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GEOTECHNICAL/GEOHYDROLOGICAL CONSIDERATIONS FOR THE NEW BUFFALO INDUSTRIAL PARK

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Mr. Arthur F. Robinson, P.E.

Vice-President

Final Geotechnical/Geohydrological Re:

Report for the New Buffalo

Industrial Park

#### Gentlemen:

In accordance with our proposal, we hereby submit our final report entitled "Geotechnical/Geohydrological Considerations for the New Buffalo Industrial Park".

We appreciate the opportunity to work with you on this project and look forward to being of continued service in the future. Should you have any additional questions or comments, please do not hesitate to contact GZA.

Very truly yours,

GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C.

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# GEOTECHNICAL/GEOHYDROLOGICAL CONSIDERATIONS FOR THE NEW BUFFALO INDUSTRIAL PARK

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#### 1.00 INTRODUCTION

The City of Buffalo Department of Community Development, Erie County and the Erie County Industrial Development Agency are jointly implementing plans to develop the New Buffalo Industrial Park to house primarily light industrial and service firms. The proposed New Buffalo Industrial Park is located on an approximately 135 acre site near the eastern boundary of the City of Buffalo, and approximately bounded by William Street to the north, South Ogden Street to the east, Dingens Street to the south, and Bailey Avenue to the west. A project locus map is presented as Figure 1.

Goldberg-Zoino Associates of New York, P.C. (GZA), acting as a geotechnical/geohydrological consultant, has prepared this final report for the project designers, Olson and Terzian, P.C. It summarizes GZA's recent field, office and laboratory studies at the New Buffalo Industrial Park site and makes various engineering and construction recommendations.

#### 1.10 STUDY OBJECTIVES

GZA was initially engaged to explore subsurface conditions at the site and to evaluate how these conditions would affect the design and construction of roadways, utilities, and future building foundations. Subsequent to GZA's initial assignment the Erie County Department of Environment and Planning (DEP) reported that areas within the site may have, in the past, received industrial and potentially contaminated fill. Thus, GZA was assigned the task of initiating geohydrologic studies at the site to locate and quantify these suspected fills, determine their impact on ground water and surface water, and to evaluate the affect of such wastes on the site's planned construction.

#### 1.20 PURPOSE AND SCOPE

GZA's work included the following to accomplish the previously stated objectives:

- Reviewed available, relevant data to assist in characterizing the past and present site conditions,
- Engaged a test boring and test pit subcontractor,
- 3. Monitored and logged 23 test borings,
- 4. Monitored and logged 55 test pits,
- 5. Monitored ground water levels in observation wells,
- Collected ground water and surface water samples for analytical testing,



- 7. Completed soils laboratory identification tests on selected soil samples,
- Retained soil samples from several test pits for analytical chemical testing,
- Analyzed the data to make appropriate foundation and construction recommendations, and
- 10. Completed a geohydrologic assessment of the site to determine ground water conditions.

**GZ**\

#### 2.00 SITE HISTORY

Documentation of the previous uses of the site is not extensive. Data sources are limited to old city surveys, fire insurance maps and aerial photographs. Several small industries have been located on the site near the existing peripheral streets, but the interior of the site has been either occupied by railroad yards or remained undeveloped. Undeveloped portions have been used for miscellaneous dumping activities.

The 1891 Buffalo City Atlas (see Figure 2) indicates that the railroad embankment, currently bisecting the site, was in place and owned by the Delaware, Lackawanna and Western Railroad. The area southeast of the embankment was previously occupied by a Lehigh Valley Railroad switching yard with car and locomotive maintenance facilities. These buildings, now demolished, were constructed of either brick and stone or wood. East of the railroad embankment/Dingens Street intersection (near the current Kintex Building location) several railroad tracks crossed Dingens Street at grade and there were several adjacent wood frame structures. The area west of the railroad embankment, along Dingens Street, was generally undeveloped. A brick yard, reputedly owned by the Bush Brothers, was located near the intersection of Bailey Avenue and Dingens Street. The north-central and northwest sections of the site were occupied by a large Erie and Western Railroad yard. Several small, presumably wood frame, structures were located at the site's northwestern and northeastern corners.

Examination of subsequent various aerial photographs and maps indicates that fill has been deposited randomly throughout the The majority of landfilling apparently occurred between the 1920's and the early 1950's and was generally concentrated in the area west of the railroad embankment and south of the former Erie and Western rail lines. The current pond in the approximate center of the site was at one time much larger but its size has been reduced by filling. It is not certain who . did this filling but the nearby railroads are suspected. Other potential parties could be some former industries identified on early Sanbourn Fire Underwriter maps. This may include a former fuel processing facility located near the current NFS building. This facility manufactured and processed coal, coke, and charcoal, and waste residue could likely have been disposed in open areas of the site.

Figure 3 is a combination of aerial photographs taken of the site in 1958. A lumber yard was in operation in the northwestern corner along the railroad tracks bordering the site's northern edge. The 1958 photograph also shows a waste processing and recycling facility, presumably for automotive wastes, located



on Bailey Avenue north of the Dingens Street intersection and now the site of a machine shop and the former A&R Waste Building. Behind this location various haul roads are evident on the photograph (Figure 3). Mounds of apparent fill can be distinguished along the haul roads, and it is reasonable to expect that much of this material was from the waste processing facility.

# 3.00 SITE EXPLORATIONS AND TESTING

GZA's site exploration consisted of 23 soil and rock test borings, converting 17 of these borings into ground water monitoring wells, 55 test pits, various soil identification tests, and analytical testing of both soil and ground water samples. An exploration plan showing the location of test borings, test pits, and monitoring locations is presented as Figure 4.

# 3.10 Test Borings

Test borings were done in two phases for this project. The initial test borings (B-1 through B-20) were done in May and June, 1983, by Earth Dimensions, Inc. of East Aurora, New York and the secondary phase borings (B-21 through B-23) were done in October, 1983, by Parratt-Wolff, Inc. of East Syracuse, New York.

Earth Dimensions, Inc. used a truck mounted Mobile B-34 drill rig and Parratt-Wolff, Inc. used a truck mounted CME-55 drill rig. All borings were similarly drilled and the process consisted of augering overburden material between sampling depths with hollow stem augers (either 3.5 or 3.75 inch inside diameter (I.D.)) to permit NX-size rock coring. Soil samples were obtained at 5-foot intervals by driving a standard split-spoon sampler (2 foot (ft.) long by 1.375 inch I.D.) with a 140-pound hammer falling 30 inches (ASTM D-1586). The number of blows required to drive the sampler 12 inches is defined as the Standard Penetration Test (SPT) N-value. Rock was cored in 8 of the test borings using a double tube NX size core barrel with a diamond bit, to verify top of rock elevations.

GZA personnel observed drilling procedures and prepared stratigraphic logs based upon material collected from the test borings. Additionally, a model PI lØl photoionization analyzer manufactured by H-Nu Systems, Inc. was used to scan soil samples and the air near the test borings for the presence of potentially harmful organic vapors. Overburden samples were visually classified in the field by GZA using the Unified Soil Classification System. Rock samples were examined by GZA to determine the rock type, structure, percentage of core recovery and Rock Quality Designation (RQD). Core recovery is the ratio of the sample length recovered divided by the length of core run, expressed as a percentage. RQD is defined as the summation of all pieces of core greater than 4 inches in length divided by the core run length and expressed as a percentage. In both cases core sections broken by drilling or handling are fitted together and considered as one piece.

Boring locations were selected by GZA, and Olson & Terzian, P.C. determined ground surface elevations. Figure 4 presents



the location of all test borings and the boring logs are included in Appendix A. Additionally, the results of the test borings are summarized on Table I "Summary of Test Boring Quantities" located on the next page.

#### 3.20 Test Pits

Fifty-five test pits were made at the locations shown on Figure 4 by the Boyd and Brown Construction and Development Corporation. Test pits designated with a "TP" prefix were completed in May and June, 1983 and those with a "TP-II" designation were completed in November, 1983. A Model 580C Case backhoe and a John Deere Model 310A backhoe, both with a 14 ft. reach, were used to excavate the test pits. GZA personnel monitored the excavation of each of the test pits and prepared stratigraphic logs indicating the classification of in-situ materials. The PI 101 photoionizer was also used during excavation of most of the test pits to scan air samples for the presence of potentially harmful organic vapors.

Test pit elevations are only approximate as they were estimated from topographic site plans prepared at two foot contours. Test pit logs prepared by GZA representatives for each of the test pits are included in Appendix B.

Soil and fill samples were retained from several of the pits along the railroad embankment for laboratory classification testing. Grain size analyses and one Atterberg Limit Determination were done on these samples to determine the suitability of these soils as pavement subbase and general construction fill. The results of these analyses are presented graphically in Appendix C. Additional samples of fill material were collected from selected test pits for analytical chemical testing and this work is discussed in Section 3.40.

# 3.30 Monitoring Wells

Observation wells were installed in 17 boreholes at varying depths throughout the site to characterize the site's ground water regime. These wells consist of 1.5 inch I.D. and 0.75inch I.D. Schedule 40 flush coupled PVC pipe with slotted well screens varying between 2 and 10 ft. long, depending upon subsurface conditions. Backfill within the annular space surrounding the well consists of #4 ROK sand around the screened section of the well and an approximate one foot thick bentonite seal above the sand. In-situ clay material with a cement grout plug at the ground surface covers the bentonite on the majority of the wells. Wells B-21, B-22, and B-23 contain a mixture of grout and one percent bentonite slurry above the bentonite seal to the ground surface.



TABLE I: SUMMARY OF TEST BORING QUANTITIES

<del>n -</del>	Test Boring Number	Date Completed	Ground Surface Elevation (ft.) (City Datum)	Depth of Boring (ft		TOR Elevation (ft.) (City Datum)
	B <b>-</b> 1	5/23/83	30.48	27.8	/ 2.7 *	
**	B-2	5/31/83	31.22	20.5	/ 10.7 *	
<b>M</b>	B-3	5/31/83	31.57	19.6	/ 12.0	14.9
,	B-4	5/30/83	33.03	15.0	/ 18.0 *	
Maria	B-5	5/30/83	33.84	18.9	/ 14.9 **	
	B-6	6/2/83	33.92 -	29.8	/ 3.1	6.6
وسون	B-7	5/24/83	29.34	21.5	/ 7.8 *	
ate is	B-8	5/26/83	25.92	34.8	/ -8.9	-4.2
***	B-9	5/23/83	22.23	35.0	/ -12.8 *	
	B- 10	6/3/83	30.61	28.0	/ 2.6 *	
•	B-11	5/24/83	25.07	36.1	/ -11.0	-6.8
-	B-12	5/20/83	24.66	26.5	/ -1.8 *	
•-	B-13	5/18/83	23.04	34.1	/ -11.1 *	
<b>B</b> loorer	B- 14	6/1/83	33.08	32.6	/ 0.5 *	
•	B-15	5/27/83	29.27	16.5	/ 7.5 *	
<b></b> .	B-16	5/18/83	25.67	31.4	/ -5.7	-0.9
¥=·-	B-17	5/19/83	26.00	28.1	/ -2.1	0.2
to-u	B-18	5/20/83	25.49	33.3	/ -7.8 *	
<u>.</u> .	B-19	5/27/83	29.69	31.2	/ -1.5	1.7
n	B-20	5/17/83	29.46	26.0	/ 3.5	6.3
,,,,	B-21	10/27/83	26.16	24.0	/ 2.2 **	
	B-22	10/28/83	34.87	32.1	/ 2.8 **	
	B-23	10/28/83	23.80	36.2	/ -12.4 **	

Notes: BOH = Bottom of Hole

TOR = Top of Rock

\* Split Spoon Refusal

\*\* Auger Refusal



Details of individual well installations are presented on the boring logs in Appendix A and summarized in Table II "Monitoring Well Details", on the following page. GZA monitored water levels in each of the wells and these data are presented as Appendix D.

# 3.40 Field and Laboratory Analytical Testing

Test samples were collected from various locations during the course of this study for analytical testing. These samples were collected from monitoring wells, surface water supplies, and test pits, as discussed below.

Ground water samples were collected from selected monitoring wells on several occasions using stainless steel bailers with teflon check-valves. Prior to sampling, the bailers were cleaned with laboratory grade detergent followed by successive rinses with analytical grade methanol and distilled water. A separate bailer was used to sample each well so as to prevent cross-contamination and, prior to collecting each test sample, a minimum of three volumes of water were purged from the well. The samples collected were appropriately preserved and delivered to ARO Laboratories of Buffalo, New York, following United States Environmental Protection Agency (EPA) Chain of Custody procedures. Additionally some split samples were retained by GZA for Gas Chromatographic (GC) screening to detect volatile organic constituents using GZA's in-house equipment.

Surface water samples were collected on several occasions from the ponded water, immediately north-east of the stone stock-pile. This water was handled similarly to the ground water samples and one sample was delivered to ARO Laboratories for analysis.

Overburden samples from the fills were collected during the test pit explorations. Selected split samples, representative of the different fills found at the site, were collected. One was delivered to ARO Laboratories, for analysis, following EPA Chain of Custody Procedures and the other was screened by GZA with a GC.

In-situ testing for pH, specific conductance, and temperature was done by GZA on each sample at the time of sampling. Additionally, the H-Nu photoionizer was used to test many of the samples in the field for the presence of organic contamination. The results of these tests and those of ARO are presented in Appendix E, and Section 5.00 discusses the results of this analytical testing.



# TABLE II MONITORING WELL DETAĻLS

Well <u>Number</u>	Elevation of Screened Interval (City Datum - ft.)	Material Type Around Screened Interval
B-1	3.5 - 8.3	Silty fine SAND (Glacial Till)
B-2	11.2 - 16.0	Glacial Till to Silty CLAY
B-5	15.8 - 20.4	Glacial Till to Silty CLAY
B-6	20.7 - 30.3	Misc. Fill
B-7	10.3 - 15.1	Saturated Silty CLAY
B-8	8.9 - 18.5	Misc. Fill
B-9	(-10.3) - (-5.5)	Sandy SILT (Glacial Till)
B-10	3.6 - 8.4	Glacial Till to Silty CLAY
B-11	7.9 - 17.5	Silty CLAY to Misc. Fill
B-12	12.7 - 17.5	Misc. Fill
B-13	3.0 - 5.0	Saturated Silty CLAY
B-16	Ø.7 - 2.7	Fine Sandy SILT (Glacial Till)
B-18	(-7.1) - (-5.1)	Silty CLAY
B-19	1.7 - 6.5	Fine Sandy SILT (Glacial Till)
B-21	3.2 - 8.0	Glacial Till to Silty CLAY
B-22	2.8 - 7.6	Glacial Till to Silty CLAY
B-23	(-12.4) - (-7.6)	Silty fine SAND (Glacial Till)
<b>.7</b> \		



# 4.00 SITE CONDITIONS

This section presents a brief discussion of the existing land use at the New Buffalo Industrial Park Site and of GZA's interpretation of subsurface conditions. These interpretations are based on a review of available data and the results of the subsurface exploration program.

#### 4.10 Current Land Use

Today the approximately 135 acre site consists of largely undeveloped land with various owners. A 20 to 25 ft. high abandoned railroad embankment bisects the site running from the eastern edge of the NFS property at Dingens Street to the northeast corner of the site. The central section of the site is dominated by an approximate 4-acre pond with connecting drainage ways. This pond is reported to be approximately 5 ft. deep with some random, isolated areas as deep as 10 ft.

Laboratory tests of the embankment material (see Appendix C) indicate that the material within the embankment is similar to the on-site natural silts and silty clays found during the explorations. Thus, it is possible that on-site materials were used to construct the embankment and that the pond was a borrow pit. It is also possible that, following construction of the embankment, the borrow pit filled with run-off and rain water to create the pond as the natural materials, with their typically low permeability, act as a seal retaining the pond's water.

Currently, the area immediately surrounding the pond is being filled with predominantly construction debris, stone, concrete, etc. from unidentified sources, as observed by GZA personnel during field studies.

Immediately west of the pond is a large stockpile of stone reputedly owned by the Pinto Equipment Company, who operates on-site rock crushing equipment to process the stone into construction materials. Several small businesses and structures, including a collison shop and a diner, are located west of the stone stockpile, and along Bailey Avenue. East of the NFS property, on Dingens Street, the only active areas are the Kintex Bldg. (210 Dingens Street) and an employee parking lot for the UPS building, located on the south side of Dingens Street. The remaining areas are largely vacant with the exception of a Niagara Mohawk Power Corporation (NMPC) substation located along Bailey Avenue. NMPC also maintains a 90 ft. to 110 ft. wide right-of-way containing transmission lines extending from their substation to the site's northeast corner. North of the NMPC right-of-way, there are frequent rail lines which are remnants of the earlier Erie & Western Railroad. These lines, which are not currently in active service, were, during this study, used for railcar storage.



A gas well owned by Niagara Frontier Services, is located approximately 200 ft. west of the railroad embankment in the north central section of the site near test boring B-15. An approximate 4 inch diameter cast iron pipeline approximately 3 to 4 ft. below ground surface connects the gas well to NFS energy plant located on the Dingens Street property.

The existing surface conditions and current land uses are summarized on Figure 5.

#### 4.20 Fill Material

Significant portions of the project site have, in the past, been subjected to landfilling with fills ranging in thickness from 3 ft. to 14 ft. Typically these fills are best classified as randomly deposited heterogeneous fill materials consisting of the following:

- uncontrolled soil fills (clay, silt, sand, and gravel of various percentages);
- construction debris (bricks, concrete, wood, etc.);
- junk fill (rubbish, glass, paper, etc.); and
- suspected industrial fills (coal, oil soaked materials, sludges, etc.).

Strength and density properties of the fill materials are difficult to characterize because of the fill variability. The commonly used N-values (as determined by the Standard Penetration Test, ASTM D-1586) for estimating the relative density of overburden materials, do not, in many cases, accurately represent the actual conditions within these heterogeneous fills because of obstructions encountered while testing. The bottom of the fill materials, at the site, is often defined by a thin layer of organic material (roots, decaying plants, black discoloration) thought to be the original ground surface. The currently estimated bottom of fill elevation (i.e. top of natural overburden materials) is presented as Figure 6.

Although the fill is variable, some generalizations can be made regarding its consistency throughout the site. To facilitate this discussion the site has been divided according to fill type. It should be noted that these divisions are based on the general fills expected and since the material is heterogeneous, variations may be encountered during construction. These divisions are presented on Figure 5 and a brief discussion of each of the sections is presented below:



# AREA "A"

Fill consists of black cinders, wood ties and wood chips, large concrete obstructions and brick fragments. The concrete obstructions may be buried foundations. As shown in Figure 3, this area once contained a saw mill and lumber yard complex and thus fills typical of this type of operation should be expected during construction.

#### AREA "B"

This area, between the NMPC right-of-way and the embankment, was apparently never significantly developed and generally remained open lands. The accessibility of this open area apparently made it a particularly attractive location for the disposal of waste materials. Area B can be subdivided into three areas based upon the prominent fill types located during the explorations.

Area B-l contains junk fill and rubbish with industrial fill either intermixed throughout or concentrated in isolated sections. For example, an apparent sludge deposit (see test results in Section 5.00) was located near the stone pile in the location presented on Figure 5. This 4 to 5 ft. thick deposit may extend under the stone pile and, as will be discussed in section 5.00, precautions will be required when handling this material. While the source of the fill materials in area B-l is uncertain, the former junk yard, and waste processing facility identified on Figure 3, and the nearby railroads are likely sources.

Fill in Area B-2 contains a significant quantity of building rubble, and significant quantities of coal and oil soaked soils. This area's proximity to the former fuel processing plant, now the site of the NFS building (see Figure 3) would indicate that these materials are probably waste by-products of that operation.

Area B-3 is dominated by construction debris consisting of concrete slabs, large stone, wood timbers, empty drums, etc. Judging by the nature and condition of this material, this area is the most recent fill area on the project site. In fact, filling was occurring immediately east of the pond during GZA's work at the site and these fills were observed to be predominantly construction debris and soil.

# AREA "C"

This section was apparently not subjected to significant filling. However, this area is low and was often flooded during GZA's explorations making it impossible to complete many test pits in this area. The limited explorations in Area C did indicate



that some soil fills have been placed in this area. These fills could have been placed when the NFS gas well (Figure 5) and pipeline were constructed, for either haul roads for drill rig access or as spoil from the gas pipeline trench.

#### AREA D

This area, east of the railroad embankment, does not appear to contain significant thicknesses of fill. Since the area formerly was operated as a rail yard with a round house and maintenance area for the Lehigh Valley Railroad, there are buried foundations present. The approximate locations of these suspected foundations are shown on Figures 2 and 3. The area also contains various amounts of coal and oil waste, particularly near the site's eastern property line, behind the Super Duper Plaza. Also, since the area contained frequent rail lines, ballast and structural fill for the rail lines should be expected.

# 4.30 Naturally Deposited Overburden

Naturally deposited soils underlying fills at the New Buffalo Industrial Park site consist of lacustrine silts and clays overlying glacial till. As shown on the geologic profiles (Figures 8 and 9, Legend Sheet for these profiles presented as Figure 7), the natural soils typically consist of the following sequence, beginning immediately below the fills:

- A thin veneer of organic material, generally less than one foot thick which represents the former ground surface and topsoil of the site. This layer was not present in all borings and it may have been stripped in areas, prior to filling at the site.
- An approximately 2 to 8 ft. layer of hard silt (ML) to a silt-clay mixture (ML-CL) underlies the former topsoil. Typically, this material is light brown to olive green with a trace of fine gravel and has occasional high angle silt to fine sand seams throughout.
- Beneath the above clays and silts is a silty clay (CL) varying in thickness from 8 to 25 ft. Generally, this brown to gray clay is saturated and has a soft to medium stiff consistency. This lacustrine clay often contains varves and lenses of gray silt to fine sand varying in thickness from less than 0.25 inch to more than 0.5 inches.
- Below the clay and immediately above top of rock, a generally dense to very dense glacial till deposit is found. The till varies in thickness but generally ranges from 2 to 5 ft. and is a gray fine sandy silt (ML) to silty fine sand (SM) matrix with some fine to coarse gravel and rock fragments. The till layer thickens occasionally to as much as 13 feet, and it



is generally part of the site's uppermost aquifer with a permeability estimated to range from  $10^{-3}$  to  $10^{-4}$  cm/sec. This stratum also often contains large boulders and cobbles (see boring B-20) which may be mistaken for top of rock.

#### 4.40 Bedrock

Bedrock is the Onondaga Limestone Formation which is a gray massive bedded limestone with occasional thin shale partings and nodules of hard chert. Top of rock is slightly to moderately weathered along discontinuities and bedding planes. The rock quality is generally "good" to "excellent", based on the RQDs which average 75%.

The rock surface generally dips in a southerly to south-easterly direction through the site. The rock surface is estimated to be approximately Elevation (Elev.) 18 (City of Buffalo Datum) in the northwest corner (boring B-4) and is Elev. -12.8 along the Dingens Street boundary. Rock surface elevations in the local area often vary several feet over short distances.

Rock surface contour lines are presented on Figure 10. As shown, the rock at the site is generally lowest in the center of the site along a roughly north-northeast to south-southwest axis, indicating the presence of a buried glacial valley. However, additional borings would be required for confirmation.

# 4.50 Ground Water

Three ground water systems have been identified at the site. The glacial till and fractured top of rock represents the primary ground water aquifer. This system is a confined aquifer by the essentially impermeable overlying silty clays and unfractured bedrock below. Water levels, determined by measurement of wells sealed within this zone, ranged from approximately 10 to 15 ft. below ground surface. As shown by the ground water contour map presented as Figure 11 ground water in the glacial till/top of rock aquifer flows east-southeasterly at an approximate gradient of less than one percent, apparently towards the Buffalo River.

The second ground water system identified at the site is within the saturated silty clay. Ground water is essentially "trapped" within the interstices of this material and for practical purposes it should be considered an aquiclude with no significant off-site flow because of the material's low permeability, estimated to be approaching  $10^{-8}$  cm/sec. Water levels measured in wells located in this zone are within several feet of the ground surface.

Above the silty clays a perched ground water system is found within the granular miscellaneous fills of the site. The amount of water and flow d) rections of this ground water system are dependent upon several factors including the nature



of fill materials and proximity to surface water supply and discharge points. Typically, water within the fills is found at depths of 3 to 5 ft. and often is distinguished by a petroleum odor.

#### 4.60 Surface Water

The source and flow directions of surface water at the site is uncertain. It is probable that the pond in the center of the site was created by its filling with run-off precipitation and discharge from perched water systems. Because of the low permeability of underlying natural deposits, it is unlikely that surface waters discharge into prominent ground water systems of the glacial till and bedrock at the site.

The remnants of man-made drainage ways are evident at the site, particularly along the former rail lines. However, no significant surface drainage was noted at the site attributable to the siltation and disrepair of discharge conduits installed by the railroads. In fact, the effect of the plugged discharge conduits is stagnant water that floods low areas of the site for much of the year.



#### 5.00 GEOHYDROLOGIC CONSIDERATIONS

Significant amounts of landfilling have been done throughout the site and the nature of the fills placed during landfilling is extremely variable. Thus, this geohydrologic assessment was undertaken to determine and quantify site conditions, the nature of wastes, and their impact on nearby ground water and surface water supplies. This section discusses GZA's findings to date and presents our current recommendations, based on these findings.

# 5.10 Analytical Test Results

Analytical testing was done on various samples collected by GZA according to the procedures discussed in Section 3.40. These tests were done in two phases; Phase 1 in May-June, 1983 and Phase 2 in November-December, 1983. The Phase 1 work was done to complete an initial assessment of the geohydrologic conditions at the site and Phase 2 work was done to expand upon these earlier findings.

# 5.11 Analysis of Soil Samples

Soil samples were collected from the test pits within the miscellaneous fills and tested via analytical methods for various parameters. Table III "Analytical Test Samples from the Miscellaneous Fill Material" on the next page summarizes the soil samples tested to date and analytical results of this testing are included in Appendix E.

Testing of the miscellaneous fill samples varied with each sample. However, the procedure for most of the test pits consisted of initially using the H-Nu photoionizer to monitor the air quality during excavation for the presence of potentially harmful organic vapors and then testing the samples in the lab via analytical techniques. Significant organic vapor levels were not detected during test pit explorations, with the exception of several test pits done in the landfill area designated B-1, on Figure 5. The organic vapor readings measured during excavation of test pits TP-II-7 and TP-II-9 were elevated and thus appropriate precautions were taken while sampling this material. It should be noted however, that a screening of this material with a GC did not reveal significant organic contaminants other than methane gas, which is a common by-product of decaying refuse.

The Phase I analytical testing program of the soil samples was implemented to obtain preliminary information on the nature and extent of contamination within the fill. Thus, initially these soil samples were prepared by ARO laboratories via extraction and digestion techniques and analyzed by infra-red (IR) Spectroscopy to determine the presence of major constituents ( > 0.1%) via functional group classification. The IR spectra did not show any major constituents to be present other than hydrocarbons. Subsequent testing, by ARO, via gas chromatographic



Table III

Analytical Test Samples from the Miscellaneous Fill Material

1

Test Pit	Approximate Sample Depth	Remarks
PHASE 1		
TP-4	4.0 ft.	Purple sludge with intermixed soils, distinct odor
TP-13	2.5 ft.	Sandy gravel fill contaminated with oil; distinct petroleum or tar-like odor.
TP-16A	5.0 ft.	Black "tar" fill
TP-33	3.5 ft.	Black sandy fill contaminated with oil, distinct oil odor
TP-59	Ø.5 ft.	Blue/purple sludge deposit with distinct odor
PHASE 2		
TP-II-1	1.5 ft.	Black tar or asphalt like material, distinct petroleum odor.
TP-II-3	4.0 ft.	Black coal fragments
TP-II-5	Ø.4 ft.	Purple/blue sludge intermixed with soil
	6.0 ft.	Gray ashes and cinders
TP-II-6	4.0 ft.	Dark blue sludge and cinders, slight odor
	4.4 ft.	Black granular construction debris intermixed with industrial fill, slight odor



# Table III (contd.)

	Test Pit	Approximate Sample Depth	Remarks
	TP-II-7	5.0 ft.	Purple/blue fibrous deposit intermixed with sludge, distinct odor
		7.5 ft.	Black fibrous fill material
,	TP-II-9	1.0 ft.	Fine red-brown foundry sand with petroleum odor
	TP-II-10	3.0 ft.	Black granular soil containing oil, petroleum odor.

(GC) analysis of the concentrated extracts confirmed this finding. The GC curves indicated that the major hydrocarbons present in the samples are apparently severely weathered diesel fuel and/or motor oil. Volatile constituents of the hydrocarbons (i.e. carbon #8-12) were not found in significant quantities indicating that these may have volatilized since the materials were deposited.

The purple sludge material in TP-59 appeared to be a dye, or a dye by-product. This material was thus analyzed by ARO for aniline, substituted anilines, and nitro-aromatics (nitro-benzene etc.) and none were detected at elevated levels.

The sludge material in TP-4 was analyzed for various heavy metals, and significant quantities of lead (399.0 mg/kg) and chromium (21.0 mg/kg) were detected. Additionally, the pH of a 50% slurry of the TP-4 sample was 4.8, which is a very low value. The nature and consistency of this material would seem to indicate a paint or dye by-product that could have been classified as a hazardous waste and thus additional testing was required. Phase 2 tests were thus done to determine, primarily, if the sludge material found in TP-4 was "hazardous" and if petroleum based fills at the site were contaminated with polychlorinated biphenyls (PCB's).

The EP Toxicity Test is used as a guideline for determining if a given sample is hazardous. The test requires that a standardized quantity of treated water be run through a sample of a waste, compacted in specified equipment, and that the resulting leachate be tested for various parameters.

The EPA designated maximum contaminant levels (MCL) for this leachate (as specified in the Code of Federal Regulations Section 40 Part 261.24) are as follows:

Contaminant	Maximum Concentration parts per million (ppm)		
Arsenic	5.0		
Barium	100.0		
Cadmium	1.0		
Chromium	5.0		
Lead	5.0		
Mercury	Ø.2		
Selenium	1.0		
Silver	5.0		

The EP Toxicity Test (heavy metal fraction) was done on two samples collected during Phase 2 (TP-II-7 (5.0 ft.) and TP-II-9 (1.0 ft.)). The TP-II-7 sample contained a purple sludge,



similar to that found in TP-4, and the TP-II-9 sample was typical of other industrial fills found at the site. The test results (see Appendix E) indicated that these materials were not hazardous, as the metal content of the leachate was below the designated MCL's.

