

August 7, 2020

Trowbridge Wolf Michaels
Landscape Architects LLP
1001 West Seneca Street Suite 201
Ithaca, New York 14850

Attention: Margot D. Chiuten, RLA ASLA

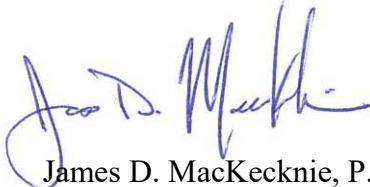
Subject: Geotechnical Engineering Investigation
Buffalo Outer Harbor Phase 2
Fuhrmann Boulevard
City of Buffalo, Erie County, New York

Ms. Chiuten:

Ravi Engineering & Land Surveying, P.C. is pleased to submit the revised Geotechnical Engineering Report for the above referenced project. If you require additional information please contact the undersigned at (585) 703-9932. Thank you.

Respectfully submitted,

RAVI ENGINEERING & LAND SURVEYING, P.C.



James D. MacKecknie, P.G.
Project Manager

Attachment: Geotechnical Engineering Investigation Report

REPORT
GEOTECHNICAL ENGINEERING INVESTIGATION
BUFFALO OUTER HARBOR PHASE 2
FUHRMANN BOULEVARD
CITY OF BUFFALO, ERIE COUNTY, NEW YORK

For

Trowbridge Wolf Michaels Landscape Architects

August 2020

August 7, 2020

Trowbridge Wolf Michaels Landscape Architects
1001 West Seneca Street, Suite 201
Ithaca, New York 14850

Attention: Margot Chiuten

Subject: Geotechnical Engineering Investigation
Buffalo Outer Harbor Phase 2
Fuhrmann Boulevard
City of Buffalo, Erie County, New York

Readers:

This report presents the results of a geotechnical engineering investigation for the project identified above. Information regarding the proposed construction was provided to us by Trowbridge Wolf Michaels Landscape Architects, and by WSP.

UNDERSTANDING OF PROPOSED CONSTRUCTION

The proposed construction includes three one-story buildings, one or more decks, a landscaped amphitheater, several light poles, two pylons, and areas of pavement.

Additional comments regarding the proposed construction are presented in subsequent sections of this report.

SUBSURFACE EXPLORATIONS

Subsurface explorations for this investigation consisted of 18 test borings, identified as B-1-20 through B-18-20. The quantity and locations of the borings were determined by others. Because of field conditions, it was necessary to shift some of the borings from their originally requested locations. The as-drilled locations of the borings are shown on the plans in Appendix A. The approximate ground surface elevations, at the boring locations, are presented in attached Table 1. Also presented in Table 1 are the proposed features at or near each boring location, as provided to us by others.

The borings were performed by Earth Dimensions, Inc., using rotary drilling equipment, between 7/1/20 and 7/14/20.

Of the 18 borings, 14 were each advanced to a depth of 27 feet below the ground surface.

Four of the borings (B-3-20, B-4-20, B-10-20, and B-15-20) were advanced to the top of apparent bedrock. Two of these borings (B-4-20 and B-15-20) were each cored an additional 10 feet into bedrock.

The logs of the borings, as prepared by Earth Dimensions, Inc., are presented in Appendix B. Detailed descriptions of the subsurface conditions encountered, as well as a concise summary, are presented on the log of each boring.

Selected subsurface information is also presented in attached Table 1.

COMMENTS ON SUBSURFACE CONDITIONS

All of the borings encountered random fill materials. The depth of the random fill, at the boring locations, ranged from approximately 4 feet to approximately 22 feet below the ground surface. The approximate depths and elevations of the bottom of random fill are presented in attached Table 1.

The natural soils, underlying the random fill, are variable. Some of these soils are relatively weak and compressible. Organic matter is present at some locations and depths.

As previously noted, four of the borings were advanced to the top of apparent bedrock. Two of these borings were also advanced into bedrock. The bedrock, within the depths explored, is described as limestone. The depth to the top of bedrock, where encountered, ranged from approximately 52 feet to approximately 66 feet below the ground surface. In general, the depth to bedrock appeared to decrease from south to north. The approximate depths and elevations of the top of bedrock, where encountered, are presented in attached Table 1.

Observations of down-hole groundwater and sample moisture were made during the test boring program. It should be noted that short-term observations may not be representative of actual groundwater levels, and that groundwater levels will vary with factors including location, time, precipitation, season, and site activities. In general, it is likely that groundwater will be encountered near or above the level of nearby Lake Erie.

It should be noted that objects too large to be retrieved by the sampling equipment (including cobbles, boulders, and concrete fragments) are likely to be present. Such objects are especially likely to be present in the random fill.

More detailed descriptions of the subsurface conditions, as encountered by the borings, are provided on the logs in Appendix B. Selected subsurface information is also presented in attached Table 1.

DESIGN AND CONSTRUCTION

General

All design and construction should meet or exceed the requirements of all applicable codes.

With regard to the International Building Code, a seismic Site Class of “E” should be applied to this project. This corresponds to a “Soft soil profile.”

Foundations for Three Proposed One-Story Buildings

It is understood that the floors of the buildings in the south and south-central parts of the site will be at or near existing grade. It is also understood that the floor of the building in the north part of the site will be approximately 2 feet higher than existing grade.

It is recommended that each of the three proposed one-story buildings be supported by a reinforced concrete mat foundation. The top of each mat foundation would serve as the building’s floor. All of the following requirements should be satisfied:

- No topsoil, existing utilities, or other unsuitable materials should be left in place. It is anticipated that much of the existing fill, however, including trace amounts of organic matter, may be left in place.
- Compacted granular fill should be placed below each foundation. The thickness of the compacted granular fill should be at least 12 inches. Greater thicknesses of compacted granular fill are likely to be necessary.
- Subgrades should be prepared, and granular fill should be placed and compacted, as described elsewhere in this report.
- Drained, unsaturated conditions should be maintained within the compacted granular fill.
- Design of each foundation should be based on a maximum net allowable bearing pressure of 500 pounds per square foot, and a subgrade modulus (K) not exceeding 25 pounds per cubic inch.
- Each mat foundation should be haunched/thickened along its perimeter, and perhaps elsewhere as necessary, to provide additional stiffness.
- Exterior haunches or frost walls should consist of reinforced concrete, and should extend at least 4 feet below final adjacent exterior grade.
- The final grading should be such that surface water is conducted away from each structure.

For a mat foundation properly designed and installed in accordance with this report, the post-construction settlement is not expected to exceed 1 inch. The post-construction shear strain (angular distortion) resulting from differential settlement is not expected to exceed 0.2 percent.

Deck Foundations

Based on the conditions encountered by boring B-3-20, the proposed decks are not well suited to conventional spread footings, mat foundations, or drilled shafts. A preferable foundation system would be steel piles driven to bedrock. It might be possible to reduce the number of piles, by stiffening the beams atop the piles.

The piles could be H piles, open-end pipe piles, or closed-end pipe piles filled with concrete.

H piles and open-end pipe piles may be designed for a maximum allowable axial stress of 35 percent of the yield strength, or 17,500 pounds per square inch, whichever is less.

Closed-end pipe piles, if driven to refusal and filled with good-quality concrete (at least 4,000 psi), may be designed for an allowable load of 1,200 pounds per square inch of total pile cross-sectional area.

Piles should be driven, using a suitable hammer, to practical refusal on or in bedrock.

The ultimate capacity of each pile should be at least twice the allowable load. Pile capacities should be verified by the use of a pile-driving analyzer (PDA), by load testing, or by a combination of the two. Applicable code requirements should be followed.

The minimum center-to-center spacing of piles should be 30 inches or 2.5 pile widths, whichever is greater.

Lateral loads, buckling, the need for cross-bracing, and the need for batter piles should all be considered.

Piles should be installed by a contractor experienced in this specialized work. Obstructions and other installation difficulties should be anticipated. All piles should be installed in such a way that they are not overstressed or otherwise damaged during installation.

Landscaped Amphitheater

It is understood that the landscaped amphitheater will be constructed in the south part of the site, in the area of borings B-1-20, B-2-20, and B-3-20. It is also understood that grade increases as great as approximately 6 feet will be required.

It is recommended that the grade increases be achieved using compacted common and/or granular fill. Subgrades should be prepared, and fill should be placed and compacted, as described elsewhere in this report.

Final slopes should be no steeper than 1 vertical on 3 horizontal.

The proposed grade increases are likely to cause compression of the underlying soft soils, resulting in settlement. It is estimated that a settlement of roughly 1 inch per each foot of grade increase is possible. Grade increases, therefore, should be achieved as early as possible in the construction sequence.

Foundations for Light Poles and Pylons

It is understood that the vertical loads from light poles and pylons will be modest, and that the primary concern is overturning.

The design and construction of the light pole and pylon foundations will be strongly controlled by the existing random fill materials.

It is recommended that the light pole and pylon foundations consist of drilled shafts, and that the existing random fill materials generally be left in place.

Each drilled shaft should be designed for a tip bearing pressure not exceeding 1,000 pounds per square foot.

Each drilled shaft should be at least 2.5 feet in diameter.

The resistance to lateral load and overturning moment should be computed using the method proposed by Broms (1964), or a similar method. Analysis should be based on a soil unit weight of 60 pounds per cubic foot, and a passive lateral earth pressure coefficient of 2.50. A safety factor of at least 3.00 should be applied.

It is anticipated that the drilled shafts will be installed using conventional rotary drilling methods and temporary casings. Drilling difficulties should be expected. Dewatering is likely to be necessary. All concrete should be placed in the dry, or by a suitable tremie method.

Pavement

A practical pavement design is based on factors including subgrade quality, frost action, traffic loads, traffic frequency, design life, and the relative importance of initial costs versus future maintenance.

At this site, the subgrade quality for flexible pavement should be represented using a California Bearing Ratio (CBR) not exceeding 5.

For auto parking areas, the recommended minimum flexible pavement section consists of a 1-inch asphaltic top course, a 2-inch asphaltic binder course, and a 12-inch subbase course of compacted granular fill.

For areas subjected to more frequent and/or heavier vehicles, the minimum combined thickness of asphaltic top and binder courses should be increased to 5 inches. The minimum thickness of the granular subbase should be increased to 16 inches.

The subgrade quality for rigid pavement should be represented using a subgrade modulus (K) not exceeding 75 pounds per cubic inch. The rigid section should consist of reinforced concrete, and should be at least 6 inches thick. At least 12 inches of compacted granular fill should be placed below the slab.

For all pavement sections, compacted common fill may be placed as required below the granular fill.

No existing topsoil or other unsuitable materials should be left in place. Complete removal of the existing fill materials, however, should not be necessary. Subgrades should be prepared, and fill should be placed and compacted, as described elsewhere in this report.

Drained, unsaturated conditions should be maintained within all pavement sections. Surface water should be conducted away from paved areas and structures.

The project designers may wish to consider pavement sections that are more or less conservative than those presented. This could depend on the traffic and cost factors described above, as well as the performance of existing and previous pavement sections at the site.

Excavation and Construction Dewatering

Excavation should be performed in accordance with all applicable local, state, and federal requirements. The sides of all excavations should be sloped or supported as required by safety regulations. Existing structures, utilities, and other property should be protected.

With regard to the current OSHA regulations, Type C soil should be assumed. This would apply to adequately dewatered soil.

To minimize subgrade disturbance, excavation should be performed with increasing care as subgrade levels are approached.

All work should be performed in the dry. In addition, the dewatering should be sufficient to permit suitable preparation of the subgrade and compaction of any subsequent fill materials.

The contractor should be prepared to dewater as necessary, and should choose and employ an appropriate type of dewatering system. Any dewatering system should be operated in such a way that disturbance or removal of the subgrade soil does not occur.

Subgrade Preparation

It is cautioned that the soils at this site contain fine-grained material, and that they will be sensitive to disturbance. Subgrades should be kept free of water, subjected to a minimum amount of construction traffic, exposed no longer than necessary, and not permitted to freeze.

