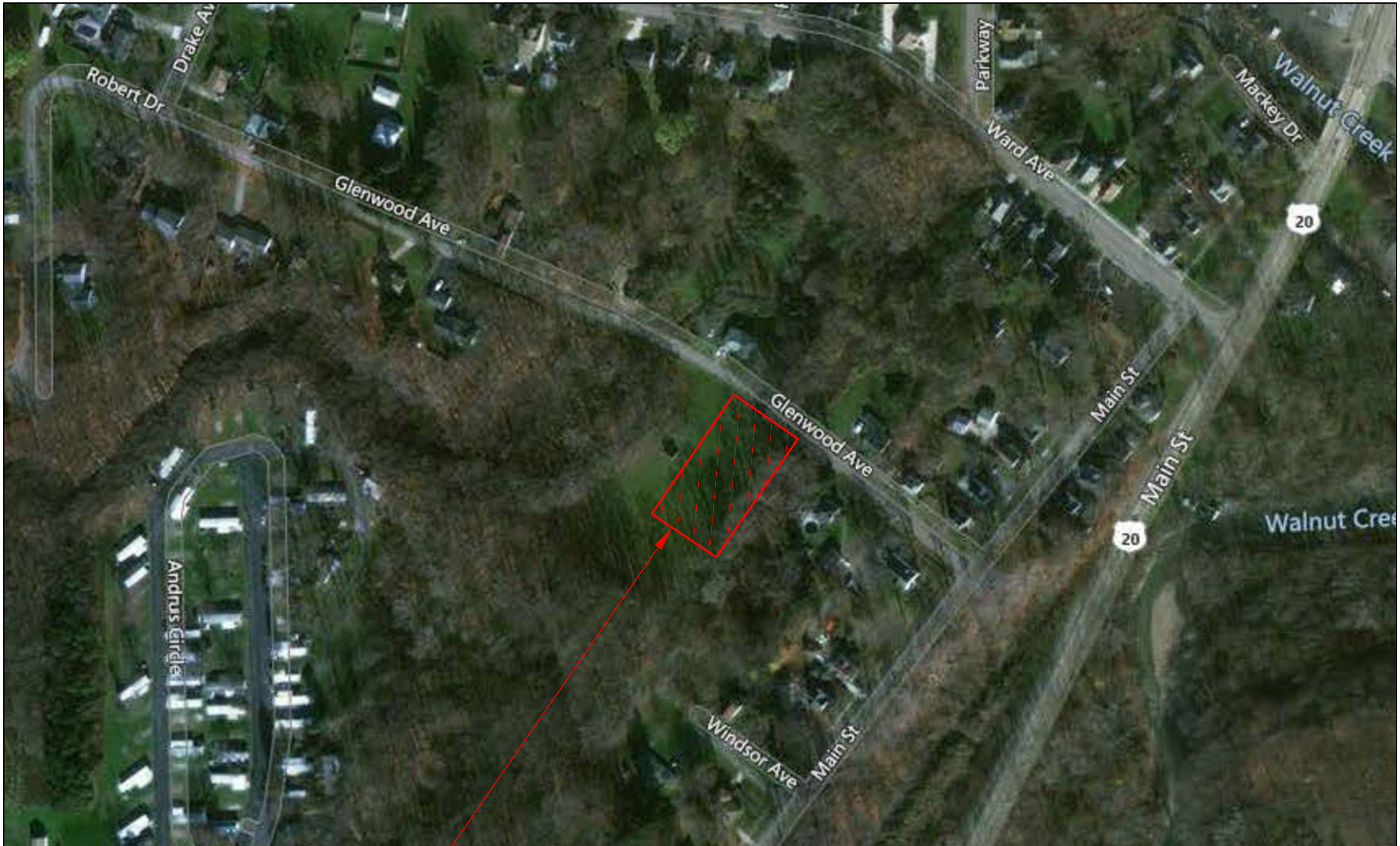
Additional information regarding the use and interpretation of this report is presented in Appendix B.

