

# Exhibit M. Highland Park Mixed-Use Development Site Preliminary Desktop Geotechnical Review





Professional Service Industries, Inc. 1853 New Natchitoches Road West Monroe, Louisiana 71292 Phone: (318) 387-2327

December 30, 2019

Northeast Louisiana Economic Alliance 204 Fair Avenue Winnsboro, LA 71295

Attn: Ms. Tana Trichel Phone: (318) 348-0826 Email: ttrichel@nelea.us

Re: Geotechnical Desktop Review Memorandum West End Golf Course Highland Park West Monroe, Louisiana PSI Project No. 0257951

Highland Park Mixed-Use Development Site Preliminary Desktop Geotechnical Review

Dear Ms. Trichel:

Professional Service Industries, Inc. (PSI) is pleased to submit our Geotechnical Desktop Review Memorandum for the above-referenced project. This memo presents preliminary information regarding the compatibility of the site with industrial development, suitability of the soils for building foundations and on-site roadways, requirements for soil augmentation for construction, and depth of groundwater.

We appreciate the opportunity to perform this study. If you have any questions pertaining to this memo, please contact our office at (318) 387-2327.

Respectfully submitted,

**PROFESSIONAL SERVICE INDUSTRIES, INC.** 

li Gazi

Ali Hijazi Project Manager

Nabil Mikhail, P.E., D.GE. Chief Engineer

Name: Nabil Mikhail, P.E., D.GE. Date: December 30, 2019 License No.: 35300 THIS PRELIMINARY DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR ISSUANCE OF A PERMIT.

www.intertek.com/building



# TABLE OF CONTENTS

PROJECT INFORMATION	1
PROJECT AUTHORIZATION	1
PROJECT DESCRIPTION	1
SITE AND SUBSURFACE CONDITIONS	2
SITE LOCATION AND DESCRIPTION	2
SITE GEOLOGY	2
LIKELY SITE CONDITIONS	2
GROUNDWATER	2
GEOTECHNICAL DISCUSSION	3
POTENTIAL FOUNDATION TYPES AND CAPACITIES	3
MEMORANDUM LIMITATIONS	4

APPENDIX - SITE VICINITY MAP



## **PROJECT INFORMATION**

#### **PROJECT AUTHORIZATION**

Professional Service Industries, Inc. (PSI) has completed a geotechnical desktop study for the site of the proposed West End Golf Course in West Monroe, Louisiana. Our services were performed in general accordance with PSI Proposal No. 266649 dated January 17, 2019. Authorization was provided by Ms. Tana Trichel of Northeast Louisiana Economic Alliance by signing our proposal on September 17, 2019.

#### **PROJECT DESCRIPTION**

The primary objective of this geotechnical desktop study is to develop a general geotechnical characterization of the approximately 16-acre site in West Monroe, Louisiana, as required to support the Louisiana Economic Development (LED) Site Certification process. It is understood that the site is on the west side of Highland Park and is currently developed as a non-operational golf course facility. Based on the furnished information, PSI understands that in keeping with the LED Site Certification requirements, this geotechnical desktop study should consider whether the site is capable of supporting shallow and/or deep foundations for a typical 100,000 square foot industrial/commercial building. It is understood that the structural column loads could be around 300 kips, while the wall loads could be around five (5) kips per foot.

PSI was provided with Google Earth location files and site maps depicting the boundaries of the subject site. No project-specific data with regard to the proposed development or structures (beyond the aforementioned loads) was available at the time of this memo. It was requested that PSI provide an unofficial opinion discussing the general type and quality of soils expected to be found in the general vicinity of the site.

PSI's contracted scope of services included no field or laboratory activities, only the preparation of this Geotechnical Desktop Study Memorandum. This general geotechnical site characterization memo provides an initial baseline of the site subsurface conditions that will likely be encountered during future site development based only on PSI's knowledge of the surrounding areas. In addition, PSI reviewed approximately 15 projects completed in the local area within 5 miles of the project site (many within a one-mile radius). However, as with any geotechnical investigation, and particularly in this case given the fact that no actual field investigation was conducted, variations the provided probable subsurface conditions and those actually encountered at the site should be expected. Additionally, it is likely that other conditions may exist within the boundaries of the site that cannot be determined through this study.