The above samples and a sample from TP-II-5 (6.0 ft.) were also tested for their reactivity potential (as described in the Code of Federal Regulation Section 40 Part 261.23). The test results, as presented in Appendix E, indicate that these samples are classified as nonreactive according to EPA guidelines.

Samples from the test pits were also routinely tested for pH by creating a 50% slurry by weight with prepurified water and measuring the pH of the sample with an electronic probe. Several samples, as listed below, had a very low, or acidic, pH.

Sample Location	Depth	Hq
TP-4	4.5 ft.	4.8
TP-II-6	4.0 ft.	5.1
TP-II-6	4.4 ft.	4.4
TP-II-7	5.0 ft.	2.6

These acidic materials could be detrimental to any underground utilities or structures that may be installed within or near these fills. GZA's studies suggest that the low pH is probably associated with the purple sludge-like deposits found near the stone pile in the location presented on Figure 5. Presently it appears that the low pH material is a relatively localized occurrence as the pH of ground water in nearby wells is near neutral (pH = 7.0). No wells, however, were installed within the fills west of the stone pile. Thus, low pH ground water, moving toward the pond and drainage way along the NMPC right-of-way, is possible. Precautions such as expanded corrosivity studies are recommended to determine if pretreatment techniques, use of alternative materials, or removal of the acidic fills are required prior to construction.

The analytical testing of fills containing significant amounts of petroleum (TP-13, TP-II-1, TP-II-3, and TP-II-7) included testing for Polychlorinated Biphenyl (PCB) concentrations. The results (Appendix E) indicate that PCB's are not present in elevated quantities, as the samples tested contained less than 1.0 mg/kg. of PCB's.

Four samples, collected during Phase 2 work (TP-II-6, 4.0 ft.; TP-II-6, 4.4 ft.; TP-II-5; and TP-II-10), were examined for volatile organics in GZA's laboratory using a gas chromatograph.



The samples were relatively free of organic contamination although TP-II-5 did contain a significant amount of methane gas and apparently a trace amount of a benzene derivative. The location of TP-II-5, near the former landfill (designated B-1, Figure 5), indicates that these results are reasonable.

# 5.12 Analysis of Ground Water and Surface Water Samples

Phase I ground water sampling and testing was done to obtain preliminary information on the quality of water at the site. To this end, samples were collected from wells sealed within various soil types and tested for selected parameters. Appendix E includes a "Log of Analytical Testing" listing the different tests done during Phase I and it also presents the results of these tests.

As shown in Appendix E, ground water in several of the wells had concentrations of lead, chromium, and phenols that exceeded the New York State Department of Environmental Conservation Class GA (potable water supplies) standards. Generally, these wells (B-1, B-8, B-11, and B-12) are located adjacent to the former landfill designated area "B" on Figure 5. Gas Chromatographic tests on water from these wells for various organic constiuents did not, however, indicate elevated levels as shown in Appendix E.

The preliminary results of Phase 1 necessitated additional Phase 2 testing to determine primarily if the apparent contamination found in the ground water near fill area "B" was leaving the site. Therefore, an expanded ground water testing program was done in November-December, 1983 and test results are included in Appendix E.

Phase 2 ground water samples were tested for an expanded list of parameters including the EPA designated priority pollutant metals. The samples tested included ground water collected from three wells (B-21, B-22 and B-23) sealed within the glacial till/fractured top of rock zone which, as discussed in Section 4.50, was identified as the primary aquifer at the site. Wells B-21 and B-22 are located near the site's property lines, positions downgradient of fill areas, and thus they represent ground water exiting the site. Well B-23 is located immediately downgradient of fill area "B", shown in Phase 1 to contain apparently contaminated water and thus in a position to indicate contaminent migration. A sample was also collected from well B-12 which contained the highest lead and chromium levels during Phase 1.



All four samples were passed through a 0.45 micron filter prior to chemical analysis so as to determine dissolved constituents of the ground water. The rationale for such testing being that constituents dissolved within the ground water are the best representation of the mechanism of ground water transport, as sediments would not likely be transported off-site by the ground water.

The results of this testing (Appendix E) indicate the ground water in wells B-21, B-22 and B-23 is relatively free of dissolved heavy metal contamination, indicating that contamination is not impacting off-site water supplies. Additionally the levels of dissolved metals measured in B-12 were below class GA standards suggesting that the earlier high lead and chromium levels found in some of the the wells tested during Phase 1 were due to sediments in the ground water and not dissolved constituents of the water.

The ground water samples collected in Phase 2 were also analyzed using GZA's laboratory GC. The screening indicated they were free of volatile organic contamination, other than methane in B-12.

Limited surface water testing was done because off-site drainage is insignificant and thus off-site contamination of water was not considered a problem. One sample of the pond water was tested and the concentrations of the limited parameters tested are below class GA standards.



# 6.00 GEOTECHNICAL ENGINEERING CONSIDERATIONS

Geotechnical engineering considerations for the design and construction of the infrastructure are presented in this section. A general discussion on various foundation systems for structures on individual parcels is presented and the potential uses of the existing railroad embankment soil are addressed.

#### 6.10 Roadways

# 6.11 Design Considerations

The proposed roadway locations are shown in Figure 4. The typical road section will consist of a 40-foot wide, 9-inch thick reinforced concrete slab. The slab will be supported by a layer of subbase material overlying the existing subgrade soil, which is miscellaneous fill. The fill thickness and consistency vary and therefore the suitability of the fill for supporting pavements will also vary. Generally, the fill is expected to be adequately stable for pavement support in areas where railroad tracks currently exist. Fill in these areas is expected to consist primarily of slag, cinders and ballast. It is expected to be relatively dense from the many years of supporting railroad traffic, and it should be relatively free draining. The suitability of the fill in other areas will vary and will need to be addressed during construction.

A rigid pavement system has been designed and therefore the recommended subbase material type and thickness are based primarily on drainage considerations. The recommended subbase thickness is 6 inches. The subbase should be a clean, open graded sand and gravel, or preferably, a crushed stone. The material should satisfy the subbase material specification of the New York State Department of Transportation (NYSDOT). Longitudinal subbase drains, under the curbs, would further enhance the drainage characteristics of the pavement system.

#### 6.12 Construction Considerations

The site's subsurface conditions are variable and the successful performance of the pavement system is highly dependent upon the execution of appropriate construction procedures, particularly the subgrade preparation. The purpose of this section is to provide basic roadway construction guidelines and to identify areas of potential construction difficulty.

In general, after the roadway subgrade elevation has been established, the subgrade surface stability should be tested before proceeding with the subbase layer construction. Density testing in fill soils is inappropriate and therefore, the surface stability should be evaluated by proofrolling with equipment described in the NYSDOT Specifications (a 30-ton gross weight evenly distributed on 4 wheels). Proofrolling should identify



loosely deposited or unsuitable soils near the subgrade surface and underlying soft areas. A qualified geotechnical engineer should be retained during construction to observe proofrolling operations and the response of the subgrade.

There are several remedial measures that should be implemented if a proofrolling test fails and they are dependent upon the subgrade's response to proofrolling. Areas of disturbed, but suitable soil at the surface should be compacted using either a vibratory roller for granular soils or a sheepsfoot roller for cohesive soils. If the soil at the subgrade surface is unsuitable, i.e. refuse, organics, etc. or a proofrolling test result suggests the presence of an underlying soft area, the road subgrade will need to be overexcavated. The overexcavated area should then be backfilled with crushed stone to achieve the necessary subgrade stability. Specific overexcavation procedures will depend upon the horizontal extent of the unstable pocket and its stiffness. Each pocket should be evaluated independently, but generally, the less severe areas can be corrected by overexcavating 0.5 to 1.0 foot and backfilling with the specified subbase material. Extensive unstable areas could be corrected by overexcavating 1 to 2 feet, depending on the severity, and backfilling with a very coarse crushed stone, such as "blast shot rock". Extensive unstable areas are likely to extend deeper than the overexcavation depth, but a very coarse grained soil will tend to "bridge" over it. The unprocessed stone in the on-site stockpile appears to be a suitable material for deeper overexcavations, provided particles with dimensions exceeding the overexcavation depth are first removed.

Old foundations protruding to the subgrade surface should be removed to at least 2 feet below the roadway subgrade elevation and the remaining pit should be backfilled. Backfilling should be done in lifts, compacted to 90% of the maximum dry density as determined by ASTM D-1557, Method C, "Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using a 10-pound Rammer and an 18-inch Drop". If a coarse grained backfill, i.e. crushed stone, is used, the appropriate moisture content will be determined by the material properties. However, if a fine-grained soil, i.e. silty fine sand or clay is used, then the moisture content should be specified as  $\pm$  1% of the optimum as determined by ASTM D-1557, Method C.

The proposed location of Gateway Drive begins at Bailey Avenue, continues easterly to the central portion of the site, curves to the right and continues south to an intersection on Dingens Street, see Figure 4. Reference Line stationing begins at Bailey Avenue. The fill thickness increases gradually from about 3 feet near Bailey Avenue to about 13 feet near Station 20+00. This area is presently undeveloped but much of it was occupied by a lumber yard (see Section 2.00). Some soft fill and old foundations were observed during explorations and should be expected in this area.



Gateway Drive, from approximately Station 20+00 to the existing railroad embankment, will pass through the former Erie and Western railroad yard and then a swampy area. Extensive explorations in these areas were not possible because tracks still occupy the railroad yard and the swamp prevented access. However, the soil conditions can be inferred with reasonable accuracy using surrounding soil data and information from old All maps showing former site uses indicate the presence of the existing railroad yard. Therefore, the fill will probably be similar to that found east of the railroad embankment (former Lehigh Valley Railroad Yard) and is expected to consist primarily of cinders and slag. Large buried foundations are not expected Drainage of the swamp will be required and the in this area. ground surface will probably consist of a layer of soft sediment and organics overlying the natural silts and clays. The soft sediments may need to be removed prior to construction.

Gateway Drive, south of the railroad embankment, will pass through the former Lehigh Valley Railroad Yard. Some of the fill will consist of the cinders and slag ballast placed during construction of the railroad. Since abandonment of the railroad however, several industries have used this area as a disposal site. The fill thickness is expected to vary from 3 to 6 feet (possibly more). Concrete or stone building foundations should also be expected in this area, particularly within 600 feet of Dingens Street (see former site maps, Figures 2 and 3).

The proposed Enterprise Avenue begins at Bailey Avenue, extends easterly across the site intersecting Gateway Drive and ends at South Ogden Street, see Figure 4. Explorations were not done from Station  $\emptyset+\emptyset\emptyset$  (Bailey Avenue) to Station  $5+\emptyset\emptyset$  because an existing, frequently used haul road and existing building with connecting buried utilities limited access. However, fill through this area is expected to be about 5 feet thick.

The fill thickness along Enterprise Avenue varies from about 5 to 11 feet between Stations 6+00 and 11+00. The consistency of the fill is very irregular and includes scrap metal, building rubble, construction debris, and industrial wastes. The nature of the industrial waste deposits is summarized in Section 5.00 and removal or neutralization of some of these deposits may be required. The section from Station 11+00 to the railroad embankment will probably consist of disposed construction debris ranging from 6 to 14 feet thick.

Enterprise Avenue, east of the railroad embankment, passes through the former Lehigh Valley Railroad yard. Fill in this area is thinner, about 4 feet, and is expected to consist primarily of slag and cinders. Some small railroad structures are shown near the proposed Enterprise Avenue location (see Figure 2) but no foundations were encountered during explorations. The probability of encountering massive foundations in this area is less likely than elsewhere.



The recommended crushed stone subbase should be compacted to 95% of the maximum dry density as determined by ASTM D-1557, Method C. The compacted subbase density should be measured regularly as part of the construction quality control program.

# 6.20 Underground Utilities

#### 6.21 Design Considerations

Underground utilities for the New Buffalo Industrial Park will include storm sewers, sanitary sewers, water lines and private utilities such as gas, electricity, and telephone. It is understood that the storm sewers will be located beneath the proposed roads and the remaining utilities will be located outside of the road limits, but within the 66-foot-wide right-of-way, i.e. beneath sidewalks. It is understood that storm sewers will be reinforced concrete pipe, sanitary sewers will be tile pipe, and the water lines will be ductile iron pipe. It is also understood that storm and sanitary sewers will be supported by a continuous concrete cradle. The cradle will be 12 inches thick below the pipe and extend to the pipe springline. It will also span the trench.

The effects of corrosion on buried utilities should be examined particularly with respect to concrete materials. There may be pockets of corrosive materials that will be unknown until exposed by excavation.

Storm sewers will range from about 5 to 20 feet below the existing grade and will range in diameter from 18 to 60 inches. Two alternative sewer designs have been proposed; one for a 5 year flood, the second for a ten year flood. Generally, the 10 year flood proposal has associated large storm sewer pipes at greater depths as shown on the Geologic Profiles, Figures 12, 13 and 14. The storm sewer, under Gateway Drive, will be founded mostly on the natural, stiff silty clay (see Geologic Profile, Figure 12). The stiff silty clay will provide adequate support for the pipe and manholes. Under Enterprise Avenue, portions of the sewer will be founded on a thin fill layer between Stations 0+00 and 25+00 (see Geologic Profiles, Figures 13 and The suitability of the fill for pipe support will vary and will require evaluation during construction. Overexcavation of the fill with subsequent backfilling may be required in isolated Overexcavation is not presently expected to be extensive and the depths are not expected to exceed two feet. From about Station 25+00 to South Ogden Street, the sewer will be founded on the silty clay, glacial till or even possibly rock, depending upon the design alternative selected, see Figure 14. All of these materials should provide adequate support for the pipe.

Industrial wastes and refuse have been deposited along Enterprise Avenue, between Bailey Avenue and Gateway Drive. Methane and hydrogen sulfide gases have been observed in this



area (probably from the rubbish decompostion) and GZA recommends containing these gases in this area. It is possible for these gases to travel through any permeable sewer trench backfill to the remainder of the site. This gas migration can be limited by (1) the use of a well graded sewer backfill with more than about 20% fines (i.e. finer than the #200 sieve) or (2) the use of clay barriers or dams at regular intervals along the sewer alignment if an open-graded (uniform) crushed stone backfill The use of a well graded sewer backfill is preferred. If clay dams are necessary the recommended spacing will depend upon the actual conditions encountered during construction. It is presently anticpated that a 300-foot spacing would be appropriate. The dams should be about 5 feet long (in the pipe direction) and should extend from the pipe or cradle to the road subgrade surface. Test data indicate that the material within the railroad embankment should be a suitable source for the proposed clay dams.

It is understood that sanitary sewers will be 8-inch diameter pipes, shallower than the storm sewers, and will be located primarily in the fill deposits. Some overexcavation of unsuitable fills or building foundations should be expected in isolated areas to adequately support the sanitary sewer. The amount of overexcavation will depend upon actual conditions encountered during construction but is not expected to be excessive and recommended depths will probably not exceed one foot.

The water lines will be about 5 feet deep and located in the fills. Some of the fill, particularly along Enterprise Avenue between Bailey Avenue and Gateway Drive, is very acidic and will be corrosive to the ductile iron water pipe. A corrosive protection coating is recommended in this area.

#### 6.22 Construction Considerations

Excavating the fills and natural clays should be moderately easy except where obstructions are encountered. Test boring data suggest that some till excavation and possibly some rock excavation should be expected if the 10 year flood design alternative, as shown on Figures 12, 13 and 14 is selected. Till excavation will vary from moderately difficult to difficult because of the varying density and the presence of boulders, see Boring B-20, Appendix A. Any rock excavation is expected to require drilling and blasting. The sewer excavations may be open cut, provided OSHA excavation standards are implemented.

Rock surface data under Enterprise Avenue from Station 35+00 to South Ogden Street are limited but suggest that the rock surface is near the 10 year flood design sewer invert. Depending upon the design alternative selected, some rock excavation may be required. Since the surrounding area is developed, blasting specifications should be restrictive to limit vibration damage to nearby structures. A qualified geotechnical engineer should review the contractor's blasting design before any blasting



is permitted. The limited rock surface data prohibit an accurate estimate of rock excavation quantities.

Some construction dewatering for the utility installations will be necessary to maintain a stable trench bottom. This is necessitated by the perched water table in the fill. The volume of water inflows will vary throughout the site, with the depth of the excavation, the type of fill material, and with the contractor's excavation procedures. A sophisticated dewatering system, such as well points, is not presently anticipated. If the sewer invert does not extend into the glacial till stratum and the contractor takes appropriate construction steps, groundwater control could be limited to sumps within the excavation. Some simple steps that the contractor can take to assist in controlling groundwater inflows are:

- (1) Begin the excavation at the deepest point and proceed to the shallower point, and
- (2) Keep the length of the excavation open at any one time to a minimum,

If the sewer invert extends into the glacial till stratum or rock, a formal dewatering system such as deep wells (rock, till) or well points (till) will probably be necessary to adequately depress the water table. It is recommended the water table be depressed at least one foot below the invert. The dewatering system should have provisions for corrosion.

The stability of the trench base will be an indicator of the dewatering system effectiveness and therefore should be regularly inspected. Any unstable bases should be corrected before installing the sewer pipe to limit the potential for future settlements.

It is presently anticipated that excavation spoil from the storm sewer will generally be unacceptable backfill material because the sewer is located beneath the roads. There are essentially two backfill materials that would be suitable for the storm sewer backfill, the on-site railroad embankment material and a well-graded crushed stone. Each material has associated advantages and disadvantages as listed below:

#### Railroad Embankment Material

# (1) Advantages

- It is comparatively inexpensive because it is already on-site.
- When properly compacted, it has a relatively low permeability to (1) limit the migration of gases along the sewer alignment and, (2) assist in construction ground water control during construction.



#### (2) <u>Disadvantages</u>

- The in-situ moisture content may need to be adjusted to achieve satisfactory compaction results.
- It will be comparatively less workable after extended rainy periods.

#### A Crushed Stone Material

#### (1) Advantages

 Typically, this material dries quickly, thus making it workable shortly after extended rainy periods.

# (2) Disadvantages

- The permeability is expected to be relatively high unless the amount of fines is about 20% or greater by weight. The high permeability will enable on-site gases (methane and hydrogen sulfide) to migrate through the backfill and will make construction groundwater control more difficult.
- This type of material at an acceptable gradation is not available on-site and thus its use is expected to be more costly.

Some spoil from the sanitary sewer and water line excavations may be suitable material for backfilling these excavations because these utilities will not be under the roads. Spoil, such as railroad cinders, will be acceptable for backfill in these trenches. Industrial wastes and refuse however, should not be considered suitable for any backfilling purposes. Unsuitable backfill soils may be used for architectural grading (i.e. non-bearing material). This would reduce the amount of off-site disposal.

Proper backfilling of the storm sewer excavation is necessary to form a firm foundation for the overlying pavement structure. It is recommended that the storm sewer backfill, i.e. the material between the sewer and the pavement subgrade elevation, be compacted to 90% of the maximum dry density as determined by ASTM D1557, Method C. The backfill lift thickness should be limited to 6 inches and the maximum particle size should be limited to 4 inches if a vibratory drum roller is used. Lighter equipment will decrease the allowable lift thickness. The moisture content should be controlled to achieve satisfactory results. If a fine grained backfill is selected, the moisture content should be within 1% of optimum as determined by ASTM D1557, Method C. It is understood that sidewalks will overlie sanitary sewers and water lines and therefore backfilling requirements are less.



#### 6.30 Building Foundations

The geotechnical program for the New Buffalo Industrial Park was developed to obtain generalized site subsurface data to permit recommendations concerning only the infrastructure design and construction. Foundation designs for individual parcels will require geotechnical programs designed specifically for that parcel. However, based on the available geotechnical data, some foundation generalizations can be made.

Generally, founding buildings on fill soils is not recommended. For light to moderate weight buildings, excavation of the fill and replacement with controlled structural backfill may be an economical alternative because it would permit a shallow foundation, i.e. spread footings or a mat. If the fill is thick, a deep foundation may be more economical. A deep foundation would generally consist of end bearing piles or caissons bearing on sound rock (the Onondaga Limestone Formation). The corrosive nature of some on-site fills may affect steel or concrete piles and will need to be addressed as part of the specific foundation design.

Natural soils at the site are capable of supporting light to moderate weight buildings. Natural soil strengths vary somewhat throughout the site but the minimum allowable bearing capacity ranges from 1.5 to 2 tons per square foot (tsf). There are areas where the natural soil bearing capacity will be higher but a review on a site by site basis will be required. It may be possible to use slab-on-grade floor slabs, depending on the structure's use and weight. All exterior shallow foundations and those in unheated areas should be buried 4 feet for frost protection.

Portions of the existing pond are on a parcel which will be developed. It is recommended that the pond be drained and all bottom sediments removed. The sediment should be chemically tested to determine the appropriate means of disposal. Any subsequent backfilling should be controlled to make the parcel suitable for development.

#### 6.40 Uses of the Railroad Embankment Materials

Material in the existing railroad embankment appears to be very consistent. Test pit explorations within the railroad embankment suggest that it is silty clay with a cinder and gravel cover. The silty clay moisture contents, based on GZA laboratory tests, range from 12.8% to 15.5% and average 13.8%. The liquid limit is 25%, the plastic limit is 17% and the plastic index is 8%. Grain size analyses show that approximately 60% is finer than the No. 200 sieve (0.074mm). Grain size distribution curves and a summary of this soil testing are presented in Appendix C.

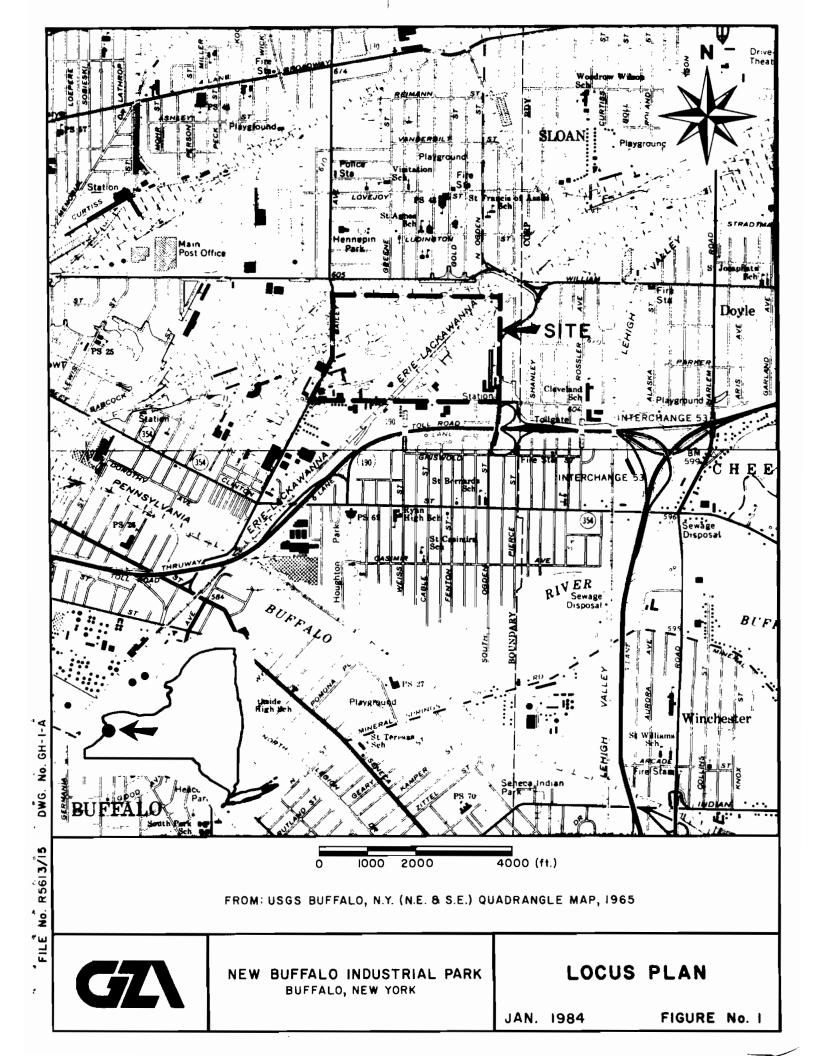


This material may have several ueful applications in the construction of the Industrial Park infrastructure, such as:

- (1) Common Backfill;
- (2) Clay Barriers;
- (3) Storm Sewer Backfill.

The moisture content of the embankment material will proabably need to be adjusted to achieve the desired compaction results.





## APPENDIX A

Test Borina Logs B-1 Through B-23



-BORING LOG-

PROJECT Buffalo Industrial Park GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL - GEOHYDROLOGICAL CONSULTANTS FILE NO. R5613 BORING NO. B-1 CONTRACTOR \_\_\_Earth Dimensions, Inc.\_ SURFACE ELEV. \_\_\_\_\_606.49/30.48 DRILLER \_\_\_\_\_ Doug Oscar DATUM US Lake Survey/City of Buffalo TYPE OF DRILL RIG Mobile B-34 LOCATION North East of A&R Waste SAMPLING METHOD Split Spoon-Standard Sampling CASING 3½" 1.D. Hollow Stem Augers DATE STARTED 5/23/83 COMPLETED 5/23/83 ENGINEER R. Kampff SIZE AND TYPE OF BIT No Rock Core DIRECTION OF HOLE: VERTICAL INCLINED [] DEGREES FROM VERTICAL \_\_\_\_\_ OVERBURDEN SAMPLES: DISTURBED \_\_\_\_6\_\_\_\_ UNDISTURBED \_\_\_\_-THICKNESS OF OVERBURDEN \_\_\_\_\_ 27.8 ft.\_\_\_\_ TOP OF ROCK ELEVATION \_\_\_\_ DEPTH DRILLED INTO ROCK \_\_\_\_\_ BOTTOM OF HOLE ELEVATION \_ 578.69/2.68 27.8 ft. (Split Spoon Refusal) TOTAL DEPTH OF HOLE \_\_\_ BLOWS
PER
0.5 FT.
SAMPLE
TYPE, NO.
A LOCATION N-VALUE OR % REC DEPTH (FT.) LEGEND 80°8 REMARKS SOIL AND ROCK DESCRIPTION Equipment Installed 0 Miscellaneous Fill, brown with orange pockets, sandy silt w/ intermixed 3 10 44 cinders, concrete, and brick fragments, 5-1 S-1 (0.0'-2.0') 100% Sample Recovery 21 23 2. 3 ...changes to: silty clay FILL, evidence of organics  $\theta \approx 5.0$  ft. (original ground surface?) 6 (4.5'-6.5')12 33 15 42% Sample Recovery SILT & CLAY, red-brown, hard, gray silt varves throughout, pocket of tan fine 18 sand @ 6.2', damp, slightly plastic (ML-CL) 8. g. Silty CLAY, red-brown, stiff, trace coarse sand, damp, slightly plastic 10-10 (9.5'-11.5') 5 S-358% Sample 6 11 11 Recovery 5 12-12 13 13 14 DISCONTINUITY CLASSIFICATION DEGREE OF OPENING SPECIAL FEATURES WEATHERING ORIENTATION CLOSED FRESH HB HAMMER BREAK SO SLIGHTLY OPEN O OPEN s SLIGHT LOW ANGLE (≤ 45°) SLIGHT TO MODERATE HA HIGH ANGLE (> 45°) MODERATE VERTICAL MV MODERATE TO SEVERE MISCELLANEOUS NOTES: BORING NO. B-1 \_\_\_\_ SHEET I OF 2



## GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

#### -BORING LOG-

PROJECT _	Buffalo	Industrial	Park	

FILE NO. R5613 BORING NO. B-1

DEPTH (FT.)	BLOWS PER 0.5 FT	SAMPLE TYPE, NO B LOCATION	N -VALUE OR % REC.	ROD %	REMARKS	LEGEND	DEPTH (FT.)	CORE	SOIL AND ROCK DESCRIPTION  Equipment Installed
15 16 17	2 3 5 5 5	S-4	10		S-4 (14.5'-16.5') 100% Sample Recovery		15 — 16 — 17 —		grades to: SILT & CLAY, occasional fine sand pockets, wet, very slightly plastic (ML-CL)
18	1 2 3 3	S-5	6		S-5 (19.5'-21.5') 92% Sample Recovery		18 19 20 21		Silty CLAY, red-brown, medium stiff, trace fine gravel, 1/8" thick gray-brown silt lenses throughout, saturated, plastic (CL)
23 24 25 26 27	1 1 2 5	S-6	7		S-6 (24.5'-26.5') 88% Sample Recovery		22 — 23 — 24 — 25 — 26 — 27 —		Silty fine SAND, gray, loose, little fine-medium subangular gravel, trace clay, saturated, very slightly plastic (SM-Glacial Till)
28	50/0"						28		Refusal with Split Spoon Sampler @ 27.8 ft.  The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual

ORIENTATION

DEGREE OF OPENING

WEATHERING

SPECIAL FEATURES

H HORIZONTAL
LA LOW ANGLE (± 45°)
HA HIGH ANGLE (\* 45°)
T VERTICAL

DEGREE OF OPENING

C CLOSED
SO SLIGHTLY OPEN
SM SLIGHT TO MODERATE
MY MODERATE
MY MODERATE
TV SEVERE

MISCELLANEOUS NOTES:

BORING	NO. B-1	SHEET 2	OF 2



		DBO IS	-BORIN ECT Buffalo Industr	IG LOG-	
GOLDBERG-ZOINO ASSOCI	ATES OF NY PC		ECT BUTTATO INGUSTR	idi rark	_
GEOTECHNICAL - GEOHYDRO		FILE	NO. <u>R5613</u>	BORING NO. B-2	
CONTRACTOREarth Dime			SURFACE ELEV.		
DRILLER Doug Oscar				urvey/City of Buffalo	
TYPE OF DRILL RIG Mobi				ft. east of Bailey Ave.	
SAMPLING METHODSpli			near Niagara Moha		
CASING 312" I.D. Hollow St SIZE AND TYPE OF BIT 1	_		ENGINEER R. Ka	mpff COMPLETED 5/3	<u>31/8</u> 3
DIRECTION OF HOLE: VE					
OVERBURDEN SAMPLES:					
THICKNESS OF OVERBUR					
DEPTH DRILLED INTO RO				TION586.73/10.72	_
TOTAL DEPTH OF HOLE	20.5 ft. (	Spiit Spoon	Ketusai)		
DEPTH (FT) BLOWS BLOWS O.5 FR O.5 FT SAMPLE TYPE, NO. B. LOCATION N-VALUE OR % REC. ROD ROD	REMARKS 9	CORE BREAKS	SOIL AND	ROCK DESCRIPTION	
DEPTH (FT) BLOWS PER O.5 FT SAMPLE TYPE, N N-VALUE NO W R RQD RQD	REMARKS DEPTH	BRE S		Equip Insta	
		-			<del>""</del> -
0 6	S-1 0	1 1	Missallaneous Fill h	lack modium dans d	Δ
1 1ª S-1 28	(0.0'-2.0')		Miscellaneous Fill, b fine-medium sand, lit gravel, coal fragment	tle silt, with ash,	Δ α
16	79% Sample	4	graver, coar rragment	a.	÷ 4
2 12	Recovery 2	$\dashv$ $\mid$			
3	]	1			
	l	]			
4	4	-			
£ 6		1			
8 S-2 35	(4.5'-6.5')	<u> </u>			
612	No Recovery 6.				
23	Redrive spoon to	- I -	SILT & CLAY, brown W/s sand lenses, hard, oc	casional pockets	
'-	/		of tan fine sand, sil occur in high angle l	enses, moist,	
8	8		slightly plastic (ML-	·CL)	
		4  -			
9	9.	$\dashv$ $\mid$			
10 10	S-3 10		Silty <u>CLAY</u> , red-brown bands of silt, nard,		
15 S-3 32	(9.5'-11.5') No Recovery	-	(CL)		
11 17	Redrove spoon to collect sample	_			
12	12				
		-			
13	13.	-		<b></b>	
14	14	<u> </u>			
ORIENTATION	DISCONTINUIT DEGREE OF OPENING	Y CLASSIFI	CATION WEATHERING	SPECIAL FEATURES	_
H HORIZONTAL LA LOW ANGLE (\$ 45°)	C CLOSED SO SLIGHTLY OPEN	F FRES		HB HAMMER BREAK	
HA HIGH ANGLE (> 45°)	O OPEN	SM SLIG	GHT TO MODERATE ERATE		
T VERTICAL			ERATE TO SEVERE		
MISCELLANEOUS NOTES:		V SEVI	ERE		
			BORING N	NO. B-2 SHEET I	0F 2

DWG. No. GH-2-C

FILE No. R5613/15



NEW BUFFALO INDUSTRIAL PARK BUFFALO, NEW YORK

ESTIMATED TOP OF ROCK CONTOURS

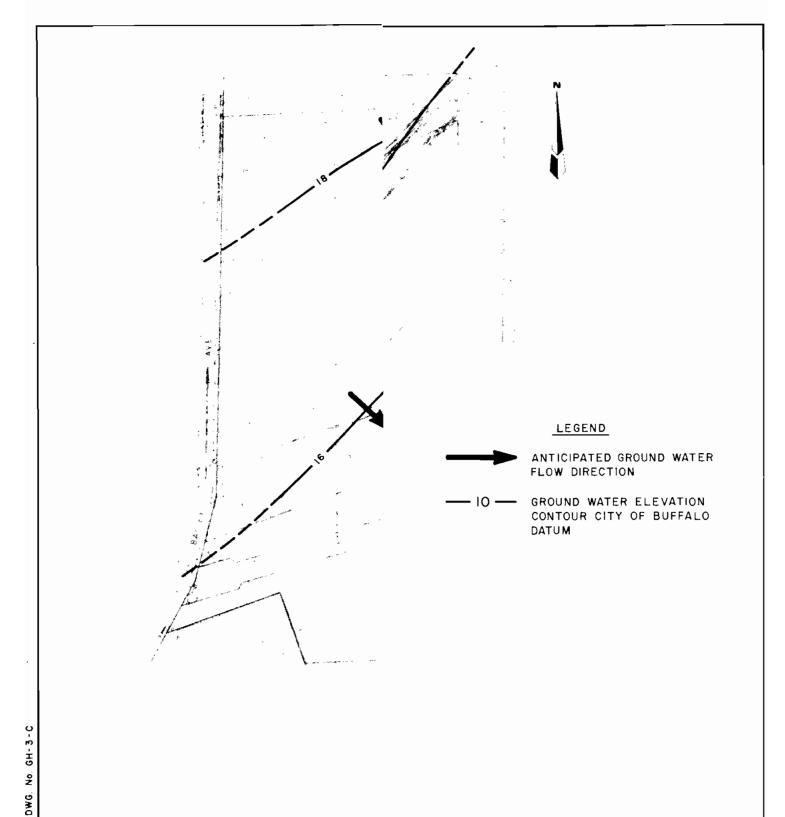
NOTES:

1) TOP OF ROCK EXPLORATION 2) ELEVATION ()

3) THIS DRAWIN

JANUARY 1984

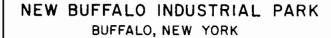
FIGURE No. 10



NOTES:

I) GROI SPAC

2) THIS (ft.)