Respectfully Submitted:

WMA ENGINEERING, DPC dba
EMPIRE GEOTECHNICAL ENGINEERING SERVICES

John J. Danzer, P.E.
Senior Geotechnical Engineer

FIGURES



APPROXIMATE LOCATION OF PROJECT SITE

N

NOTE:
SITE LOCATION PLAN DEVELOPED FROM
BING MAPS - MICROSOFT CORPORATION

WMA ENGINEERING DPC|DBA EMPIRE GEOTECHNICAL ENGINEERING SERVICES	THE RESOURCE CENTER GLENWOOD AVENUE SILVER CREEK, NEW YORK		
SITE LOCATION PLAN	DR BY: WMA	SCALE: NTS	PROJECT NO.: WB-20-075
	CHKD BY: JJD	DATE: 07/20/2020	FIGURE NO: 1

"As Laid Out" Exploration Locations - GPS Coordinates			
Exploration Number	Latitude (Northing)	Longitude (Easting)	Ground Surface Elevation (feet)
B-1	42° 32' 12.0"	-79° 10' 24.1"	101.5
B-2	42° 32' 11.8"	-79° 10' 23.3"	100.3
B-3	42° 32' 12.3"	-79° 10' 22.3"	103.1

LEGEND:

B-1 INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING.

BM BENCHMARK: TOP OF EXISTING HYDRANT, VALVE ADJUSTING NUT. ELEVATION = 96.52 FEET, AS ESTABLISHED BY OTHERS.

NOTE:

FIGURE DEVELOPED FROM GOOGLE EARTH

N

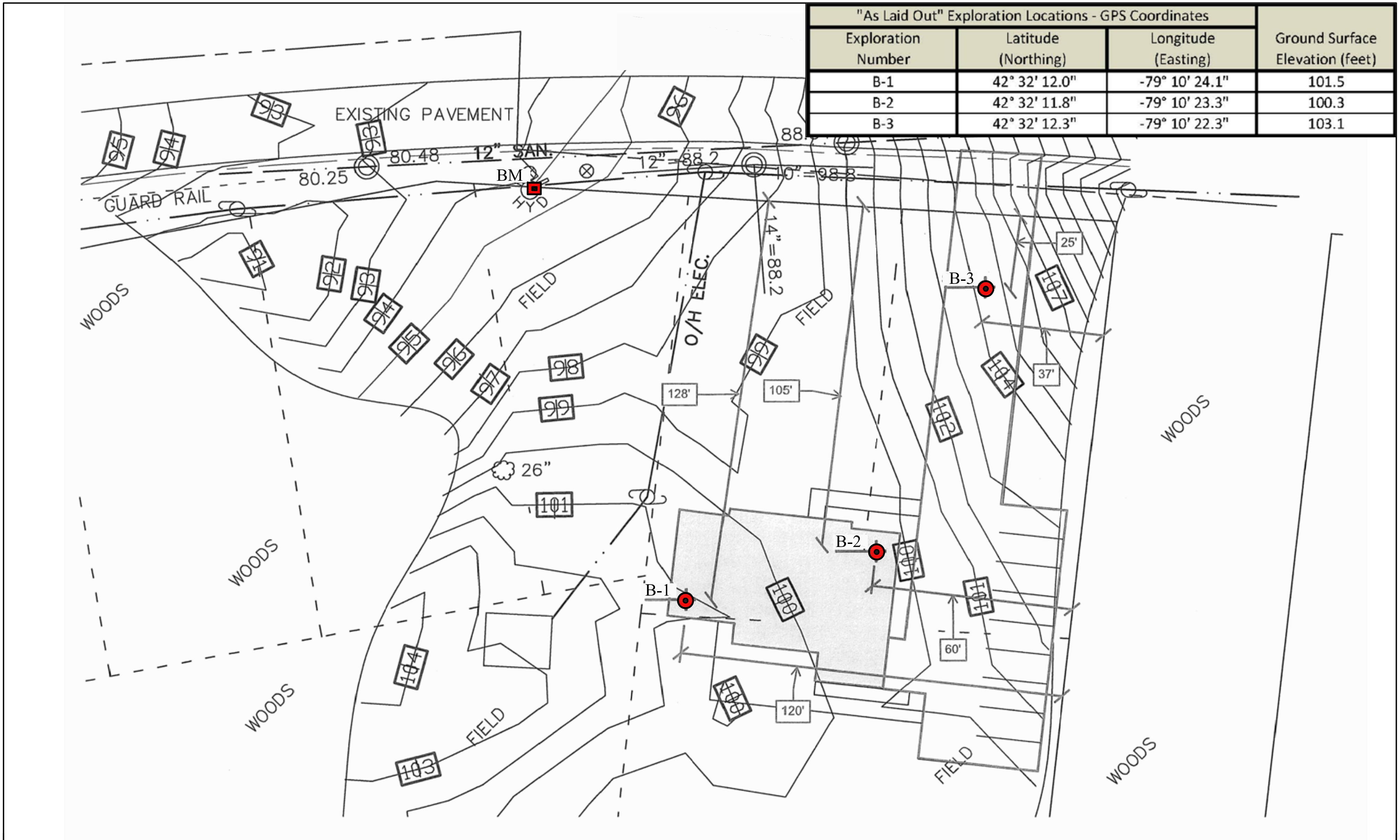
WMA ENGINEERING DPC|DBA
EMPIRE GEOTECHNICAL
ENGINEERING SERVICES

THE RESOURCE CENTER
GLENWOOD AVENUE
SILVER CREEK, NEW YORK

SUBSURFACE EXPLORATION PLAN
(EXISTING SITE CONDITIONS)

DR BY: WMA	SCALE: NTS	PROJECT NO.: WB-20-075
CHKD BY: JJD	DATE: 07/20/2020	FIGURE NO: 2

"As Laid Out" Exploration Locations - GPS Coordinates			Ground Surface Elevation (feet)
Exploration Number	Latitude (Northing)	Longitude (Easting)	
B-1	42° 32' 12.0"	-79° 10' 24.1"	101.5
B-2	42° 32' 11.8"	-79° 10' 23.3"	100.3
B-3	42° 32' 12.3"	-79° 10' 22.3"	103.1



LEGEND:

B-1 INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING.

BM BENCHMARK: TOP OF EXISTING HYDRANT VALVE ADJUSTING NUT. ELEVATION = 96.52 FEET, AS ESTABLISHED BY OTHERS.

N

NOTE:

SITE PLAN PREPARED BY LABELLA ASSOCIATES

WMA ENGINEERING DPC|DBA
EMPIRE GEOTECHNICAL ENGINEERING SERVICES

THE RESOURCE CENTER
GLENWOOD AVENUE
SILVER CREEK, NEW YORK

SUBSURFACE EXPLORATION PLAN
(PROPOSED SITE DEVELOPMENT)

DR BY: WMA	SCALE: NTS	PROJECT NO.: WB-20-075
CHKD BY: JJD	DATE: 07/20/2020	FIGURE NO: 3

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 ______________________

DEPTH (ft)	SAMPLES	SAMPLE No.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	BLOWS ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	3	3	4	8	7	10	3" TOPSOIL	Groundwater at 10' upon completion, and 5' 24 hrs. after completion
								15	Brown SILT, some Sand, trace clay, ML (Moist-Loose)	
								50/.5		
									Gray SHALE, medium hard, weathered, thin bedded, some fractures	
5										Run#1, 2.5'-5.0' 95% Recovery 50% RQD

1 2 3 4 5 6 7 8 9 10

(numbered features explained on reverse)