Subgrades should be carefully prepared and thoroughly examined by qualified personnel. Subgrades should also be tamped using vibratory equipment, to the greatest extent possible without loosening or softening the subgrade soils.

Where space permits, subgrades should be thoroughly proofrolled with both a large vibratory roller and a fully-loaded ten-wheel dump truck. The primary objective of this additional effort is to identify and/or compact any voids or loose zones in the existing random fill materials.

No new fill or foundation concrete should be placed over material that is loose, soft, wet, frozen, or otherwise unsuitable with respect to the design recommendations. No more than trace amounts of organic matter should be left in place.

Fill and Backfill

Granular fill should consist of a durable sand and gravel or crusher-run stone, free of any organic matter. The plasticity index should be less than 5. Granular fill should have 100 percent finer than 3 inches, 20 to 60 percent finer than the Number 4 sieve, and no more than 10 percent finer than the Number 200 sieve.

Granular fill could also be specified as meeting the NYSDOT requirements for Subbase Course Type 1, 2, or 4.

Common fill should consist of durable soil material, free of any organic matter. The plasticity index should be less than 15. Common fill should have 100 percent finer than 6 inches, at least 90 percent finer than 3 inches, and at least 20 percent finer than the Number 4 sieve.

It should be noted that granular fill meets all of the requirements of common fill, and that granular fill can generally be placed and compacted with less difficulty.

All load-bearing fill should be compacted, in lifts of 9 inches or less, to at least 95 percent of the maximum dry density determined by ASTM D 1557.

The in-place density and water content of compacted fill should be determined by ASTM D 6938. At least one test should be performed per 2,500 square feet, per lift.

CLOSING COMMENTS AND RECOMMENDATIONS

Professional services for this investigation were performed in accordance with generally accepted geotechnical engineering practices, exclusively for the subject project. No warranty, expressed or implied, is made.

Subsurface conditions are inferred from the logs of subsurface explorations. Conditions between, beyond, and below these explorations are likely to vary. It should also be noted that subsurface conditions are often described on the basis of visual examinations of recovered samples, that these visual descriptions may not always agree well with descriptions made on the basis of laboratory tests, and that the distinction between fill and naturally-deposited soil can not always be readily determined on the basis of recovered samples. If subsurface conditions are subsequently revealed that appear to be significantly different or less favorable than those described, we should be given the opportunity to revise the statements in this report.

Designers and contractors are advised that this report was prepared primarily for design purposes, and that it may not contain sufficient information for bidding. Contractors should visit the site, review this report and the related exploration logs, and evaluate potential construction difficulties on the basis of their own knowledge and experience.

It is recommended that qualified personnel be retained to review the geotechnical portions of the contract drawings and specifications, and to provide monitoring services during construction.

It has been a pleasure assisting you with this investigation. If you have questions or comments regarding this report, please contact the undersigned.

Yours truly,

RAVI ENGINEERING & LAND SURVEYING, P.C.



Nagappa Ravindra, P.E.
President



Ray M. Teeter, P.E.
Geotechnical Engineer

Attachments: Table 1 – Selected Subsurface Information
 Appendix A – Test Boring Location Plans
 Appendix B – Test Boring Logs

Table 1
Selected Subsurface Information
Buffalo Outer Harbor Phase 2
Fuhrmann Boulevard
City of Buffalo, Erie County, New York

| <u>Boring Number</u> | <u>Approx. Ground Surface Elevation</u> | <u>Approximate Bottom of Fill</u> | | <u>Approximate Top of Bedrock</u> | | <u>Proposed Feature</u> |
|-----------------------------|--|--|-------------------------|--|-------------------------|--------------------------------|
| | | <u>Depth</u> | <u>Elevation</u> | <u>Depth</u> | <u>Elevation</u> | |
| B-1-20 | 580 | 6 | 574 | not encountered | | light pole |
| B-2-20 | 585 | 14 | 571 | not encountered | | pylon |
| B-3-20 | 580 | 4 | 576 | 66 | 514 | deck |
| B-4-20 | 585 | 15 | 570 | 64 | 521 | south building |
| B-5-20 | 586 | 14 | 572 | not encountered | | south building |
| B-6-20 | 585 | 11 | 574 | not encountered | | light pole |
| B-7-20 | 585 | 20 | 565 | not encountered | | light pole |
| B-8-20 | 586 | 22 | 564 | not encountered | | light pole |
| B-9-20 | 585 | 22 | 563 | not encountered | | light pole |
| B-10-20 | 584 | 21 | 563 | 52 | 532 | south-central building |
| B-11-20 | 583 | 22 | 561 | not encountered | | south-central building |
| B-12-20 | 581 | 12 | 569 | not encountered | | north building |
| B-13-20 | 581 | 12 | 569 | not encountered | | north building |
| B-14-20 | 581 | 12 | 569 | not encountered | | north building |
| B-15-20 | 581 | 13 | 568 | 53 | 528 | north building |
| B-16-20 | 581 | 12 | 569 | not encountered | | north building |
| B-17-20 | 581 | 13 | 568 | not encountered | | north building |
| B-18-20 | 582 | 7 | 575 | not encountered | | pylon |

Note: All elevations and depths are in feet, and are approximate. Elevations and depths at other locations will vary. See accompanying report and boring logs for additional information.

Appendix A

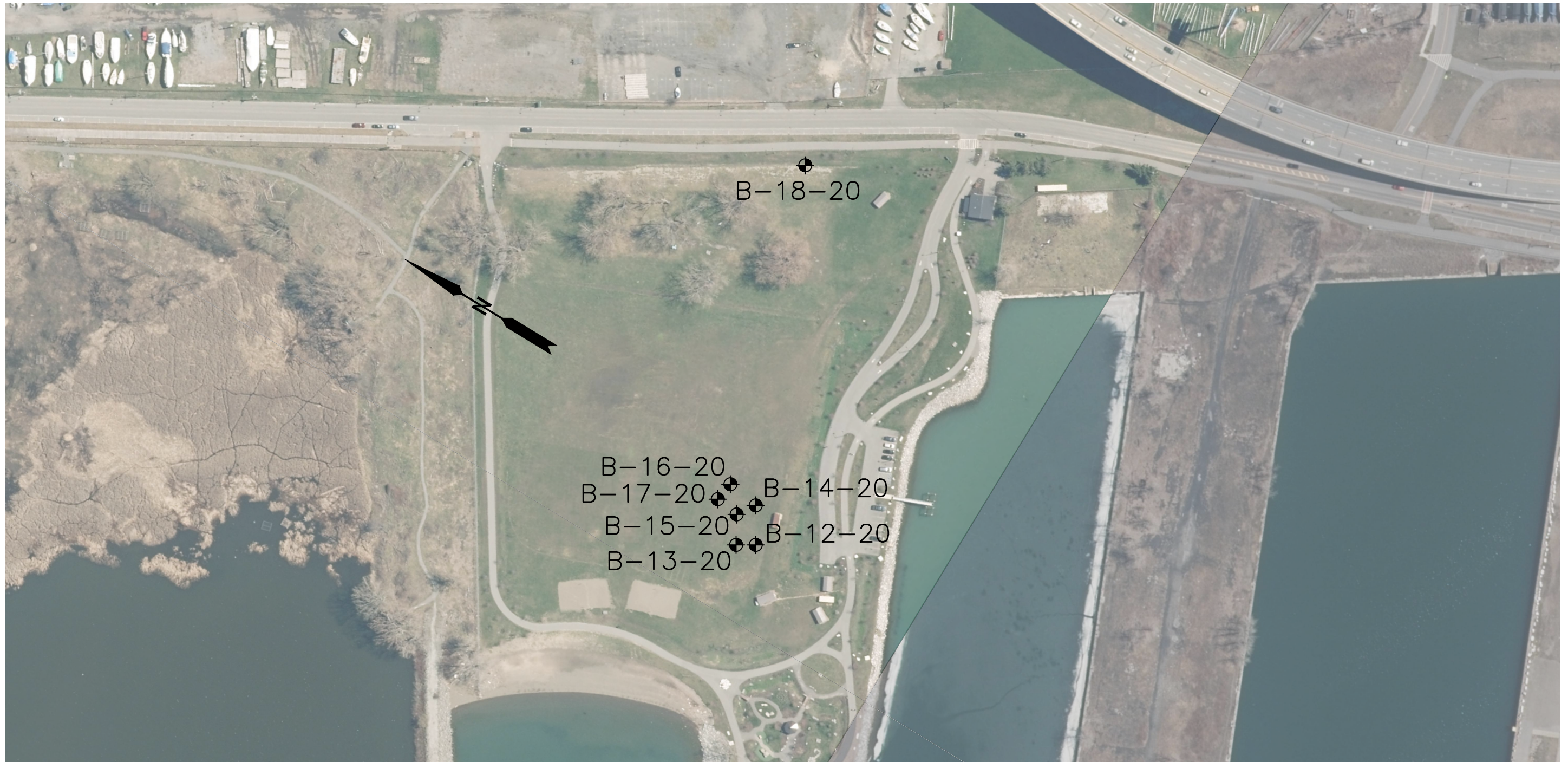
Test Boring Location Plans



Test Boring Location Plan
Borings B-1-20 through B-11-20
Buffalo Outer Harbor - Phase 2
Fuhrmann Boulevard
City of Buffalo, Erie County, New York

| | | | |
|-----------------|-----------------|----------------|----------------|
| DWG # 20-16-204 | Scale : 1"=150' | Date : 7/29/20 | Drawn By : JFF |
|-----------------|-----------------|----------------|----------------|


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& LAND SURVEYING, P.C.**
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Test Boring Location Plan
Borings B-12-20 through B-18-20
Buffalo Outer Harbor - Phase 2
Fuhrmann Boulevard
City of Buffalo, Erie County, New York

DWG # 20-16-204 Scale : 1"=150' Date : 7/29/20 Drawn By : JFF

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Appendix B
Test Boring Logs



EARTH DIMENSIONS, INC.

Soil and Hydrogeologic Investigations • Wetland Delineations

1091 Jamison Road • Elma, NY 14059

(716) 655-1717 • EDI@earthdimensions.com

13E96b

HOLE NO. B-1-20

SURF. ELEVATION

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/06/20 COMPLETED 07/06/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|----|-----|------|-------|-------|----|------|---|--|
| 1 | 16 | | | | | | Gray asphalt pavement. | Asphalt pavement to 0.3 feet over sandy soil fill with some gravel, trace silt and slag to 4.1 feet over sand and gravel fill with trace silt and slag to 6.0 feet over clayey slack water sediment with trace sand to 15.0 feet over silty slack water sediment with trace sand and organic matter to 20.0 feet over silty slack water sediment with little sand, trace to little gravel to 25.0 feet over water sorted and deposited sand and gravel with trace silt to end of boring. WH: Sampler penetration with weight of rods and hammer. ↓ Water level at 11.9 feet below ground surface at completion. Note: Added water to augers prior to sample number 9 to combat running sand conditions. Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 12.0 feet and 5.0-foot interval sampling to end of boring at 27.0 feet. Bore hole was backfilled with cuttings to ground surface upon completion. |
| 13 | | 6 | | | 14 | | Moist gray to dark gray gravelly (SAND) fill with 20 to 40% gravel, trace silt and slag, compact, massive soil structure, (SW). 0.3 | |
| | | | 8 | | | | | |
| | | | | 12 | | | | |
| 2 | 16 | | | | | | | |
| 12 | | 27 | | | | | 4.1 | |
| | | | 50/4 | | | | | |
| 3 | 35 | | | | | | | |
| 5 | 17 | 17 | | | 33 | | 6.0 | |
| | | | 16 | | | | | |
| | | | | 17 | | | | |
| 4 | 4 | | | | | | | |
| 9 | | 1 | | | 2 | | | |
| | | | 1 | | | | 8.0 | |
| 5 | 1 | | | | | | | |
| 8 | | 1 | | | 2 | | | |
| | | | 1 | | | | | |
| 10 | 6 | WH | | | | | | |
| | 16 | | WH | | <1 | | | |
| | | | | WH | | | | |
| | | | | WH | | | | |
| | | | | | | | 15.0 | |
| 15 | 7 | 1 | | | | | | |
| | 18 | | 1 | | 2 | | | |
| | | | | 1 | | | | |
| | | | | | | | | |
| | | | | 1 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 20 | | | | | | | 20.0 | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 1 OF 2



EARTH DIMENSIONS, INC.

