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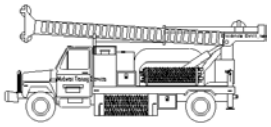

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REPORT OF SUBSURFACE EXPLORATION AND FOUNDATION RECOMMENDATIONS

PROPOSED SOLAR PHOTOVOLTAIC PROJECT

OGLESBY, ILLINOIS

PREPARED FOR
ILLINOIS MUNICIPAL ELECTRIC AGENCY
SPRINGFIELD, ILLINOIS

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Scope of Project

The purpose of this exploration was to explore the subsurface conditions at the site for an evaluation of an acceptable foundation system for the proposed installation, Midwest Testing Services, Inc. scope of services included drilling a total of ten (10) hollow stem auger borings to a maximum investigative depth of 16-feet below the existing ground surface. This report outlines the testing procedures, presents available project investigation, describes the site and subsurface conditions, and presents, recommendations for the foundation system.

General Geology and Soil Conditions

Most of the Northern Illinois subsoils were deposited during the glacial period known as "The Ice Age" or formerly as the Pleistocene Epoch, ranging from approximately 2.5 million to 10,000 years ago. During this time, glaciers with massive sheets of ice hundreds of feet thick dominated the North American Landscape.

These massive ice sheets formed in Canada due to heavy snowfall. The snow compacted into ice and began flowing, some of which traveled through the Lake Michigan basin and as far south as Central Illinois and as far west as the Mississippi River.

The massive glaciers gouged and ground up any rock in their paths, erasing Norther Illinois of any existing topography. The ground up rock imbedded in the glaciers ranged in size from clay to boulders, with varying amounts of everything in between. The material, called till, was deposited at the margins of the ice in large curved landforms called moraines. Once the glaciers began melting, the end moraines acted as dams holding back the water forming large glacial lakes. Eventually the moraines acted as dams holding back the water forming large glacial lakes. Eventually the moraines would fail, allowing the water to drain. These rushing waters would carry sediment and deposit it away from the original location of the ice. This deposit type called an outwash is unique from till because it is well sorted. The water separated the different size particles based on flow velocity. Typically, larger grain sizes are observed as the bottom of an outwash deposit, with decreasing grain size moving up the stratigraphic column, indicating decreasing flow velocity as the glacial lakes drained.

Underlying the glacial deposits is bedrock. Bedrock is defined as the solid rock buried beneath any glacial or un-lithified material. Most of the north-eastern Illinois bedrock is buried by glacial material, lessening to the west and south. The bedrock consists of limestone, dolomite, sandstone and shale. These were deposited by an ancient inland sea whose margins fluctuated across Illinois that existed approximately 610 million to 290 million years ago during the Cambrian Period. Underlying the bedrock is basement rock. This ancient rock consist mostly of the igneous rock granite.

This area consists of Quaternary deposits of the Wisconsin Episode. The Henry Formation within the Wisconsin Episode is composed of sands and gravels deposited in glacial river, outwash fans beaches and dunes from melt water of the degrading glaciers. The bedrock in this location is of the Paleozic eras and the Pennsylvania Period. Bedrock was not encountered on any of the ten (10) borings.

The soils encountered on this site mostly consisted of stiff to very stiff clay with a very stiff silty clay loam material occasionally being revealed at the lower limit of the boring in some locations.

For a more detailed description of the soils encountered please see the boring logs attached to this report.

DRILLING, FIELD AND LAB TESTING PROCEDURES

Drilling and Sampling:

Soil borings were completed with a truck mounted Diedrich D-50 drill using conventional 2 ¼ inch I.D. hollow stem augers to advance the bore holes. Representative samples were obtained using split spoon sampling procedures in accordance with ASTM procedures.

Field Testing:

During the sampling procedure, standard penetration tests (SPT) were performed at regular intervals to obtain the standard penetrations value of the subsoils. The standard penetration value (N) is defined as the number of blows of a 140 pound hammer falling a distance of 30-inches, required to advance the split spoon sampler one foot into the soils. The results of the standard penetration tests indicate the relative density and consistency of the soils, thereby providing a basis for estimating the relative strength and compressibility of the various subsoils.