APPROXIMATE GROUND WATER CONTOURS: CONFINED AQUIFER GLACIAL TILL/ FRACTURED BEDROCK

JANUARY 1984

FIGURE No. II

GZ

FILE No. R5613/15



GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

## -BORING LOG-

PROJECT Buffalo Industrial Park

FILE NO. R5613 BORING NO. B-2

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE TYPE, NO. B LOCATION	N -VALUE OR % REC.	RQD %	REMARKS	LEGEND	<b>DEP</b> TH (FT.)	CORE BREAKS	SOIL AND ROCK DESCRIPTION	Equipment Installed
15 —	1 2 2	S-4	6		S-4 (14.5'-16.5') 100% Sample		15 —		grades to: medium stiff, trace fine gravel beginning 0 $\simeq$ 16.2 ft.	
17	4		:		Recovery		17 —			
19 — 20 —	20	S-5	40		S-5 (19.5'-20.5') 68% Sample Rec.	_	19 —		Silty fine-medium <u>SAND</u> , gray, dense, little fine-medium sub-angular gravel trace clay, wet, very slightly plastic (SM-Glacial Till)	
21 —	50/0"						21 —		Split Spoon Refusal @ 20.5 ft.  The stratification lines represent the approximate boundary between soil and ro The actual transition may be gradual.	ck types.
-   -   -										- - -
- - -				1			-			
							-			- - -
- - -										- - -
- -							-   -   -			-
- -										

	DISCONTINUITY	CLASSIFICATION	
ORIENTATION	DEGREE OF OPENING	WEATHERING	SPECIAL FEATURES
H HORIZONTAL LA LOW ANGLE (5 45°) HA HIGH ANGLE (> 45°) T VERTICAL	C CLOSED SO SLIGHTLY OPEN O OPEN	F FRESH S SLIGHT SM SLIGHT TO MODERATE M MODERATE MV MODERATE TO SEVERE V SEVERE	HB HAMMER BREAK

 $\textbf{MISCELLANEOUS NOTES:} \qquad \quad \text{Note:} \quad \text{Groundwater level @ 14.0 ft. through augers upon completion.}$ 

BORING NO. B-2 SHEET 2 OF 2

<b>GZ</b> \		BORING LOG- PROJECT Buffalo Industrial Park		
GOLDBERG-ZOINO ASSOCI GEOTECHNICAL-GEOHYDRO		FILE NO. R50	BORING NO. B-3	
DRILLER	nsions, Inc.  ile B-34 t Spoon-Standard Sampling tem Augers Nx Size Rock Core	DATU LOCA Will DATE	M US Lake Survey/City of Buffalo TION ~ 650 ft. south east of iam & Bailey Street Intersection STARTED 5/31/83 COMPLETED 5/31/83 NEER R. Laport	
OVERBURDEN SAMPLES: THICKNESS OF OVERBUR DEPTH DRILLED INTO RO	DISTURBED 4 DEN 16.7 ft.	UNDISTURBED TOP OF ROCK BOTTOM OF H	ES FROM VERTICAL   ELEVATION 590.88/14.87  OLE ELEVATION 587.98/11.97	
DEPTH (FT.) BLOWS BLOWS O.5 FT. O.5 FT. SAMPLE TYPE, NO. B. LOCATION N-VALUE OR % REC. ROD %	REWARKS DEPTH	CORE	SOIL AND ROCK DESCRIPTION	
0 2 1 9 S-1 17 2 7 3 3	S-1 (0.0'-2.0') 40% Sample Recovery 2-	Miscellar sand, tra fragments	reous Fill, black, medium dense, silty ce clay w/roots, cinders, brick, damp	
5 3 12 5 17 6 30 7	S-2 (4.5'-6.5') 88% Sample Recovery	brown and	LT, tan-brown mottled orange, hard, gray silt to fine sand lenses t, damp, slightly plastic (ML)	
8	5-3 (9.5'-11.5') 67% Sample Recovery 11	trace tar	Y, red-brown, hard, trace fine gravel, fine sand occurring in random pockets, ightly plastic (CL)	
ORIENTATION H HORIZONTAL	DISCONTINUITY  DEGREE OF OPENING  C CLOSED	CLASSIFICATION WEATHE	RING SPECIAL FEATURES  HB HAMMER BREAK	
H HORIZONTAL LA LOW ANGLE (≤ 45°) HA HIGH ANGLE (> 45°) T VERTICAL	SO SLIGHTLY OPEN D OPEN	S SLIGHT TO MO M MODERATE MV MODERATE TO V SEVERE	DERATE	
MISCELLANEOUS NOTES:			BORING NO. B-3 SHEET I OF 2	



DEPTH
(FT.)
BLOWS
PER
0.5 FT.
SAMPLE
TYPE, NO.
B LOCATION
N - VALUE
OR % REC.

C-1

15 \_

17.

18\_

19\_

20 \_

5

24 50/0"

## GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

88 8

29

93%

83%

REMARKS

S-4 (14.5'-16.5')

100% Sample Recovery

C-1 (16.7'-19.6')