Soil and Hydrogeologic Investigations • Wetland Delineations

1091 Jamison Road • Elma, NY 14059

(716) 655-1717 • EDI@earthdimensions.com

SURF. ELEVATION

13E96b

HOLE NO. B-2-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/07/20 COMPLETED 07/07/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|-----|------|-------|-------|----|------|---|---|
| REC | | | | | | | | |
| 1 | 5 | | | | | | | |
| 10 | | 8 | | | 14 | | Moist brownish gray (SILTY-SAND) topsoil fill with 3 to 7% gravel, little silt and organic matter, compact, massive soil structure, (SM). | Sandy topsoil fill with little silt and organic matter to 0.8 feet over coarse silty soil fill with little gravel and sand, trace slag to 2.0 feet over sandy soil fill with trace to little gravel and silt, trace slag to 6.0 feet over coarse silty soil fill with little sand and gravel, trace slag, clay, and wood fiber to 12.0 feet over sandy soil fill with little silt and gravel, trace concrete debris to 13.5 feet over clayey slack water sediment with trace sand to 25.0 feet over water sorted and deposited sand with trace clay to end of boring. |
| 2 | 11 | | | | | | | |
| 17 | | 12 | | | 20 | | Moist dark brown (SANDY-SILT) fill with 10 to 20% gravel, little sand, trace slag, compact, massive soil structure, (ML). | |
| 3 | 7 | | | | | | | |
| 5 | 19 | 5 | | | 8 | | Moist black (SILTY-SAND) fill with 5 to 15% gravel, trace to little silt, trace slag, compact, massive soil structure, (SM). | |
| 4 | 8 | | | | | | | |
| 15 | | 6 | | | 18 | | Moist to extremely moist, wet below 10.0 feet, dark gray (SANDY-SILT) fill with 10 to 20% gravel, little sand, trace slag, clay, and wood fiber, compact, massive soil structure, (ML). | |
| 5 | 6 | | | | | | | |
| 10 | 10 | 6 | | | 9 | | Wet gray to dark gray (SILTY-SAND) fill with 10 to 20% gravel, little silt, trace concrete debris, very dense, massive soil structure, (SM). | |
| 6 | 3 | | | | | | | |
| 6 | | 6 | | | | | | |
| | | | 50/3 | | | | | Water level at 11.0 feet below ground surface upon completion. |
| 7 | 3 | | | | | | | Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 16.0 feet and 5.0-foot interval sampling to end of boring at 27.0 feet. Bore hole was backfilled with cuttings to ground surface upon completion. WH: Sampler penetration with weight of rods and hammer. |
| 5 | | 11 | | | | | | |
| | | | 50/1 | | | | | |
| 8 | 1 | | | | | | | |
| 15 | 18 | 1 | | | 2 | | Extremely moist gray (SILTY-CLAY) with trace sand, very soft to soft, thinly laminated with very thin coarse silt lenses, (CL). | |
| | | | | 1 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 20 | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 1 OF 2



EARTH DIMENSIONS, INC.

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(716) 655-1717 • EDI@earthdimensions.com

13E96b

HOLE NO. B-2-20

SURF. ELEVATION

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/07/20 COMPLETED 07/07/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|-----|------|-------|-------|---|------|---|-------------------------|
| REC | | | | | | | | |
| 9 | WH | | | | 2 | | Extremely moist gray (SILTY-CLAY) with trace sand, very soft to soft, thinly laminated with very thin coarse silt lenses, (CL). | |
| 24 | | 1 | | | | | | |
| | | | 1 | | | | | |
| | | | | 2 | | | | |
| | | | | | | | grades downward to | 25.0 |
| 10 | 2 | | | | 8 | | Wet gray (SAND) mostly fine size, trace silt, loose, thinly bedded, (SP). | |
| 20 | | 4 | | | | | | |
| | | | 4 | | | | | |
| | | | | 5 | | | | |
| | | | | | | | Boring completed at 27.0 feet. | 27.0 |
| 25 | | | | | | | | |
| 30 | | | | | | | | |
| 35 | | | | | | | | |
| 40 | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 2 OF 2



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SURF. ELEVATION

13E96b

HOLE NO. B-3-20

PROJECT Buffalo Outer Harbor Phase 2






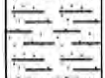








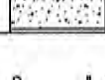
LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/06/20 COMPLETED 07/06/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|-----|------|-------|-------|----|---|--|--|
| REC | | | | | | | | |
| 1 | 17 | | | | | | Gray asphalt pavement. | Asphalt pavement to 0.3 feet over sandy soil fill with some gravel, trace slag, concrete debris, and brick fragments to 4.1 feet over silty slack water sediment with trace sand, clay, and organic matter to 6.0 feet over silty slack water sediment with little to some clay, trace sand to 15.0 feet over clayey slack water sediment with trace sand to 21.2 feet over water sorted and deposited sand with trace silt to 30.0 feet over clayey lake sediment with trace sand to 65.5 feet over coarse silty glacial till with little sand and gravel to auger refusal. Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 12.0 feet and 5.0-foot interval sampling to auger refusal at 66.3 feet. Bore hole was backfilled with cuttings to ground surface upon completion. |
| 12 | | 10 | | | 18 |  | Moist gray to dark gray gravelly (SAND) fill with 20 to 40% gravel, trace silt, slag, concrete debris and brick fragments, compact, massive soil structure, (SW). 0.3 | |
| 2 | 7 | | | | 18 |  | Extremely moist dark gray (SILT) trace organic matter, sand, and clay, loose, thinly bedded, (ML). 4.1 | |
| 10 | | 10 | | | 18 |  | grades downward to 6.0 | |
| 3 | 4 | | | | 4 |  | Extremely moist gray (CLAYEY-SILT) with little to some clay, trace sand, very loose, thinly laminated with very thin coarse silt lenses, (CL). 6.0 | |
| 23 | | 2 | | | 4 |  | grades downward to 15.0 | |
| 4 | 1 | | | | 2 |  | Wet gray (SILTY-SAND) with mostly fine size sand, some silt, compact, thinly bedded, (SM). 15.0 | |
| 20 | | 1 | | | 2 |  | grades downward to 20.0 | |
| 5 | | | 2 | | 2 |  | | |
| 11 | | | 1 | | 2 |  | | |
| 10 | | | | 1 | 2 |  | | |
| 6 | 1 | | | | 2 |  | | |
| 13 | | 1 | | | 2 |  | | |
| 15 | | | | 1 | 2 |  | | |
| 7 | 1 | | | | 5 |  | | |
| 14 | | 2 | | | 5 |  | | |
| | | | 3 | | | | | |
| | | | | 3 | | | | |
| 20 | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 1 OF 4



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Soil and Hydrogeologic Investigations • Wetland Delineations

1091 Jamison Road • Elma, NY 14059

(716) 655-1717 • EDI@earthdimensions.com

13E96b

HOLE NO. B-3-20

SURF. ELEVATION

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/06/20 COMPLETED 07/06/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|------------|-----|------|-------|-------|----|------|--|-------------------------|
| <u>REC</u> | | | | | | | | |
| 8 | 2 | | | | 3 | | Extremely moist gray (SILTY-CLAY) with trace sand, firm, thinly laminated with very thin coarse silt lenses, (CL). clear transition to 21.2 | |
| 23 | | 1 | | | | | Wet gray (SAND) mostly fine size, trace silt, compact with tendency to liquefy when disturbed, thinly bedded, (SP). | |
| | | | 2 | | | | | |
| | | | | 2 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 25 | | | | | | | | |
| 9 | 5 | | | | 12 | | | |
| 24 | | 7 | | | | | | |
| | | | 5 | | | | | |
| | | | | 4 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 30 | | | | | | | grades downward to 30.0 | |
| 10 | 6 | | | | 10 | | Moist gray (SILTY-CLAY) with trace sand, firm to stiff, thinly laminated with very thin coarse silt lenses, (CL). | |
| 10 | | 7 | | | | | | |
| | | | 3 | | | | | |
| | | | | 3 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 35 | | | | | | | | |
| 11 | 5 | | | | 6 | | | |
| 15 | | 2 | | | | | | |
| | | | 4 | | | | | |
| | | | | 4 | | | | |
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| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 40 | | | | | | | | |



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SURF. ELEVATION

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/06/20 COMPLETED 07/06/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS | |
|-----|-----|------|-------|-------|----|------|---|---|--|
| REC | | | | | | | | | |
| 12 | 4 | | | | 5 | | Moist gray (SILTY-CLAY) with trace sand, firm to stiff, thinly laminated with very thin coarse silt lenses, (CL). | ↓ Water level at 42.3 feet below ground surface at completion. WR: Sampler penetration with weight of rods. WH: Sampler penetration with weight of rods and hammer. | |
| 24 | | 2 | | | | | | | |
| | | | 3 | | | | | | |
| | | | | 3 | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 45 | | | | | | | | | |
| 13 | 5 | | | | 10 | | | | |
| 15 | | 4 | | | | | | | |
| | | | 6 | | | | | | |
| | | | | 8 | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 50 | | | | | | | | | |
| 14 | WR | | | | <1 | | | | |
| 15 | | WR | | | | | | | |
| | | | WH | | | | | | |
| | | | | WH | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 55 | | | | | | | | | |
| 15 | WR | | | | <2 | | | | |
| 24 | | WR | | | | | | | |
| | | | 1 | | | | | | |
| | | | | 1 | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 60 | | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 3 OF 4



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SURF. ELEVATION

13E96b

HOLE NO. B-4-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/01/20 COMPLETED 07/02/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|----|-----|------|-------|-------|----|------|--|--|
| 1 | 4 | | | | | | | |
| 18 | | 8 | | | 23 | | Moist light brown (SANDY-SILT) topsoil fill with little sand and organic matter, loose, massive soil structure, (ML). | Coarse silty topsoil fill with little sand and organic matter to 0.4 feet over sandy soil fill with some gravel, little slag, trace silt and brick fragments to 4.0 feet over sandy soil fill with some gravel, trace to little silt to 6.9 feet over coarse silty soil fill with little sand, trace gravel to 9.0 feet over coarse silty soil fill with little gravel and sand, trace clay and brick fragments to 14.0 feet over mostly asphalt remnants/tar residue to 15.0 feet over water sorted and deposited sand with trace silt to 20.7 feet over water sorted and deposited sand with little gravel, trace to little silt to 25.0 feet over water sorted and deposited sand with trace gravel to 30.0 feet over clayey lake sediment with trace sand and gravel to 35.0 feet over clayey lake sediment with trace sand to 45.0 feet over silty slack water sediment with trace sand and clay to 50.0 feet over clayey lake sediment with trace sand to 64.2 feet over limestone bedrock to end of coring. |
| 2 | 19 | | | | 40 | | Moist dark gray to gray gravelly (SAND) fill with 20 to 40% gravel, little slag, trace silt and brick fragments, stratified, massive soil structure, (SW), (GW). | |
| 3 | 19 | | | | 30 | | Extremely moist brown gravelly (SILTY-SAND) fill with 20 to 40% gravel, trace to little silt, compact, massive soil structure, (SM). | |
| 4 | 9 | | | | 6 | | Extremely moist to wet gray (SANDY-SILT) fill with 3 to 7% gravel, little sand, loose, massive soil structure, (ML). | |
| 5 | 5 | | | | 7 | | Extremely moist gray (SANDY-SILT) fill with 10 to 20% gravel, little sand, trace clay and brick fragments, loose, massive soil structure, (ML). | |
| 6 | 5 | | | | 7 | | | |
| 7 | 3 | | | | 10 | | | |
| 8 | 20 | | | | 28 | | Mostly asphalt remnants and tar residue. | |
| 15 | 18 | 21 | | | | | Wet black (SAND) mostly fine to medium size, trace silt, compact, thinly bedded, (SP). | |
| 20 | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 1 OF 4