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"	Coarse Grained (Granular)
Cobble	3" - 12"	
Gravel - Coarse	3" - 3/4"	
- Fine	3/4" - #4	
Sand - Coarse	#4 - #10	
- Medium	#10 - #40	
- Fine	#40 - #200	
Silt - Non Plastic (Granular) Clay - Plastic (Cohesive)	<#200	Fine Grained

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**
Very 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

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

TABLE VI

Rock Classification Term		Meaning
Hardness	- Soft	Scratched by fingernail
	- Medium Hard	Scratched easily by penknife
	- Hard	Scratched with difficulty by penknife
	- Very Hard	Cannot be scratched by penknife
Weathering	- Very Weathered - Weathered - Sound	Judged from the relative amounts of disintegration, iron staining, core recovery, clay seams, etc.

Rock Classification Term		Meaning	
Bedding	- Laminated	(<1")	Natural breaks in Rock Layers
	- Thin Bedded	(1" - 4")	
	- Bedded	(4" - 12")	
	- Thick Bedded	(12" - 36")	
	- Massive	(>36")	

(Fracturing refers to natural breaks in the rock oriented at some angle to the rock layers)

The Resource Center
Glenwood Avenue
Silver Creek, New York

TABLE A - EXPLORATION LOCATIONS & GROUND SURFACE ELEVATIONS

"As Laid Out" Exploration Locations - GPS Coordinates			Ground Surface Elevation (feet)
Exploration Number	Latitude (Northing)	Longitude (Easting)	
B-1	42° 32' 12.0"	-79° 10' 24.1"	101.5
B-2	42° 32' 11.8"	-79° 10' 23.3"	100.3
B-3	42° 32' 12.3"	-79° 10' 22.3"	103.1

Note: Exploration locations are "as laid out / staked" locations.

WMA Engineering, DPC dba
Empire Geotechnical Engineering Services
5167 South Park Avenue
Hamburg, New York
WMA Project No: WB-20-075

DATE	**SJB SERVICES, INC.**	HOLE NO. B-1
START 6/9/2020	**SUBSURFACE LOG**	SURF. ELEV 101.5' +/-
FINISH 6/9/2020		G.W. DEPTH See Notes
SHEET 1 OF 1		

PROJECT: THE RESOURCE CENTER — LOCATION: GLENWOOD AVENUE, SILVER CREEK, NEW YORK

PROJ. NO.: BE-20-075

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID	SOIL OR ROCK CLASSIFICATION	NOTES
							TOPSOIL	Driller noted approx. 3" of Sandy Topsoil at the surface.
	1	2	2				Brown f-c SAND, some fine Gravel, little Silty Clay, tr.slag, tr.organics (moist, FILL)	
		5	3		7			
	2	3	5				Brown Silty CLAY, some f-c Sand, tr.gravel, fine Sand Partings (moist, stiff, CL)	
		4	4		9			
5	3	2	2				Contains little f-c Sand (moist-wet, medium)	
		2	2		4			
	4	3	3				Contains some f-c Sand and f-m Sand Partings	
		3	4		6			
	5	3	8				Gray highly weathered SHALE (moist)	
10		30	50/0.1		38		Becomes weathered Shale	NQ '2' Size Rock Core
	6	50/0.3			REF		Gray SHALE Rock, soft, sound, thinly bedded to thickly bedded, contains both natural and mechanical fractures	RUN #1: 10.3' - 15.3' REC = 98% RQD = 97%
15								
							Boring Complete at 15.3'	No Free Standing Water encountered at prior to rock coring. Free Standing Water recorded at 4.0' at boring completion rock coring.
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: D. DELUDE   DRILL RIG TYPE : DIEDRICH-50