		PRO	-BORING LOG-	
				_
ANTS		FILI	E NO. <u>R5613</u> <b>BORING NO</b> . <u>R-3</u>	_
LEGEND	DEPTH (FT.)	CORE	SOIL AND ROCK DESCRIPTION	
	-			1
	16 —		SILT, gray, very stiff, some clay, little fine- medium sand, wet, slightly plastic (ML-Glacial Till)	
Щ.Ц	17		Top of Rock 16.7 ft.  ONONDAGA LIMESTONE	
	-	~~~	H, SO, F-S	_
	18 —		H, SO, S along shale parting	
	19	$\langle$	H, O. S-M	_
	_		DB along shale parting	
	20		Bottom of Hole 19.6 ft.	-
	_		The stratification lines represent the approximate boundary between soil and rock	1
	-		types. The actual transition may be gradual.	-
				_
				$\Box$
	_			-
	_			$\dashv$
	_			
	—			_
	-			$\exists$
	_			
	-			$\dashv$
	_			$\dashv$
	_			

DISCONTINUITY CLASSIFICATION							
ORIENTATION	DEGREE OF OPENING	WEATHERING	SPECIAL FEATURES				
H HORIZONTAL LA LOW ANGLE (± 45°) HA HIGH ANGLE (~ 45°) T VERTICAL	C CLOSED SD SLIGHTLY OPEN O OPEN	F FRESH S SLIGHT SM SLIGHT TO MODERATE M MODERATE MV MODERATE TO SEVERE V SEVERE	HB HAMMER BREAK				

MISCELLANEOUS NOTES:

Groundwater level  $12.5^{\circ}$  through augers prior to rock coring.

BORING	NO	B-3	SHEET	2	OF 2
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			-BORING LOG-
		PRO	OJECT _Buffalo Industrial Park
			Sarraro Magazirar Fark
GOLDBERG - ZOINO ASSOCIA GEOTECHNICAL - GEOHYDRO		FIL	E NO. <u>R5613</u> BORING NO. <u>B-4</u>
CONTRACTOREarth Dim	ensions, Inc.		SURFACE ELEV. 609.04/33.03
DRILLERDoug Osca	r		DATUM US Lake Survey/City of Buffalo
TYPE OF DRILL RIG Mobi	ile B-34		LOCATION North property line
SAMPLING METHOD _Split	Spoon-Standard Sampling		200 ft. east of Bailey Ave. 0820 1100
CASING 312" I.D. Hollow S	tem Augers		DATE STARTED 5/30/83 COMPLETED 5/30/83
SIZE AND TYPE OF BIT _	No Rock Core		ENGINEER R. Laport
DIRECTION OF HOLE: VE	RTICAL 🖾 INCLINED		DEGREES FROM VERTICAL
			DISTURBED
			OF ROCK ELEVATION
			TTOM OF HOLE ELEVATION594.04/18.03
TOTAL DEPTH OF HOLE			
	15.0 10.120	16 300011	nerusar)
DEPTH (FT) BLOWS PER O.5 FT. SAMPLE TYPE, NO. B. LOCATION N-VALUE OR % REC. RQD	REMARKS RAMARAS	CORE BREAKS	SOIL AND ROCK DESCRIPTION
5	S-1	-	Miscellaneous Fill, brown, very stiff, sandy
1 8 S-1 13	(0.0'-2.0')	. —	silt, with wood fragments, damp
3 5	29% Sample XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	, -	
2		?	_
3	│	3—	Difficulty in augering because of obstructions
	l 💥	4	buried air hose and wood fragments observed.
4	L	<u> </u>	Possible topsoil w/roots (Original Ground Surface?
52	S-2	<u>;</u> _	
5 S-2 19	(4.5'-6.5')	4	Clayey <u>SILT</u> , tan w/orange mottling, stiff, high angle gray silt varves throughout, damp,
6 8	60% Sample	;	slightly plastic (ML)
7		, _]	
[ ]		4	·
88		3—	-
		. 🕇	
9		' 🗌	-
108	S-3	) <u> </u>	Silty varved CLAY, brown w/orange mottling, hard, gray silt lenses throughout, damp,
15 S-3 44	(9.5'-11.5')	-	moderately plastic (CL)
11 21 23	100% Sample Recovery	-	-
12	12	2	_
		4	
13	1:	3	-
14			Sandy SILT, gray, medium stiff, little clay,
			trace medium gravel and rock fragments, wet, very slightly plastic (ML-SM - Glacial Till)
15 3 S-4 6	(14.5'-15.0')            19 100% Rec.   DISCONTINUI	TY CLAS	Split Spoon Refusal @ 15.0 ft.
ORIENTATION	DEGREE OF OPENING	. , CLAS	WEATHERING SPECIAL FEATURES
H HORIZONTAL LA LOW ANGLE (≤ 45°)	C CLOSED SO SLIGHTLY OPEN		FRESH HB HAMMER BREAK SLIGHT
HA HIGH ANGLE (> 45°) T VERTICAL	O OPEN		SLIGHT TO MODERATE MODERATE
· · · · · · · · · · · · · · · · · · ·		MY	MODERATE TO SEVERE SEVERE
MISCELLANEOUS NOTES:	Groundwater level @ 12.		n completion w/augers removed.
	The stratification lines	reoresen	it the approximate boundary between soil and rock
	types. The actual trans		
			BORING NO. DI SHEET I OF I



-BORING LOG-

BORING NO. B-5 SHEET I OF 2

PROJECT \_Buffalo Industrial Park GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL GEOHYDROLOGICAL CONSULTANTS FILE NO. R5613 \_ BORING NO. B-5 SURFACE ELEV. \_\_\_609.85/33.84 CONTRACTOR <u>Earth Dimensions, Inc.</u> DRILLER \_\_\_ Don Owens DATUM US Lake Survey/City of Buffalo TYPE OF DRILL RIG Mobile 8-34 LOCATION North property line SAMPLING METHOD \_Split Spoon-Standard Sampling ~ 650 ft. East of Bailey Ave. CASING 312" I.D. Hollow Stem Augers DATE STARTED 5/30/83 COMPLETED 5/30/83 SIZE AND TYPE OF BIT No Rock Core ENGINEER R. Laport DIRECTION OF HOLE: VERTICAL INCLINED DEGREES FROM VERTICAL \_\_ OVERBURDEN SAMPLES: DISTURBED \_\_\_\_4 UNDISTURBED \_\_\_\_-THICKNESS OF OVERBURDEN 18.9 ft. TOP OF ROCK ELEVATION \_\_\_\_\_\_ \_\_\_\_\_BOTTOM OF HOLE ELEVATION \_\_\_\_\_590.95/14.94 DEPTH DRILLED INTO ROCK \_\_\_\_ TOTAL DEPTH OF HOLE \_\_ 18.9 ft. (Auger Refusal) .VALUE % REC CORE BREAKS LEGEND DEPTH (FT.) 800% SOIL AND ROCK DESCRIPTION REMARKS Equipment r & Installed 0-4  $\frac{\text{Miscellaneous Fill}}{\text{w/ brick fragments (pcs.}} > 1"), \text{ damp}$ S-1 (0.0'-2.0') 8 S-1 20 12 83% Sample Recovery 40 Difficult augering through obstructions (concrete) ...changes to: black w/ wood fibers, cinders, wet (4.5'-6.5') 10 19 5-2 9 75% Sample Recovery 10  $\underline{\underline{\text{SILT}}},$  gray-brown w/ orange mottling and occasional black discoloration, very stiff, some clay, gray high angle silt to fine sand lenses, damp, slightly plastic (ML) Silty CLAY, brown, hard, distinctly 12 S-3 10 mottled, moist, slightly plastic (CL) (9.5'-11.5')25 S-3 88 41 100% Sample 11-Recovery 47 12-12-13-13-14 DISCONTINUITY CLASSIFICATION DEGREE OF OPENING SPECIAL FEATURES ORIENTATION WEATHERING HB HAMMER BREAK CLOSED FRESH H HORIZONTAL SO SLIGHTLY OPEN LA LOW ANGLE (5 45°) SLIGHT OPEN SM SLIGHT TO MODERATE HA HIGH ANGLE (> 45°) MODERATE T VERTICAL MV MODERATE TO SEVERE SEVERE MISCELLANEOUS NOTES:



GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

#### -BORING LOG-

PROJECT	Buffalo	Industrial	Park	

FILE NO. R5613 BORING NO. B-5

WS WS ER FT FT PLE NO.	LUE REC.	ROD %	REMARKS	Q.	돌유	AKS	SOIL AND ROCK DESCRIPTION
DEPTH (FT.) BLOWS PER 0.5 FT. SAMPLE TYPE, NO.	N -VALUE OR % REC.	ă,	NE MANAG	LEGEND	DEPTH (FT.)	CORE BREAKS	Equipment Installed
15 4 6 5-4 16 8 11	19		S-4 (14.5'-16.5') 96% Sample Recovery		15		grades to: wery stiff, trace fine gravel (encountered @ ~ 16.0 ft.), moderately plastic (CL)
18					17 18 19		Drilling Change (frequent gravel and cobbles) possible Glacial Till  Bottom of Hole
					- - -		Auger Refusal @ 18.9 ft.  The stratification lines represent the approximate boundary between soil and rock types.  The actual transition may be gradual.
					- - -		- - - -
					- - - -		-  
					   -   -		
					-   -   -		- - - -
					   		- - - -
			DIS	CONTIN	- - - IUIT Y	CLASS	HFICATION

ORIENTATION

DEGREE OF OPENING

WEATHERING

SPECIAL FEATURES

H HORIZONTAL
LA LOW ANGLE (5 45°)
HA HIGH ANGLE (7 45°)
T VERTICAL

DEGREE OF OPENING

C CLOSED
SO SLIGHTLY OPEN
S SLIGHT
S SLIGHT
S SLIGHT
M MODERATE
MV MODERATE
MV MODERATE
V SEVERE

MISCELLANEOUS NOTES:

BORING NO. B-5 SHEET 2 OF 2



BORING NO. B-6 SHEET I OF 2

<b>GZ</b> \			PROJEC	CT <u>Buffalo Industri</u>		
GOLDBERG - ZOINO ASSOCI GEOTECHNICAL - GEOHYDRO			FILE N	OR5613	BORING NO.	B-6
CONTRACTOR Earth Dime  DRILLER Doug Oscar  TYPE OF DRILL RIG Mobl  SAMPLING METHOD Split  CASING 312" I.D. Hollow S  SIZE AND TYPE OF BIT	ie B-34 Spoon-Standard Sample tem Augers			SURFACE ELEV DATUM US Lake S LOCATION North1250 ft. East of DATE STARTED 6/ ENGINEER _R. Lap	urvey/City of Buff Property Line Bailey Ave.	ED <u>6/2/83</u>
DIRECTION OF HOLE: VE OVERBURDEN SAMPLES: THICKNESS OF OVERBUR DEPTH DRILLED INTO RO TOTAL DEPTH OF HOLE	DISTURBED 6  DEN 26.3 ft.  DCK 3.5 ft.		UNDIST	ROCK ELEVATION	582.63/6.62	
DEPTH (FT.) BLOWS DER O.S.FT. SAMPLE TYPE, NO. B. LOCATION N-VALUE OR %, REC. RQD	REMARKS GW B	DЕРТН (FT.)	CORE	SOIL AND R	OCK DESCRIPTION	Equipment 1
0	S-1 (0.0'-2.0') 40% Sample Recovery  S-2 (4.5'-6.5') 46% Sample Recovery  S-3 (9.5'-11.5') 58% Sample Recovery	1— 2— 3— 4— 5— 6— 7— 9— 11— 11— 12— 13— 13— 13— 13— 13— 13— 13— 13— 13— 13	Mi ar of Si sa di si	scellaneous Fill, broomp.  Ite: detween 2'84' blacterial with ash and cight petroleum odor  scellaneous Fill, blacterial with ash fragments, w/ of brick, moist  Iterial returned on active of the company occurry of the continuous pockets, lt varves throughout, astic (CL)	ganics and ash,  ack granular fill coal fragments,  ack, loose, coal accasional pieces  ugers is brown  hard, trace fine ing in high angle gray	
ORIENTATION  H HORIZONTAL LA LOW ANGLE (5 45°) HA HIGH ANGLE (> 45°) T VERTICAL  MISCELLANEOUS NOTES:	DISCONTIN  DEGREE OF OPENING  C CLOSED SO SLIGHTLY OPEN O OPEN  1. Note: Well instal 5 ft. east of	F FRESIS SLIGH SM SLIGH M MODE MV MODE V SEVE a new ho	WEATHERING  H IT IT TO MODERATE RATE RATE TO SEVERE	SPECIAL FEA' HB HAMMER BREAK p located approxim		
	J 11. E051 (	J. D-U.				



## GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

## -BORING LOG-

PROJECT Buffalo Industrial Park

FILE NO. R5613 BORING NO. B-6

<b>DEРТН</b> (FT.)	BLOWS PER 0.5 FT.	SAMPLE TYPE, NO.	N-VALUE OR % REC.	ROD %	REMARKS	LEGEND	DEPTH (FT.)	CORE BREAKS	SOIL AND	ROCK DESCRIPTION	Equipment Installed
15	2 5 8	S-4	18		S-4 (14.5'-16.5') 73% Sample		15 —		grading to: dark by with occasional gray s plastic	rown, very stiff ilt varves, modera	tely
16	10				Recovery		16 —				_
17							17 —				_
18—							18 —				<u>-</u>
19—							19 —		Silty fine SAND gray	donce little fire	
20	10	S-5	20		S-5 (19.5'-21.5')		20 —		Silty fine <u>SAND</u> gray, subangular gravel, tra plastic (SM-Glacial Ti	ce clay, wet, very	slightly
21-	11 27	3-5	38		67% Sample Recovery		21 —				
22							22 —				
23—							23—				_
24—							24 —				-
25	55	S <b>-</b> 6	100+		(24.5'-25.4') 89% Sample Rec.		25 —		grading to: very de	ense	_
26—	100/.4	ļ			89% Sample Rec.		- 26 —		Tan	5 Darel 26 2 5	_
27—	50/0						- 27 —	000	LFractured rock ONOND.	f Rock 26.3 ft. AGA LIMESTONE	
-			20%		C-1 (26.3'-29.8')	盏	-		H, O, SM LA, C, F-S		
28 —		C-1	89%	89%			28 — -		2, 0, 1		_
29 <b>—</b>						薑	29 — -		H, C, S		_
30							30 —			of Hole 29.8 ft.	-
_							-		The stratification lin approximate boundary b types. The actual tra	etween soil and ro	
_							_				_
_							_				_
_							_				_
_							_				_
							-				_
		ENTAT	100					CLASS	IFICATION WEATHERING	EDECIAL FEA	THECO
LAL	LA LOW ANGLE (± 45°)			DEGREE OF O		,	F FRESH S SLIGHT  WEATHERING SPECIAL FEATURES  HB HAMMER BREAK			UNES	
HA F	IA HIGH ANGLE (>45°)				O OPEN			SM SLIGHT TO MODERATE M MODERATE			

SLIGHT SM SLIGHT TO MODERATE M MODERATE
MV MODERATE TO SEVERE SEVERE

MISCELLANEOUS NOTES:

BORING	NO	D., 6	SHEET	2	ΛE	2
BURING	NU.	B∽D	SMEET	_	-10	~



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_	ov	π:	ING		JU -

BORING NO. 8-7 SHEET I OF 2

<b>C7</b> \		PROJE	CT Buffalo Industr	rial Park	
GOLDBERG - ZOINO ASSOCIA GEOTECHNICAL - GEOHYDRO		FILE N	NO. R5613	BORING NO. B-7	.
TYPE OF DRILL RIG Mobi			SURFACE ELEV.  DATUM US Lake S  LOCATION Near	urvey/City of Buffalo	
	em Augers No Rock Core		DATE STARTED 5, ENGINEER R. Ka	<u>/23/83</u> COMPLETED <u>5/24/83</u>	<u>}</u>
OVERBURDEN SAMPLES: THICKNESS OF OVERBUR DEPTH DRILLED INTO RO	RTICAL INCLINED  DISTURBED 5  DEN OCK  21.5 ft.	UNDIST TOP OF BOTTO	TURBED ROCK ELEVATION	·	
DEPTH (FT.) BLOWS PER O.5 FT. SAMPLE TYPE, NO. B. LOCATION N-VALUE OR % REC. RQD	REMARKS CEEND DEPTH	CORE	SOIL AND I	ROCK DESCRIPTION  Equipment Installed	
0 10 1 26 S-1 * 2	S-1 (0.0'-2.0') 58% Sample Recovery 2- 3- 3- 4- (4.5'-6.5') 38% Sample Recovery 6- 7- 8- 9- 2% Sample Rec. 2-Sample Rec. 2-Samples Collected 11-		SILT, olive green, sand, trace clay, w plastic (ML)	material, with  hard, little fine et, very slightly	
13 14	13-	- - - - -	alightly plastic (ML-		
ORIENTATION	DISCONTINUITY DEGREE OF OPENING	CLASSIFI	CATION WEATHERING	SPECIAL FEATURES	$\exists$
H HORIZONTAL  LA LOW ANGLE (< 45°)  HA HIGH ANGLE (> 45°)  T VERTICAL	C CLOSED SO SLIGHTLY OPEN O OPEN	M MODE MV MODE V SEVE	H HT HT TO MODERATE ERATE RATE TO SEVERE RE	HB HAMMER BREAK	
MISCELLANEOUS NOTES: *	"N" value may have been influ	enced by o	bstructions enc <b>o</b> unter	red during sampling.	



#### GOLDBERG - ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL - GEOHYDROLOGICAL CONSULTANTS

#### -BORING LOG-

PROJECT	Buffalo	Industrial	Park	
				_

15	EPTH (FT.)	BLOWS PER 0.5 FT	SAMPLE TYPE, NO. B. LOCATION	N -VALUE OR % REC.	RoD %	REMARKS	LEGEND	DEPTH (FT.)	CORE BREAKS	SOIL AND ROCK DESCRIPTION	
15	۵		S/ TY B	⊼ 8			ן בי	ō	) <b>8</b>		Equipment Installed
17	-	5 6	S-4	14		(14.5'-16.5') 75% Sample		-		occasional brown silt to fine sand	
20 1	_							-			
Recovery  22  Bottom of Hole 21.5 ft.  The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual.	20 —	1	S-5	4		(19.5'-16.5') 100% Sample		20—			
The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual.	-					Recovery		21 —		Rottom of Holo 21 E ft	
' <del>'   </del>	22							22 —		The stratification lines represent the a boundary between soil and rock types. T	

ORIENTATION

DEGREE OF OPENING

WEATHERING

SPECIAL FEATURES

H HORIZONTAL

LA LOW ANGLE (# 45°)

HA HIGH ANGLE (\* 45°)

T VERTICAL

DISCONTINUTT

CLASSIFICATION

WEATHERING

SPECIAL FEATURES

HB HAMMER BREAK

S SLIGHT TO MODERATE

M MODERATE

M MODERATE

MV MODERATE

V SEVERE

MISCELLANEOUS NOTES:

Groundwater level  $17.2\ \text{ft.}$  through augers upon completion.

BORING	NO.	B-7	SHEET	2	OF 2	_
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-BORING LOG-PROJECT Buffalo Industrial Park GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. FILE NO. R5613 BORING NO. B-8 GEOTECHNICAL - GEOHYDROLOGICAL CONSULTANTS CONTRACTOR \_\_\_Earth Dimensions, Inc. SURFACE ELEV. 601.93/25.92 DATUM US Lake Survey/City of Buffalo DRILLER Doug Oscar TYPE OF DRILL RIG Mobile B-34 LOCATION Adjacent to Niagara Frontier SAMPLING METHOD \_\_Split Spoon-Standard Sampling Services parking lot DATE STARTED 5/25/83 COMPLETED 5/26/83 CASING 35" I.D. Hollow Stem Augers SIZE AND TYPE OF BIT NX Size Rock Core ENGINEER R. Laport DIRECTION OF HOLE: VERTICAL INCLINED DEGREES FROM VERTICAL . OVERBURDEN SAMPLES: DISTURBED \_\_\_\_\_\_ UNDISTURBED \_\_\_\_\_-THICKNESS OF OVERBURDEN 30.1 ft. TOP OF ROCK ELEVATION 571.83/-4.18 DEPTH DRILLED INTO ROCK \_\_\_ 4.7 ft. BOTTOM OF HOLE ELEVATION 567.13/-8.88 34.8 ft. TOTAL DEPTH OF HOLE \_\_ BLOWS
PER
0.5 FT.
SAMPLE
TYPE, NO. N-VALUE OR % REC. DEPTH (FT.) 80°8 REMARKS SOIL AND ROCK DESCRIPTION Equipment Installed Miscellaneous Fill, black, sandy grayel S-1 (0.0'-2.0') 4 9 size w/ cinders, organics, and brick S-1 12 fragments, damp 8 40° Sample Recovery 4 5 S-2 (4.5'-6.5') ...changes to: loose, with frequent 4 organic material S-2 9 3 29% Sample Recovery 6 Difficult augering Oil or grease evident on augers Miscellaneous Fill, gray-brown, very stiff, silt, some clay, brick fragments (10.2'-10.7'), cinders (10.7'-11.2'), wet 10-10 (9.5'-11.5') 3 S-3 20 8 60% Sample 11-11-Recovery Note:  $^{\circ}$  .1 ft. of brown clayey  $\underline{\text{SILT}}$  in bottom of split spoon for S-3 12-13 14 DISCONTINUITY CLASSIFICATION DEGREE OF OPENING WEATHERING SPECIAL FEATURES ORIENTATION HB HAMMER BREAK CLOSED HORIZONTAL SO SLIGHTLY OPEN SLIGHT LA LOW ANGLE (\$45°) SM SLIGHT TO MODERATE HA HIGH ANGLE (> 45°) OPEN VERTICAL MODERATE MY MODERATE TO SEVERE MISCELLANEOUS NOTES:

BORING NO.\_B-8

SHEET I OF 2



#### GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

#### -BORING LOG-

PROJECT Buffalo Industrial Park

FILE NO. R5613 BORING NO. B-8

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE TYPE, NO. B. LOCATION	N -VALUE OR % REC.	Rob %	REMARKS	LEGEND	ОЕРТН (FT.)	CORE	SOIL AND ROCK DESCRIPTION	
= ~	<b>6</b> 5	SA TYF	Z &			ا تو	<u> </u>	2 <b>E</b>		Equipment Installed
15— 16—	1 4 7 8	S-4	15		S-4 (14.5'-16.5') 77% Sample Recovery		15 —		Clayey <u>SILT</u> , brown, stiff, trace gravel, damp, slightly plastic (ML-CL)	- - - - -
17	1 1	S-5	7		S-5 (19.5'-21.5')		19 —		Silty varved <u>CLAY</u> , red-brown, medium stiff, lenses of gray silt to fine sand · 1/8" thick, wet, moderately plastic (CL	
21— 22— 23— 24—	3 4				73% Sample Recovery		21 —			-
25 — 26 — 27 —	1 2 3	S-6	5		S-6 (24.5'-26.5') 100% Sample Recovery		25 — 26 — 27 —		grades to: saturated	
29 —	20 50/. 1	\$-7			S-7 (29.5'-30.1') S-7 100%		28		Sandy <u>SILT</u> , gray, little fine gravel, trace clay, wet, very slightly plastic (SM-ML-Glacial Till)  H, O, M  Top of Rock 30.1 ft.	
31 — 32 — 33 —		C-1	96%	92%	C-1 (30.1'-34.8')		31 — 32 — 33 —		H, SO, S H, SO, S ONOMIDAGA LIMESTONE H, SO, S H, O, SM H, SO, S	
34 —							34 — 35 —		Bottom of Hole 34.8 ft.	- -

ORIENTATION

DEGREE OF OPENING

WEATHERING

SPECIAL FEATURES

H HORIZONTAL
LA LOW ANGLE (5:45°)
HA HIGH ANGLE (\*45°)
T VERTICAL

DEGREE OF OPENING

DEGREE OF OPENING

WEATHERING

F FRESH
S SLIGHT
S SLIGHT
M MODERATE
MV MODERATE
MV MODERATE
V SEVERE

MISCELLANEOUS NOTES:

The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual.

BORING NO. B-8 SHEET 2 OF 2



					-BORING	G LOG-	
<b>U</b> L			PROJE	CT Buffa	lo Industr	ial Park	
GOLDBERG-ZOINO ASSOCI GEOTECHNICAL - GEOHYDRO			FILE !	NO. <u>R5613</u>		BORING NO.	B-9
CONTRACTOR _ Earth Dime	nsions, Inc.			SURFACE	E ELEV.	598.24/22.23	
DRILLER Doug Oscar	·			DATUM_	US Lake Si	urvey/City of Buff	<u>falo</u>
TYPE OF DRILL RIG Mot							
SAMPLING METHOD Spli						Dingens St.	<u></u>
CASING 34" I.D. Hollow S SIZE AND TYPE OF BIT_						2D/83 COMPLET	
DIRECTION OF HOLE: VE							
OVERBURDEN SAMPLES: THICKNESS OF OVERBUR							
DEPTH DRILLED INTO RE							I
TOTAL DEPTH OF HOLE							
PEPTH (FT.) BLOWS BLOWS PER O.5 FT. SAMPLE TYPE, NO. B. LOCATION N-VALUE OR % REC. RQD		<b>DEPTH</b> (FT.)	CORE		OIL AND R	OCK DESCRIPTION	
BLO SALO	LE	H )	BRC				Equipment Installed
0		0_					<u></u>
1 40 5 1	(0.0'-2.0')	-				ots	A
1 40 S-1 *	33% Sample	1	w	ith cinders,	, brick, ar	nd concrete	
2 14	Recovery	2		•		of concrete @	
3		_	1		ugering-ho	le relocated	
3		3		., ,			
4		4					
5 2	S-2	5					
7 S-2 26	(4.5'-6.5')	_		black	organic ma	terial and roots	- 666
6 12	75% Sample Recovery	6		(original g	ro <u>und su</u> rf	ray high angle	
7		7	l lv:	arves, very lastic (ML-C	stiff, dam		
8		. –			,_ ,		
·   .		0					
9		9					
106	\$-3 (9.5'-11.5')	10				rd, some clay t and fine sand	
18 S-3 53	71% Sample	11		arves (IIL)			
30	Recovery	-					
12		12					
13		13					
14		14	01.00050				
ORIENTATION	DISCONTING DEGREE OF OPENING	UITY	CLASSIFIC	CATION WEATHERING	;	SPECIAL FEA	TURES
H HORIZONTAL LA LOW ANGLE (5 45°) HA HIGH ANGLE (> 45°) T VERTICAL	C CLOSED SO SLIGHTLY OPEN O OPEN		M MODE MV MODE V SEVE	HT HT TO MODER! ERATE ERATE TO SEV	ERE	HB HAMMER BREAK	
MISCELLANEOUS NOTES: * "	N" value may have been inf	luence	ed by obs	tructions er	ncountered	during sampling.	
				_			
					BORING NO	O <del>B-9</del> SHEE	ET 1 OF 2

	3	7_	1					PRO	-BORING LOG- DJECT Buffalo Industrial Park	
					ATES OF N.Y.,P.C Logical consul		•	FIL	E NO BORING NO.	B-9
0EPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE TYPE, NO. B LOCATION	N -VALUE OR % REC.	RQD %	REMARKS	LEGEND	DEPTH (FT.)	CORE BREAKS	SOIL AND ROCK DESCRIPTION	Equipment Installed
15 — 16 — 17 —	1 2 3 4	S-4	7		S-4 (14.5'-16.5') 83% Sample Recovery		15 — 16 — 17 —		Silty <u>CLAY</u> , red-brown, medium stiff, wet, slight-moderately plastic (CL)	
18 — - 19 — - 20 — - 21 —	1 1 2 3	- S-5	5		S-5 (19.5'-21.5') 100% Sample Recovery		18 — 19 — 20 — 21 —		Same as previous sample	
22 — 23 — 24 — 25 —	1 3	S-6	12		S-6 (24.5'-26.5')		22 — 23 — 24 — 25 —		Augering more difficult  Clayey <u>SILT</u> , gray, stiff, little fine- medium sand, trace fine gravel, wet, very slightly plastic (ML-Glacial Till)	
26 — 27 — 28 — 29 —	6				75% Sample Recovery		26 — 27 — 28 — 29 —		grading to sandy silt, very dense, little fine-medium gravel and rock	
30 — 31 — 32 — 33 — 33 —	13 26 42	S-7	68		(29.5'-31.5') 17% Sample Recovery		30 — 31 — 32 — 33 — 33 —		fragments, trace clay (SM-Glacial Till)  Cobbles encountered during augering	

	DISCONTINUITY	CLASSIFICATION			
ORIENTATION	DEGREE OF OPENING	WEATHERING	SPECIAL FEATURES		
H HORIZONTAL LA LOW ANGLE (\$45°) HA HIGH ANGLE (\$45°) T VERTICAL	C CLOSED SO SLIGHTLY OPEN O OPEN	F FRESH S SLIGHT SM SLIGHT TO MODERATE M MODERATE MV MODERATE TO SEVERE V SEVERE	HB HAMMER BREAK		

MISCELLANEOUS NOTES:

5-8

30

50/0\*

The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual.

Same as previous sample

BORING NO. B-9 SHEET 2 OF 2
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Bottom of Hole @ 35.0 ft. Split Spoon Refusal



		)G -

		-BORING LOG- PROJECT Buffalo Industrial Park					
GOLDBERG-ZOINO ASSOCI GEOTECHNICAL - GEOHYDRO			FILE NO				
CONTRACTOR <u>Earth Dime</u> DRILLER <u>Doug Oscar</u> TYPE OF DRILL RIG <u>Mot</u> SAMPLING METHOD <u>Split</u> CASING <u>3½" I.D. Hollow</u> SIZE AND TYPE OF BIT _	ile B-34 : Spoon-Standard Sampling Stem Augers		SURFACE ELEV.  DATUM US Lake S  LOCATION ~ 1800  ~300 ft.+ South of  DATE STARTED 6.  ENGINEER R. Lai	urvey/City of Buff ft. East of Baile Northern Propert /2/83 COMPLET	ey Ave. y Line ED 6/3/83		
DIRECTION OF HOLE: VE OVERBURDEN SAMPLES: THICKNESS OF OVERBUR DEPTH DRILLED INTO RO TOTAL DEPTH OF HOLE	DISTURBED 6  DEN 28.0 ft.  DCK 28.0 ft.	UNDIST	TURBED F ROCK ELEVATION M OF HOLE ELEVA				
(FT.) BLOWS PER O.S. FT. SAMPLE TYPE, NO. B. LOCATION N-VALUE OR % REC. RQD %	REMARKS	DEPTH (FT.)	CORE	SOIL AND R	OCK DESCRIPTION	Equipment Installed	
0 1 1 S-1 11 2 9 3 4 4 4 11 3 S-3 2 3 2 3	S-1 (0.0'-2.0') 19% Sample Recovery  S-2 (5.0'-5.9') S-2 56% Sample Recovery  S-3 (10.0'-12.0') B0% Sample Recovery, Two Samples Taken	2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 11 - 1	Mi tr wo	scellaneous Fill, brok fragments, wood mp  scellaneous Fill, brok ace clay, gravel frace od in bottom of sample of the clay, with organizagments  scellaneous Fill? gravelsckets, silty fine-medickets, silty fine-medickets.	own, silty sand, ments, piece of le, wet  own-black, soft, ics and wood		
13 14		13 - 14		ganic odor			
ORIENTATION	DISCONTIN	UITY (	CLASSIFIC		SPECIAL FEA	TURES	
ORIENTATION  H HORIZONTAL LA LDW ANGLE (\$ 45°) HA HIGH ANGLE (> 45°) T VERTICAL  DEGREE OF OPENING  C CLOSED SO SLIGHTLY OPEN D OPEN				F FRESH S SLIGHT SM SLIGHT TO MODERATE M MODERATE WV MODERATE TO SEVERE V SEVERE			
MISCELLANEOUS NOTES: *	"N" value may not be rep ampling.	resent	ative bed	cause of obstructions	encountered durin	g	

BORING NO. B-10 SHEET I OF 2

GZ
GOLDBERG - ZOINO

GOLDBERG-ZOINO ASSOCIATES OF N.Y.,P.C. Geotechnical-Geohydrological consultants

## -BORING LOG-

PROJECT	Buffalo	Industrial	Park	

FILE NO. R5613 BORING NO. B-10

	GEOTIFICE GOLGGELANTS					5011110 HO, 515				
DEPTH (FT.) BLOWS PER 0.5 FER SAMPLE TYPE, NO.	N -VALUE OR % REC. ROD	REMARKS	LEGEND	ОЕРТН (FT.)	CORE BREAKS	SOIL AND ROCK DESCRIPTION  Equipment Installed				
15 — 3 16 — 10 16 — 17 — 23	39	S-4 (15.0'-17.0') 85% Sample Recovery		15 —		Silty CLAY, red-brown, hard, occasional high angle gray silt varve, moist, slightly plastic (CL)				
18	8	S-5 (20.0'-22.0') 100% Sample Recovery		18		grades to: medium stiff, with gray silt varves throughout, wet, moderately plastic				
2324251		S-6 (25.0'-27.0')		23 — 24 — 25 — -		Silty SAND, gray, medium dense, little fine-medium subangular gravel, trace				
26 3 5 27 9 28 50/0"	14	85% Sample Recovery		26 — 27 — 28 —		Silty SAND, gray, medium dense, little fine-medium subangular gravel, trace clay, wet, very slightly plastic (SM-Glacial Till)				
				- - -		Split Spoon Refusal @ 28.0 ft  The stratification lines represent the approximate — boundary between soil and rock types. Theactual transition may be gradual				
						-				
		DIS	CONTIN	UITY	CLASS	SIFICATION				

DISCONTINUITY CLASSIFICATION										
ORIENTATION	DEGREE OF OPENING	WEATHERING	SPECIAL FEATURES							