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SURF. ELEVATION —

13E98b

HOLE NO. B-4-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Euhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/01/20 COMPLETED 07/02/20

DEPTH IN FT BLOWS ON SAMPLER

| SN REC | 0/ 6 | 6/ 12 | 12/ 18 | 18/ 24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----------|---------|----------|-----------|-----------|----|------|--|--|
| 9 | 7 | | | | 18 | | Wet black (SAND) mostly fine to medium size, trace silt, compact, thinly bedded, (SP). grades downward to 20.7 | ▼ Water level at 21.3 feet below ground surface at completion. |
| 17 | | 7 | | | | | Wet gray (SILTY-SAND) with 10 to 20% gravel, trace to little silt, compact, stratified, (SM). grades downward to 25.0 | |
| | | | 11 | | | | | |
| | | | | 12 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 10 | 2 | | | | 7 | | Wet dark gray (SAND) with 3 to 7% gravel, loose, thinly bedded, (SW). grades downward to 30.0 | |
| 20 | | 2 | | | | | | |
| | | | 3 | | | | | |
| | | | | 5 | | | | |
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| 11 | 11 | | | | 21 | | Moist to extremely moist gray (SILTY-CLAY) with 3 to 7% gravel, trace sand, very stiff, thinly laminated with very thin coarse silt lenses, (CL). grades downward to 35.0 | |
| 14 | | 9 | | | | | | |
| | | | 12 | | | | | |
| | | | | 13 | | | | |
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| | | | | | | | | |
| 12 | 2 | | | | 5 | | Moist gray (SILTY-CLAY) with trace sand, firm, thinly laminated with very thin coarse silt lenses, (CL). | |
| 22 | | 3 | | | | | | |
| | | | 2 | | | | | |
| | | | | 3 | | | | |
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N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Jason Kryszak, cns



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13E96b

HOLE NO. B-4-20

SURF. ELEVATION

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/01/20 COMPLETED 07/02/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/ 6 | 6/ 12 | 12/ 18 | 18/ 24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|------------|---------|----------|-----------|-----------|----|------|---|--|
| <u>REC</u> | | | | | | | | |
| 13 | 3 | | | | | | | |
| 22 | | 4 | | | 9 | | Moist gray (SILTY-CLAY) with trace sand, firm, thinly laminated with very thin coarse silt lenses, (CL). | WR: Sampler penetration with weight of rods. |
| | | | 5 | | | | | |
| | | | | 6 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 45 | | | | | | | grades downward to 45.0 | |
| 14 | 9 | | | | | | Wet gray (SILT) with trace sand and clay, compact, thinly bedded, (ML). | |
| 14 | | 10 | | | 22 | | | |
| | | | 12 | | | | | |
| | | | | 16 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 50 | | | | | | | grades downward to 50.0 | |
| 15 | 10 | | | | | | Extremely moist gray (SILTY-CLAY) with trace sand, stiff, thinly laminated with very thin coarse silt lenses, (CL). | |
| 20 | | 6 | | | 11 | | | |
| | | | 5 | | | | | |
| | | | | 6 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 55 | 16 | WR | | | | | | |
| | 24 | | WR | | <2 | | | |
| | | | 1 | | | | | |
| | | | | 1 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 60 | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)



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SURF. ELEVATION —

13E96b

HOLE NO. B-5-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Euhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/02/20 COMPLETED 07/02/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/ 6 | 6/ 12 | 12/ 18 | 18/ 24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|---------|----------|-----------|-----------|----|------|--|---|
| REC | | | | | | | | |
| | | | | | | | Gray asphalt pavement. 0.2 | Asphalt pavement to 0.2 feet over sandy soil fill with some gravel, trace to little silt, trace slag, asphalt remnants, and ceramic and brick fragments to 6.6 feet over silty soil fill with little clay, trace sand to 8.0 feet over coarse silty soil fill with little gravel and sand, trace brick fragments and concrete debris to 12.0 feet over clayey soil fill with trace sand, gravel, and concrete debris to 14.0 feet over water sorted and deposited sand with trace silt to 25.0 feet over water sorted and deposited sand with some gravel, trace silt to end of boring. Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 16.0 feet and 5.0-foot interval sampling to end of boring at 27.0 feet. Bore hole was backfilled with cuttings to ground surface upon completion. |
| 1 | 23 | | | | | | | |
| 3 | | 50/2 | | | | | Moist dark gray gravelly (SILTY-SAND) fill with 20 to 40% gravel, trace to little silt, trace asphalt remnants, slag, and ceramic and brick fragments, compact to dense, massive soil structure, (SM). 6.6 | |
| 2 | 22 | | | | | | | |
| 16 | | 18 | | | 29 | | | |
| | | | 11 | | | | | |
| | | | | 9 | | | | |
| 3 | 7 | | | | | | | |
| 5 | 11 | 9 | | | 14 | | | |
| | | | 5 | | | | | |
| | | | | 7 | | | | |
| 4 | 8 | | | | | | | |
| 15 | | 3 | | | 5 | | Extremely moist gray (CLAYEY-SILT) fill with little clay, trace sand, firm, massive soil structure, (ML-CL). 8.0 | |
| | | | 2 | | | | | |
| 5 | 7 | | | | | | | |
| 7 | | 5 | | | 9 | | Extremely moist gray (SANDY-SILT) fill with 10 to 20% gravel, little sand, trace brick fragments and concrete debris, loose to compact, massive soil structure, (ML). 12.0 | |
| | | | 4 | | | | | |
| 10 | 6 | 5 | | | | | | |
| 16 | | 6 | | | 16 | | | |
| | | | 10 | | | | | |
| | | | | 13 | | | | |
| 7 | 8 | | | | | | Extremely moist gray (SILTY-CLAY) fill with 3 to 7% gravel, trace sand and concrete debris, stiff, massive soil structure, (CL). 14.2 | |
| 6 | | 7 | | | 13 | | | |
| | | | 6 | | | | | |
| | | | | 6 | | | | |
| 8 | 5 | | | | | | | |
| 15 | 6 | 8 | | | 18 | | Wet black (SAND) mostly fine to medium size, trace silt, compact, thinly bedded, (SP). 20.0 | |
| | | | 10 | | | | | |
| | | | | 11 | | | | |
| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 20 | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 1 OF 2



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SURF. ELEVATION —

13E96b

HOLE NO. B-5-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/02/20 COMPLETED 07/02/20

DEPTH BLOWS ON
IN FT SAMPLER

| SN | 0/ 6 | 6/ 12 | 12/ 18 | 18/ 24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|------------|---------|----------|-----------|-----------|----|------|---|--|
| REC | | | | | | | | |
| 9 | 6 | | | | 9 | | Wet gray (SAND) mostly fine to medium size, trace silt, compact, thinly bedded, (SP). | |
| 23 | | 5 | | | | | | |
| | | | 4 | | | | | |
| | | | | 7 | | | | |
| | | | | | | | grades downward to 25.0 | |
| 10 | 9 | | | | 24 | | Wet dark gray gravelly (SAND) with 20 to 40% gravel, trace silt, compact, stratified, (SW), (GW). | ▼ Water level at 25.3 feet below ground surface at completion. |
| 19 | | 11 | | | | | | |
| | | | 13 | | | | | |
| | | | | 10 | | | 27.0 | |
| | | | | | | | Boring completed at 27.0 feet. | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

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SHEET 2 OF 2



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SURF. ELEVATION

13E96b

HOLE NO. B-6-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/07/20 COMPLETED 07/07/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|-----|------|-------|-------|---|------|---|-------------------------|
| REC | | | | | | | | |
| 8 | 1 | | | | 9 | | Extremely moist to wet gray (SILTY-CLAY) with trace sand, very soft, thinly laminated with very thin coarse silt lenses, (CL). grades downward to 21.0 | |
| 18 | | 2 | | | | | Wet dark gray (SAND) mostly fine size, trace silt, compact, thinly bedded, (SP). grades downward to 25.0 | |
| | | | 7 | | | | | |
| | | | | 10 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 25 | | | | | | | | |
| 9 | 2 | | | | 6 | | Moist gray (SILTY-CLAY) with trace sand, firm, thinly laminated with very thin coarse silt lenses, (CL). grades downward to 27.0 | |
| 18 | | 2 | | | | | | |
| | | | 4 | | | | | |
| | | | | 4 | | | | |
| | | | | | | | Boring completed at 27.0 feet. | |
| | | | | | | | | |
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| 30 | | | | | | | | |
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| 40 | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 2 OF 2



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SURF. ELEVATION

13E96b

HOLE NO. B-7-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/07/20 COMPLETED 07/07/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|----|-----|------|-------|-------|----|------|---|--|
| 1 | 13 | | | | | | | |
| 18 | | 15 | | | 27 | | Moist brown gravelly (SAND) fill with 20 to 40% gravel, trace silt and asphalt remnants, compact, massive soil structure, (SW). | Sandy soil fill with some gravel, trace silt and asphalt remnants to 2.0 feet over silty soil fill with little sand and gravel, trace concrete debris to 6.0 feet over sandy soil fill with little gravel and silt, trace brick fragments to 9.5 feet over silty soil fill with trace slag to 12.0 feet over sandy soil fill with little gravel, trace to little silt, trace wood fiber, slag, and fibrous materials to 20.0 feet over water sorted and deposited sand with trace to little silt to end of boring. Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 22.0 feet and 5.0-foot interval sampling to end of boring at 27.0 feet. Bore hole was backfilled with cuttings to ground surface upon completion. |
| 2 | 27 | | | | 26 | | Moist brown (SANDY-SILT) fill with 10 to 20% gravel, little sand, trace concrete debris, compact, massive soil structure, (ML). | |
| 20 | | 11 | | | | | | |
| 3 | 21 | | | | 32 | | Extremely moist gray (SILTY-SAND) fill with 10 to 20% gravel, little silt, trace brick fragments, compact, loose below 8.0 feet, massive soil structure, (SM). | |
| 5 | 9 | 26 | | | | | | |
| 4 | 21 | | | | 18 | | Extremely moist gray (SAND-SILT-CLAY) fill with 5 to 15% gravel, trace to little sand and clay, trace slag, firm, massive soil structure, (ML-CL). | |
| 16 | | 11 | | | 7 | | Extremely moist to wet dark gray to black (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace wood fiber and slag, trace fibrous material from 15.8 to 16.0 feet, compact, massive soil structure, (SM). | |
| 5 | 2 | | | | | | | |
| 8 | | 3 | | | 5 | | | |
| 10 | | | 4 | | | | | |
| 6 | 1 | | | | 16 | | | |
| 9 | | 2 | | | 5 | | | |
| 7 | 4 | | | | 21 | | | |
| 12 | | 6 | | | 14 | | | |
| 8 | 3 | | | | | | | |
| 10 | | 3 | | | | | | |
| 15 | | | 2 | | | | | |
| 9 | 4 | | | | | | | |
| 6 | | 9 | | | | | | |
| 20 | | | 12 | | | | | |
| 10 | 5 | | | | | | | |
| 8 | | 9 | | | | | | |
| | | | 5 | | | | | |
| | | | | 5 | | | | |
| | | | | | | | grades downward to 20.0 | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 1 OF 2



EARTH DIMENSIONS, INC.