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

SJB SERVICES, INC.
SUBSURFACE LOG

DATE		HOLE NO.	B-2
START	6/8/2020	SURF. ELEV	100.3' +/-
FINISH	6/8/2020	G.W. DEPTH	See Notes
SHEET	1 OF 2		

PROJECT: THE RESOURCE CENTER
PROJ. NO.: BE-20-075
LOCATION: GLENWOOD AVENUE, SILVER CREEK, NEW YORK

DEPTH FT.	SMPL NO.	0/6	6/12	12/18	N	PID	SOIL OR ROCK CLASSIFICATION	NOTES
	1	2	5				Dark Brown f-c SAND, some fine Gravel, tr.clayey silt, tr.metal, tr.organics (moist, FILL)	Driller noted approx. 2" of Sand soil the surface.
		7	4		12			
	2	1	1				Brown fine GRAVEL, some f-c Sand, tr.silty clay, tr.organics (moist, FILL)	
		1	1		2			
5	3	1	1					Sample #3: No Recovery
		1	1		2			
	4	1	3					
		4	4		7		Brown Silty CLAY, little f-m Sand (moist, medium, CL)	
	5	2	2				Brown-Gray fine GRAVEL, some f-c Sand, little Silty Clay (moist, loose, GC-GM)	
10		5	13		7			
	6	50/0.4			REF		Gray highly weathered SHALE (moist)	REF = Sample Spoon Refusal
							Gray weathered LIMESTONE (moist)	
15	7	50/0.2			REF			NQ '2' Size Rock Core
							Gray SHALE Rock, soft, weathered, laminated to thickly bedded, both natural and mechanical fractures	RUN #1: 14.7' - 20.7' REC = 79% RQD = 63%
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: D. DELUDE

DRILL RIG TYPE : DIEDRICH-50

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE			
START	6/8/2020		
FINISH	6/8/2020		
SHEET	2 OF 2		

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-2
SURF. ELEV 100.3' +/-
G.W. DEPTH See Notes

PROJECT: THE RESOURCE CENTER
PROJ. NO.: BE-20-075
LOCATION: GLENWOOD AVENUE
SILVER CREEK, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
20							
						Boring Complete at 20.7'	No Free Standing Water encountered prior to rock coring. Free Standing Water recorded at 1.9' at boring completion following rock coring.
25							
30							
35							
40							

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: D. DELUDE

DRILL RIG TYPE : DIEDRICH-50

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE			
START	6/8/2020		
FINISH	6/8/2020	**SJB SERVICES, INC.**	HOLE NO. B-3
SHEET	1 OF 2	**SUBSURFACE LOG**	SURF. ELEV 103.1' +/-
			G.W. DEPTH See Notes

PROJECT: THE RESOURCE CENTER — LOCATION: GLENWOOD AVENUE, SILVER CREEK, NEW YORK
PROJ. NO.: BE-20-075

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID	SOIL OR ROCK CLASSIFICATION	NOTES
	1	1	3				Dark Brown f-c SAND and fine Gravel, tr.silty clay, tr.organics (moist, FILL)	Driller noted Sand FILL at the surface.
		2	3		5			
	2	2	1				Brown fine GRAVEL, some f-c Sand, little Silty Clay, tr.organics (moist, FILL)	
		1	1		2			
5	3	WOH/1.0					Brown-Gray f-m SAND, some Silty Clay, tr.gravel (moist-wet, loose, SC-SM)	WOH = Weight of Hammer and Rods
		4	7		4			
	4	6	4				Becomes f-c Sand, little fine Gravel	
		4	3		8			
	5	2	1				Brown Silty CLAY, little fine Sand, Silt Partings (moist-wet, medium, CL)	
10		3	2		4			
	6	WOH	2				Becomes Brown-Gray	
		3	2		5			
15							Gray highly weathered SHALE (moist)	REF = Sample Spoon Refusal
	7	50/0.3			REF		Boring Complete with Sample Spoon Refusal at 15.3'	No Free Standing Water encountered at boring completion
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: D. DELUDE — DRILL RIG TYPE : DIEDRICH-50

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

APPENDIX B

GEOTECHNICAL REPORT LIMITATIONS

GEOTECHNICAL REPORT LIMITATIONS

WMA Engineering DPC / DBA Empire Geotechnical Engineering Services (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.