H HORIZONTAL LA LOW ANGLE (±45°) HA HIGH ANGLE (*45°) T VERTICAL	C CLOSED SO SLIGHTLY OPEN O OPEN	F FRESH S SLIGHT SM SLIGHT TO MODERATE M MODERATE WY MODERATE TO SEVERE V SEVERE	HB HAMMER BREAK							

MISCELLANEOUS NOTES:

			_		
BORING	NO	B-10	SHEET	2	OF 2

<b>GZ</b> \						-BORING LOG- PROJECT Buffalo Industrial Park							
GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS							FILE NO. R5613 BORING NO. B-11						
CONTRA	CTOR	Eart	h Dime	nsions, Inc.				SURFA	CE ELEV.	601.08/25.07			
DRILLER										urvey/City of Buf			_
TYPE OF								LOCAT	ION <u>East</u>	end of Landfill ar	ea		_
				<u>t Spoon-Standar</u> d <u>tem Augers</u>				-   <del></del>	STARTER (	5/24/83 COMPLET		/04	
				NX Rock Core					EER R. L			/ 24	<u>/8</u> 3 —
				RTICAL 🖾 DISTURBED						ERTICAL			_
										569.18/-6.8	3		_
										TION <u>564.98/-11.0</u>			
TOTAL I	ЕРТН	OF F	OLE .	36	5. <u>1</u> ft.								
(FT.) BLOWS PER	SAMPLE TYPE, NO. LOCATION	N-VALUE R % REC.	R&D %	REMARKS	LEGEND	DEPTH (FT.)	CORE BREAKS		SOIL AND F	ROCK DESCRIPTION	Equi		
		~ 5			-	1					Inst	a11	ed
0				_							<u> </u>	П	<u> </u>
4	-			S-1 (0.0'-2.0')		}		Miscellaneo	us Fill, bl	ack sandy fill	۵۵	Н	Δ.
1 12	S-1	32		56% Sample		1		wet	cs, glass,	brick fragments,	P. 7	П	D -
2 14				Recovery	_‱	2_							
· +	-					}		Difficult a	ugering 2.5	'-3.5 '			
3	1					3 -							
4						{							
1					<b>-</b>	}		change to no glass in	o: silty sa sample	and fill, loose,			
5 4				S-2 (4.5'-6.5')		5							
6 5	S-2	8		42% Sample		6					AATTA TATA		· ·
3				Recovery	₩	<b>∛</b> -							
7	$\dashv$					7-							
8						-8						Ξ	
`\—	-					) ° -						Ε	
9	1					9						Ξ	-
10 2				S-3	<b>*****</b>	10-		mesh, and pa	per scraps	me clay, with wir noted in sample	e	Ξ	
3	S-3	5		(9.5'-11.5')		<b>1</b>		of sample	coll sealme	ent at the bottom		Ε	
11 3	1			25% Sample Recovery		11						Ξ	
12			)		<b>-</b>	12-						Ξ	-
*	-					<b>1</b> -					-	Ξ	
13	-					13						Ξ	
14	1					14						Ξ	
OF	RIENTAT	10N		DEGREE OF			CLASS	IFICAT <u>ION</u> WEATHERII	NG	SPECIAL FEA	TURES	3	
H HORIZON		50)		C CLOSED	N			RESH LIGHT		HB HAMMER BREAK			
LA LOW ANGLE (\$45°)  MA HIGH ANGLE (\$45°)  T VERTICAL  SO SLIGHTLY OPEN  O OPEN						SM S	LIGHT TO MODE ODERATE	RATE					
	-						MV M	ODERATE TO SE	EVERE				
MISCELLAN	EOUS ;	NOTES:					. 3	<u> </u>					
									BORING N	O. <u>B-11</u> SHE	ET I	OF	2

# GZ

GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

#### -BORING LOG-

PROJECT Buffalo Industrial Park

FILE NO. <u>R5613</u> **BORING NO.** <u>B-11</u>

		HTDHU	OLOGICAL CONSULTANTS			BORING NO. B-11			D-11
DEPTH (FT.) BLOWS PER 0.5 FT SAMPLE TYPE, NO.	N -VALUE OR % REC.	RQD %	REMARKS	LEGEND	<b>ОЕРТН</b> (FT.)	CORE BREAKS	SOIL AND ROCK		Equipment Installed
15 2 5 S-4 16 10	16		S-4 (14.5'-16.5') 79% Sample Recovery		15 -		Silty <u>CLAY</u> , brown, very stiff, medium sand, wet,moderately pl		
18—————————————————————————————————————			S-5		18—		grades to: stiff, saturate	d	
20 4 21 5 21 6 22 23	11		(19.5'-21.5') 83% Sample Recovery		21				***************************************
24 25 1 S-6 26 4	7		S-6 (24.5'-26.5') 92% Sample Recovery		24 — 25 — 26 —		grades to: medium stiff, r varved silty clay	ed-brown	-
28 29 1			S-7		28 —		grades to occasional gray v	arves of	- - - - - -
30 2 31 2 31 4 32 50/0	6		(29.5'-31.5') 100% Sample Recovery		31 —		Sandy SILT, brown, medium strictay, trace fine gravel and fragments, wet, slightly pla (ML-SM- Glacial Till) Top of Rock 31.9 ft.	rock	-
33	74%	74%	C-1 (31.9'-36.1') NOTE: REC. & RQD. low because of rock left in		33 —	_	H, SO, SM H, SO, SM LA, SO, S ONONDAGA L1MESTONE H, O, S		
35 36			hole DISC				NOTE: 1.1 ft of core left in Bottom of Hole:  IFICATION  WEATHFRING		

ı		DISCONTINUITY	CLASSIFICATION	
	ORIENTATION	DEGREE OF OPENING	WEATHERING	SPECIAL FEATURES
	H HORIZONTAL LA LOW ANGLE (= 45°) HA HIGH ANGLE (> 45°) T VERTICAL	C CLOSED SO SLIGHTLY OPEN O OPEN	F FRESH S SLIGHT SM SLIGHT TO MODERATE M MODERATE MY MODERATE TO SEVERE V SEVERE	HB HAMMER BREAK

MISCELLANEOUS NOTES:

5/24/83 Groundwater level 8.0 ft. through augers prior to rock coring.

The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual.

BORING NO. B-11 SHEET 2 OF 2

GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS  CONTRACTOR Earth Dimensions, Inc.  DRILLER Doug Oscar  TYPE OF DRILL RIG Mobile U-34  SAMPLING METHOD Split Spoon-Standard Sampling  CASING 35" 1.0. Hollow Stem Augers  SIZE AND TYPE OF BIT No Rock Core	DATUM US Lake Survey/City of Buffalo  LOCATION <u>East end of Landfill Area</u> DATE STARTED5/20/83 COMPLETED 5/2D/83			
OVERBURDEN SAMPLES: DISTURBED 6  THICKNESS OF OVERBURDEN -  DEPTH DRILLED INTO ROCK -  TOTAL DEPTH OF HOLE 26.5 ft.	TOP OF ROCK ELEVATION  BOTTOM OF HOLE ELEVATION _574.17/-1.84  SOIL AND ROCK DESCRIPTION Equipment			
0-3 1-8 5-1 (0.0'-2.0') 62% Sample Recovery  3-1 5-1 1-5-1 24 5-2 (4.5'-6.5') 23% Sample Recovery  7	Miscellaneous Fill, dark brown, clayey silt, with cinders, roots, and black organic material, damp change to black, soft, with oil material intermixed in sample, wet change to: very stiff, occasional brick fragments, distinct petroleum odor  SILT, brown, hard, some red clay generally in %" thick bands, moist, slightly plastic (ML-CL)			
13 1 1 1 1	; <del>-</del>			

\_\_ SHEET | OF 2



GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

#### -BORING LOG-

PROJECT Buffalo Industrial Park

FILE NO. \_\_R5613 BORING NO. \_\_B-12

DEPTH (FT.)	BLOWS PER 0.5 FT	SAMPLE TYPE, NO.	N -VALUE OR % REC.	ROD %	REMARKS	LEGEND	DEPTH (FT.)	CORE	SOIL AND ROCK DESCRIPTION	Equipment Installed
15 16	2 6 8	-S- <b>4</b>	18		S-4 (14.5'-16.5') 50% Sample Recovery		15 — 16 —		Silty <u>CLAY</u> , brown, very stiff, trace fine sand, tan silt to fine sand lenses ~ 1/8" thick throughout, wet, slightly plastic (CL)	
17— 18— 19—							17— 18— 19—			
20	2 4 6 8	-S-5	14		S-5 (19.5'-21.5') 67% Sample Recovery		20—		igrades to: stiff, trace fine gravel	
23 24							23— 23— 24—		grades to: gray silt varves	<u>-</u>
25 - 26	1 2 4	S-6	6		S-6 (24.5'-26.5') 100% Sample Recovery		25 — 26 —		Black fine sand layer @ 26.0 ft.  Bottom of Hole @ 26.5 ft.	
-   -   -							-   -   -	l	The stratification lines represent the ap boundary between soil and rock types. Th transition may be gradual.	proximate -
-							     -			- - -
   -   -							-			  
						CONTIN		CLASS	SIFICATION	

DISCONTINUITY CLASSIFICATION

ORIENTATION

DEGREE OF OPENING

WEATHERING

SPECIAL FEATURES

H HORIZONTAL
LA LOW ANGLE (145°)
HA HIGH ANGLE (\*45°)
T VERTICAL

OPEN

DISCONTINUITY CLASSIFICATION

WEATHERING

F FRESH
SUBHT
SLIGHT
M MODERATE
MV MODERATE
MV MODERATE
V SEVERE

MISCELLANEOUS NOTES:

BORING NO. B-12 SHEET 2 OF 2

GOLDBERG - ZOINO ASSOCIATED TO THE CONTROL OF THE C		-BORING LOG- PROJECT Buffalo Industrial Park				
CONTRACTOREarth Dim DRILLER Doug Osca TYPE OF DRILL RIGMO SAMPLING METHOD _Spli CASING _31½" I.D. Hollow St SIZE AND TYPE OF BIT	obile B-34 t Spoon-Standard Sampli em Augers		DATUM <u>US Lake</u> : LOCATION <u>~ 600</u> adjacent to railro	599.05/23.04  Survey/City of Buffort. North of Dinger oad embankment 5/18/83 COMPLETE Kampff	alo ns Street	
DIRECTION OF HOLE: VEI  OVERBURDEN SAMPLES:  THICKNESS OF OVERBUR  DEPTH DRILLED INTO RO TOTAL DEPTH OF HOLE  ON % REC.  ROD  ROD  WOD  NO  NO  NO  NO  NO  NO  NO  NO  NO	DISTURBED	<u>.                                    </u>	UNDIST TOP OF BOTTOM	URBED ROCK ELEVATION M OF HOLE ELEVA fusal)	N	
0 11 1 34 2 16 3 16 3 34 3 34 3 3 3 3 3 3 3 3 3 3 3 3 3 3	S-1 (0.0'-2.0') 54% Sample Recovery	- O	Mis	cellaneous Fill, bla d gravel fill, some s st	I	Equipment Installed
5 2 9 19 S-2 46 6 27 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	S-2 (4.5'-6.5') 44% Sample Recovery	5 - 6 - 7 - 8 -	(Or	E: black silty clay riginal Ground Surfac T & CLAY, olive gree asional tan fine san st, slightly plastic	ce ?) en, hard, nd and silt pockets	
9 8 10 22 S-3 90 11 50 12 13	S-3 (9.5'-11.5') 92% Sample Recovery	10 11 12 13	san	ty <u>CLAY</u> , brown, hard id, moist, slightly p grades to: varved c ck gray silt lenses	olastic (CL) :lay with 1/8"	
ORIENTATION  H HORIZONTAL LA LOW ANGLE (> 45°) NA HIGH ANGLE (> 45°) T VERTICAL	DISCONT  DEGREE OF OPENIN  C CLOSED SO SLIGHTLY OPEN O OPEN	F FRESH S SLIGH SM SLIGH M MODE	WEATHERING HIT IT MODERATE RATE RATE TO SEVERE	SPECIAL FEATI	URES	
MISCELLANEOUS NOTES:				BORING N		1 OF 2

					1						
GZ\								-BORING LOG- PROJECT _Buffalo Industrial Park			
					ATES OF N.Y., P.O LOGICAL CONSUL		<b>i</b>	FIL	E NOR5613	BORING NO.	B-13
DEPTH (FT.)	BLOWS PER 0.5 FT	SAMPLE TYPE, NO.	N -VALUE OR % REC.	ROD %	REMARKS	LEGEND	DEPTH (FT.)	CORE BREAKS	SOIL AND	ROCK DESCRIPTION	Equipment
15— 16— 17— 18— 19— 20— 21— 22— 23— 24— 25— 26— 27— 28— 29— 30— 31— 32—	13 13 13 1 1 1 3 4	S-4 S-5	7		S-4 (14.5'-16.5') 54% Sample Recovery  S-5 (19.5'-21.5') 100% Sample Recovery  S-6 (24.5'-26.5') 100% Sample Recovery		15 —  16 —  17 —  18 —  19 —  20 —  21 —  22 —  23 —  24 —  25 —  26 —  27 —  28 —  29 —  30 —  31 —  32 —  32 —		grades to: very stisand, occasional pocket sand, mottled orange be wet  Augering becomes very e grades to: CLAY, metrown with 1/8" to 1/4" lenses, saturated, plas grades to: soft  Clayey SILT, gray-brown trace fine-medium sand plastic (HL-Glacial Ti	s of fine gray ginning @ 16.2 ft.  asy  dium stiff red- thick gray silt tic  n, medium stiff, , wet, slightly	Installed
33 —	50/0"						33 <del></del> 34		Rottom o	f Hole 34.1 ft.	p 4
35 — 36							35 — 36		Split S	Spoon Refusal	-
	OR	ENTAT	ION		DEGREE OF (	CONTIN		CLASS	SIFICATION WEATHERING	SPECIAL FEA	TURES

ORIENTATION

DEGREE OF OPENING

WEATHERING

SPECIAL FEATURES

H HORIZONTAL
LA LOW ANGLE (5 45°)
HA HIGH ANGLE (> 45°)
T VERTICAL

C CLOSED
SO SLIGHTLY OPEN
S SLIGHT
SM SLIGHT TO MODERATE
MY MODERATE
MY MODERATE
T VERTICAL

MY MODERATE
V SEVERE

MISCELLANEOUS NOTES:

 $5/18/83\ 13{:}20$  Groundwater level 29.3 ft. through augers upon completion of drilling

The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual.

BORING NO. B-13 SHEET 2 OF 2

		-BORING LOG-			
GZ		PROJECT Buffalo Industrial Park			
GOLDBERG-ZOINO ASSOCIA		FILE NO. R5613 BORING NO. B-14			
CONTRACTOREarth 0				SURFACE ELEV.	609.09/33.08
DRILLER Doug Osc					Survey/City of Buffalo
TYPE OF DRILL RIG Mo					ft. South of active
SAMPLING METHOD Split CASING 34" I.D. Hollow St				railroad along Wil	
SIZE AND TYPE OF BIT_					31/83 COMPLETED 6/1/83 ampff
DIRECTION OF HOLE: VE	RTICAL 🖾 INCLINE	:D [	]	DEGREES FROM VE	RTICAL
OVERBURDEN SAMPLES:					
THICKNESS OF OVERBUR					
DEPTH DRILLED INTO RO					TION5/6.49/0.48
TOTAL DEPTH OF HOLE	32.6 ft. (5	рит	spoon ke	Tusai)	
DEPTH (FT.) BLOWS BLOWS PER O.5 FR O.5 FR TYPE, NO. BLOCATION N-VALUE OR % REC.	REMARKS QUE	06PTH (FT.)	CORE	SOIL AND R	OCK DESCRIPTION
		0			
18	S-1 (0.0'-2.0')	Ŭ -	Mi	scellaneous Fill, bla	ck, silty sand with brick
1 33 S-1 25	46% Sample	1—		agments, ash, cinders mp	, and organics throughout,
2 12	Recovery	2			_
<del></del>	l 💥				-
3		3			_
4		4—			
<sub>5</sub> 9	S-2	٦	Sa	me as above with piec	es of wood and concrete
13 S-2 20	(4.5'-6.5')	'n			
67	38% Sample Recovery	6—			_
37	*See note below	_ †			-
7		$\Box$			_
8———	l 💥	8			
	l				_
9	L	9—			
10 8 71	S-3 (9.5'-11.5')	10	51		ngo hand como clav
31 3-3 /1	73% Sample	]	tr	ace fine sand (tan co	lor occurring in pockets), nses throughout, trace
40	Recovery	11	or	ganics (possible orig	inal ground surface at slightly plastic (ML)
12	11111	12-		io (c.), moise, very	
					_
13		13			
14	DISCONTINU	JITY	CLASSIFI	CATION	
ORIENTATION	DEGREE OF OPENING		F FRES	WEATHERING	SPECIAL FEATURES  HB HAMMER BREAK
H HORIZONTAL LA LOW ANGLE (\$ 45°) HA HIGH ANGLE (\$ 45°) T VERTICAL	C CLOSED SO SLIGHTLY OPEN O OPEN		S SLIG SM SLIG M MODI	HT HT TO MODERATE Erate Erate To Severe	HB HAMMER DREAR
MISCELLANEOUS NOTES:	*Hit obstruction @ 7.0 re-drillea.	ft. i			10 ft. west and

BORING NO. B-14 SHEET I OF 2



# GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

#### -BORING LOG-

PROJECT \_\_Buffalo Industrial Park

FILE NO. \_\_\_\_R5613 \_\_\_\_\_ BORING NO. \_B-14

Solidary   Solidary							_				
10	DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE TYPE, NO.	N -VALUE OR % REC.	RQD %	REMARKS	LEGEND	DEPTH (FT.)	CORE BREAKS	SOIL AND	ROCK DESCRIPTION
10								_			
18	-	9	S-4	24		(14.5'-16.5') 65% Sample		-		varves, very stiff, tra   with silt in varves 1/8	ace fine sand occurring
18	17_							17.	1		
19			]					1′ -			-
1	18	_						18			_
20	-	+						-			
1	19_	<del>                                     </del>						19			-
100x Sample   21   22   23   24   25   24   25   24   25   26   5   26   5   27   27   28   29   29   29   29   29   20   30   1   7   5% Sample   8ecovery   31   7   75% Sample   8ecovery   32   50/0"   32   33   33   33   33   33   33   3	20_	1	S-5	5				20 —		grades to: medium: - no evidence of sand	stiff, saturated, plastic in varves
22	21_	<del></del>						21			-
23		1 3				Recovery		-			
24	22		]					22 —			- 
Silty SAND, gray, medium dense, little fine-medium subangular gravel, little clay, saturated, slightly plastic (SM-Glacial Till)   26	23_							23 —			
25	24	-						24 —			-
27	25	_	S-6	11				25 —		l medium subangular grave	el. little clav.
28	26	-	-					26 —			-
29	27_							27			-
29	28		1					28 —			_
30 1	.	+	-					-			
31 7 9 75% Sample Recovery 32 50/0" 32 8ottom of Hole Split Spoon Refusal @ 32.6 ft.  The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual.	29		-					29 —			-
31 7 9 75% Sample Recovery 31 32 - 8ottom of Hole Split Spoon Refusal @ 32.6 ft.  33 - Split Spoon Refusal @ 32.6 ft.  The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual.	30 —	_		,,,		S-7 (29.5'-31.5')		30 —		grades to: some finand rock fragments, tra	ne-coarse subangular gravel ace clay, very slightly —
32	31 —	<del>+</del>	3-/	16		75% Sample		31 —		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	_
33 — Split Spoon Refusal @ 32.6 ft.  The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual.  DISCONTINUITY CLASSIFICATION	32 —	_				<u> </u>		32 —			-
The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual.  DISCONTINUITY CLASSIFICATION	-	<del> </del>		ļ			11111	-	-		
DISCONTINUITY CLASSIFICATION	-							33 —		The stratification line boundary between soil a	es represent the approximate and rock types. The actual
	-							-		s. and to the may be grade	,
	_		1					_			_
ORIENTATION DEGREE OF OPENING WEATHERING SPECIAL FEATURES		OP.	IFNTAT	ION		DEGREE OF O			CLASS	WEATHERING	SPECIAL FEATURES

DEGREE OF OPENING WEATHERING SPECIAL FEATURES ORIENTATION H HORIZONTAL C CLDSED FRESH HB HAMMER BREAK LA LOW ANGLE (± 45°)
HA HIGH ANGLE ( + 45°)
T VERTICAL SO SLIGHTLY OPEN S SLIGHT SM SLIGHT TO MODERATE DPEN M MODERATE MV MODERATE TO SEVERE V SEVERE

MISCELLANEOUS NOTES:

BORING NO. B-14 SHEET 2 OF 2



<b>GZ</b> \		PR	-BORING LOG- PROJECT _Buffalo Industrial Park			
GOLDBERG - ZOINO ASSOCI GEOTECHNICAL - GEOHYDRO	ATES OF N.Y., P.C. DLOGICAL CONSULTANTS	FII	FILE NOR5613 BORING NO. B-15			
CONTRACTOR Earth Dime DRILLER Doug Oscar TYPE OF DRILL RIG Mob: SAMPLING METHOD Spli CASING 35" I.D. Hollow S SIZE AND TYPE OF BIT	<u>le B-34</u> t Spoon-Standard Sampling tem Augers	]	DATUM US Lake LOCATION ~ 100  DATE STARTED	~ 600.01/29.27  Survey/City of Buffalo  ft. Southwest of NFS Gas well  6/27/83 COMPLETED 5/27/63		
DEPTH DRILLED INTO RE	DISTURBED 4  RDEN -  DCK	UN TOI	DISTURBED <u>-</u> P OF ROCK ELEVATIO	N ATION~583.51/7.5		
DEPTH (FT.) BLOWS PER 0.5 FT. SAMPLE TYPE, NO. B LOCATION N-VALUE OR % REC. ROD	REMARKS GN	CORE BREAKS	SOIL AND	ROCK DESCRIPTION		
0 8 17 17 14 2 18 32 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	S-1 (0.0'-2.0') 62% Sample Recovery	- 0 - 1- - 2- 3	Nopsoil and Roots Miscellaneous Fill, budamp, nonplastic	rown, dense, silty sand,		
5 1 3 S-2 8 6 4 7 7	S-2 (4.5'-6.5') 38% Sample Recovery	5 - 6 - 7	Miscellaneous Fill, go clayey silt with brich black petroleum contam	ray-brown, medium stiff, c fragments, evidence of inated soil, wet		
8		8 9		retrieved from augers  and roots found in test pit - ground surface)		
10 8 17 S-3 48 11 26	S-3 (9.5'-11.5') 10D% Sample Recovery	10	hard, trace fine sand.	d-brown with tan-gray varves, fine sand to silt pocket , moist, slightly plastic —		
13		13				
ORIENTATION  H HORIZONTAL LA LOW ANGLE (\$ 45°) HA HIGH ANGLE (\$ 45°) T VERTICAL	DISCONTING  DEGREE OF OPENING  C CLOSED SO SLIGHTLY OPEN O OPEN	M	WEATHERING FRESH SLIGHT SLIGHT TO MODERATE MODERATE MODERATE TO SEVERE SEVERE	SPECIAL FEATURES HB HAMMER BREAK		
MISCELLANEOUS NOTES:		<u> </u>	BORING	NO. B-15 SHEET I OF 2		



GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

#### -BORING LOG-

PROJECT Buffalo Industrial Park	
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FILE NO. R5613 BORING NO. B-15

DEPTH (FT.) BLOWS PER 0.5 FT. SAMPLE TYPE, NO.	N -VALUE OR % REC.	RQD %	REMARKS	LEGEND	DEPTH (FT.)	CORE BREAKS	SOIL AND ROCK DESCRIPTION
15 1 1 S-4	7		S-4 (14.5'-16.5') 100% Sample Recovery		15 —		grades to: medium stiff, wet, slightly plastic to moderately plastic
10			Recovery		16		The stratification lines represent the approximate – boundary between soil and rock types. The actual transition may be gradual.
			DIS	CONTIN		CLASS	SIFICATION

DISCONTINUITY CLASSIFICATION DEGREE OF OPENING WEATHERING SPECIAL FEATURES ORIENTATION HB HAMMER BREAK CLOSED FRESH HORIZONTAL LA LOW ANGLE (5 45°)
HA HIGH ANGLE (> 45°) SO SLIGHTLY OPEN O OPEN SLIGHT SM SLIGHT TO MODERATE M MODERATE T VERTICAL MY MODERATE TO SEVERE V SEVERE

MISCELLANEOUS NOTES:

BORING NO. B-15 SHEET 2 OF 2

<del></del> _	1	-BORING LOG- PROJECT Buffalo Industrial Park			
GOLDBERG - ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL - GEOHYDROLOGICAL CONSULTANTS	FILE I	NO. R5613	BORING NO.	B-16	
CONTRACTOR Earth Dimensions, Inc.  DRILLER Doug Oscar  TYPE OF DRILL RIG Mobile B-34  SAMPLING METHOD Split Spoon- Standard Sampling  CASING 35" I.D. Hollow Stem Augers  SIZE AND TYPE OF BIT Nx Rock Core		DATUM US Lake Survey/City of Buffalo  LOCATION 250 ft. West of Twin Fair  parking lot			
OVERBUROEN SAMPLES: DISTURBED6	TOP O	TOP OF ROCK ELEVATION			
0 4 1 5 S-1 41	Fi or mo	iscellaneous Fill, bla inders (railroad balla inplastic  ine sandy <u>SILT</u> , brown in the sandy sill, brown in the sandy sill, brown in the sandy sill, slightly plastic	mottled tan- ce fine gravel, (ML)	Installed  A A A A A A A A A A A A A A A A A A A	
10 9   S-3   10   S-3   10   11   12   12   13   14   DISCONTINUITY	or   s1   NO   11	range-tan fine sand le llt varves, moist, (CL DTE: evidence of organ 1.0 ft.	nses and gray )		
ORIENTATION  H HORIZONTAL  LA LOW ANGLE (\$45°) HA HIGH ANGLE (>45°) T VERTICAL  OPEN  DEGREE OF OPENING  C CLOSED SO SLIGHTLY DPEN OPEN  OPEN	F FRES	WEATHERING SH SHT TO MODERATE ERATE ERATE TO SEVERE	SPECIAL FEATHB HAMMER BREAK	TURES	

BORING NO. B-16

SHEET 1 OF 2



# GOLDBERG - ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL - GEOHYDROLOGICAL CONSULTANTS

#### -BORING LOG-

PROJECT Buffalo Industrial Park

FILE NO. R5613 BORING NO. B-16

DEPTH (FT.)	BLOWS PER 0.5 FT.	MPLE E, NO. CATION	N -VALUE DR % REC.	800 %	REMARKS	LEGEND	0ЕРТН (FT.)	CORE BREAKS	SOIL AND	ROCK DESCRIPTION	
9	<b>9</b> .9	SAP TYP B LO	N	L.		LEG	DE!	98 C			Equipment 1nstalled
15— 16—	1 2 3 4	S-4	7		S-4 (14.5'-16.5') 100% Sample Recovery		15		grades to: <u>CLAY</u> , ma little silt, wet, mode	edium stiff, . rately plastic	
17— 18— 19— 20—	1 1				S-5 (19.5'-21.5')		17 —		grades to: trace f between 21.0' and 21.5	ine-medium gravel '.	
21— 22— 23— 23— 24—	4 3	S-5	7		100% Sample Recovery		22 — 23 — 24 —				
25— 26—	1 2 4 6	S-6	10		S-6 (24.5'-26.5') 92% Sample Recovery		25 — 26 —		Sandy <u>SILT</u> , gray-brown fine-medium subangular fragments, trace clay, plastic (SM-ML-Glacial Top of Rock 2	gravel and rock wet, very slightly Till)	
27— 28— 29— 30— 31—		-C-1	97%	81%	C-1 (26.6'-31.4')		27 — 28 — 29 — 30 — 31 —		H, 0, SM H, S0, S ONONDAGA LI H, C, F wavy LA, 0, S. H, 0, SM brown stain LA, S0, S H, S0, S LA, S0, S	MESTONE Frequent chert nodules beginning @ 28.5'	1.1.1.1.1
-									The stratification line boundary between soil a transition may be grade	and rock types. Th	 
<del></del>	OR	IENTAT	ION		DIS DEGREE OF C			CLASS	SIFICATION WEATHERING	SPECIAL FEA	TURES

ORIENTATION DEGREE OF OPENING WEATHERING SPECIAL FEATURES HB HAMMER BREAK H HORIZONTAL LA LOW ANGLE (± 45°) CLOSED F S FRESH SO SLIGHTLY OPEN SLIGHT SM SLIGHT TO MODERATE HA HIGH ANGLE (>45°) O OPEN M MODERATE VERTICAL MV MODERATE TO SEVERE SEVERE

MISCELLANEOUS NOTES: 5/17/83 Grou

5/17/83 Groundwater level 15.1 ft. through augers prior to rock coring.



-BORING LOG-

GZ			PF	PROJECT Buffalo Industrial Park				
GOLDBERG-ZOINO ASSOCI GEOTECHNICAL-GEOHYDRO			FI	LE NOR5613	3	BORING NO. 8-17		
CONTRACTOR Earth Dime	nsions, Inc.			SURFA	CE ELEV.	602.01/26.00		
DRILLER Doug Oscar						urvey/City of Buffalo		
TYPE OF DRILL RIG Mobil				I		) ft. West of Super Dupe		
SAMPLING METHODSp1				I				
CASING 31 1.D. Hollow	Stem Augers					19/83 COMPLETED 5/		
SIZE AND TYPE OF BIT_	Nx Rock Core					mpff		
DIRECTION OF HOLE: VE								
OVERBURDEN SAMPLES:								
THICKNESS OF OVERBUR								
DEPTH DRILLED INTO RO				TTOM OF HO	LE ELEVA	TION573.91/-2.1	—	
TOTAL DEPTH OF HOLE		28.1 ft.		,				
FT.) BLOWS PER O.5 FR O.5 FR TYPE, NO. B. LOCATION N-VALUE OR % REC. RQD	REMARKS	LEGEND	CORE		SOIL AND F	ROCK DESCRIPTION		
0			_					
14	S-1	******	7			OPSOIL & ROOTS		
$1 - \frac{24}{19}$ S-1 37	(0.0'-2.0')	: IXXXXI	1	Miscellaneou damp, non-pl	<u>ıs Fill</u> , bla astic	ck, sand, silt, and cir	ders ,_	
, 18	62% Sample Recovery		. 🕇					
		<b>-</b>	2				-	
3		<b>             </b>	3—					
+			-					
4			1—	SILT, olive-	green with	orange pockets of fine	-	
5 6 16	Two Samples S-2	. <b>ا</b> ااااا		slightly pla		e clav, moist, very	_	
10 S-2	(4.5'-6.5')	111111111111111111111111111111111111111	' <b>.</b>					
6 19 44	79% Sample Recovery		5			<del></del>		
1	Recovery	-      <b>  </b>	1			clay, tan silt to fine sample, moist, slightly		
7———			7	plastic (ML		sample, morse, stightly	-	
8———			<u>,                                    </u>				_	
+	:		4					
9			<del>,</del>					
10 3	S-3	10	$\Box$	Silty <u>CLAY</u> , plastic (CL)	red-brown,	stiff, wet, moderately		
4 S-3 13	(9.5'-11.5')	"	<b>'</b>					
11 7 6	100% Sample Recovery	11	ı				_	
12	Accovery	T///// ,.	, 🗖					
·- —		12	-					
13		13	3				_	
14		<i>/////</i>	, -					
			TY CLA	SSIFICATION				
ORIENTATION H HORIZONTAL	DEGREE OF	OPENING	F	WEATHER!	NG	SPECIAL FEATURES HB HAMMER BREAK		
H HORIZONTAL LA LOW ANGLE (≤ 45°) HA HIGH ANGLE (> 45°) T VERTICAL	SO SLIGHTLY OPE	N	S SM M	SLIGHT TO MODE MODERATE MODERATE TO SE SEVERE		III IIIIIIIII DILAN		
MISCELLANEOUS NOTES:	-							
					BORING N	O. B-17 SHEET I	0F_2	

GZ
GOLDBERG - ZOINO A

GOLDBERG - ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL - GEOHYDROLOGICAL CONSULTANTS

## -BORING LOG-

PROJECT Buffalo Industrial Park

FILE NO. R5613 BORING NO. B-17

DEPTH (FT.)	BLOWS PER 0.5 FT	SAMPLE TYPE, NO. B LOCATION	N -VALUE OR % REC.	Rop %	REMARKS	LEGEND	DEPTH (FT.)	CORE BREAKS	SOIL AND ROCK DESCRIPTION
						/////			
15—	1 1 2 2	·S-4	4		S-4 (14.5'-16.5') 100% Sample Recovery		15 —		grades to: soft, with gray silt lenses ½"  thick throughout
17—							17		
-		-					-		_
18							18 -		<del>-</del>
<u>-</u>		•					-		
19		1					19		_
20	6				S-5 (19.5'-21.5')		20		Silty fine-medium <u>SAND</u> , gray, trace clay, trace fine-medium subangular gravel, wet, very slightly
21-	11	S-5	37		67% Sample				plastic (SM-Glacial Till)
	26				Recovery		21 —		
22—		1					22		_
-		-					-		-
23—		1					23 —		_
- ا		1					-		-
24							24		_
25	31				S-6		25		<u>-</u>
-	50 50/.3	S-6	100+		(24.5'-25.8') 92% Sample Recovery	& O	-		Fine-medium GRAVEL, gray, very dense, some coarse- medium sand, wet, nonplastic (GW)