Soil and Hydrogeologic Investigations • Wetland Delineations

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(716) 655-1717 • EDI@earthdimensions.com

SURF. ELEVATION —

13E98b

HOLE NO. B-7-20

PROJECT Buffalo Outer Harbor Phase 2


LOCATION Euhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/07/20 COMPLETED 07/07/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/ 6 | 6/ 12 | 12/ 18 | 18/ 24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|---------|----------|-----------|-----------|----|---|--|-------------------------|
| REC | | | | | | | | |
| 11 | 7 | | | | |  | Wet dark gray (SILTY-SAND) with mostly fine size sand, trace to little silt, compact, thinly bedded, (SM). | |
| 19 | | 9 | | | | | | |
| | | | 13 | | | | | |
| | | | | 19 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 25 | 12 | 16 | | | | | | |
| | 19 | | 4 | | | | | |
| | | | | 12 | | | | |
| | | | | 10 | | | | |
| | | | | | 16 | | | 27.0 |
| | | | | | | | Boring completed at 27.0 feet. | |
| | | | | | | | | |
| | | | | | | | | |
| 30 | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 35 | | | | | | | | |
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| | | | | | | | | |
| 40 | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 2 OF 2



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13E96b

HOLE NO. B-8-20

SURF. ELEVATION

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/08/20 COMPLETED 07/08/20

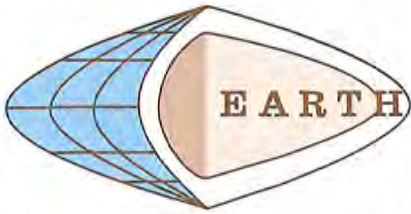
DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|------|------|-------|-------|----|------|---|--|
| REC | | | | | | | | |
| 1 | 12 | | | | 27 | | Moist brown gray very gravelly (SAND) fill with 40 to 60% gravel, trace silt, trace concrete debris, very dense, massive soil structure, (SM). | Sand and gravel fill with trace concrete debris to 8.0 feet over sandy soil fill with little gravel, trace to little silt, trace brick fragments to 14.0 feet over sandy soil fill with some gravel, trace brick fragments, concrete debris, rubber, and wood fiber to 22.0 feet over silty slack water sediment with some organic matter, trace sand to 25.0 feet over water sorted and deposited sand with little gravel, trace silt to end of boring. |
| 14 | | 13 | | | | | | |
| | | | 14 | | | | | |
| | | | 18 | | | | | |
| 2 | 50/4 | | | | 61 | | Moist, wet below 10.5 feet, gray to reddish brown gravelly (SILTY-SAND) fill with 20 to 40% gravel, trace to little silt, trace brick fragments, loose, massive soil structure, (SM). | Water level at 10.8 feet below ground surface at completion. Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 24.0 feet and 5.0-foot interval sampling to end of boring at 27.0 feet. Bore hole was backfilled with cuttings to ground surface upon completion. |
| 3 | | | | | | | | |
| 3 | 50/3 | | | | | | | |
| 3 | | | | | | | | |
| 4 | 45 | | | | 6 | | Wet gray gravelly (SAND) fill with 20 to 40% gravel, trace brick fragments, concrete debris, rubber, and wood fiber, loose, massive soil structure, (SW). | |
| 1 | | 50 | | | | | | |
| | | | 11 | | | | | |
| | | | 4 | | | | | |
| 5 | 2 | | | | 4 | | Wet gray gravelly (SAND) fill with 20 to 40% gravel, trace brick fragments, concrete debris, rubber, and wood fiber, loose, massive soil structure, (SW). | |
| 6 | | 4 | | | | | | |
| | | | 2 | | | | | |
| | | | 2 | | | | | |
| 6 | 4 | | | | 5 | | Wet gray gravelly (SAND) fill with 20 to 40% gravel, trace brick fragments, concrete debris, rubber, and wood fiber, loose, massive soil structure, (SW). | |
| 8 | | 3 | | | | | | |
| | | | 4 | | | | | |
| | | | 4 | | | | | |
| 7 | 3 | | | | 3 | | Wet gray gravelly (SAND) fill with 20 to 40% gravel, trace brick fragments, concrete debris, rubber, and wood fiber, loose, massive soil structure, (SW). | |
| 8 | | 2 | | | | | | |
| | | | 2 | | | | | |
| | | | 3 | | | | | |
| 8 | 3 | | | | 3 | | Wet gray gravelly (SAND) fill with 20 to 40% gravel, trace brick fragments, concrete debris, rubber, and wood fiber, loose, massive soil structure, (SW). | |
| 2 | | 2 | | | | | | |
| | | | 3 | | | | | |
| | | | 2 | | | | | |
| 9 | 2 | | | | 3 | | Wet gray gravelly (SAND) fill with 20 to 40% gravel, trace brick fragments, concrete debris, rubber, and wood fiber, loose, massive soil structure, (SW). | |
| 6 | | 2 | | | | | | |
| | | | 1 | | | | | |
| | | | 2 | | | | | |
| 10 | 1 | | | | 3 | | Wet gray gravelly (SAND) fill with 20 to 40% gravel, trace brick fragments, concrete debris, rubber, and wood fiber, loose, massive soil structure, (SW). | |
| 8 | | 1 | | | | | | |
| | | | 2 | | | | | |
| | | | 4 | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 1 OF 2



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SURF. ELEVATION

13E96b

HOLE NO. B-8-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Euhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/08/20 COMPLETED 07/08/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/ 6 | 6/ 12 | 12/ 18 | 18/ 24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS | |
|-----|---------|----------|-----------|-----------|----|------|---|-------------------------|--|
| REC | | | | | | | | | |
| 11 | 4 | | | | | | Wet gray gravelly (SAND) fill with 20 to 40% gravel, trace brick fragments, concrete debris, rubber, and wood fiber, loose, massive soil structure, (SW). | | |
| 3 | | 2 | | | 5 | | | | |
| | | | 3 | | | | | | |
| | | | | 3 | | | | | |
| 12 | 5 | | | | | | | | |
| 6 | | 2 | | | | | Extremely moist to wet brown to dark gray (SILT) with some organic matter trace sand, very loose, thinly bedded to massive soil structure, (ML) to (PT). | 22.0 | |
| | | | 2 | | 4 | | | | |
| | | | | 2 | | | | | |
| | | | | | 2 | | | | |
| 13 | 8 | | | | | | | | |
| 11 | | 11 | | | | | Wet gray (SAND) with 10 to 20% gravel, trace silt, compact, stratified, (SW). | 25.0 | |
| | | | 9 | | 20 | | | | |
| | | | | 4 | | | | | |
| | | | | | | | | 27.0 | |
| | | | | | | | Boring completed at 27.0 feet. | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 2 OF 2



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13E96b

HOLE NO. B-9-20

SURF. ELEVATION

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/08/20 COMPLETED 07/08/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|----|-----|------|-------|-------|----|------|---|---|
| 1 | 9 | | | | | | | |
| 15 | | 9 | | | 19 | | Moist gray to dark gray gravelly (SAND) fill with 20 to 40% gravel, trace silt and slag, compact, massive soil structure, (SW). | Sandy soil fill with some gravel, trace silt and slag to 2.0 feet over coarse silty soil fill with little gravel and sand, trace brick fragments and concrete debris to 6.0 feet over sandy soil fill with little gravel, trace to little silt, trace brick and glass fragments and concrete debris to 12.0 feet over sandy soil fill with some gravel, trace silt, brick and glass fragments, concrete debris, and wood fiber to 22.3 feet over water sorted and deposited sand with trace silt and gravel to end of boring. |
| 2 | 32 | | | | | | 2.0 | |
| 24 | | 27 | | | 44 | | Moist gray to dark gray (SANDY-SILT) fill with 10 to 20% gravel, little sand, trace brick fragments, concrete debris, compact to dense, massive soil structure, (ML). | |
| 3 | 14 | | | | | | | |
| 5 | 12 | 18 | | | 27 | | Moist dark gray (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace brick and glass fragments and concrete debris, compact to dense, massive soil structure, (SM). | |
| 4 | 24 | | | | | | 6.0 | |
| 13 | | 15 | | | 32 | | Wet dark gray (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace brick and glass fragments and concrete debris, loose, massive soil structure, (SM). | |
| 5 | 12 | | | | | | | |
| 17 | | 4 | | | 12 | | Wet dark gray (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace brick and glass fragments and concrete debris, loose, massive soil structure, (SM). | |
| 10 | 6 | | | | | | 10.0 | |
| 6 | 4 | | | | | | | |
| 6 | | 3 | | | 5 | | Wet black gravelly (SAND) fill with 20 to 40% gravel, trace silt, brick and glass fragments, concrete debris, and wood fiber, very loose, massive soil structure, (SW). | |
| 7 | 1 | | | | | | | |
| 4 | | 2 | | | 3 | | Wet black gravelly (SAND) fill with 20 to 40% gravel, trace silt, brick and glass fragments, concrete debris, and wood fiber, very loose, massive soil structure, (SW). | |
| 8 | 5 | | | | | | | |
| 15 | 5 | 6 | | | 8 | | Wet black gravelly (SAND) fill with 20 to 40% gravel, trace silt, brick and glass fragments, concrete debris, and wood fiber, very loose, massive soil structure, (SW). | |
| 9 | 4 | | | | | | | |
| 4 | | 3 | | | 6 | | Wet black gravelly (SAND) fill with 20 to 40% gravel, trace silt, brick and glass fragments, concrete debris, and wood fiber, very loose, massive soil structure, (SW). | |
| 10 | 3 | | | | | | | |
| 4 | | 4 | | | 6 | | Wet black gravelly (SAND) fill with 20 to 40% gravel, trace silt, brick and glass fragments, concrete debris, and wood fiber, very loose, massive soil structure, (SW). | |
| 20 | | | 2 | | | | | |

Water level at 11.2 feet below ground surface at completion.

Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 24.0 feet and 5.0-foot interval sampling to end of boring at 27.0 feet. Bore hole was backfilled with cuttings to ground surface upon completion.

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 1 OF 2



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SURF. ELEVATION

13E96b

HOLE NO. B-9-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Euhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/08/20 COMPLETED 07/08/20

DEPTH BLOWS ON
IN FT SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|-----|------|-------|-------|---|------|---|-------------------------|
| REC | | | | | | | | |
| 11 | 4 | | | | | | Wet black gravelly (SAND) fill with 20 to 40% gravel, trace silt, birck and glass fragments, concrete debris, and wood fiber, very loose, massive soil structure, (SW). | |
| 3 | | 3 | | 4 | | | | |
| | | | 1 | | | | | |
| | | | | 2 | | | | |
| 12 | 7 | | | | | | Wet gray (SAND) mostly medium size with 3 to 7% gravel, trace silt, loose, thinly bedded, (SP). | 22.3 |
| 18 | | 3 | | 7 | | | | |
| | | | 4 | | | | | |
| | | | | 6 | | | | |
| 13 | 1 | | | | | | Wet gray (SAND) mostly medium size with 3 to 7% gravel, trace silt, loose, thinly bedded, (SP). | 27.0 |
| 23 | | 7 | | 9 | | | | |
| | | | 2 | | | | | |
| | | | | 3 | | | | |
| | | | | | | | Boring completed at 27.0 feet. | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 2 OF 2