Water Level Measurements:

No water was encountered during the drilling and upon completion of the borings. Since the soils at this site are relatively impervious the accurate determination of groundwater elevation may not be possible even after several days of measurement. Seasonal fluctuation and recent rainfall conditions may influence future levels of groundwater levels at this site.

Ground surface elevations of the boring locations were determined by Chamlin & Associates of Peru, Illinois. Elevations varied from a high of 631.3 to a low of 628.79.

Earth Resistivity:

The earth resistivity was conducted in accordance with ASTM G-57. "Standard Method for Field Measurement of Resistivity Using the Wenner Four Electrode Method." The resistivity was measured using probe spacing of 2.5, 5 and 10-feet in the vicinity of borings B-1 and B-9. The results are summarized on the Soil Resistivity Report sheet included in the appendix.

Site And Subsurface Conditions

Site Conditions:

The project site for the proposed Solar Farm is located in the southwest side of Oglesby, Illinois, specifically encompassing approximately 4.2 acres which is part of the south half of the northwest quarter of section 36, township 33 north, range1 east of the principal meridian.

At the time of the field exploration, the site was being used for agricultural purposes being a soybean field which had been previously harvested. There is approximately a 2 ½ foot differential between the ten boring locations.

Subsurface Conditions:

A total of ten (10) soil borings were randomly scattered throughout the project area. The approximate soil borings locations are shown on the boring location plans.

Topsoil thickness varies from 6 to 16-inches. Below the surface material, undisturbed stiff to very stiff cohesive soils consisting of lean clays extend to the termination depth of 16-feet for all boring location,

The subsurface description is of a generalized nature to highlight the major surface Stratification features and material characteristics. The boring logs included in the appendix should be reviewed for specific information at individual boring locations. These records include soil descriptions, stratification, penetration resistance, location of the samples and laboratory test data. The stratifications shown on the boring logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transitions may be gradual. Water level information obtained during field operations is also shown on these boring logs.

Foundation Recommendations

Based on the available soil borings and laboratory testing, drilled shafts are recommended to support the Photovoltaic racking structure.

The following unit resistance should be used to determine the diameter and length of the drilled shafts:

		Qu	Su	Passive Resistance
Depth	**Soil Type**	**KSf**	**KSf**	**KSF**
0-6’	Clay	2.5	1.25	2.5
6’-16’	Clay	4.0	2.0	4.0

Notes

$S_u = C$ = Cohesion

Ignore passive, pressure in frost zone of 3 ½ -feet in Oglesby area.

Construction Considerations

If mass grading is required to bring the site up to plan elevation it is recommended that subsequently to topsoil removal all the fill should be placed in 9-inch lifts and compacted to a minimum of 98% ASTM D-698 (Standard Proctor).

Summary

A subsurface exploration and an elevation of foundation and groundwater conditions has been completed for the proposed Solar Photovoltaic project in Oglesby, Illinois.

The recommendations presented herein are based on the available soil information obtained and the preliminary design information provided. Any changes in the soil conditions encountered during construction should be brought to the attention of the soils engineer to determine if modifications in the recommendations are required. Final design plans and specifications should also be reviewed by the soils engineer to assure that the recommendations have been interpreted and implemented as intended. It is recommended that the earthwork and foundations be monitored by the soils engineer in order to test and evaluate bearing capacities, and the selection, placement and compaction of controlled fills.

This geotechnical study has been conducted in a manner consistent with that level of care ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. Findings, recommendations, and opinions contained herein have be promulgated in accordance with generally accepted practice in the fields of foundation engineering, soils mechanics, and engineering geology. No other representatives, expressed or implied, and no warranty or guarantee is included or intended in this report.

Respectfully submitted,

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JS/jlh