26	00, .0	1			_		26		LA, SO, F Top of Rock 25.8 ft.
27 —		C-1	93%	52%	C-1 (25.8'-28.1')		27 —		H, SO, S
		] `	33%	JER	,				H, O, SM ONONOAGA LIMESTONE — H, SO, F
28							28 —	===	H, SO, S
-		-					-		Bottom of Hole 28.1 ft.
-  -							  -		The stratification lines represent the approximate — boundary between soil and rock types. The actual transition may be gradual.
-		1					-		_
-		1				1	-		-
-		1					-		_
									-
							_		
		-							
-		-					-		-
_		1					_		
-		1					-		-
				,			_		_
-		1					_		-
					DIS	CONTIN	UITY	CLASS	SIFICATION

DISCONTINUITY CLASSIFICATION

ORIENTATION

DEGREE OF OPENING

WEATHERING

SPECIAL FEATURES

H HORIZONTAL
LOW ANGLE (± 45°)
HA HIGH ANGLE (+ 45°)
T VERTICAL

DISCONTINUITY CLASSIFICATION

WEATHERING

F FRESH
S SLIGHT
SM SLIGHT TO MODERATE
M MODERATE
MV MODERATE
MV MODERATE
V SEVERE

MISCELLANEOUS NOTES:

5/19/83 Groundwater level 6.3 ft. through augers before rock coring. 5/19/83 Groundwater level 9.1 ft. through augers following rock coring.

BORING NO. B-17 SHEET 2 OF 2

			-BORII	NG LOG-		
		PROJE	CT Buffalo Indus	trial Park		
GOLDBERG-ZOINO ASSOCI GEOTECHNICAL-GEOHYDRO	ATES OF N.Y., P.C. DLOGICAL CONSULTANTS	FILE	NO. <u>R5613</u>	BORING NO. B-18		
CONTRACTOREarth Dim	ensions, Inc.		SURFACE ELEV.	601.50/25.49		
DRILLER Doug Osca			DATUM US Lake	Survey/City of Buffalo		
TYPE OF DRILL RIGMO			LOCATION ~ 50 1	ft. West of UPS parking lot		
SAMPLING METHOD _Spli	<u> </u>					
CASING 35" I.D. Hollow S				5/19/83 COMPLETED <u>5/20/8</u> 3		
SIZE AND TYPE OF BIT _	No Rock Core		ENGINEER R. I	Kampff		
DIRECTION OF HOLE: VE	RTICAL 🖾 INCLINE	D 🗆	DEGREES FROM V	ERTICAL		
OVERBURDEN SAMPLES:	DISTURBED7	UNDIST	TURBED			
				N		
DEPTH DRILLED INTO RO				ATION568.2/-7.81		
TOTAL DEPTH OF HOLE		( <u>Spl</u> it Spoon	Refusal)			
		10				
FTT) FTT) FORM SPER SPER SPER SPER SPER SPER SPER SPER	REMARKS Q	(FT.) CORE BREAKS	SOIL AND	ROCK DESCRIPTION		
(FT.) BLOWS PER O.5 FT. SAMPLE TYPE, NO. B. LOCATION N-VALUE OR % REC RQD %		3		Equipment Installed		
		-		<u>-</u>		
0 2	S-1 XXX	0	scellaneous Fill, bl	ack, dense.		
1 12 S-1 41	(0.0'-2.0')	ci	nders, gravel, sand, n-plastic	with roots, moist,		
22	54% Sample		.changes to: brown,	silty clay fill		
2 19	Recovery	2	. changes to: Drown,	sitty clay iiii		
3		_				
4		4				
5 4	S-2		scollanoous Fill by	coup black loose		
3 S-2 9	(4.5'-6.5')		Miscellaneous Fill, brown-black, loose sand, gravel with organics, moist			
6 4 5	50% Sample Recovery	6—	=	— — <i>— (//), (//)</i>		
7	Two Samples Taken	_				
<u> </u>						
8———		8-				
	.					
		SI	LT, brown, hard, som	e clav. moist.		
10 26	S-3 (9.5'-11.5')		ightly plastic (ML)			
37 S-3 85	50% Sample					
48	Recovery					
12		12				
13		_				
		13				
14		TY CLASSIFIC	CATION			
ORIENTATION	DEGREE OF OPENING		WEATHERING	SPECIAL FEATURES		
H HORIZONTAL La Low angle (≤ 45°)	C CLOSEO SO SLIGHTLY OPEN	F FRES	4T	HB HAMMER BREAK		
HA HIGH ANGLE (> 45°) T VERTICAL	O OPEN	M MODE	TO MODERATE			
		MV MODE V SEVE	RATE TO SEVERE RE			
MISCELLANEOUS NOTES:						

BORING NO. B-18

SHEET I OF 2

	<i>]</i>	
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GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

#### -BORING LOG-

PROJECT Buffalo Industrial Park

FILE NO. R5613 BORING NO. B-18

DEPTH (FT.)	BLOWS PER 0.5 FT	SAMPLE TYPE, NO.	N -VALUE OR % REC.	800 %	REMARKS	LEGEND	DEPTH (FT.)	CORE	SOIL AND ROCK DESCRIPTION		
٥		\$7 77 8	۾ <del>۾</del>			"	0	0 16		Equipo	ent led
15 16	2 4 5	5-4	13		S-4 (14.5'-16.5') 88% Sample Recovery		15—		Silty <u>CLAY</u> , red-brown with occasional gray silt varves, stiff, wet, moderately plastic (CL)		
17	0						17—		Drilling becomes easier @ 17.5 ft.		
20	1 1 2 2	\$-5	4		S-5 (19.5'-21.5') 100% Sample Recovery		19— 20— 21—		grades to: soft, trace fine sand with gray silt lenses 1/8" - 1/4" thick throughout		
22—23—24—					-		22 — 23 — 24 —				
25— 26— 27—	1 1 1 2	S-6	3		S-6 (24.5'-26.5') 100% Sample Recovery		25 — 26 —		Same as previous sample		
28 28 29 30	1 1 3	S-7	6		S-7 (29.5'-31.5')		29 —		grades to: medium stiff, little fine- medium gravel beginning @ 31.0 ft.	_	
31 32 33	3 50/0"				88% Sample Recovery		31 — 32 — 33 — 33 —		Frequent gravel and cobbles detected while augering (Glacial Till?)  Bottom of Hole 33.3 ft.		
34							34		Split Spoon Refusal  The stratification lines represent the ap boundary between soil and rock types. Th transition may be gradual.	proxim e actu	ate al

DISCONTINUITY CLASSIFICATION

ORIENTATION

DEGREE OF OPENING

WEATHERING

SPECIAL FEATURES

H HORIZONTAL
LA LOW ANGLE (± 45°)
HA HIGH ANGLE (> 45°)
T VERTICAL

OPEN

DISCONTINUITY CLASSIFICATION

WEATHERING

F FRESH
S SLIGHT
S SLIGHT
TO MODERATE
MV MODERATE
MV MODERATE
V SEVERE

MISCELLANEOUS NOTES:

BORING NO. B-18 SHEET 2 OF 2



-	B	)R	IN	G	L	o	G	_
_	D١	ᇧ	IIV	v	L	u	v	_

BORING NO. B-19

SHEET I OF 2

MISCELLANEOUS NOTES: "N" value may not be during sampling.	e representati	V SEVE		bstructions encount	ered		
H HORIZONTAL C CLOSED  LA LOW ANGLE (\$ 45°) SO SLIGHTLY OP  HA HIGH ANGLE (\$ 45°) O OPEN  T VERTICAL	EN	M MODE		HB HAMMER BREAK			
ORIENTATION DEGREE OF	OPENING_	CLASSIFIC	WEATHERING	SPECIAL FEAT	TURES		
4	14	CL ASSISTE	- ATION				
3———	13-	Aug	ering becomes easier				
27 Recovery	12-	thr	oughout, wet, slight	tly plastic (CL)			
0 17 S-3 48 (9.5'-11.5') 1 21 100% Sample	10-	sar	ty <u>CLAY</u> , brown, hard	sand varves			
9 S-3							
8——————————————————————————————————————							
7	-		3070 (III)				
6 22 54 58% Sample Recovery	6	son sil	<u>T</u> , brown with orange ie clay, high angle g t seams throughout, stic (ML)	ray fine sand-			
5 2 (4.5'-6.5')	- 5-	sli	y,with wood fibers, ghtly plastic				
4	4	Mis	cellaneous Fill, gra	y-brown, silt.and			
3———	- 3-				Λ		
1		pla pla	stic		A 7.4		
0 S-1 (0.0'-2.0')	°-	sar	cellaneous Fill, bro		Δ Δ		
<del>                                     </del>				_	Installed -		
BLOWS O.5 FT. SAMPLE TYPE, NO. B. LOCATION N-VALUE OR % REC. ROD %%	LEGEND DEPTH (FT.)	CORE	SOIL AND F		Equipment		
TOTAL DEPTH OF HOLE		BUTTU	TOP HOLE ELEVA	110N <u>374.37-1.31</u>			
THICKNESS OF OVERBURDEN DEPTH DRILLED INTO ROCK							
DIRECTION OF HOLE: VERTICAL 🛭 OVERBURDEN SAMPLES: DISTURBED							
CASING 3½" I.D. Hollow Stem Augers SIZE AND TYPE OF BIT Nx Rock Core			DATE STARTED 5		.U <u>5/2//8</u> 3		
SAMPLING METHOD Split Spoon-Standard			DATE STARTER :	COMPLETE	'D = (07/00		
DRILLER Doug Oscar  TYPE OF DRILL RIGMobile B-34			LOCATIONExtre				
CONTRACTOR <u>Earth Dimensions, Inc.</u>		1	SURFACE ELEV. DATUM US Lake S				
GOLDBERG-ZOINO ASSOCIATES OF N.Y., P. GEOTECHNICAL-GEOHYDROLOGICAL CONSU		FILE N	OR5613	BORING NO	B-19		
GLI		PROJECT Buffalo Industrial Park					
		-BORING LOG-					



## GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

## -BORING LOG-

PROJECT	Buffalo	Industrial	Park	 

FILE NO. R5613 BORING NO. B-19

DEPTH (FT.)	BLOWS PER 0.5 FT	SAMPLE YPE, NO. LOCATION	N -VALUE OR % REC.	RQD %	REMARKS	EGEND	DEPTH (FT.)	CORE	SOIL AND ROCK DESCRIPTION	   Equipment
		ு ட க	Zō							Installed
15	1 1 2 3	.S-4	5		S-4 (14.5'-16.5') 100% Sample Recovery		15 —		grades to: red-brown medium stiff, with gray silt lenses throughout, moderately plastic	
17—							17 — 18 — 19 —			
20	1 1 2 2	<b>S-</b> 5	4		S-5 (19.5'-21.5') 100% Sample Recovery		20 —		grades to: soft	
23— 23— 24— 25—	1	     			S-6		23 — 24 — 25 —		grades to: trace fine gravel	
26—	3 3	S-6	6		(24.5'-26.5') 100% Sample Recovery		26 — 26 — 27 —		Sandy SILT, gray-brown, medium stiff, little clay, trace fine gravel, wet, slightly plastic (ML-SM-Glacial Till)	
	50/0"	†					-		Top of Rock 28.0 ft.	= =
29 — 30 — 31 —		C-1	95%	92%	C-1 (18.0'-31.2')		28 — 29 — 30 — 31 —	ान्य <u>क्ष</u>	Broken Rock H, SO, S H, C, F ONONDAGA LIMESTONE H, C, F H, SO, S H, SO, S	
-							- - - - -		Bottom of Hole 31.2 ft.  The stratification lines represent the a boundary between soil and rock types. The transition may be gradual.	pproximate he actual
		<u></u>					_			-
		HENTA			DIS			CLASS	SIFICATION  WEATHERING SPECIAL FEA	TUBES

DISCONTINUITY CLASSIFICATION

ORIENTATION

DEGREE OF OPENING

WEATHERING

SPECIAL FEATURES

H HORIZONTAL
LA LOW ANGLE (= 45°)
HA HIGH ANGLE (\* 45°)
T VERTICAL

DISCONTINUITY CLASSIFICATION

WEATHERING

SPECIAL FEATURES

F FRESH
S SLIGHT
SM SLIGHT TO MODERATE
M MODERATE
MV MODERATE
V SEVERE

HB HAMMER BREAK

MISCELLANEOUS NOTES:

BORING	NO	B-19	SHEET	2	OF	2	
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_		-								
				-BORIN	G LOG-					
			PROJE	CT <u>Buffalo Indus</u> tri						
GOLDBERG-ZOINO ASSOCI GEOTECHNICAL-GEOHYDRO		s	FILE N	NO. R5613	BORING NO. B-20					
CONTRACTOREarth Dim	ensions, Inc.			SURFACE ELEV.	605.47/29.46					
DRILLER Doug Oscar	r			DATUM US Lake S	Survey/City of Buffalo					
TYPE OF DRILL RIG Mob	ile B-34			LOCATION150	ft. North of Twin Fair					
SAMPLING METHOD Spli	t Spoon-Standard Samplin	g		parking lot & 10	O Ft West of South Ogden St.					
CASING 312" I.D. Hollow Sto				DATE STARTED 5/	17/83 COMPLETED5/17/83					
SIZE AND TYPE OF BIT _	Nx Rock Core			ENGINEER R. K	Ampff					
DIRECTION OF HOLE: VE	RTICAL 🖸 INCLIN	NED []	)	DEGREES FROM VE	ERTICAL					
OVERBURDEN SAMPLES: DISTURBED UNDISTURBED										
THICKNESS OF OVERBUR	DEN21.0 ft		TOP OF	ROCK ELEVATION	582.27/6.26					
DEPTH DRILLED INTO RO	OCK 5.0_ft		вотто	M OF HOLE ELEVA	TION _579.47/3.46					
TOTAL DEPTH OF HOLE	26.0 ft									
DEPTH (FT) BLOWS PER 0.5 FT SAMPLE TYPE, NO B. LOCATION N-VALUE OR % REC. RQD %	REMARKS PER PROPERTY OF THE PR	DEPTH (FT.)	CORE	SOIL AND R	ROCK DESCRIPTION					
		<del>  </del>		<del></del>						
0-		0								
8	(0.0'-2.0')	1	M:	<u>Topsoil &amp; Roots</u> scellaneous Fill, bla	ck, silty sand with cinders,					
1—————————————————————————————————————	75% Sample			avel, and brick fragme						
2 45	Recovery	2								
	l	- K			el size material encountered					
3	l	3	during augering							
4		4—								
12		-	ос	curring in random poc	hard, trace coarse sand kets, gray silt to fine					
5 13 22 S-2 95	S-2 (4.5'-6 5')	5	Sa'	moist, slightly plastic — —						
6 35	100% Sample	6								
60	Recovery	∥ ┤			-					
7	<u> </u>									
8———		8	Εa	sier augering	_					
+					-					
9		9	Si	ltvCLAY. red-brown w	ith gray varves, stiff,					
10 5	S-3 (9.5'-11.5')	10-		ace fine sand, wet, s						
5 S-3 14	79% Sample				-					
11 7	Recovery	11								
12		12			-					
					<u>-</u>					
13		13			-					
14	DISCONTI	14 NUITY	CLASSIFIC	CATION						
ORIENTATION	DEGREE OF OPENING			WEATHERING	SPECIAL FEATURES					
H HORIZONTAL LA LOW ANGLE (\$ 45°) HA HIGH ANGLE (\$ 45°) T VERTICAL	C CLOSED SO SLIGHTLY OPEN O OPEN		M MODE	HT HT TO MODERATE RATE RATE TO SEVERE	HB HAMMER BREAK					
MISCELLANEOUS NOTES: *	"N" values may not be r hile sampling.	epresen	tative b	ecause of obstruction	s encountered					

BORING NO. B-20 SHEET I OF 2



### GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

<b>–</b> E	30	RI	Ν	G	L	0	G -
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PROJECT	Buffalo	Industrial	Park	_	

FILE NO. R5613 BORING NO. B-20

				.,,,,,,						
DEPTH (FT.) BLOWS PER 0.5 FT SAMPLE	A LOCATION  N - VALUE  OR % REC.	ROD %	REMARKS	LEGEND	<b>ДЕРТН</b> (FT.)	CORE BREAKS	SOIL AND ROCK DESCRIPTION			
15 1 3 S-4	4 9		S-4 (14.5'-16.5') 100% Sample Recovery		15 — 16 —		grades to medium stiff, no varves evident			
17 18 19 13 S-5 20 16 50/.1'	5 29	_	S-5 (19.0'-20.1') 31% Sample Rec.		17 —		Silty <u>SAND</u> , gray, medium dense, little fine- medium gravel and rock fragments, wet, nonplastic (SM-Glacial Till)			
21 22					21	0.0	Auger Refusal 21.0'  Zone of broken rock (possible boulders and cobbles)			
23 C- 24	1 50%	37≪	C-1 (21.0'-26.0')		23 — 24 — 25 —	0 0	Estimated Top of Rock 23.3 ft			
26					26 — —		H, SO, S  ONONOAGA LIMESTONE  Bottom of Hole 26.0 ft.  The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual.			
					- 					
							- - -			
			Dic	CONTIN		CI ACO				

DISCONTINUITY CLASSIFICATION DEGREE OF OPENING WEATHERING SPECIAL FEATURES ORIENTATION H HORIZONTAL LA LOW ANGLE (± 45°) HA HIGH ANGLE (\* 45°) T VERTICAL HB HAMMER BREAK CLOSED F FRESH SO SLIGHTLY OPEN S SLIGHT SM SLIGHT TO MODERATE O OPEN M MODERATE MY MODERATE TO SEVERE SEVERE

MISCELLANEOUS NOTES:

BORING NO. B-20 SHEET 2 OF 2

-BORING LOG-PROJECT New Buffalo Industrial Park GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL · GEOHYDROLOGICAL CONSULTANTS FILE NO. \_\_\_\_\_ BORING NO. B-21 CONTRACTOR Parratt-Wolff, Inc. SURFACE ELEV. 602.17/26.16 DRILLER Bill Rice DATUM US Lake Survey/City of Buffalo TYPE OF DRILL RIG \_ CME-55 LOCATION <u>East of Super Duper</u> SAMPLING METHOD Split Spoon - Standard Sampling See location plan CASING 3 3/4 in. I.D. Hollow Stem Augers DATE STARTED 10/27/83COMPLETED 10/27/83 SIZE AND TYPE OF BIT No Rock Core ENGINEER R. Laport DIRECTION OF HOLE: VERTICAL [] INCLINED 🗆 DEGREES FROM VERTICAL \_ OVERBURDEN SAMPLES: DISTURBED \_\_\_\_\_ 5\_\_\_ UNDISTURBED \_\_\_\_ -THICKNESS OF OVERBURDEN \_\_\_\_ TOP OF ROCK ELEVATION \_\_\_\_\_ DEPTH DRILLED INTO ROCK \_\_\_\_\_\_ BOTTOM OF HOLE ELEVATION 578,17/2.16 TOTAL DEPTH OF HOLE 24.0 ft. (Auger Refusal) BLOWS
PER
0.5 FT.
SAMPLE
TYPE, NO. N-VALUE OR % REC. CORE BREAKS DEPTH (FT.) LEGEND DEPTH (FT.) Rob % SOIL AND ROCK DESCRIPTION REMARKS Equipment Installed 0-MISCELLANEOUS FILL, brown, medium dense S-1 (0.0'-2.0') fine-coarse sand and fine gravel with S-1 14 7 55% Sample cinders and metal fragments, damp 9 Recovery 3-Clayey SILT, brown with gray silt lenses, stiff, trace fine sand, trace 2 S-2 (5.0'-7.0') 100% Sample fine gravel, damp, slightly plastic S-2 15 7 r e Recovery 8 10 10 Silty <u>CLAY</u>, gray with occasional olive green silt lenses, soft, wet, moderately S-3 3 (10.0'-12.0') 11-70% Sample plastic (CL) Recovery 12 12-13 14 DISCONTINUITY CLASSIFICATION SPECIAL FEATURES ORIENTATION DEGREE OF OPENING WEATHERING HB HAMMER BREAK HORIZONTAL CLOSED LA LOW ANGLE (\$45°) 50 SLIGHTLY OPEN SLIGHT SM SLIGHT TO MODERATE HIGH ANGLE (> 45°) OPEN MODERATE VERTICAL MV MODERATE TO SEVERE SEVERE MISCELLANEOUS NOTES:

BORING NO. B-21

SHEET I OF 2



GOLDBERG - ZOINO ASSOCIATES OF N.Y., P.C.
GEOTECHNICAL - GEOHYDROLOGICAL CONSULTANTS

FILE NO. R5615

### -BORING LOG-

PROJECT	New Buffalo	Industrial Park		
EU E NO	D5615	BORING	NO	D 21

	_									
DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE TYPE, NO. B. LOCATION	N -VALUE OR % REC.	RQD %	REMARKS	LEGEND	DEPTH (FT.)	CORE BREAKS	SOIL AND ROCK DESCRIPTIO	N Equipment Installed
15 16 17	1 1 2 7	. S-a	9		S-4 (15.0'-17.0') 100% Sample Recovery		15 — 16 — 17 —		grades to: stiff, little fine- medium sand beginning at 16.5 ft.	\$ \frac{1}{2}
18— 19—							- 18 — - 19 —		Note: Augering becomes more difficult at 17.2 ft.	
20— 21— - 22—	3 3 3 2	S-5	5		S-5 (20.0'-22.0') 100% Sample Recovery		20 — 21 — 22 —		Fine-medium <u>SAND</u> , gray-brown, loose, little silt, trace fine-medium gravel, trace clay, wet, very slightly plastic (SM-Glacial Till)	
23—							23 — - 24 —		Note: Difficult augering 22-24 ft.; frequent boulders and rock fragments  Bottom of Hole 24.0 ft.	
- - -							-		Auger Refusal	- - - -
- - -		-					- - -			- - - -
-							-			- - -
-							-			- - - -
-		i					_	]		

	DISCONTINUITY CLASSIFICATION								
ORIENTATION	DEGREE OF OPENING	WEATHERING	SPECIAL FEATURES						
H HORIZONTAL LA LOW ANGLE (± 45°) HA HIGH ANGLE (> 45°) T VERTICAL	C CLOSED SO SLIGHTLY OPEN O OPEN	F FRESH S SLIGHT SM SLIGHT TO MODERATE M MODERATE MV MODERATE TO SEVERE V SEVERE	HB HAMMER BREAK						

MISCELLANEOUS NOTES:

BORING NO. B-21 SHEET 2 OF 2

-BORING LOG-PROJECT New Buffalo Industrial Park GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. FILE NO. R5615 GEOTECHNICAL GEOHYDROLOGICAL CONSULTANTS \_\_\_\_ BORING NO. B-22 SURFACE ELEV. 610.88/34.87 CONTRACTOR Parratt-Wolff, Inc. DATUM US Lake Survey/City of Buffalo DRILLER \_\_\_\_\_8ill Rice TYPE OF DRILL RIG CME-55 LOCATION See location plan SAMPLING METHOD <u>Split Spoon - Standard Sampling</u> CASING 3 3/4 in. 1.D. - Hollow Stem Augers DATE STARTED 10/28/83 COMPLETED 10/28/83 SIZE AND TYPE OF BIT No Rock Core ENGINEER R. Laport DIRECTION OF HOLE: VERTICAL INCLINED [] DEGREES FROM VERTICAL \_ OVERBURDEN SAMPLES: DISTURBED \_\_\_\_\_\_ UNDISTURBED \_\_\_\_\_\_ THICKNESS OF OVERBURDEN \_\_\_\_\_ TOP OF ROCK ELEVATION DEPTH DRILLED INTO ROCK \_\_\_\_\_ BOTTOM OF HOLE ELEVATION 578.78/2.77 TOTAL DEPTH OF HOLE 32.1 ft. (Auger Refusal) BLOWS
PER
0.5 FT.
SAMPLE
TYPE, NO. N - VALUE OR % REC. EGEND CORE BREAKS DEPTH (FT.) DEPTH (FT.) RQD % SOIL AND ROCK DESCRIPTION REMARKS Equipment Installed 0 0-TOPSOIL & ROOTS (0.0'-2.0')4 Miscellaneous Fill, brown, medium dense, S-1 15 65% Sample fine-medium sand, some silt, trace Recovery fine-medium gravel, damp, nonplastic 9 2 Ċ. 3 3. 0 4 5 3 \$-2 (5.0'-7.0') Same as previous sample S-2 8 6 55% Sample 6 4 Recovery D 4 7 Δ ß 8. Δ. q g Δ 10 Δ 10 ...grades to: very loose little finemedium gravel, wet Δ΄. (10.0'-12.0') 5-3 4 11 85% Sample 11 V Recovery ...grades to: black, trace organic 12 12 material (original ground surface?) ۵ Δ 13 13 Δ Δ 14 DISCONTINUITY CLASSIFICATION SPECIAL FEATURES ORIENTATION DEGREE OF OPENING WEATHERING HB HAMMER BREAK FRESH HORIZONTAL CLOSED SO SLIGHTLY OPEN SLIGHT LA LOW ANGLE (5 45°) HA HIGH ANGLE (> 45°) OPEN SM SLIGHT TO MODERATE VERTICAL MODERATE MODERATE TO SEVERE MISCELLANEOUS NOTES:

BORING NO. B-22

SHEET I OF 2



GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

#### -BORING LOG-

PROJECT	New Buffalo	Industrial Park	_
PROJECT	New Buffalo	Industrial Park	_

FILE NO. R5615 BORING NO. B-22

		<u></u>						
DEPTH (FT) BLOWS PER 0.5 FT SAMPLE	B LOCATION	OR % REC.	REMARKS	LEGEND	<b>ОЕРТН</b> (FT.)	CORE BREAKS	SOIL AND ROCK DESCRIPTION	DN Equipment Installed
15 3 16 4 S 11 17 14	i-4 2	5	S-4 (15.0'-17.0') 40% Sample Recovery		15 — 16 — 17 —		Clayey <u>SILT</u> , brown with gray/tan silt lenses, <u>Very</u> stiff, trace fine sand, moist, slightly plastic (ML)	A
19 20 2					18 — 19 — 20 —			
21 3 S 4 22 4	5-5	8	S-5 (20.0'-22.0') 80% Sample Recovery		21 — 22 —		Silty varved <u>CLAY</u> , red-brown with high angle gray silt varves, stiff, moist, slightly plastic (CL)	
24					23 — 24 — 25 —		grades to: medium stiff	
26 2 S 27 3	5-6	5	S-6 (25.0'-27.0') 95% Sample Recovery		26 — 26 — 27 —			
29					28 29 30			
5 31 10 5 32 50/.3'	5-7 1	.5	S-7 (30.0'-31.8') 100% Sample Recovery		31		Sandy SILT, brown, stiff, little fine-medium gravel, trace clay, wet, very slightly plastic (ML-Glacial Till)	
							Bottom of Hole 32.1 ft.  Auger Refusal  The stratification lines represent the boundary between soil and rock types. transition may be gradual.	approximate The actual
							UCICATION	<u>-</u> -

DISCONTINUITY CLASSIFICATION ORIENTATION DEGREE OF OPENING WEATHERING SPECIAL FEATURES H HORIZONTAL LA LOW ANGLE (\$45°) HB HAMMER BREAK CLOSED FRESH C CLOSED SO SLIGHTLY OPEN SLIGHT HA HIGH ANGLE (> 45°) OPEN SM SLIGHT TO MODERATE T VERTICAL MODERATE MV MODERATE TO SEVERE **SEVERE** 

MISCELLANEOUS NOTES

BORING NO. B-22 SHEET 2 OF 2



## -BORING LOG-

GL			PROJECT New Buffalo Industrial Park					
GOLDBERG-ZOINO ASSOCI GEOTECHNICAL - GEOHYDRO			FILE N	O. <u>R5615</u>		BORING	NO. <u>B-23</u>	
CONTRACTOR Parratt-Wo	lff. Inc.			SURFA	CE ELEV.	599.81/23.4	80	
DRILLER Bill Rice							of Buffalo	
TYPE OF DRILL RIG								
SAMPLING METHODSD								
CASING 3 3/4 inch I.D. Ho				DATE S	TARTED 10.	/28/83 COME	PI FTFD10/28/83	
SIZE AND TYPE OF BIT_								
DIRECTION OF HOLE: VEI OVERBURDEN SAMPLES:								
THICKNESS OF OVERBUR								
DEPTH DRILLED INTO RO								
TOTAL DEPTH OF HOLE					LE ELEVAN	1011 0001017		
	30.2 11	<u>(8</u> u	iger ketus	<b>a</b> 1)				
DEPTH (FT.) BLOWS BLOWS C.5 FR C.5 FR C.5 FR C.6 PR NO.00 BLOCATION N-VALUE OR % REC. RQD	REMARKS REMARKS	0ЕРТН (FT.)	CORE	,	SOIL AND R	OCK DESCRIP	Equipment Installed	
0 5 1 14 S-1 28	S-1 (0.0'-2.0') 35% Sample	0 _	Mis	d and find	s <u>Fill</u> , brow e-coarse gra onal cinders	wn, medium de avel, some si s, damp	ense,	
2 18	Recovery	2—					V	
3		3					4	
5		4	Cla			 own, stiff, w	_         _         _	
6 4 S-2 11	S-2 (5.0'-7.0') 85% Sample	6—	sli	asional f ghtly pla	ine sand-si stic (ML)	lt lenses, we	et, a	
7 7	Recovery	7—		grades to	: moist			
8		8—						
9———		9						
105		10—	tan	grades to fine san	: very stir d lenses	ff, occasiona		
11 8 S-3 28	S-3 (10.0'-12.0')	11—						
13 12 15	95% Sample Recovery	12						
13		1,3-					P = ==================================	
14		14						
15		15					- ۵   ۵ -	
	DISCONTINU	JITY						
ORIENTATION H HORIZONTAL	C CLOSED		F FRESI	WEATHERIN	IG .	SPECIAL	FEATURES BREAK	
H HORIZONTAL LA LOW ANGLE (≤ 45°) HA HIGH ANGLE (> 45°) T VERTICAL	SO SLIGHTLY OPEN O OPEN		S SLIGH SM SLIGH M MODE	T IT TO MODE! RATE RATE TO SE		- HAMMEN		
MISCELLANEOUS NOTES:				_				
					BORING NO	DB-23	SHEET I OF 2	



GOLDBERG-ZOINO ASSOCIATES OF N.Y., P.C. GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

#### -BORING LOG-

PROJECT New Buffalo Industrial Park

FILE NO. R5615 BORING NO. B-23

DEPTH (FT) BLOWS PER 0.5 FT SAMPLE TYPE, NO.	N -VALUE OR % REC.	RQD %	REMARKS	LEGEND	DEPTH (FT.)	CORE BREAKS	SOIL AND	ROCK DESCRIPTION		
0 SA	≥ &			LE	90	98			Equip Insta	ment 11ed
16 3 S-4 17 4	8		S-4 (15.0'-17.0') 90% Sample Recovery		16 17		Silty varved <u>CLAY</u> , bro moist, moderately plas	wn, medium stiff, tic (CL)	۵	7
18————————————————————————————————————			\$-5		18—		grades to: red-bro soft, trace coarse san	wn @ 21.0 ft., d	Δ · · · · · · · · · · · · · · · · · · ·	· Δ
21	4		(20.0'-22.0') 100% Sample Recovery		21— 22— 23— 24—				Δ Δ	<i>A</i>
25 2 S-6 1 27 2 28	3		S-6 (25.0'-27.0') 100% Sample Recovery		25— 26— 27— 28—		grades to: ⅓" thic throughout	k silt lenses	4.	. Δ
29 30 1 31 1 2 32 1 33 33	3		S-7 (30.0'-32.0') 100% Sample Recovery		29— 30— 31— 32— 33—		Same as previous sampl	e	۵	
35 11 S-8 36 9 50/.2'	20		(35.0'-36.2') 100% Sample Rec		34— 35— 36—			ace clay, wet, (SM-Glacial Till Hole 36.2 ft.		
			פות	CONTIN	UITY	CLASS	- Auge	r Refusal -		
ORIENTAT	ION		DEGREE OF O			JLA33	WEATHERING	SPECIAL FE	ATURES	-
HORIZONTAL		$\overline{}$	C CLOSED		$\neg$	e 61	FSH	HR HAMMER RREA		_

H HORIZONTAL LA LOW ANGLE (± 45°) C CLOSED FRESH HB HAMMER BREAK SO SLIGHTLY OPEN S SLIGHT SM SLIGHT TO MODERATE HA HIGH ANGLE ( + 45°) T VERTICAL OPEN MODERATE MV MODERATE TO SEVERE SEVERE

MISCELLANEOUS NOTES:

The stratification lines represent the approximate boundary between soil and rock types. The actual transition may be gradual.

## APPENDIX B

Test Pit Logs

-Phase 1 designated with "TP" done May-June, 1983

-Phase 2 designated with "TP II" done November, 1983

	TE	ST PIT	FIEL	D L	OG			
GOLDBERG · ZOINO	8 ASSOC. INC		PROJEC	T	Ť	EST PI	Г No	4
GEOTECHNICAL/GE	•	DESCRIPTIO			al Park F	ILE No.	R5613	
CONSULTANTS			W Crñ. of		- I	ATE	6-1-83	
GZA ENGINEER _	R. Laport	EXCAVA	TION EQUI	PMENT			Ev. <u>≃605/</u>	
WEATHER _overd		operator <u>T</u> make Case	<u>'ony Barbal</u>	ato	OC T	IME STAR	12:4	<u>5</u>
WEATHER		CAPACITY	cu.yd. RE		4 ft T	IME COMP	ETED 13:0	J
DEPTH	SOIL	DESC	RIPTIO	N		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
— o —	Topsoil & Roo	ts						
	Miscellaneous	Fill, fine-m	nedium sand			E		
L 2' - XXXX	Minos I I and a second		-1			E		
2	Miscellaneous (~4" diameter)			ıntermix	ea rocks			
L_ 3'	( 1 Grame ser)	and preces	o. woo-			E		
						l E		
├ <b>ढ़</b> ॱ─ऻ‱ॗ	Pumplo cludgo	matorial						_
l (XXXXX)	Purple sludge		<u> </u>			E		
- 5' - XXXX	Miscellaneous silt, distinc		tine-medi	um sand,	some			1
l— 6' —₩₩	3110, 41001110	o pao. o rau				M		
	Bott	om of Hole (F	Refusal) 6.	3 ft.		7 <sub>D</sub>		
r -	The stratific	ation lines	convocant t	ho appro	vimato			<del>-</del>
8'	boundary betw							
	transition ma	y be gradual	•			-		
— a,								<u> </u>
10'								
— 12' —								
L 13' —								