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13E96b

HOLE NO. B-10-20

SURF. ELEVATION

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/08/20 COMPLETED 07/09/20

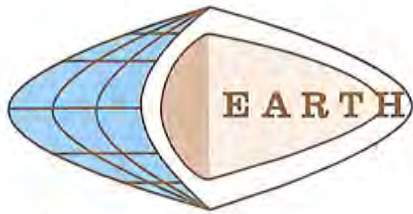
DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|-----|------|-------|-------|----|------|--|--|
| REC | | | | | | | | |
| 1 | 10 | | | | | | | |
| 15 | | 12 | | | 27 | | Moist light brown (SANDY-SILT) fill with 3 to 7% gravel, little sand, trace organic matter, compact, massive soil structure, (ML). | Coarse silty soil fill with little sand, trace gravel and organic matter to 0.9 feet over sandy soil fill with some gravel, trace silt, slag, concrete debris, ash, and glass fragments to 4.2 feet over sandy soil fill with little gravel, trace to little silt, trace brick and glass fragments, slag, and ash to 21.0 feet over clayey slack water sediment with trace sand to 30.0 feet over water sorted and deposited sand with little gravel, trace silt to 31.1 feet over silty slack water sediment with trace sand and clay to 35.0 feet over clayey lake sediment with trace sand to 45.0 feet over silty glacial drift with little clay and gravel, trace to little sand to 50.0 feet over sandy glacial till with some gravel, little silt to auger refusal. |
| 2 | 15 | | | | 16 | | Moist gray gravelly (SAND) fill with 20 to 40% gravel, trace silt, trace slag, concrete debris, glass fragments and ash, compact, massive soil structure, (SW). | |
| 15 | | 9 | | | 22 | | Moist, extremely moist to wet at 9.0 feet, wet below 16.0 feet, black (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace brick and glass fragments, slag, and ash, loose to compact, massive soil structure, (SM). | Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 24.0 feet and 5.0-foot interval sampling to end of boring at 51.8 feet. Bore hole was backfilled with cuttings to ground surface upon completion. |
| 3 | 15 | | | | 24 | | | |
| 5 | 13 | | 12 | | 9 | | | |
| | | | 10 | | 6 | | | |
| | | | 10 | | 8 | | | |
| 4 | 6 | | | | 17 | | | |
| 20 | | 14 | | | 12 | | | |
| | | | 10 | | 5 | | | |
| 5 | 6 | | | | | | | |
| 16 | | 4 | | | | | | |
| | | | 5 | | | | | |
| 10 | 6 | | | | | | | |
| 15 | 5 | | | | | | | |
| | | 3 | | | | | | |
| | | | 3 | | | | | |
| 7 | 5 | | | | | | | |
| 13 | | 4 | | | | | | |
| | | | 4 | | | | | |
| | | | 10 | | | | | |
| 8 | 7 | | | | | | | |
| 13 | | 5 | | | | | | |
| | | | 12 | | | | | |
| | | | 16 | | | | | |
| 9 | 17 | | | | | | | |
| 8 | | 7 | | | | | | |
| | | | 5 | | | | | |
| | | | 4 | | | | | |
| 10 | 4 | | | | | | | |
| 9 | | 3 | | | | | | |
| | | | 2 | | | | | |
| 20 | | | 2 | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 1 OF 3



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SURF. ELEVATION

13E96b

HOLE NO. B-10-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Euhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/08/20 COMPLETED 07/09/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|-----|------|-------|-------|----|------|--|-------------------------|
| REC | | | | | | | | |
| 11 | 2 | | | | 3 | | Moist, extremely moist to wet at 9.0 feet, wet below 16.0 feet, black (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace brick and glass fragments, slag, and ash, loose to compact, massive soil structure, (SM). 21.0 | |
| 5 | | 2 | | | | | | |
| | | | 1 | | | | | |
| | | | | 4 | | | | |
| | | | | | | | | |
| | | | | | 6 | | Extremely moist gray (SILTY-CLAY) with trace sand, soft, thinly laminated with very thin coarse silt lenses, (CL). grades downward to 30.0 | |
| 12 | 2 | | | | | | | |
| 14 | | 2 | | | | | | |
| | | | 4 | | | | | |
| | | | | 7 | | | | |
| | | | | | 11 | | Wet gray (SAND) with 10 to 20% gravel, trace silt, compact, stratified, (SW). clear transition to 31.1 | |
| 13 | 8 | | | | | | | |
| 16 | | 8 | | | | | | |
| | | | 3 | | | | | |
| | | | | 4 | | | | |
| | | | | | 5 | | Extremely moist gray (SILT) with trace sand and clay, loose, thinly bedded, (ML). grades downward to 35.0 | |
| 14 | 5 | | | | | | | |
| 18 | | 2 | | | | | | |
| | | | 3 | | | | | |
| | | | | 3 | | | | |
| | | | | | 5 | | Extremely moist gray (SILTY-CLAY) with trace sand, firm, thinly laminated with very thin coarse silt lenses, (CL). | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

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SHEET 2 OF 3



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13E96b

HOLE NO. B-10-20

SURF. ELEVATION

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/08/20 COMPLETED 07/09/20

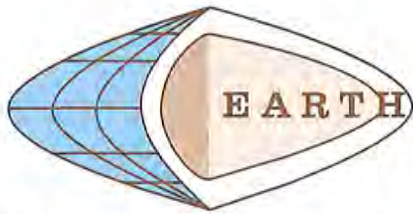
DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|------------|-----|------|-------|-------|---|------|---|-------------------------|
| <u>REC</u> | | | | | | | | |
| 15 | 8 | | | | | | Extremely moist gray (SILTY-CLAY) with trace sand, firm, thinly laminated with very thin coarse silt lenses, (CL). | |
| 17 | | 2 | | | | | | |
| | | | 1 | | | | | |
| | | | | 4 | | | | |
| | | | | | | | grades downward to | 45.0 |
| 16 | 2 | | | | | | Extremely moist gray (SAND-SILT-CLAY) with 10 to 20% gravel, little clay, trace to little sand, stiff, massive soil structure, (ML-CL). | |
| 16 | | 4 | | | | | | |
| | | | 5 | | | | | |
| | | | | 10 | | | | |
| | | | | | | | grades downward to | 50.0 |
| 17 | 10 | | | | | | Moist gray gravelly (SILTY-SAND) with 20 to 40% gravel, little silt, very dense, massive soil structure, (SM). | |
| 8 | | 56 | | | | | | |
| | | | 50/3 | | | | | |
| | | | | | | | | 51.8 |
| | | | | | | | Boring completed at 51.8 feet. | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 3 OF 3



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13E96b

HOLE NO. B-11-20

SURF. ELEVATION

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/09/20 COMPLETED 07/09/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|------------|------|------|-------|-------|----|------|---|--|
| <i>REC</i> | | | | | | | | |
| 1 | 10 | | | | 28 | | Moist gray to dark gray gravelly (SAND) fill with 20 to 40% gravel, trace silt, slag, and brick and glass fragments, compact to dense, massive soil structure, (SW). | Sandy soil fill with some gravel, trace silt, slag, and brick and glass fragments to 7.3 feet over sandy soil fill with little gravel, trace to little silt, trace slag, glass fragments, and wood fiber to 16.0 feet over sandy soil fill with some gravel, trace silt, glass fragments, and wood fiber to 22.0 feet over clayey slack water sediment with trace sand to end of boring. |
| 10 | | 11 | | | | | | |
| | | | 17 | | | | | |
| | | | | 21 | | | | |
| 2 | 22 | | | | 40 | | | |
| 20 | | 12 | | | | | | |
| | | | 28 | | | | | |
| | | | | 36 | | | | |
| 3 | 50/3 | | | | | | | |
| 5 | 1 | | | | | | | |
| | | | | | | | | |
| 4 | 38 | | | | 25 | | | |
| 7 | | 20 | | | | | 7.3 | |
| | | | 5 | | | | | |
| | | | | 4 | | | Extremely moist dark gray (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace slag, glass fragments, and wood fiber, loose to compact, massive soil structure, (SM). | |
| 5 | 3 | | | | 7 | | | |
| 17 | | 4 | | | | | | |
| | | | 3 | | | | | |
| 10 | | | | 2 | | | | |
| 6 | 3 | | | | 11 | | | |
| 16 | | 3 | | | | | | |
| | | | 8 | | | | | |
| | | | | 3 | | | | |
| 7 | 3 | | | | 7 | | | |
| 12 | | 3 | | | | | | ▼ Water level at 12.4 feet below ground surface upon completion. |
| | | | 4 | | | | | |
| | | | | 8 | | | | |
| 8 | 3 | | | | 5 | | | |
| 15 | 8 | 2 | | | | | 16.0 | |
| | | | 3 | | | | | |
| | | | | 3 | | | | |
| 9 | 5 | | | | 2 | | Wet black gravelly (SAND) fill with 20 to 40% gravel, trace silt, glass fragments, and wood fiber, very loose, massive soil structure, (SW). | Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 24.0 feet and 5.0-foot interval sampling to end of boring at 27.0 feet. Bore hole was backfilled with cuttings to ground surface upon completion. |
| 10 | | 1 | | | | | | |
| | | | 1 | | | | | |
| | | | | 5 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 20 | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Krvyszak, (cns)

SHEET 1 OF 2



EARTH DIMENSIONS, INC.

Soil and Hydrogeologic Investigations • Wetland Delineations

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(716) 655-1717 • EDI@earthdimensions.com

SURF. ELEVATION

13E96b

HOLE NO. B-11-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Euhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/09/20 COMPLETED 07/09/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/ 6 | 6/ 12 | 12/ 18 | 18/ 24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|---------|----------|-----------|-----------|----|--------------------------------|--------------------------------|--|
| REC | | | | | | | | |
| 10 | 5 | | | | | | | |
| 4 | | 2 | | | 5 | | | Wet black gravelly (SAND) fill with 20 to 40% gravel, trace silt, glass fragments, and wood fiber, very loose, massive soil structure, (SW). |
| | | | 3 | | | | | |
| | | | | 4 | | | | |
| 11 | 5 | | | | | | | 22.0 |
| 1 | | 2 | | | 4 | | | Extremely moist gray (SILTY-CLAY) with trace sand, soft to firm, thinly laminated with very thin coarse silt lenses, (CL). |
| | | | 2 | | | | | |
| | | | | 2 | | | | |
| 25 | | | | | | | | |
| 12 | 4 | | | | | | | |
| 4 | | 5 | | | 10 | | | |
| | | | 5 | | | | | |
| | | | | 4 | | | | |
| | | | | | | 27.0 | | |
| | | | | | | Boring completed at 27.0 feet. | | |
| 30 | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 35 | | | | | | | | |
| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 40 | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 2 OF 2



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SURF. ELEVATION

13E96b

HOLE NO. B-12-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/13/20 COMPLETED 07/13/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|----|-----|------|-------|-------|----|------|---|---|
| 1 | 6 | | | | | | | |
| 16 | | 11 | | | 24 | | Moist light brown (SANDY-SILT) fill with 3 to 7% gravel, little sand, trace organic matter, compact, massive soil structure, (ML). 0.8 | <p>Coarse silty soil fill with little sand, trace organic matter and gravel to 0.8 feet over sandy soil fill with little gravel, trace to little silt, trace brick fragments, concrete debris, slag, and wood fiber to 11.6 feet over water sorted and deposited sand with trace silt to 21.2 feet over coarse silty slack water sediment with trace to little sand to 25.0 feet over water sorted and deposited sand with trace to little silt to end of boring.</p> <p>Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 12.0 feet and 5.0-foot interval sampling to end of boring at 27.0 feet. Bore hole was backfilled with cuttings to ground surface upon completion.</p> |
| 2 | 32 | | | | 46 | | Moist, wet below 8.2 feet, dark gray to gray (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace brick fragments, concrete debris, slag, and wood fiber, compact to dense, massive soil structure, (SM). 11.6 | |
| 17 | | 34 | | | 46 | | | |
| 3 | 12 | | | | 47 | | | |
| 16 | | 27 | | | 47 | | | |
| 4 | 11 | | | | 13 | | | |
| 18 | | 4 | | | 13 | | | |
| 5 | 10 | | | | 13 | | | |
| 20 | | 6 | | | 13 | | | |
| 6 | 6 | | | | 24 | | Extremely moist to wet gray to dark gray (SAND) mostly fine size, trace silt and organic matter, compact, thinly bedded, (SP). | |
| 15 | | 12 | | | 24 | | | |
| 7 | 16 | | | | 11 | | | <p>▼ Water level at 15.3 feet below ground surface at completion.</p> |
| 17 | | 8 | | | 11 | | | |
| 8 | | | | | | | | |
| 18 | | | | | | | | |
| 9 | | | | | | | | |
| 19 | | | | | | | | |
| 10 | | | | | | | | |
| 20 | | | | | | | | |
| 11 | | | | | | | | |
| 21 | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 1 OF 2



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SURF. ELEVATION

13E96b

HOLE NO. B-12-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/13/20 COMPLETED 07/13/20