Please note that this memorandum should be considered preliminary, to be used only for general evaluation of the suitability of the site for the proposed development. The discussions and commentary provided are be based on our experience in the general vicinity of the subject site rather than site-specific data, and therefore it should not be used for the final design and construction of any structure(s) or foundation(s). PSI understands that a detailed geotechnical exploration and analysis will be performed at a later stage once the design and function of the proposed development have been finalized.



## SITE AND SUBSURFACE CONDITIONS

#### SITE LOCATION AND DESCRIPTION

The approximately 16-acre site is located on the west side of Highland Park, which is situated on the southeast intersection of North 7<sup>th</sup> Street and Arkansas Road in West Monroe, Louisiana. The Latitude and Longitude near the center of the site are approximately N 32.525589° and W 92.146866°, respectively. At the time the most recent Google Earth Imagery (April of 2019), it appears that the site is still minimally developed as a golf course with sidewalks and trees throughout, though the golf course is no longer operational.

Based on PSI's knowledge of the site, it is understood that the former golf course closed on December 31, 2017, and that the park continued to be maintained as a nature preserve with walking trails. Based on a review of Google Earth imagery, the area of the proposed development appears to decrease in elevation about 10 feet from the north to the south end of the property. In addition, some sparse trees were noted throughout the center of the site. However, it should be noted that the available Google Earth aerial imagery includes some gaps in coverage and low-quality imagery, and it is therefore may not be sufficient to fully determine the extent of previous development or the history of the site.

### SITE GEOLOGY

The United States Geological Survey (USGS) maps the site as located within the Deweyville Terrace formation. This formation is generally characterized by gray mixed with brown to red clay and silty clay with some sand and gravel. However, it should be noted that due to the size of the site, the lack of a field exploration, and variations typical of alluvial formations, all of the characteristics of the mapped USGS formation may not be reflected at the project site.

#### LIKELY SITE CONDITIONS

Please note that while PSI based our expectations of the soils in the area of the project site on over 15 different projects within a 5 mile radius of the project site (many within a 1-mile radius), the soils in the area of West Monroe can vary significantly due to the drastic elevation differences and the proximity to the Ouachita River. In addition, this site specifically varies in elevation up to 10 feet.

Based on a review of projects in the local area as previously discussed, PSI expects the upper soils in the area of the project site to vary significantly, but should consist primarily of very loose to medium dense silty sand or soft to stiff sandy silt in the upper 10 to 20 feet, with strata of firm to stiff lean and fat clay throughout. Below 10 to 20 feet, strata of stiff to very stiff lean and fat clay are likely to be encountered. Some loose to dense sand layers may be encountered below 50 feet.

#### GROUNDWATER

Free groundwater can be expected to be encountered at a depth of approximately 15 feet to 30 feet below the existing ground surface at the subject site. Groundwater levels at the site can fluctuate based on variations in rainfall, evaporation, surface runoff, and other hydro-geologic factors.



PSI Project No: 0257951 West End Golf Course – Geotechnical Desktop Study West Monroe, Louisiana December 30, 2019 Page 3

## **GEOTECHNICAL DISCUSSION**

The types and bearing depth of foundations suitable for a given structure depend primarily on several factors including the subsurface conditions, previous site development, the function of the structure, the loads it may carry, the cost of the foundation, and the criteria set by the Design Engineer with respect to vertical and differential movements which the structure can withstand without experiencing significant damage or intolerable movements.

Based on our review of historical geotechnical information and our experience in the area of the proposed project site, the site is generally considered compatible with industrial development, depending on the function and anticipated loads of the proposed structure(s). The soils encountered at nearby project sites indicate that the site will likely be suitable for building foundations and/or construction of on-site roadways following proper site preparation (which could include undercut and fill operations, depending on the competency of the soils in the upper 10 feet at the project site, and the elevation differences across the site), however the soils will likely not be able to support the provided maximum column loads as discussed below.