<u> </u>								
REMARKS: 1	. Groundwater @	5.6 ft. upo	n completio	n of exc	avation.			
TEST PIT PL	AN LEGEND	<u>):</u>	PROPORT		ABBREV	ATIONS		
<u> </u>	BOULDER	COUNT	USE	<u>D</u>	F - FINE		EFFO	
3'	SIZE RANG CLASSIFICAT	E LETTER	TRACE (TR)		C - COARSE	O MEDILIN		DERATE
T (1)	6" - 18"	A	LITTLE (LI.)		F/C - FINE T		GROUNDW	FICULT ATER
NORTH	18"-36"	В	SOME (SQ)		V- VERY		ELAPSED	7 G.W.L
<b>VOLUME</b> = 5.6	_cu.yd. 36" AND LAR	GER C	AND	35 - 50%	BN BROWN YEL YELL	ow	READING 4	. G.W.L

	_	TE	ST PI	r FIEL	.D L	.OG			
GOLDBER	G · ZOINO	& ASSOC., INC		PROJEC	T		TEST PI	T No	j
		OHYDROLOGICAL	DESCRIPTIO	N Buffalo	Industr	<u>ial Par</u> k ı	FILE No.	R5613	
CONSULTA	ANTS		LOCATION	<u>S. side of</u>	stone p	ile ı	DATE	6-1-83	
GZA ENG		R. Laport	EXCAVA CONTRACTOR B	ATION EQUI	PMENT		GROUND ELI	ev. <u>≃609/</u> :	<b>≃33</b>
		overcast	OPERATOR	<u>ony</u> Barbala	to .		TIME START	red <u>09</u> :	45
WEATHE	R		MAKECAPACITY	ase MO	DEL <u>580</u> ACH <u>~1</u> 2		TIME COMPL	LETED 10:	25
DEPTH		SOIL	DESC	RIPTIO	N		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
0		Miscellaneous concrete (2'x					D		
2'							М		
3' —							М		
4'		Layer of intac @ 3.5'-4.2'	ct and broke	n sandstone	blocks		D		
5'		Miscellaneous coarse sand s	ize material	mixed black with frequ	and rus	fine- p metal	E		
6'		pieces, bottle	es <u>—</u>	<del></del>			E		
							E		
8' —							E		
9'		- Numerous br	icks between	9.1 ft. and	d bottom	of test	Ē		
10'		pit ————————————————————————————————————	Bottom of P			<del>-</del>	E		
<u></u>		The stratific			he appro	oximate			
   12'		boundary betw transition ma			. The a	actual			
13'	-								
REMAR	<u>                                      </u>	1. No groundwat	er seepage n	oted prior	to backf				
		2. Minor slough							
TEST	PIT PL	AN LEGEND	<u>-</u> -	PROPORT	IONS	ABBREV	IATIONS	EXCAVA	TION
<del>           </del>	10'	BOULDER	COUNT	USE	2	F - FINE		EFFO	<u>₹T</u>
4'		SIZE RANG		TRACE (TR)	0 - 10%	M - MEDIUM C - COARSE		E — EAS	Y ERATE
T	$\mathcal{T}$	6"-18"	ON DESIGNATION	LITTLE (LI.)	10 - 20%	F/M -FINE 1		D DIF	FICULT
NO.	A) RTH	18"-36"	В	SOME (SQ)	20-35%	'w week	:	GROUNDW ELAPSED	
VOLUME		_cu.yd. 36" AND LAR	GER C	AND	35 - 50%			TIME TO READING (HRS.)	G.W.L

		TE	ST PIT	r FIEL	D L	.OG			
GOLDBERG	ZOINO & AS	SOC., INC		PROJEC	T	Т	EST PI	T No	6
	ICAL/GEOHYDR	•	DESCRIPTIO			<u>ial Par</u> k FI	LE No.	R5613	
CONSULTAN			LOCATION	100' SE of	Stonepi	ile D	ATE	6-1-83	3
074 540		anont	EXCAVA CONTRACTOR B	TION EQUI	PMENT	GF	ROUND EL	ev. ≃604/≃	28
	NEER R. L		OPERATOR	<u>ony Barbala</u>	ito			TED 10:	
WEATHER	overcast 8	(001	MAKE <u>C</u> CAPACITY		DEL $\frac{58}{2}$	8 <mark>0С</mark> 14 <b>ft</b> ті	ME COMP	LETED10:	:50
DEPTH		SOIL	DESC	RIPTIO	N		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
i	XXXXXX nume	ellaneous rous brich stone	Fill, orango	e-brown, si pieces (3'	lty clay x3'x0.3'	/, with '), and	М		1
2'X	XXXX Curb	stone					М		<u>_</u>
3'X							D		
4'	<b>****</b>						D		
5'			Bottom of T	est Pit 4.0	<b>)</b>				
6, —	0bstr	ruction pr	evented furt	her excavat	ion				
7'			tion lines r en soil and						
8'			be gradual.		. The av	o cuu i			
_ 'e _							-		
10' -									
10									
12' -									
13'									
14'-									
REMAR	KS: 1. 0-1	ft. contar	minated with	a black oi	ly subst	tance.			<u> </u>
TEST F	PIT PLAN	LEGEND	) <u>:</u>	PROPOR	TIONS	I ABBREVI	ATIONS	EXCAVA	TION
<b>→</b> ← 9	9' →	BOULDER	COUNT	USE	<u>D</u>	F-FINE		EFFO	
4'		SIZE RANG	SE LETTER	TRACE (TR.)	0 - 10%	C - COARSE	MEDULA	E EAS   M MO	SY DERATE
T	3	6" - 18"	A	LITTLE (L1.)	10 - 20%	F/M -FINE TO	COARSE		FICULT
NOF	RTH	18"-36"	В	SOME (SQ)		GR GRAY		ELAPSED _	
VOLUME =		36" AND LAR	GER C	AND	35 - 50%	BN BROWN YEL YELLO	w	TIME TO READING (HRS.)	₹/ G.W.I

		TE	ST PIT	FIEL	D L	OG			
COL DRED	G . 70INO . S	ASSOC., INC		PROJECT	г	1	EST PI	T No	7
		HYDROLOGICAL	DESCRIPTIO			I .		R5613	
CONSULTA		THOROLDGICAL	LOCATION 2				ATE		
		D. Lawrent	EXCAVA	TION EQUI	PMENT		POLIND EL	EV. ≃610/≃	34
GZA ENG	INEER	R. Laport	CONTRACTOR	B <u>oyd &amp; Bro</u> wi Tony Barbal	n ato			TED <u>11:</u>	
WEATHE	R <u>overca</u>	st & cool	MAKE	cu.yd. REA	DEL <u>58</u>			LETED 11:	
DEPTH			DESC				EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
— 0 — — ı' —		Miscellaneous several "A" ar	<u>Fill</u> , orangend "B" sized	e,silty clay concrete bl	/ interm locks	ixed with	М		
2'							D		
3'							D		
4'							D		
5'							M		
<u> —</u> 6' —		Miscellaneous	Fill, black	sandy silt	intermi	xed with	M		
7'		oil and white	granular mat	cerial (indu	ıstriai	T111 <i>()</i>	<u>M</u>		
8'			Dottom of H	-lo /0 FI\			E		
<del> </del> — э, —			Bottom of Ho	ole (8.5°)					
10'	<b>∖ ∣</b>	he stratifica coundary betwe transition may	en soil and a						
11' 									
12'									
13'   14'									
4 -	<u> </u>				_				
REMAI	- ''	nor sloughing groundwater s					on.		
TEST	PIT PLA	N LEGEND	) <u>:</u>	PROPORT	IONS	ABBREV	ATIONS	EXCAVA	TION
<b>↓ k</b>	8' -	BOULDER		USE		F - FINE		EFFO	RT
31		SIZE RANG		I  TRACE (TR.)  LITTLE(LI.)		M-MEDIUM C-COARSE F/M-FINE T F/C-FINE T		D DIF	DERATE FICULT
1	1) RTH 7.6	18"-36" 36" AND LAR	В	SOME (SQ)	20 - 35% 35 - 50%	V- VERY GR GRAY BNBROWN		GROUNDW ELAPSED TIME TO READING	G.W.L
VOLUME	= <u>c</u>	u.yd.				YEL YELL	OW	(HRS.)	F

	TE	ST PIT	FIEL	_D	LOG				
GOLDBERG · ZO	NO & ASSOC., INC		PROJEC	Τ		TE	ST PI	T No	9
	/GEOHYDROLOGICAL	DESCRIPTION	N <u>Buffalo</u>	Indust	<u>rial Par</u> k	FIL	E No.	R5613	
CONSULTANTS		LOCATION	in R.R. Em	ıba <u>nk</u> me	nt	DA	TE	6-2-83	
GZA ENGINEE	R R. Laport	EXCAVA CONTRACTOR _B	TION EQU loyd & Brow	IPMEN'	Т	GRO	OUND EL	ev. ≃ <u>614/≃3</u>	38
WEATHER ST		OPERATOR	ony Barbal	ato	580C	TIM	E START	TED 14:0	5
WEATHER	amy a warm	MAKE	1411	DDEL ACH	~14 ft.	TIN	ME COMPI	LETED 14:3	<u>,5</u>
DEPTH	SOIL	_ DESC	RIPTIO	N			EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
1'	Topsoil & Roo	ts					E-M	_	
2' —	Miscellaneous cinders with				ravel size	<u>;</u>	E-M		
I - XXX	$\bowtie$						E-M	3-A	
<b>├</b> ─ 3' ─ <b></b>	Miscel laneous	Fill, brown,	silt and o	lay, 1	ittle sand	<u>,</u>	ויורם	3-A	
. IXXX	fine-medium g	ravel, damp		•			E-M		
<b>.</b>							E-M		2
- 3 - XXX	Cros:	s Section of	R.R. Emban	kment			- ··		
e, —				ence pos	oint for		E-M		
7'-	R.R.		T >	•	ack cinder (FILL)	•	E-M		
B, —	Embankment -	14'	↑ 10'	<b>X</b>	(1122)		E-M		
a, —		W. O. M. O. W.	9'	<del>26</del>			E-M		
10, —		Holosoph	ment at the				E-M		
	$\bowtie$	└ 01ive	green sil	t			E-M		
12'	*Not	to scale					E-M		
13'	Olive green S		y, little	fine s	and		E-M		
14'	occurring in		1011				E-M		
REMARKS:	. 1. No water see	Bottom of Ho			On .				
NE MAKKO	2. Bag sample c 3. Moderate slo	ollected from	15.0'.						
TEST PIT	PLAN LEGENS		l PROPOR	TIONS	IABBRE	VIA	TIONS	EXCAVA	TION
→ + 9' -	BOULDER	<del></del>	USE		F-FINE			EFFO	
4 //////	SIZE RANG	GE LETTER	TRACE (TR.)	0 - 109		SE		E EAS	SY DERATE
1 7 6	6"-18"	ON DESIGNATION A	LITTLE (LI.)	10 - 20%	F/M -FINE   F/C - FINE		COADCE	DDIF	FICULT
NORTH	18"-36"	В	SOME (SQ)	20-359				GROUNDW ELAPSED	
VOLUME = 1	6 cu.vd. 36" AND LAF	RGER C	AND	35 - 509		WN	N	TIME TO PERENTER TO THE PERENTE TO THE PERENTER TO THE PERENTER TO THE PERENTER TO THE PERENTE	ZG.W.∟ ₹

		TE	ST	PIT	FIEL	D L	.OG			
GOLDBERG	S · ZOINO & AS	SSOC., INC			PROJEC			TEST PI	T No	1
4	IICAL/GEOHYDF	,	DESCR	RIPTION	Buffalo	Industr	<u>ial Par</u> k	FILE No.	R5613	
CONSULTAI	NTS 		LOCAT	1014 _	0 ft. Eas		ntex	DATE	6-2-83	
GZA ENGI	NEER R. L				ION EQUI	PMENT		GROUND EL	EV. <u>≃602/</u> ≏	<u> 26</u>
WEATHER	sunny & wa	<u>arm</u>	OPERATO	Cas		DEL 58	80C		TED <u>13:3</u> LETED <u>13:</u> 5	
			CAPACITY		cu.yd. RE		<u> 14</u>	1	BOULDER	Т
DEPTH		SOIL	. DE	ESCF	RIPTIO	N		EXCAV. EFFORT	COUNT	REMAR No.
	Tops	soil & Root	S					_		
ı' \[ \]		ellaneous				ders and	d brick	E_		<u> </u>
2'	fraç	gments (ind	lustria	1 fill)				E		
_,	<b>******</b>							E		
3										
4'								E	<u> </u>	1
<b>e'</b>								E		
5 —	 	ved clayey	SILT.	tan-bro	wn mottle	ed red Wi	th grav	E		
├ e' ─	silt	lenses th	rougho	ut, dam	o, slight	ly plast	cic (ML)			<del>                                     </del>
7'		ty <u>CLAY</u> , br I pockets,					nd fine	E		<del>                                     </del>
8'		·	·					E		
								E		2
a,			Bottom	of Hol	e (9.0')					† <del>-</del>
10'	The	stratifica	tion 1	ines re	present t	he appro	oximate			├
II'	trai	ndary betwe nsition may	en soi / be gr	adual.	ock types	i. The i	actual			
- 12, -										
13'										_
14'										<del>  -</del>
REMAR	KS: 1. Gro	oundwater s	eepage	of ~½	gpm. 0 ≃4	.0 ft.			<u> </u>	<u> </u>
	2. Sic	les cut ver cavation.					able up <b>c</b> r	ocomplet	ion of	
TEST E	PIT PLAN	LEGEND	:	ļ	PROPOR	TIONS	IABBRE	/IATIONS	EXCAVA	TION
<u> </u>	.5 '→	BOULDER	COUNT	. l - l	USE	<u>D</u>	F-FINE		EFFO	
2.5		SIZE RANG CLASSIFICATION	E LE'	TTER TO	RACE (TR.)	0 - 10%	C - COARSI	E		DERATE
170	<u> </u>	6"-18"		۸  ۱	ITTLE (LI.)		F/C - FINE	TO COARSE	IGROUNDY	FICULT
NOF	RTH	18"-36"		•	OME (SQ)		GR. GRAY		FL APSED	
VOLUME =	. 7.1 cu.yd.	36" AND LARG	GER	c /	ND	35 - 50%	BN BROW YEL YEL		TIME TO READING (HRS.)	₹/G. <b>W</b> .L

	TE	EST PI	TF	FIELD	LOG				
GOLDBERG · ZOINO GEOTECHNICAL/GE CONSULTANTS	•	DESCRIPT	ION <u>Bu</u>	OJECT uffalo Indu NE of Kinte	2X	FIL		R5613 6-1-83	
GZA ENGINEER _ WEATHER _sunny	R. Laport	EXCA CONTRACTOR OPERATOR MAKE CAPACITY	Boyd Tony Case	EQUIPMEN & Brown Barbalato MODEL _ LYO_ REACH	580C ~14 ft.	TIM	E STAR	EV. ≃ <u>602/</u> ≃ ГЕО <u>15:</u> LETED <u>16:</u>	35
DEPTH O	SOIL	_ DES	CRIF	PTION			EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARI No.
	Topsoil & Roo Miscellaneous fragments, sc	Fill, blac				h \	E		
	bottles, tile		wood p	16663 (2 7)	. In senge	11/5	E D		
-4'-							E		
5' — XXXX							E	·	1_
7'-							E		
8, —	Silty <u>CLAY</u> , b damp, slightl			ilt lenses	throughout	,	E È		
— 10' — — 11' —	The stratific boundary betw transition ma	reen soil ar	s repre	sent the ap	oproximate ne actual				
— 13' —									
— 14' —	-	***************************************	To the same of the						_
REMARKS: <	1. Minor ground 2. Minor slough				nd South fa	ice	at ≃7.	5'.	
TEST PIT PL  1.5  NORTH  VOLUME = 10.5	BOULDER SIZE RANG CLASSIFICAT 6" - 18" 18" - 36"	COUNT  SE LETTER TON DESIGNATION A B	I I ON TRACE	OPORTIONS <u>USED</u> (TR.) 0 - 10  .E(LI.) 10 - 20  (SQ.) 20 - 35  35 - 50	F - FINE   M - MEDIU   C - COARS   F/M - FINE   F/C - FINE   V - VERY   GR GRAY	M SE TO TO	MEDIUM COARSE	D	RT SY DERATE FICULT

		TE	ST PI	T FI	ELD	LOG				
GOLDBERG	3 · ZOINO	& ASSOC., INC		PRO	JECT		TE	ST PI	T No	3
GEOTECHN	IICAL/GE	OHYDROLOGICAL	DESCRIPTION	ON B <u>uffa</u>	<u>lo Indust</u>	rial Park	FIL	_E No.	R5613	
CONSULTA	NTS		LOCATION	~400' E	ast of Ki	<u>ntex</u>	DA	TE	6-1-83	
		lu alaudu		ATION E Boyd & B Tony Bar Case	QUIPMEN rown balato _ MODEL _	580C	TIN	ME STAR	EV. <u>≃603/</u> TED <u>16:</u>	05
			CAPACITY	cu.yd	REACH _	~14 ft.	TIN	ME COMPI	LETED 16:	
DEPTH		SOIL	DESC	CRIPT	TON			EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARI No.
		Topsoil & Roo	ts					E		
	<b>*******</b>	Miscellaneous with wood pie	ces (>4"), (	concrete	pieces (	some silt, 4"-12"),		E		
2' —		and overall st	rong oil or	tar odd	or			м		1
3 —	<b>*******</b>				D		_			
4'	<b>******</b>	Frequent bric	k fragments					_		
5' —		Trequent bric.	K Tragments	-				D		
— е, —								D		
7' —		Clayey SILT, throughout, t						D		
— 8' —	<u> </u>	plastic (ML)		,,	, , , , ,	. 3 3		D		
— a, —			Bottom of I	Hole 8.8	ft.			Ď		2
10, —		The stratific boundary betw transition ma	een soil and	d rock t						
[ ]										
12'										
-13										
<u> </u>										
REMAR	—	1. Black leacha 2. Minor slough	•							
TEST	PIT PL	AN LEGEND	:	PROF	PORTIONS	IABBRE	VIA	TIONS	EXCAVA	TION
<b>+</b>	9'-+	BOULDER	COUNT		JSED	F - FINE	184		EFFO	RT
SIZE RANGE LETTER TRACE (TR.) 0 - 10% C - COACLASSIFICATION DESIGNATION							SE		E EAS	Y XERATE
1	6"-18" A  LITTLE (LI.) 10 - 20%  F/C-							MEDIUM COARSE		FICULT
NOI	NORTH 18"-36" B SOME (SQ) 20-35%   V-								ELAPSED	
VOLUME :	DLUME = $\frac{8.1}{\text{cu.yd.}}$ 36" AND LARGER C AND 35 - 50% BN YE								READING 4	G.W.L

	TE	ST PIT	FIELD I	LOG			
GOLDBERG · ZOINO	& ASSOC., INC		PROJECT	T	EST PI	T No1	4
GEOTECHNICAL/GE	•	DESCRIPTION	B <u>uffalo Industri</u>	<u>ial Park</u>   F	ILE No.	R5613	
CONSULTANTS		LOCATION _	200 ft. East of	Bailey D	ATE	5-31-83	}
GZA ENGINEER _	R. Laport	EXCAVAT	TION EQUIPMENT	Г <sub>G</sub>	ROUND EL	ev. <u>≃608/</u>	≃32
	ovovcast	OPERATOR	ny Barbalato	T	IME START	TED <u>14:0</u>	10
WEATHER		MAKECas	SE MODEL — cu.yd. REACH —	580C ~14 ft ⊤	IME COMPI	LETED 14:1	.5
DEPTH	SOIL	_ DESC	RIPTION		EXCAV. EFFORT	BOULDER COUNT QTY, CLASS.	REMAR No.
ı'	Dark brown <u>To</u> fragments	psoil & Roots	, with occasiona	l brick	E		
2'	Miscellaneous moderately pla		mottled orange,	silty clay,	E		
l ,	moderatery pro	is the damp			E		
	Miscellaneous contamination	Fill, black,	cinders with oil				
<b>4</b> ' \\\\\\\\\\\\					<u>E</u>		
5'					E		<u></u>
					E		
e			quent silt to fin ry slightly plas		E		
<del> 7' </del>							<u> </u>
8'	Silty CLAV b	rown with an	ay silt lenses.	-	E		
9'		ly plastic (C			É		
 		Bottom of Ho	10 0 0 f+				1
		ation lines r	epresent the appi				
"	transition ma		rock types. The	actual			
12'							
13'							
14'							
REMARKS:	1. Sides cut ve	rtical & rema	ined stable upon	completion	•		
							_
TEST PIT PL	AN LEGEND	<u>):</u>	PROPORTIONS	ABBREV	ATIONS		
<del>    ←</del> 9' →	BOULDER	: _ <del></del>	USED	F - FINE M - MEDIUM		<u>EFFO</u>   <sub>EEAS</sub>	
2.5'		ION DESIGNATION!	TRACE (TR) 0 - 10%	F/M-FINE T	O MEDIUM	M	DERATE FICULT
<sup>†</sup> Ø	6"-18"		LITTLE (LI.) 10 - 20%	F/C-FINE T	O COARSE	GROUNDW	
NORTH	18"-36"		SOME (SQ) 20-35% AND 35-50%	GR GRAY		ELAPSED Z	7 G.W.L
VOLUME = 8.1	_cu.yd.	RGER C		YEL YELL		IREADING 辛	

		TE	ST PIT	FIELD	L	OG			
GOLDBER	G · ZOINO	8 ASSOC., INC		PROJECT		T	EST PI	T No1	5
		OHYDROLOGICAL	DESCRIPTIO	NBuffalo Ind	lustrial	Park FI	LE No.	R5613	
CONSULTA	ANTS		LOCATION !	500' East of	Bailey	DA	ATE	5-31-83	<b>}</b>
074 ENG	-	R. Laport	EXCAVA	TION EQUIPM Boyd & Brown	MENT	GR	OUND EL	ev. ≃610/=	±34
			OPERATOR	Tony Barbalat	:0	TII	ME STAR	TED13:	15
WEATHE	R rainy		MAKE CAPACITY	Case MODE		30C TI	ME COMP	LETED 13:	55
DEPTH		SOIL	DESC	RIPTION			EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
		Topsoil & Roots	s						
ı' 2'		Miscellaneous	Fill, brown,	silty clay w	<i>ı</i> ith bri	ćk	E		
<b>)</b> _,		fragments			E		1		
3' a'		Miscellaneous	h oil	E		2			
_	$\bowtie$	Frequent bricks	s and brick t	fragments					
5'							E		<u> </u>
<u> —</u> е' —		Silty CLAY, red slightly plasti	d-brown, with ic (ML-CL)	n gray silt l	enses,	damp,	E		
7'							E		
e'							E		
9'		Silty CLAY, bro	own, occasion	nal fine sand	pocket	s, damp,	E		
10'		slightly plast					E		3_
			Bottom of Ho	ole 10.0 ft.					
12'		The stratificate boundary between transition may	en soil and r						
13'			·						
14'									
REMAR	2	l. Groundwater s 2. Black leachat 3. Minor sloughi	ewith petrol	eum odor @ =:					
TEST	PIT PL	AN LEGEND	<u>:</u>	PROPORTIO	ons I	ABBREVIA	TIONS	EXCAVA	LION
<b>↓</b> ⊬	8' -	BOULDER	COUNT	USED		F - FINE	!	EFFOR	₹T
2.5		SIZE RANG	E LETTER ON DESIGNATION	TRACE (TR.) O	- 10%	M - MEDIUM C - COARSE	_	E EAS	Y XERATE
T 2	2	6" - 18"	A	LITTLE (LI.) 10		F/M - FINE TO F/C - FINE TO			FICULT
Ои	RTH	18"-36"	В	SOME (SQ) 20	- 35% i	V- VERY GR GRAY		ELAPSED	
VOLUME		" I	TIME TO 2 READING =	G.W.L					

		7	EST	PIT	ΓF	IELD	L	.OG				
L		A ASSOC., IN	C DESC	RIPTIO		JECT alo Ind	ustria	al Park		ST PI	T <b>No</b> 1 R5613	.5A
CONSULTA	ANTS		LOCA	TION :	<u>10' We</u>	st of B	-15_		DA	TE	6-8-83	
1		R. Laport y & warm	CONTRA OPERATO MAKE _ CAPACIT	DR	ATION Oyd & ony Ba ase cuy	EQUIPM Brown rbalato MODE		OA	TIM	E STAR	EV. <u>≃601/</u> FED <u>11:</u> LETED <u>12:</u>	50
DEPTH		SO	IL D	ESC	RIP	TION		-		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
0    ı'		Black, sandy	silt, <u>Top</u>	soil &	Roots					E		
2'							_			Е		
		   Miscel <u>lane</u> ou	s Fill	arav-hi	rown	cilt wi	th vit	rified		E		1
4'		clay pipe fr contaminated	agments,							E		
5'										Ε		
6'	$\times\!\!\times\!\!\times\!\!\times$									Ε		
	XXXX									E		_
,		Miscellaneou						gments,		Ε		
8		and pieces o Lightly varv lenses (some	ed silty	CLAY,	red-b	rown, w	ith gr			Ê		
- 9 -		(CL)	J	J		-, -: · <b>J</b>				E		2
10' —			Bott	om of I	Hole 1	0 ft.						
 		The stratifi boundary bet transition m	ween soi	1 and $1$								
13'		or and reform	ay be gi	udduii								
4'												
REMAR	KC.	1 Chaunduata			7 £±							
REMAR		1. Groundwate 2. Minor slou				complet	ion.					
TEST	PIT PL	AN LEGE	ND:		1	PORTIC	)NS	ABBRE	VIA	TIONS	EXCAVA	
3'	10'-	SIZE RA	ATION DESI	— ETTER GNATION	TRACE	<u>USED</u> (TR.) 0 (LI.) 10		F - FINE M- MEDIUS C - COARS F/M - FINE F/C - FINE	E TO	COADCE	DDIFI	— Y XERATE FICULT
NO	C) RTH	18"-3	6"	В	•	(SQ.) 20		V- VERY GR GRAY	,		GROUNDW ELAPSED TIME TO \2	
VOLUME	= <u>11.1</u>	_cu.yd. 36" AND 1	ARGER	C	AND		- 50%	BN BROV YEL YEI		/	READING =	G.W.L

	TEST	PIT F	TELD L	_OG			
GOLDBERG · ZOINO & ASS GEOTECHNICAL/GEOHYDRO CONSULTANTS	DLOGICAL DESCI	RIPTION Buf TION See 10	OJECT falo Industri	al Park I	FILE No.	5-31-83	3
GZA ENGINEER R. La WEATHER sunny & wa	OPERATO	ron <u>Boyd &amp;</u> R <u>Tony Ba</u> Case	<u> </u>		TIME START	EV. <u>≃609/</u> ED <u>11:2</u> ETED <u>11:5</u>	25
DEPTH O	SOIL DE	SCRIP	TION		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
ı' <u>Misce</u>	llaneous Fill, or rs (> 2 ft. long )				E E		
Chang	e to silty clay	E					
	y <u>SILT</u> , brown w tlyplastic (ML)	E		1_			
6'—		E					
	& <u>CLAY</u> , tan, tra ic (ML-CL)	ace fine sa	nd, damp, sli	ghtly	E		
9' —					E		
IO,	Botto	om of Hole	10 ft.		E		
bound	tratification lary between soi	l and rock					
13' 14'							
REMARKS: 1. Gro	undwater seepage	e @ ~ 4.5 f	t.		1		
3' O NORTH	LEGEND:  BOULDER COUNT  SIZE RANGE LE  CLASSIFICATION DESI  6"-18"  18"-36"  36" AND LARGER	T   TTER   TRACE GNATION   LITTL	DPORTIONS USED  (TR.) 0 - 10% E(LI.) 10 - 20% (SQ.) 20 - 35% 35 - 50%	F - FINE M - MEDIUM C - COARSE F/M - FINE F/C - FINE V - VERY GR - GRAY	TO MEDIUM TO COARSE	D — DIF GROUNDW ELAPSED _	RT SY DERATE FICULT

		TE	EST	PIT	FIE	LD	LOG				
GOLDBER	G · ZOINO	& ASSOC., INC			PROJE					T No	6A
		OHYDROLOGICAL	DESC	RIPTIO	N <u>Buffa</u>	lo Indus	strial Park	FIL	_E No.	R5613	
CONSULTA	ANTS				ee locat			DA	TE	6-8-83	
GZA ENG	INEER _	R. Laport	CONTRAC	CTOR _	TION EC Boyd & B	UIPMEN rown	NT	GR	OUND EL	EV. <u>≃608/</u>	<u>≃32</u>
		y & warm	OPERATO	OR	Tony Bar Case	<u>model</u> _	310A			TED 10:	
			CAPACITY	Υ	cu.yd,	REACH _	~14 ft_	T18	ME COMP	LETED 10:3	<del>//</del>
DEPTH		SOIL	_ D	ESC	RIPTI	ON			EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARI No.
0	$\times\!\!\times\!\!\times\!\!\times$	Miscellaneous	Fill,	brown,	with br	icks, b	rick fragme	ents	,		
'		and wood frag	nents						, E		<u> </u>
2'	$\bowtie$								E	_	<u> </u>
3'	$\bowtie$								E		
<b>A'</b>									E		
_,									М		
5		Layer of black	"tar"	fill					М		1
— 6' —		Varved clayey	SILT,	tan-bro	own, wit	n black	discolorat	ion			-
7'		along gray sil					1) (ML)		М		<del> </del>
8'			BOT	tom or	Hole 7.	).					2
9'		The stratification	en soi	1 and 1	epresent rock type	the app	proximate e actual		•		
		transition may	be gr	adua!.							
10'											
— 12' —											
<u> </u>	.										
<u> </u>	.										
REMAR	RKS:	1. Black leacha	te flo	wina in	to the h	nla 0 ~	10 gpm fro	ım ~	5 O f+		
	;	2. Moderate to	severe	slough	ing of s	ides du	ring excav	atio	on.	•	
TEST	PIT PL	AN LEGENO	<u>):</u>	ļ	PROPO	RTIONS	LABBRE	VIA	TIONS	EXCAVA	TION
1 +-	8'	BOULDER	COUN	<u>T</u>	<u> </u>	ED	F-FINE	164		<u>EFFO</u>	_
3 2		SIZE RANG CLASSIFICAT	SE LE	TTER	TRACE (TE		% C - COAR	SE	MEDILIM		DERATE
1 (	3	6"-18"		A	LITTLE (L		F/C-FINE	E TO		GROUNDW	FICULT VATER
1	RTH	18" - 36"		В	SOME (SO	1) 20-35 35-50	GR GRA	Y		ELAPSED TIME TO 12	7 G.W.L
VOLUME	= 6.2	_cu.yd. 36" AND LAR	KGER	С	LAND	<i>35 -</i> 50	YEL YE		N	READING (HRS.)	, J.W.L

	TEST PI	T FIELD	LOG			
GOLDBERG - ZOINO & ASSOC		PROJECT	l l		T No1	7
GEOTECHNICAL/GEOHYDROLO CONSULTANTS		ON Buffalo Indust	_			
	LOCATION	See location p		ATE		
GZA ENGINEER R. Lapor	CONTRACTOR	/ATION EQUIPMEN Boyd & Brown Tony Barbalato	G.		ev. <u>≃607/</u> red <u>9:1</u>	
WEATHER <u>overcast</u>		Case MODEL — cu.yd. REACH —			ETED 9:2	
	SOIL DES			EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARK No.
Topsoil	& Roots					
		, sand and silt wi concrete blocks (		E		
2' and wood	pieces > 3' long			E		<u> </u>
				E		
				Ε		
XXXXXXX oil or t		, silt, contaminat	ted with	E		1
5' XXXXXX Sandy SI	LT tan, little cl	ay, damp, very sli	ghtly	l E		<u> </u>
	ILT, tan-gray, li	ttle fine sand, da	mp, very			
	plastic (ML)			E		
8, 111111				E		
	ROTTOM OF	Hole 8 ft.		-		
boundary		represent the apport of the rock types. The				
'''	v					
12'						
13'						
14'						
	ater seepage @ 5. loughing of sides	O ft. during excavation	n.	•		
TEST PIT PLAN LE	GEND:	PROPORTIONS	I <u>ABBREVI</u>	ATIONS	EXCAVA	TION
1 <del></del>	JLDER COUNT	USED	F - FINE		<u>EFFO</u>	
4 CLAS	ZE RANGE LETTER SSIFICATION DESIGNATION	TRACE (TR.) 0 - 10	C - COARSE	) MEDIUM		DERATE
† ①   .	6"-18" A	LITTLE (L1.) 10 - 20'   SOME (SQ.) 20 - 35'	%   F/C - FINE TO	O COARSE	GROUNDW	FICULT ATER
NUKIN	8"-36" B AND LARGER C	AND 35 - 50	GR GRAY		ELAPSED TIME TO READING (HRS.)	G.W.L

		TE	ST PI	T FIEL	D L	OG				
	NICAL/GE	& ASSOC., INC	LOCATION	PROJECT ON Buffalo II See location	ndustri <u>a</u> n plan _	1 Park	FIL DA	E No.	R5613 5-31-83	3
		R. Laport ny & warm	EXCAV CONTRACTOR OPERATOR MAKE CAPACITY	ATION EQUIF Boyd & Brown Tony Barbal Case MOD CUYD. REA	DEL	30C 4 ft.	TIM		EV. <u>≃606/</u> ° FED <u>12:</u> _ETED <u>12:</u>	
DEPTH — 0 —		SOIL	_ DESC	CRIPTIO	N			EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARK No.
ı'		Miscellaneous metal, brick f						E		
2'								E		<u> </u>
3'						_		E		<u> </u>
4'		Miscellaneous	Fill, gray,	<u>clayey</u> si <u>lt</u>			_	E _		1
5'		Miscellaneous damp	Fill, fine	sand, brown,	trace g	ravel,		E		
— 6' —		danip						E _		
7'			Bottom of	Hole ≃ 7 ft.				E		
— 8' —		The stratifica boundary betwe transition may	tion lines en soil and	represent the				-		
— 10' —			20 g. acua.	•						
11'	 									_
   12'										
   13'										
   14'										
REMA	_	. Groundwater s . Severe slough			sides du	ue to the	e f	ine sar	nd layer.	
4' (NO	PIT PL 8'  D RTH = 8.3	BOULDER SIZE RANG CLASSIFICAT 6"-18" 18"-36"	COUNT  E LETTER  TON DESIGNATIO  A  B	SOME (SQ) 2	0 - 10% 0 - 20%	F - FINE M - MEDIUI C - COARS F/M - FINE F/C - FINE V - VERY GR GRAY BN BROW YEL YEL	M SE TO TO	MEDIUM COARSE	D	RT SY DERATE FIGULT

		TE	ST	PI.	T F	HEL	.D	LO	G				
GOLDBERG · ZO GEOTECHNICAL. CONSULTANTS		OLOGICAL	LOCA	TION	ON Buf RR	embani	Indust ment		Park	FIL DA	E No.	R5613 6-2-83	20
GZA ENGINEE WEATHER _S		rm	ECONTRAC OPERATO MAKE CAPACITY	OR	Tony B Case	arbala Mo	ato DEL _ ACH _	580 ~14	C ft.	TIM	E START	EV. <u>≃613/</u> TED <u>11</u> LETED <u>11</u>	:00
DEPTH — 0 —		SOIL	_ D	ESC	RIP	OIT	N				EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARK No.
0	Topso	il & Root	S								E-M		
_ '	Misce	llaneous	<u>Fill</u> ,	black	, cind	ers	,			Ī	E-M	_	
3' —	XX sand,	llaneous trace files s of shale	ne-med	red-bi ium gr	rown, ravel,	silt a with	and cl	av. 1 fragm	iaht ents,		E-M		
4'	XX prece	s or share	<b>-</b>								E-M		
5' —	$\bowtie$	Cross	Secti	ion of	R.R.			.aint	for	-	М		-
— е' —		R.R.				depth	ence p s (on B1	log) lack d	cinder		M	3	
7' —	Emb.	ankment - Soil	+	13'	,		Z	(FII	LL)		<u>E-M</u> E-M		
8, —				流	+	3000				ţ	E-M		
- 10' - XX				•	ve gre		<b>グ</b> 利 1 t				E~M		
	$\bowtie$	*Not	to sca	ale							E-M		1
12'-		olive groek									E-M		
- 13' -											E-M		
14'			Botto	m of h	dole ~	13 ft	:.				E-M		
REMARKS:	1. 0	ght groun ere sloug						ion.					<u> </u>