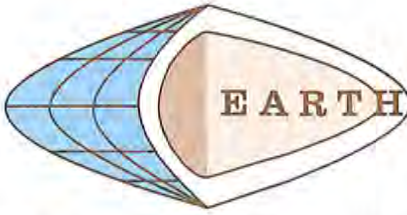
DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/ 6 | 6/ 12 | 12/ 18 | 18/ 24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|------------|----------|-----------|-----------|-----------|-----------|------|--|-------------------------|
| <u>REC</u> | | | | | | | | |
| <u>8</u> | <u>7</u> | | | | | | Extremely moist to wet gray to dark gray (SAND) mostly fine size, trace silt and organic matter, compact, thinly bedded, (SP). | |
| <u>17</u> | | <u>9</u> | | | <u>17</u> | | grades downward to 21.2 | |
| | | | <u>8</u> | | | | Extremely moist gray (SANDY-SILT) with trace to little sand, compact, thinly bedded, (ML). | |
| | | | | <u>9</u> | | | grades downward to 25.0 | |
| <u>9</u> | <u>8</u> | | | | | | Extremely moist gray (SILTY-SAND) with trace to little silt, dense, thinly bedded (SM). | |
| <u>20</u> | | <u>19</u> | | | <u>39</u> | | grades downward to 27.0 | |
| | | | <u>20</u> | | | | | |
| | | | | <u>18</u> | | | | |
| | | | | | | | Boring completed at 27.0 feet. | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 2 OF 2



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SURF. ELEVATION

13E96b

HOLE NO. B-13-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Euhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/13/20 COMPLETED 07/13/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS | |
|------------|-----|------|-------|-------|----|------|---|---|---|
| <u>REC</u> | | | | | | | | | |
| 1 | 6 | | | | | | <p>Coarse silty soil fill with little sand, trace organic matter and gravel to 0.9 feet over sandy soil fill with little silt and gravel, trace brick fragments, slag, and concrete debris to 2.0 feet over coarse silty soil fill, trace to little sand and gravel, trace brick fragments to 5.0 feet over sandy soil fill with little gravel, trace to little silt, trace slag and ash to 11.8 feet over water sorted and deposited sand with trace to little silt, trace organic matter to 20.0 feet over coarse silty slack water sediment with little sand, trace organic matter to 25.0 feet over water sorted and deposited sand with trace to little silt to end of boring.</p> <p>Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 12.0 feet and 5.0-foot interval sampling to end of boring at 27.0 feet. Bore hole was backfilled with cuttings to ground surface upon completion.</p> | | |
| 18 | | 7 | | | 23 | | | Moist light gray (SANDY-SILT) fill with 3 to 7% gravel, little sand, trace organic matter, compact, massive soil structure, (ML). 0.9 | |
| 2 | 7 | | | | | | | 13 | Moist dark gray (SILTY-SAND) fill with 10 to 20% gravel, little silt, trace brick fragments, slag, and concrete debris, compact to dense, massive soil structure, (SM). 2.0 |
| 19 | | 4 | | | | | | 31 | Moist light brown to brown (SANDY-SILT) fill with 5 to 15% gravel, trace to little sand, trace brick fragments, compact, (ML). 5.0 |
| 3 | 19 | | | | | | | 15 | Moist black (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace slag and ash, compact, to dense, massive soil structure, (SM). 11.8 |
| 5 | | 15 | | | | 48 | Extremely moist gray (SILTY-SAND) trace to little silt, trace organic matter, compact, thinly bedded, (SP). | | |
| 20 | | | 16 | | | | | | |
| | | | | 17 | | | | | |
| 4 | 11 | | | | | | | | |
| 18 | | 6 | | | | | | | |
| | | | 9 | | | | | | |
| | | | | 10 | | | | | |
| 5 | 8 | | | | | | | | |
| 17 | | 7 | | | | | | | |
| | | | 9 | | | | | | |
| | | | | 12 | | | | | |
| 10 | 9 | | | | | | | | |
| 17 | | 26 | | | | | | | |
| | | | 22 | | | | | | |
| | | | | 10 | | | | | |
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| 15 | | | | | | | | | |
| 7 | 17 | | | | | | | | |
| 20 | | 2 | | | | | | | |
| | | | 3 | | | | | | |
| | | | | 9 | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 20 | | | | | | | | | |

Water level at 15.6 feet below ground surface at completion.

grades downward to 20.0

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)



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SURF. ELEVATION

13E96b

HOLE NO. B-13-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/13/20

COMPLETED 07/13/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|-----|------|-------|-------|----|------------------|---|-------------------------|
| REC | | | | | | | | |
| 8 | 8 | | | | | [Dotted pattern] | Moist to extremely moist gray (SANDY-SILT) with little sand, trace organic matter, thinly bedded, compact to dense, (ML). | |
| 17 | | 15 | | | 34 | | | |
| | | | 19 | | | | | |
| | | | | 20 | | | | |
| | | | | | | | grades downward to | 25.0 |
| 9 | 17 | | | | | [Dotted pattern] | Moist gray (SILTY-SAND) with trace to little silt, thinly bedded, dense, (SM). | |
| 17 | | 14 | | | 31 | | | |
| | | | 17 | | | | | |
| | | | | 21 | | | | 27.0 |
| | | | | | | | Boring completed at 27.0 feet. | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 2 OF 2



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SURF. ELEVATION

13E96b

HOLE NO. B-14-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Ehrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Bavi Engineering & Land Surveying, PC

DATE STARTED 07/13/20 COMPLETED 07/13/20

DEPTH IN FT BLOWS ON SAMPLER

| SN REC | 0/ 6 | 6/ 12 | 12/ 18 | 18/ 24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----------|---------|----------|-----------|-----------|------|------|---|---|
| 1 20 | 7 | | 10 | | 22 | | Moist light gray (SANDY-SILT) fill with little sand, trace organic matter, compact, massive soil structure, (ML). 1.3 | Coarse silty soil fill with little sand, trace organic matter to 1.3 feet over sandy soil fill with little gravel, trace to little silt, trace slag, brick and glass fragments, and concrete debris to 9.2 feet over coarse silty soil fill with some sand, little gravel, trace concrete debris and brick fragments to 12.3 feet over water sorted and deposited sand with trace silt to 26.2 feet over silty slack water sediment with trace sand to end of boring. Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 14.0 feet and 5.0-foot interval sampling to end of boring at 27.0 feet. Bore hole was backfilled with cuttings to ground surface upon completion. |
| 2 16 | 10 | | 15 | | 23 | | Moist gray to dark gray (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace brick and glass fragments, concrete debris, and slag, compact, massive soil structure, (SM). | |
| 3 16 | 28 | | 23 | | 50/4 | | | |
| 4 6 | 38 | | 50/4 | | | | | |
| 5 16 | 18 | | 9 | | 16 | | | |
| 6 14 | 6 | | 12 | | 26 | | Extremely moist dark gray to gray (SANDY-SILT) fill with 10 to 20% gravel, some sand, trace concrete debris, and brick fragments, compact, (ML). 12.3 | |
| 7 20 | 13 | | 11 | | 24 | | Wet gray (SAND) mostly fine size, trace silt, compact, thinly bedded, (SP). | |
| 8 23 | 3 | | 8 | | 18 | | | |
| | | | 10 | | | | | <div style="text-align: center;"> </div> Water level at 15.0 feet below ground surface upon completion. |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 1 OF 2



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SURF. ELEVATION

13E96b

HOLE NO. B-15-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Eubmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/10/20

COMPLETED 07/10/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|-----|------|-------|-------|----|------|--|---|
| REC | | | | | | | | |
| 1 | 9 | | | | | | | |
| 20 | | 16 | | | 27 | | Moist light gray (SANDY-SILT) fill with 5 to 15% gravel, some sand, trace organic matter, compact, massive soil structure, (ML). | Coarse silty soil fill with some sand, trace to little gravel, trace organic matter to 1.0 feet over sandy soil fill with little silt and gravel, trace brick fragments to 2.0 feet over sandy soil fill with little silt and gravel, trace to little silt, trace slag to 6.5 feet over sandy soil fill with trace silt and metal debris to 8.0 feet over sandy soil fill with little gravel, trace to little silt, trace brick fragments to 10.0 feet over coarse silty soil fill with little to some sand, trace gravel to 13.0 feet over coarse silty slack water sediment to 25.0 feet over water sorted and deposited sand with trace silt to 52.5 feet over limestone bedrock to end of coring. Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 17.0 feet and 5.0-foot interval sampling to 52.5 feet. Continued below with a NQ-2 size double tubed wireline core barrel with diamond bit to end of coring at 62.5 feet. Bore hole was backfilled with cuttings to ground surface upon completion. ↓ Water level at 15.1 feet below ground surface at completion. |
| 2 | 8 | | | | | | 1.0 | |
| 19 | | 11 | | | 21 | | Moist gray (SILTY-SAND) fill with 10 to 20% gravel, little silt, trace brick fragments, compact to dense, massive soil structure, (SM). | |
| 3 | 16 | | | | | | 2.0 | |
| 5 | 18 | 9 | | | 15 | | Moist dark gray to brown (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace slag, compact, massive soil structure, (SM). | |
| 4 | 11 | 8 | | | 17 | | 6.5 | |
| 17 | | 8 | | | | | 8.0 | |
| 5 | 26 | | | | 36 | | Moist gray (SAND) fill with trace silt, flat metal debris at 7.8 feet, compact, massive soil structure, (SP). | |
| 15 | | 22 | | | | | 10.0 | |
| 10 | 6 | 7 | | | 6 | | Moist gray (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace brick fragments, compact to dense, massive soil structure, (SM). | |
| 12 | | 4 | | | | | 13.0 | |
| 7 | 27 | | | | 43 | | Moist gray (SANDY-SILT) fill with 3 to 7% gravel, little to some sand, loose, massive soil structure, (ML). | |
| 18 | | 23 | | | | | 18 | |
| 8 | 9 | | | | | | Wet gray (SANDY-SILT) with some fine size sand, compact, thinly bedded, (ML). | |
| 15 | 22 | 11 | | | | | | |
| | | | 7 | | | | | |
| | | | | 9 | | | | |
| | | | | | | | grades downward to 20.0 | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 1 OF 4



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SURF. ELEVATION

13E96b

HOLE NO. B-15-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Ehrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/10/20

COMPLETED 07/10/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|------------|-----|------|-------|-------|----|------|---|--|
| <u>REC</u> | | | | | | | | |
| 9 | 12 | | | | 15 | | Wet gray (SANDY-SILT) with some fine size sand, compact, thinly bedded, (SP). | Note: Added water prior to taking samples 10, 11, 12, 13, 14, and 15 |
| 15 | | 9 | | | | | | |
| | | | 6 | | | | | |
| | | | | 7 | | | | |
| | | | | | | | grades downward to | 25.0 |
| 10 | 5 | | | | 13 | | Wet gray (SAND) mostly fine size, trace silt, compact, tendency to liquefy when disturbed, thinly bedded, (SP). | |
| 22 | | 6 | | | | | | |
| | | | 7 | | | | | |
| | | | | 12 | | | | |
| 11 | 8 | | | | 26 | | | |
| 23 | | 7 | | | | | | |
| | | | 19 | | | | | |
| | | | | 21 | | | | |
| 12 | 4 | | | | 16 | | | |
| 20 | | 7 | | | | | | |
| | | | 9 | | | | | |
| | | | | 9 | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 2 OF 4