#### POTENTIAL FOUNDATION TYPES AND CAPACITIES

Based on PSI's experience and other local geotechnical information, it is believed that shallow spread footings bearing at least 24 inches below final grade could be designed for a net allowable bearing capacity in the range of 1,000 psf to 2,000 psf for a maximum footing width of five (5) feet, provided that the site is properly prepared as indicated above. Due to the likely presence of soft, silty soils in the upper 10 feet, it should be expected that this preparation will include undercut and replace operations that may be required for support of a shallow foundation system, based on the soils encountered at the site. In addition, as previously discussed, this bearing capacity value is based on the near-surface soils encountered at nearby project sites, and a detailed geotechnical investigation should be performed prior to the design or construction of any specific structure(s).

While a shallow foundation will likely be acceptable for some lightly loaded elements, based on the approximate loads provided to PSI, it is unlikely that the soils will be able to support a column load of 300 kips on a shallow foundation system without experiencing excessive settlement. It should be expected that a deep foundation system will be required for support of column loads. Driven or auger cast-in-place (ACIP) piles will likely need to bear at depths of 40 to 80 feet below the existing site grade to support loads of this magnitude. Rammed aggregate piers or helical piles are also utilized in this area on occasion.

The choice of the type of foundation to be used for support of a specific structure should be based on the tolerance criteria for the performance of the structure and economics of construction. Ground-supported shallow foundations or surface improvements will likely be governed by the anticipated loads and settlement tolerances. As stated previously, the information presented in this preliminary report is provided for planning purposes only and is not intended for use in design and construction. A detailed geotechnical investigation will be necessary prior to design of any proposed structures.



PSI Project No: 0257951 West End Golf Course – Geotechnical Desktop Study West Monroe, Louisiana December 30, 2019 Page 4

## **MEMORANDUM LIMITATIONS**

The information and preliminary recommendations provided in this memo are based on the available local information and PSI's knowledge of the local area. This desktop study is preliminary in nature and is not to be used for design or construction. The discussion above is based on opinion only and NOT supported by any site-specific data. It is not intended to provide any opinions on the geotechnical performance of any specific structure or equipment, as such opinions would require further investigation and specific analyses. On-the ground due diligence and data collection must be completed for any further site analysis. The actual conditions in specific areas of the site may vary from described in this memo. This memorandum has been prepared for the exclusive use of Northeast Louisiana Economic Alliance and CSRS for the proposed redevelopment of the West End Golf Course site in West Monroe, Louisiana.



PSI Project No: 0257951 West End Golf Course – Geotechnical Desktop Study West Monroe, Louisiana December 30, 2019 Page 1

APPENDIX

www.intertek.com/building



WEST END GOLF COURSE NORTH 7<sup>th</sup> STREET AND ARKANSAS ROAD WEST MONROE, LOUISIANA SITE VICINITY MAP GOOGLE EARTH IMAGERY DATE: 04/16/2018 PSI PROJECT NO.: 0257951 intertek.



GEOTECHNICAL ENGINEERING SERVICES WEST END GOLF COURSE NORTH 7<sup>th</sup> STREET AND ARKANSAS ROAD WEST MONROE, LOUISIANA

SITE VICINITY MAP - 2018 GOOGLE EARTH IMAGERY DATE: 04/16/2018 PSI PROJECT NO.: 0257951 intertek **PS** 



WEST MONROE, LOUISIANA

GOOGLE EARTH IMAGERY DATE: 01/23/1998 **PSI PROJECT NO.: 0257951** 



GEOTECHNICAL ENGINEERING SERVICES WEST END GOLF COURSE NORTH 7<sup>th</sup> STREET AND ARKANSAS ROAD WEST MONROE, LOUISIANA

AERIAL IMAGERY BING MAPS IMAGERY DATE: 2019 PSI PROJECT NO.: 0257951 intertek



LOOKING SOUTH FROM INTERSECTION OF NORTH 7<sup>th</sup> AND ARKANSAS RD. GOOGLE EARTH IMAGERY DATE: 04/2019

**PSI PROJECT NO.: 0257951** 

NORTH 7<sup>th</sup> STREET AND ARKANSAS ROAD WEST MONROE, LOUISIANA



WEST MONROE, LOUISIANA

GOOGLE EARTH IMAGERY DATE: 04/2019

**PSI PROJECT NO.: 0257951** 