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SURF. ELEVATION

13E06b

HOLE NO. B-15-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Euhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/10/20 COMPLETED 07/10/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/ 6 | 6/ 12 | 12/ 18 | 18/ 24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS | | | | | | | | | | | | | | | | | | |
|------------|------------|-------------|-----------|-----------|-------|---------------------|---|---|-------|------------|-------------|----------|-------|-------|---|------|-----|-----|----|----|---|------|-----|-----|----|----|
| <u>REC</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 7 | | | | | [Sand] | Wet gray (SAND) mostly fine size, trace silt, compact, tendency to liquefy when disturbed, thinly bedded, (SP). | | | | | | | | | | | | | | | | | | | |
| 24 | | 12 | | | 27 | | | | | | | | | | | | | | | | | | | | | |
| | | | 15 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 26 | | | | | | | | | | | | | | | | | | | | | | |
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| 45 | 14 | 4 | | | | [Silt] | Dark gray (SILT) mostly fine to medium size, trace silt, compact, tendency to liquefy when disturbed, thin to medium bedded, (SP). | | | | | | | | | | | | | | | | | | | |
| | 24 | | 4 | | | | | | 9 | | | | | | | | | | | | | | | | | |
| | | | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 6 | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | 15 | 6 | | | | [Silt] | Dark gray (SILT) mostly fine to medium size, trace silt, compact, tendency to liquefy when disturbed, thin to medium bedded, (SP). | | | | | | | | | | | | | | | | | | | |
| | 20 | | 7 | | | | | | 15 | | | | | | | | | | | | | | | | | |
| | | | | 8 | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 11 | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | | | | | | clear transition to | 52.5 | | | | | | | | | | | | | | | | | | | |
| | | | | | | [Bedrock] | Dark gray limestone bedrock, effervesces without etching, hard, massive bedding, slightly fractured, core pieces range from (0.1-3.4'), occasional fossils. | <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="border-top: 1px dashed black;">Run #</th> <th style="border-top: 1px dashed black;">Depth (ft)</th> <th style="border-top: 1px dashed black;">Length (ft)</th> <th style="border-top: 1px dashed black;">Rec (ft)</th> <th style="border-top: 1px dashed black;">Rec %</th> <th style="border-top: 1px dashed black;">RGD %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>52.5</td> <td>5.0</td> <td>4.8</td> <td>96</td> <td>90</td> </tr> <tr> <td>2</td> <td>57.5</td> <td>5.0</td> <td>4.7</td> <td>94</td> <td>88</td> </tr> </tbody> </table> | Run # | Depth (ft) | Length (ft) | Rec (ft) | Rec % | RGD % | 1 | 52.5 | 5.0 | 4.8 | 96 | 90 | 2 | 57.5 | 5.0 | 4.7 | 94 | 88 |
| Run # | Depth (ft) | Length (ft) | Rec (ft) | Rec % | RGD % | | | | | | | | | | | | | | | | | | | | | |
| 1 | 52.5 | 5.0 | 4.8 | 96 | 90 | | | | | | | | | | | | | | | | | | | | | |
| 2 | 57.5 | 5.0 | 4.7 | 94 | 88 | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | | | | | | | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

LOGGED BY Jason Kryszak, (cns)

SHEET 3 OF 4



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SURF. ELEVATION

13E96b

HOLE NO. B-15-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Euhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/10/20

COMPLETED 07/10/20

DEPTH BLOWS ON
IN FT SAMPLER

| SN | 0/ 6 | 6/ 12 | 12/ 18 | 18/ 24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|-----|---------|----------|-----------|-----------|---|------|---|---|
| REC | | | | | | | | |
| | Run | #2 | | | | | | |
| | | | | | | | Dark gray limestone bedrock, effervesces without etching, hard, massive bedding, slightly fractured, core pieces range from (0.1-3.4'), occasional fossils. | Run Depth Length Rec Rec RGD # (ft) (ft) (ft) % % ----- 57.5 2 to 5.0 4.7 94 88 62.5 |
| | | | | | | | Coring completed at 62.5 feet. | EDI Bedrock Hardness Classification ----- Hard: Intact hand-held specimen requires more than one hammer blow to break it. Can be faintly scratched by a steel nail. |
| 65 | | | | | | | | |
| 70 | | | | | | | | |
| 75 | | | | | | | | |
| 80 | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 LB. WT. FALLING 30 * PER BLOW

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SHEET 4 OF 4



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SURF. ELEVATION

13E96b

HOLE NO. B-16-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Ehrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Bavi Engineering & Land Surveying, PC

DATE STARTED 07/14/20

COMPLETED 07/14/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS | |
|-----|-----|------|-------|-------|----|------|---|--|-----|
| REC | | | | | | | | | |
| 1 | 7 | | | | | | <p>Moist light gray (SANDY-SILT) fill with 3 to 7% gravel, little sand, trace organic matter, compact, massive soil structure, (ML).</p> <p>Moist dark gray to gray (SILTY-SAND) fill with 10 to 20% gravel, trace to little silt, trace slag, brick and glass fragments, and concrete debris, compact to dense, massive soil structure, (SM).</p> <p>Wet gray (SAND) mostly fine size, trace silt, compact, thinly bedded, (SP).</p> <p>grades downward to</p> <p>Wet gray (SILTY-SAND) with trace to little silt, trace organic matter, loose, thinly bedded, (SM).</p> | <p>Coarse silty soil fill with little sand, trace organic matter and gravel to 0.8 feet over sandy soil fill with little gravel, trace to little silt, trace brick and glass fragments, slag, and concrete debris to 12.1 feet over water sorted and deposited sand with trace silt to 15.0 feet over water sorted and deposited sand with trace to little silt, trace organic matter to 21.0 feet over silty slack water sediment with little to some clay, trace sand to 25.0 feet over water sorted and deposited sand with trace to little silt to end of boring.</p> <p>Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 14.0 feet and 5.0-foot interval sampling to end of boring at 27.0 feet. Bore hole was backfilled with cuttings to ground surface upon completion.</p> <p>No water at completion.</p> | |
| 19 | | 14 | | | 33 | | | | 0.8 |
| | | | 19 | | | | | | |
| | | | | 22 | | | | | |
| 2 | 25 | | | | | | | | |
| 18 | | 27 | | | 49 | | | | |
| | | | 22 | | | | | | |
| | | | | 4 | | | | | |
| 3 | 9 | | | | | | | | |
| 5 | 10 | 10 | | | 12 | | | | |
| | | | 2 | | | | | | |
| | | | | 9 | | | | | |
| 4 | 12 | | | | | | | | |
| 6 | | 7 | | | 12 | | | | |
| | | | 5 | | | | | | |
| | | | | 5 | | | | | |
| 5 | 9 | | | | | | | | |
| 8 | | 16 | | | | | | | |
| | | | 50/3 | | | | | | |
| 10 | 6 | 7 | | | | | | | |
| | 8 | | 2 | | 4 | | | | |
| | | | | 2 | | | | | |
| | | | | 4 | | 12.1 | | | |
| 7 | 7 | | | | | | | | |
| 23 | | 7 | | | 17 | | | | |
| | | | 10 | | | | | | |
| | | | | 12 | | | | | |
| 15 | 8 | 7 | | | | | | | |
| | 22 | | 4 | | 9 | | | | |
| | | | | 5 | | | | | |
| | | | | 8 | | | | | |
| 20 | | | | | | | | | |

N=NUMBER OF BLOWS TO DRIVE 2 * SPOON 12 * WITH 140 lb. WT. FALLING 30 * PER BLOW

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SHEET 1 OF 2



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SURF. ELEVATION

13E98b

HOLE NO. B-16-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/14/20 COMPLETED 07/14/20

DEPTH BLOWS ON
IN FT SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|------------|-----|------|-------|-------|----|------|--------------------------------|-------------------------|
| REC | | | | | | | | |
| 9 | 5 | | | | | | | |
| 20 | | 4 | | | 10 | | | |
| | | | 6 | | | | | |
| | | | | 7 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 10 | 12 | | | | | | | |
| 20 | | 5 | | | 10 | | | |
| | | | 5 | | | | | |
| | | | | 10 | | | | |
| | | | | | | | 27.0 | |
| | | | | | | | Boring completed at 27.0 feet. | |

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13E96b

HOLE NO. B-18-20

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Fuhrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Ravi Engineering & Land Surveying, PC

DATE STARTED 07/09/20 COMPLETED 07/10/20

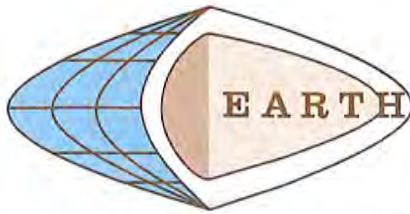
DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/6 | 6/12 | 12/18 | 18/24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|----|-----|------|-------|-------|----|------|--|---|
| 1 | 5 | | | | 8 | | Moist gray (SANDY-SILT) fill with 10 to 20% gravel, little sand, trace organic matter, loose, massive soil structure, (ML). | Coarse silty soil fill with little sand and gravel, trace organic matter to 2.0 feet over sandy soil fill with little silt and gravel, trace brick fragments, concrete debris, and wood fiber to 7.0 feet over water sorted and deposited sand with trace to little gravel, trace silt to 15.0 feet over clayey slack water sediment with trace sand to 20.0 feet over water sorted and deposited sand with trace silt and gravel to end of boring. |
| 12 | | 4 | | | | | | |
| 2 | 7 | | | | 9 | | Moist gray to brownish gray (SILTY-SAND) fill with 10 to 20% gravel, little silt, trace brick fragments, concrete debris, and wood fiber, loose, massive soil structure, (SM). | Water level at 10.1 feet below ground surface at completion. Note: Advanced bore hole with 3 1/4" ID x 7" OD hollow stem auger casing with continuous split spoon sampling to 12.0 feet and 5.0-foot interval sampling to end of boring at 27.0 feet. Bore hole was backfilled with cuttings to ground surface upon completion. |
| 10 | | 6 | | | | | | |
| 3 | 7 | | | | 14 | | Extremely moist gray (SAND) with 5 to 15% gravel, trace silt, compact, stratified, (SW). | grades downward to 15.0 |
| 13 | | 7 | | | | | | |
| 4 | 6 | | | | 19 | | Extremely moist gray (SILTY-CLAY) with trace sand, soft, thinly laminated with very thin coarse silt lenses, (CL). | grades downward to 20.0 |
| 14 | | 8 | | | | | | |
| 5 | | | 7 | | 29 | | Extremely moist gray (SILTY-CLAY) with trace sand, soft, thinly laminated with very thin coarse silt lenses, (CL). | |
| 15 | | | 11 | | | | | |
| 6 | 12 | | | | 29 | | Extremely moist gray (SILTY-CLAY) with trace sand, soft, thinly laminated with very thin coarse silt lenses, (CL). | |
| 16 | | 18 | | | | | | |
| 7 | 5 | | | | 3 | | Extremely moist gray (SILTY-CLAY) with trace sand, soft, thinly laminated with very thin coarse silt lenses, (CL). | |
| 13 | | 2 | | | | | | |
| | | | 1 | | 3 | | Extremely moist gray (SILTY-CLAY) with trace sand, soft, thinly laminated with very thin coarse silt lenses, (CL). | |
| | | | | 2 | | | | |

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SHEET 1 OF 2



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HOLE NO. B-18-20

SURF. ELEVATION

PROJECT Buffalo Outer Harbor Phase 2

LOCATION Ehrmann Boulevard

City of Buffalo, Erie County, NY

CLIENT Bavl Engineering & Land Surveying, PC

DATE STARTED 07/09/20 COMPLETED 07/10/20

DEPTH IN FT BLOWS ON SAMPLER

| SN | 0/ 6 | 6/ 12 | 12/ 18 | 18/ 24 | N | LITH | DESCRIPTION AND CLASSIFICATION | WATER TABLE AND REMARKS |
|------------|----------|----------|-----------|-----------|-----------|------|---|-------------------------|
| <u>REC</u> | | | | | | | | |
| <u>8</u> | <u>2</u> | | | | <u>4</u> | | Wet gray (SAND) with 3 to 7% gravel, trace silt, very loose, thinly bedded, (SP). | |
| <u>16</u> | | <u>2</u> | | | | | | |
| | | | <u>2</u> | | | | | |
| | | | <u>3</u> | | | | | |
| <u>25</u> | | | | | <u>11</u> | | Boring completed at 27.0 feet. | |
| <u>9</u> | <u>9</u> | | | | | | | |
| <u>18</u> | | <u>5</u> | | | | | | |
| | | | <u>6</u> | | | | | |
| <u>30</u> | | | | | | | | |
| <u>35</u> | | | | | | | | |
| <u>40</u> | | | | | | | | |

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SHEET 2 OF 2