TEST PIT	<u>PLAN</u> → 1 2 5.3 cu.yd.	LEGEND BOULDER SIZE RANG CLASSIFICATI 6"-18" 18"-36" 36" AND LAR	COUN E LE ON DES	ETTER	I I NITRACE	<u>USE</u> (TR.) LE (L1.)	O - 10° 10 - 20° 20 - 35° 35 - 50°	F   M   C   F   F   F   F   F   F   F   F   F	BBRE - FINE - MEDIU - COARS /M - FINE /C - FINE - VERY N BROV EL YE	M SE TO TO	MEDIUM COARSE	GROUNDY ELAPSED _	RT SY DERATE

	TE	ST PIT	FIELD	LOG			
	ZOINO & ASSOC., INC CAL/GEOHYDROLOGICAL TS	DESCRIPTION	PROJECT Buffalo Indust embankment	rial Park	TEST PITELLE No.	T No. <u>21</u> <u>R5613</u> 6-2-83	
l .	NEER R. Laport	EXCAVATI CONTRACTOR BOYO OPERATOR TONY MAKE CAPACITY	ON EQUIPMEN 1 & Brown 7 Barbalato 2 MODEL — CUYOL REACH		TIME START	EV. <u>≃616/</u> TED <u>12:</u> LETED <u>13:</u>	: 35
DEPTH	SOII	DESCR			EXCAV. EFFORT	BOULDER COUNT QTY, CLASS.	REMAR No.
	Topsoil & Root	<u>:s</u>			E		
2'	Miscellaneous	Fill, black, ci	inders	. <u></u> -	E		
3, —		Fill, red-browr ravel, little sa		little	E		
4'					E		1
5 — 6 · — ×	Cros:	s section of R.	R. Embankment		E		
'\			Reference podepths (on		E	_	
в, —	R.R.			ck cinder	E		
a, —	Embankment — Soil	16'		FILL	E		
10, —			10		E		
12'	*No.t	to scale			E		
13' —		to scare			E		_
14' -		Bottom of Hole		•	E		2
REMAR	-	collected for te loughing of side			cavation.		
TEST P        10  3'  NOR  VOLUME =	SIZE RANG CLASSIFICAT 6"-18" TH	COUNT  GE LETTER FION DESIGNATION TR  A LI  B SO	PROPORTIONS  USED  RACE (TR) 0 - 109  TTLE (L1.) 10 - 209  OME (SQ) 20 - 359  ND 35 - 509	F - FINE M - MEDIUM C - COARS F/M - FINE F/C - FINE V - VERY GR - GRAY	M E TO MEDIUM TO COARSE	D — DIF GROUNDW ELAPSED _	RT SY DERATE

7	EST PIT FIELD LOG			
GOLDBERG · ZOINO & ASSOC., IN	PROJECT	TEST PI	T No	25
GEOTECHNICAL/GEOHYDROLOGICA		FILE No.	R5613	
CONSULTANTS	LOCATION ~ 300' E of Chem. Bank	DATE _6	5-1-83	
GZA ENGINEER _R. Laport	EXCAVATION EQUIPMENT  CONTRACTOR BOYD & Brown		ev. <u>≃603/</u>	
WEATHER <u>overcast</u>	OPERATOR Tony Barbalato  MAKE Case MODEL 580C		TED <u>14:</u> LETED <u>14:</u>	
<del></del>	CAPACITY cu.vd. REACH ~14 ft	TIME COMP	BOULDER	T
DEPTH SO	IL DESCRIPTION	EXCAV. EFFORT	COUNT QTY. CLASS.	REMAR No.
Topsoil & R	oots, black, fine-medium sand with brick concrete (2' long x 2' in diameter)	E		
		E		
2' Miscellaneo	us Fill, red-brown, silty clay, with rust			<del> </del>
	ustrial fill between 2' & 2.5'	E		
		E		1
	, brown, with gray silt to fine sand lens damp, slightly plastic (ML)	ses E		
e'		E		
		Е		
		E		
g' Fine sandy	SILT, brown, trace clay, with frequent	→ E		
gray silt l	enses, damp, very slightly plastic (ML-SM	4) E		
10'				2
L <sub>10</sub> - 1	Bottom of Hole @ 9.7 ft.			
boundary be	ication lines represent the approximate tween soil and rock types. The actual may be gradual.			
'-				
13'			_	
4'				<del>                                     </del>
REMARKS: 1. Minor ground 2. Minor sloug	water seepage. ling of sides upon completion of excavation	on.		
TEST PIT PLAN LEGE	ID: PROPORTIONS LABBRE	VIATIONS	EXCAVA	TION
↓ <del>  </del> 9' →   BOULDE	R COUNT USED F-FINE		<u>EFFO</u>	RT
	ATION DESIGNATION	SE TO MEDIUM		SY DERATE FICULT
6"-11	" B SOME (SQ.) 20-35%   V- VERY		GROUNDW ELAPSED	
NORTH 18 - 3 VOLUME =8cu.yd.	GR GRAY	٧N	TIME TO IREADING (HRS.)	ZG.₩.L

		TE	ST PIT F	IELD L	.OG			
GOLDBER	G · ZOINO	& ASSOC., INC	PRO	JECT	TE	ST PI	T No2	6
l		OHYDROLOGICAL	DESCRIPTION Buf	falo Industri	al Park FII	LE No.	R5613	
CONSULTA		v	LOCATION Btwn. C	hem.Bank & Su		TE		
CZA ENC	INEED	R. Laport	EXCAVATION SONTRACTOR BOYD &	EQUIPMENT	GR	OUND EL	ev. <u>≃604/</u> ≃	28
			PERATOR	<u>arbalato</u>	TIN		TED 13:	
WEATHE	R		ARKE Case		14 tt. TIM	ME COMP	LETED <u>14:</u>	10
DEPTH		SOIL	DESCRIP	TION		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
ı'			Fill, sand and gr			D		
2'		Di Tek Trugillen	3 till oughout			E-M		
3' —						E		
4'			Fill, dark brown, ck oil contaminate		with	E		1
5'		pockets of bit	CK Off corroumtha st	3011		E		3
6'						E		_
 						E		
 						E		2
— 9' —			wn, some clay, wi p, very slightly		tan	Ė		
10' —								
			ottom of Hole @ 1	0.0 ft.				
— 12' —		boundary betw	ation lines represent the approximate een soil and rock types. The actual					
13'		transition ma	be gradual.					
13								
14 -								
REMAR		2. Minor grounds	into test pit @ ater seepage @ = & foundation @ = 4.	8.0 ft.		st pit	•	
TEST	PIT PL	AN LEGEND	PRO	PORTIONS	ABBREVIA	TIONS		
<u> </u>	10' <del></del>	BOULDER	COUNT	USED	F - FINE		EFF0	
4'		SIZE RANG	LETTER TRACE	(TR.) 0 - 10%	C - COARSE		E EAS   M MOD	Y XERATE
T (	<del>-</del>	6" - 18"		E(L1.) 10 - 20%	F/M -FINE TO	COADCE		FICULT
NO	RTH	18"-36"	- :	(SQ) 20-35%	V- VERY GR GRAY		ELAPSED	_
VOLUME	= 14.8	cu.yd. 36" AND LAR	ER C AND	35 - 50%	BN BROWN YEL YELLOV	w	TIME TO PER ADING HRS.)	G.W.L

	٦	EST F	PIT	FIEL	_D	LOG				
	G · ZOINO & ASSOC., IN NICAL/GEOHYDROLOGICA INTS		TION !		Indust	rial Park	FII	EST PI LE No.	T No	<u> </u>
	INEER R. Laport R sunny & warm	EXC CONTRACTO OPERATOR MAKE CAPACITY	R <u>_Воу</u>	y Barba E <b>M</b> o	vn	580C ~14 ft.	TIM	ME STAR	EV. <u>≃602/</u> TED <u>15</u> LETED <u>15</u>	: 05
DEPTH	SC	IL DE	SCRI	PTIC	N			EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARI No.
	Asphalt Coarse gray	el and crus	hed sto	one (roa	nd sub-t	oase)		E		
— ı' — — 2' —	<del>*************************************</del>	us <u>Fill</u> , bl				<del>-</del> _		E		
3'								E		
4'	- 3" thick	pieces of w	bood					E		
5'		, brown, li						E		1
— e, —	gray silt          plastic (Mi	enses throu .)	ighout,	damp, v	ery si	ightly		E		
7'								E		
e'								E		
9'								E.		
٠٥,								E		2
10, —		Bottom of	Hole	9.8 f	t.					
11'   12'	boundary be	ication lir tween soil may be grad	and ro		, ,					
13' —										
<b>4</b> '										
REMAR	KS: 1. Groundwate	r flowing @	) ~ 2 a	om from	Southea	ast corne	r o	l f test	Dit.	
	@ 4.5 ft. 2. Minor slou	•	-	'						
3' NO	SIZE R	COUNT ANGE LETTE CATION DESIGNA B" A 66" B	ER TRA	ROPOR USE ACE (TR.) TLE (LI.) ME (SQ.) D	D 0 - 10% 10 - 20%	F - FINE M- MEDIL C - COAR F/M - FINI P   F/C - FINI GR - GRA	JM SE E TO E TO Y	MEDIUM COARSE	D	RT SY DERATE FICULT

ELAPSED TIME TO IREADING (HRS.)

TE	ST PIT	FIELD	LOG			
GOLDBERG · ZOINO & ASSOC., INC GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	DESCRIPTION	PROJECT Buffalo Indus 200 ft. S. of	Kintex	TEST PI FILE No. DATE	1 140	28
GZA ENGINEER R. Laport WEATHER sunny & warm	OPERATORIO	ION EQUIPMEN yd & Brown ny Barbalato se	580C ~14 ft.	TIME STAR	EV. <u>≃598/</u> TED <u>15</u> LETED <u>16</u>	:40
DEPTH SOIL	DESCR	IPTION		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARK No.
Topsoil & Roc	fill, black,	gravel and cru	shed stone	E		
Miscellaneous	Fill, tan-bro	wn, fine-mediu		ı E		
3'Clayey <u>SILT</u> , fine sand, ar	gray-brown, oc d lenses of gr	casional pocke	ets of tan slightly	E		1
				E		
5'				E E		
	CLAY, red-brownses throughout			E		
(CL)	ises throughout	, damp, siight	ly plastic	E		
- 9' - ////				E		
10'	Bottom of Hole	- e @ 10.0 ft.		E		ļ .
	cation lines re ween soil and m		oproximate ne actual	E		2
transition ma	ay be gradual.					
REMARKS: 1. Groundwater : 2. Sides cut ver						ı
TEST PIT PLAN  LEGENT  BOULDER  SIZE RAN  CLASSIFICAT  6"-18"  NORTH  VOLUME = 8.3 cu.yd.	COUNT  GE LETTER TON DESIGNATION L  B	PROPORTIONS <u>USED</u> RACE (TR.) 0 - 10  .ITTLE (LI.) 10 - 20  .OME (SQ.) 20 - 35  AND 35 - 50	F - FINE M - MEDIUI C - COARS F/M - FINE F/C - FINE V - VERY GR GRAY	M SE TO MEDIUM TO COARSE	DDIF GROUNDW ELAPSED	RT SY DERATE FICULT

ELAPSED TIME TO READING (HRS.)

	TEST	PIT	FIELD	LOG			
GOLDBERG · ZOINO & A GEOTECHNICAL/GEOHYD CONSULTANTS	PROLOGICAL DES	CRIPTION E	ROJECT Buffalo Indus			T No29 	
GZA ENGINEER _ R. WEATHER _ sunny & v	ODEDA	tor <u>Tony</u> Case	ON EQUIPME 1 & Brown 2 Barbalato 3 MODEL CUYOL REACH	580C - 14 ft.	TIME STAR	EV. ~599/~ TED <u>16:</u> LETED <u>16:</u>	20
DEPTH	SOIL [	DESCR	IPTION		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARK No.
ı'	osoil & Roots scellaneous Fill ilroad tie (~ 6		cinders, with	n old			
	scellaneous Fill ne clay, with ci						1
5'	scellaneous Fill	_, black,	cinders				
<del>fi</del> i	LT, brown, some ne sand, gray s ry slightly plas	ilt to find			•		
		om of Hole	10.0 ft				2
bo	e stratification undary between s ansition may be	n lines reg	present the a	approximate he actual			
	ight groundwate nor sloughing o			n.	•		
TEST PIT PLAN        8'   -     3.5'	CLASSIFICATION DE 6"-18" 18"-36"	NT   TENT	USED  ACE (TR) 0 - 10  TTLE (LI.) 10 - 2  DME (SQ) 20-3  ND 35-5	F - FINE   M - MEDIL   C - COAR   F/M - FINI   O%   F/C - FINI   V - VERY   GR GRA	E TO MEDIUM E TO COARSE Y	EFFO  E — EAS  M — MOI  DIF  GROUNDW  ELAPSED	RT SY DERATE FICULT

		TE	ST PIT	FIELD	LOG			
GOLDBER	RG · ZOINO & AS	SOC., INC		PROJECT		TEST PI	T No3	0
	NICAL/GEOHYDR	-	DESCRIPTIO	N Buffalo Indust	<u>rial Par</u> k F	ILE No.	R5613	
CONSULTA			LOCATION	R.R. embankment	·	DATE	6-2-83	
		l anont	EXCAV	TION EQUIPMEN	T G	ROUND EL	ev. <u>≃611/</u> :	<del></del> ≃35
			CONTRACTOR	ony Barbalato			TED	
WEATHE	R _sunny & w	arm (	MAKE( CAPACITY	Case MODEL — CU.Yd. REACH —	580C ~14 ft_	TIME COMP	LETED <u>15</u>	:35
DEPTH	R.R. e	SOIL	DESC	RIPTION Berm adjac	ent to embar	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
├ o ─	Тор	soil & Roo	ts					
1'		cellaneous brick fra		, cinders with s	and, gravel	• E		
2'		Drick ira	gments			E		
						l E		
3,	Bro	wn fine sa	nd	Miscellaneo				
a'	Red	-brown sil	tv clav.	black, cind 1 "B" sized	lers   boulder.	E		
, E'	lit		coarse gravel			E		
5						E		
— 6 —				'		Е		
7' —	₩₩	Cros	s Section of	F R.R. Embankment	& Berm			_
в'	<b>XXXXX</b>		Res	Reference p	point for	E		<u> </u>
٠,				depths (on Bi	logj lack cinder	Ė		
<b>— 9</b> —	Emt	R.R. bankment —		T	(FILL)	E		
10, —		Soil	13'	9'		E		
- 12' -	<b>******</b>		<del></del>	- 10 <del></del>		E		-
13'	KXXXXXX		Bottom of F	Hole ~ 13 ft.		<del>-</del>		
14'-								
REMA	RKS: 1. Moc Note:	derate-seve Depths es	ere sloughin stimated due	g of sides during to sloughing.	g excavation	of test	; pit.	
TEST	PIT PLAN	LEGEND	<u>:</u>	PROPORTIONS	ABBREV	IATIONS	EXCAVA	TION
1 1	10'	BOULDER	COUNT	USED	F-FINE		EFF01	
4'		SIZE RANG CLASSIFICATI	E LETTER ON DESIGNATION		% C - COARSE	O MEDIUM		DERATE
1	<del></del>	6" - 18"	A	LITTLE (LI.) 10 - 20	/ F/C - FINE T	O OOADOE	D DIF	FICULT ATER
NC	ORTH	18"-36"	В	SOME (SQ) 20-35	GR GRAY		ELAPSED	7 G.W.L
VOLUME	= <u>15.6</u> cu.yd.	36" AND LAR	GER C	AND 35 - 50°	%   BN BROWN YEL YELL	.ow	TIME TO READING (HRS.)	- J.W.L

	TE	ST PIT	FIE	LD L	.OG				
GOLDBERG · ZOINO & A	SSOC., INC		PROJE	CT	T	TES	T PI	T No32	2
GEOTECHNICAL/GEOHYD	-	DESCRIPTIO	N <u>Buffal</u>	<u>Industr</u>	<u>ial Par</u> k	FILE	E No.	R5613	
CONSULTANTS		LOCATION	See <u>locat</u>	ion plan		DAT	Έ	6-2-83	
GZA ENGINEERR.	Lanort	EXCAVA CONTRACTOR B	TION EQU	IPMENT	<u> </u>	GROU	JND ELI	ev. <u>~601/</u>	<u>≃25</u>
WEATHER & w		OPERATORI	ony Barba	lato	E000			TED13:	
WEATHER _Suffry & W	<u>ra i i i i i i i i i i i i i i i i i i i</u>	MAKEC CAPACITY	<del></del>	IODEL	580C ~14 ft.	TIME	COMPL	ETED 13:	30
DEPTH	SOIL	DESC	RIPTIO	N			EXCAV.	BOULDER COUNT QTY. CLASS.	REMARI No.
Тор	soil & Roo	ts							
	scellaneous ushed stone	Fill, black	, gravel	with cind	ers and		Ε		
_ 2'	frequent br	ick fragment	S			-	E		
		Fill, gray,				_	Ε		1
4'-	ay with woo	d fragments,	pieces o	rock (>	3")		E		
5' Lay	ver of oil	or tar conta	minated g	ravelly f	i11	=	М		
	lty <u>CLAY</u> , g astic (CL)	ray-brown, t	race sand,	damp, mod	derately		М		
							М		
	naterial be	comes stiffe	r				М		
							Ņ		
	1						М		2
10'		Bottom of Ho	le 0 9.8	ft.		$\vdash$			
bou	undary betw	ation lines een soil and	rock type						
- 12' tra	ansition ma	y be gradual	•						
<u> </u>									
4'						┝			
		lowing into		@ ~ 2 gpm	from Eas	st &	West		
I		pth of $\sim 2.7$ whing of side		mpletion					
TEST PIT PLAN	LEGEND	:	PROPOR	TIONS	ABBRE	VIAT	IONS	EXCAVA	TION
↓ <del> </del> ← 9.5 ← <del> </del>	BOULDER		<u>uşı</u>	<u>ED</u>	F-FINE		<u> </u>	EFFO	
3.	SIZE RANG		I  TRACE (TR.)	0 - 10%	C - COARS	Ε	 	E — EAS	Y ERATE
T TO	6"-18"	A PESIGNATION	LITTLE (LI.)	10 - 20%	F/M - FINE		AADOE I		FICULT
NORTH	18"-36"	В	SOME (SQ)		V- VERY GR GRAY			ELAPSED	
VOLUME = 10.3 cu.yd.	36" AND LAR	GER C	AND	35 - 50%	BN BROW YEL YEL			TIME TO READING (HRS.)	G.W.L

		TE	ST F	PIT I	FIELD	L	.OG				
1	G · ZOINO & AS NICAL/GEOHYDI NTS	-		PTION Bu	OJECT ffalo Inc			FIL	ST PI' E No.	T No. <u>3</u> R5613 6-2-83	
	INEER R.	ild	EXC CONTRACTOR OPERATOR MAKE CAPACITY	AVATION R Boyd Tony Case	N EQUIPN & Brown Barbalat	MENT	580C ~14 ft	GRO	UND ELI	EV. ~602/~ TED	35
DEPTH	-	SOIL	_ DES	SCRIF	PTION				EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARI No.
0 ı' 2'	Mis cru Mis	soil & Roo cellaneous shed stone cellaneous tar odor	Fill, bl	of wood					E E		
3' 4'	Mis	cellaneous taminated							E E E		1
5 6' 7' 8'		ty <u>CLAY</u> . b oughout, d					enses		E E E		2
— 9' — — 10' — — 12' — — 13' — — 14' —	bou	stratific ndary betw nsition ma	een soil	nes repre and rocl	esent the	appro			E		2
REMAR	fac	undwater w es of test t walled c	pit @ a	depth o	$f \sim 3 ft.$		@ ~ 2 gpr	m fr	om Eas	t & South	1
3' NO	PIT PLAN  8' —    RTH  8.4 cu.yd.	LEGEND BOULDER SIZE RANG CLASSIFICATI 6"-18" 18"-36" 36" AND LARG	COUNT E LETTE ON DESIGNA A B	I ER TION TRACE	OPORTIC <u>USED</u> E (TR) O LE(LI) IO : (SQ) 20 35	- 10% - 20%	F - FINE   M - MEDIUI   C - COARS   F/M - FINE   F/C - FINE   V - VERY   GR GRAY	M SE TO N TO C	MEDIUM   COARSE	DDIFI GROUNDW ELAPSED	RT SY DERATE FICULT

	TEST PIT FIELD LOG			
GOLDBERG ZOINO & ASSOC.,	INC PROJECT		T No3	4
GEOTECHNICAL/GEOHYDROLOGIC	D CC-1- Industrial David	FILE No.	R5613	
CONSULTANTS	LOCATION See location plan	DATE	6-2-83	
GZA ENGINEER R. Laport	EXCAVATION EQUIPMENT CONTRACTOR BOYD & Brown		.ev. <u>~606</u> /	
WEATHERsunny	OPERATOR Tony Barbalato  MAKE Case MODEL 580C		TED 9:0	
WEATHER	CAPACITY MODEL MODEL REACH	TIME COMP	LETED 9:3	30
	OIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAI No.
100S011 &				
- I' - XXXXX Miscerian	eous Fill, black, gravelly sand	E		<del> </del>
2' Change to	:_light brownsand	E		
- (XXXXXXXI <u>Miscellan</u>	eous Fill, sand and silt with wood and			
3' brick fra	gments	E		1
	ayey <u>SILT</u> , brown, occasional fine sand amp, very slightly plastic (ML)	E	-	
		E		
_ 5				
— 6' — Varved si	lty CLAY, red-brown with gray silt lenses	E		-
(some hig	h angle), damp, slightly plastic (CL)	E		
8'		E		
9,		Ε		2
3 -	Bottom of Hole 9.0 ft.			
boundary	ification lines represent the approximate between soil and rock types. The actual			
transitio	n may be gradual.			
— 12' —				
— 13' —				
14'				
	er seeping into test pit @ ~ 3 ft. ughing of side walls upon completion.	•	•	
TEST PIT PLAN LEGE	ND: PROPORTIONS ABBRI	EVIATIONS	EXCAVA	TION
<u> </u>	DER COUNT USED F-FINE	LIM .	<u>EFF⊕1</u>	
2.5 CLASSIF	RANGE LETTER TRACE (TR.) 0 - 10% C - COARTICATION DESIGNATION			ERATE
1 ' (4)	18" A   LITTLE (LI.) 10 - 20%   F/C - FIN	E TO COARSE	GROUNDW	FICULT ATER
NORTH 18"-	GR GRA	Y WN	ELAPSED TIME TO 2	7 G.W.L
VOLUME = $\frac{7.5}{\text{cu.yd.}}$ and	LARGER C   AND 35 - 50%   BN BRO		READING 4	F 3.4.L

	TE	EST PI	r FIELD	LOG			
GOLDBER	G · ZOINO & ASSOC., INC		PROJECT		TEST	PIT No	35
GEOTECH	NICAL/GEOHYDROLOGICAL	DESCRIPTIO	N <u>Buffalo</u> Inc	dustrial Park	FILE N	No. R5613	
CONSULTA	ANTS	LOCATION N	lear S.Ogden;	<u>50'S of RRE</u> mt	DATE .	6-2-83	
1	INEER R. Laport		ATION EQUIPM Boyd & Brown onv Barbalato		GROUND TIME ST	ELEV. <u>~605/</u>	′≃29 : 30
WEATHE	R sunny & cool	T. T	ase MODEL cu.yd. REACH			MPLETED 9:	00
DEPTH	SOII		RIPTION		EXC/ EFFO	AV. BOULDER	REMAR
  ı'	Miscellaneous	Fill, black	gravel and c	inders	E		
2'	<u>Miscellaneou</u>	s Fill, black	c, silty sand		E		
3'					E		
4'	Miscellaneous metal, orange	Fill, gray,	gravelly san	d with scrap	E		
٠, ا			very slightly	plastic (ML)	E		
6'			rown with gray amp, slightly				
7'					Е		ļ
8'					М		
— 9' —		Pottom of I	1010 0 0 ft		м		1,2
		BOLLOIII O1 F	Hole 8.8 ft.				
— 10' — — 11' —		ween soil and	represent the I rock types.				
12'							
<u> </u>							
   i4'							
REMAR	RKS: 1. No groundwate 2. Sides cut ver			oon completio	n of tes	st pit.	
<u>↓</u> <del> ←</del> 8 2.75	6"-18" RTH 18"-36"	COUNT  E LETTER ON DESIGNATION A B	LITTLE (LI.) 10 -   SOME (SQ.) 20-	F - FINE   M - MEDIUI   C - COARS   F/M - FINE   20%   F/C - FINE   35%   V - VERY   GR - GRAY	M SE TO MEDIU TO COARS	ELAPSED	RT SY DERATE FICULT VATER
VOLUME :	= 7.6 cu.yd. 36" AND LAR	GER C	AND 35 -	50%   BN BROV YEL YEI	_	READING (HRS.)	G.W.L

	TE	ST PIT	FIELD	LOG				
	S · ZOINO B ASSOC., INC IICAL/GEOHYDROLOGICAL NTS	LOCATION Se	PROJECT Buffalo Indus e location pla	an	FIL		T No3 R5613 5-31-83	
		EXCAVAT CONTRACTOR BO OPERATOR TO MAKE CAPACITY	ny Barbalato_	580C ~14 ft	TIM	E STAR	EV. <u>≃607/</u> 2 TED <u>10:</u> LETED <u>11:</u>	55
DEPTH	SOIL	DESCF	RIPTION			EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARK No.
ı' 	Topsoil & Roo Miscellaneous fragments	ots Fill, black,	sand and silt	with brick		E E		
3'	Change to: g	ranular fill				E		ļ
4'	Clayey SILT, plastic (ML)	light br <b>o</b> wn,	damp, very sl	ightly		E E		
6' 7'	Varved silty plastic (CL)	CLAY, red-bro	wn, damp, sli	ghtly		E E		
— 10' — — 8' —	- pocket of t	tan clayey s <b>il</b>	t			E E E		1,2
— 11' — — 12' — — 13' — — 14' —	boundary betw	Bottom of Holcation lines reveen soil and my be gradual.	epresent the s			E		
REMAR	KS: 1. No groundwat 2. Sides cut ve			oon completi	on o	of exca	vation.	
3' NOF	6"-18"	COUNT  E LETTER ION DESIGNATION  A  B	PROPORTION USED  TRACE (TR.) 0 - II LITTLE (LI.) 10 - 2 SOME (SQ.) 20- 3 AND 35- 5	F - FINE M - MEDIL C - COAR F/M - FINI	JM SE E TO E TO Y	MEDIUM COARSE	D	RT SY DERATE FICULT

## TEST PIT FIELD LOG 38 TEST PIT No. \_ **PROJECT** GOLDBERG · ZOINO & ASSOC., INC DESCRIPTION Buffalo Industrial Park R5613 FILE No. GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS See location plan 6-1-83 LOCATION DATE EXCAVATION EQUIPMENT ACTOR Boyd & Brown Tony Barbalato GROUND ELEV. ≃608/≃32 GZA ENGINEER \_\_\_ R. Laport CONTRACTOR 8:30 TIME STARTED **OPERATOR** WEATHER sunny & cool 5800 TIME COMPLETED 9:00 MAKE Case MODEL 14 cu.yd. CAPACITY REACH BOULDER EXCAV. REMARK DESCRIPTION SOIL DEPTH COUNT **EFFORT** No. QTY. CLASS. - 0 Topsoil & Roots Ε Miscellaneous Fill, brown, sandy silt with numerous bricks, large pieces of concrete (6"-36") A & B Ε F 1 3 Miscellaneous Fill, black granular material contaminated with oil Ε Miscellaneous Fill, dark brown, silty sand with pockets of black oil contaminated soil Ε 2 - 5' E 6 Clayey SILT, light brown, occasional pockets of tan fine sand, damp, very slightly plastic (ML) Ε 7' Ε - 8' Varved silty CLAY, red-brown with occasional Ε fine sand pockets, damp, slightly plastic (CL) - 9' Bottom of Hole 9.0 ft. - 10, -The stratification lines represent the approximate - 11' boundary between soil and rock types. The actual transition may be gradual. - 12' -— I3' -- 14' -REMARKS: Moderate sloughing of side walls between 2.0 % 2.8 ft. Groundwater seepage @ 5.1 ft. TEST PIT PLAN LEGEND: **PROPORTIONS** ABBREVIATIONS EXCAVATION UŞED **EFFORT** F - FINE 91 BOULDER COUNT M - MEDIUM CLASSIFICATION DESIGNATION TRACE (TR.) 0 - 10% - EASY C - COARSE MODERATE F/M - FINE TO MEDIUM -DIFFICULT F/C - FINE TO COARSE GROUNDWATER LITTLE (LI.) 10 - 20% 6" - 18" SOME (SQ) 20-35% | V- VERY 18" - 36" В ELAPSED

AND

36" AND LARGER

GR. - GRAY

YEL - YELLOW

35 - 50% | BN. - BROWN

TIME TO

(HRS.)

\3∕ G.W.L

NORTH

VOLUME =\_

9.0

.cu.yd.

-	TEST PIT FIELD	LOG			
GOLDBERG · ZOINO & ASSOC., IN					39
GEOTECHNICAL/GEOHYDROLOGICA CONSULTANTS		_	ILE No.	R5613	
	LOCATION Landfill near A		ATE	<u>6-13-83</u>	
GZA ENGINEER R. Laport	EXCAVATION EQUIPME contractor Boyd & Brown	NT		EV. <u>≃610/</u>	
WEATHER sunny & warm	OPERATOR Tony Barbalato MAKE Case MODEL	7101	ME STAR		:20
	CAPACITY CU.YO. REACH	~ <u>14</u> <u>ft.</u>	IME COMP	LETED	. 50 T
DEPTH SC	IL DESCRIPTION		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMA No
	ous Fill, brown, sand and silt l, intact glass bottles, 5 gal		E	QTT. CLASS.	
can	•		E		
			E		
_ <b>a</b> ·			E		
			E		
- 5 - XXX			Е		
_ •			м		
	<u>ous Fill</u> , gray-white with rust scrap metal	; discoloratio	n) M		
- • - <del></del>			М		
MXXXXI oil odor	ous Fill, black, granular mate	rial with	М		
Layer of co	oarse gravel and cobbles		м		1
	Bottom of Hole 10.8 ft.				
boundary b	fication lines represent the a etween soil and rock types. T may be gradual.				
	may be graduar.				
<u> </u>					
REMARKS: 1. Slight slow	ughing of sides upon completio	n.			
TEST PIT PLAN LEGE	ND: PROPORTIONS	ABBREVI	ATIONS I	EXCAVA	TION
→ H BOULDE	R COUNT USED	F - FINE		EFFO	
SIZE RA				E EAS	SY DERATE
6"-16		F/M - FINE TO			FICULT
NORTH 18"-3	6" B   SOME (SQ.) 20-35	•		ELAPSED _	_
VOLUME = 12 cu.yd. 36" AND L	ARGER C AND 35 - 50		w l	TIME TO PERIOD TO THE PERIOD T	/ G.W.I

	TE	ST PI	T F	ELD	L	OG				
GOLDBERG · ZOINO GEOTECHNICAL/GE CONSULTANTS	OHYDROLOGICAL	DESCRIPTI LOCATION	ON <u>Buf</u> 25' S.	of pon	d	ial Park	FIL	E No.	T No. <u>4</u> <u>R5613</u> 6-8-83	4 
GZA ENGINEER _ WEATHER _sunny	& warm	EXCAY CONTRACTOR DOPERATOR TOPE MAKE JOHN DOPERACITY	ATION Boyd & B ony Bar Deere	<u>bal</u> ato MODEL	3]	10A 14 <b>ft</b>	TIM	E START	EV. <u>≃604/</u> FED <u>13:</u> LETED <u>13:</u>	05
DEPTH	SOIL	DES	CRIP	TION				EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
	Topsoil & Roc	ts		_				E		
2'							_	Е		
	Miscellaneous fragments, in					brick		Е		
4'	Tragmentos, Tr		.s, pico					Е		
5'								Е		1
- 6' - XXX	Miscellaneous	Fill, silt	ty clay,	with s	trands	s of		E		
7'								Е		
B' —	Miscellaneous fragments, st			with b	rick			Е		
9'								Е		2
- 10' - XXXX	Clayey SILT,						1,,	Е		
II'	intrusion alo plastic (ML)		it lelise		, very		'y	E		3
— 12' —	<del>-</del> 1	Bottom of								
13'	The stratific boundary between transition ma	een soil ar	nd rock							
		J 22 J. 1110								
2	. Groundwater s . Oil contamina . Minor sloughi	ted water s	eeping				ft.			1
TEST PIT PL    10'     3'	BOULDER SIZE RANG CLASSIFICATI 6"-18" 18"-36"	COUNT E LETTER ON DESIGNATIO A B	     TRACE   LITTLE	PORTIO USED (TR) 0 - (LI.) 10 - (SQ.) 20 - 35 -	· 10% · 20%	F - FINE M - MEDIU C - COARS F/M - FINE F/C - FINE V - VERY GR - GRAY	M SE TO TO	MEDIUM COARSE	D DIF GROUNDW ELAPSED	RT SY DERATE FICULT

	TE	ST PIT FIELD LOG			
GOLDBERG · ZOI	NO & ASSOC., INC	PROJECT	TEST PI	T No. <u>4</u>	6
	GEOHYDROLOGICAL	DESCRIPTION Buffalo Industrial Park	FILE No.	R5613	
CONSULTANTS	_	LOCATION See location plan	DATE		
	D lanout	EXCAVATION EQUIPMENT	GROUND EL	ev. <u>≃606/</u> :	<u></u> ≃30
GZA ENGINEER		CONTRACTOR Boyd & Brown OPERATOR Tony Barbalato MAKE Case MODEL 310A		TED 10:	
WEATHER Sun	iny & warm	MAKE Case MODEL 310A CAPACITY CULVE REACH ~14 ft	TIME COMP	LETED <u>11:</u>	15
DEPTH	SOIL	DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT	REMAR No.
— o —		<del></del>		QTY. CLASS.	╁
	Topsoil & Roc	ots	E		
'	$\boxtimes$	•			
L 2'XXXX	Miscellaneous	Fill, brown, silty clay	E		
I ₩₩		,,,,,			١.
3' <del>-</del>  \\\\\\	<b>X</b>		E		1
l . 💥💥	<b>X</b>	274	ΙE		
4 <sup>-</sup>  \\\\\\\\\	(X) Change to: S	ilty clay with boulders		4	
L 5'	$\bowtie$		E	"A"	
_ 3 _ XXXX	$\boxtimes$		_		
— 6' —	Layer of fibe	rous organic material (orig. ground	— <u>E</u>		2
	surface?)		T E		
7' <i>\/////</i>		CLAY, red-brown with gray silt lenses			
. /////	(Some righ an	gle), damp, slightly plastic (CL)	E		
_ 8/////					
9' <i>/////</i>			E		
			_		
— ю' —/////			E	<u> </u>	
/////	<u>//</u>		<b>⊢</b> Ε		
		Bottom of Hole 10.6 ft.			
— 12' —	The stratific	ation lines represent the approximate			
'-	boundary betw	een soil and rock types. The actual			
13'	transition ma	y be gradual.			
<u> </u>					<del>                                     </del>
REMARKS:		eepage from all faces @ ~ 2 ft.			
		ing of side walls between 3.2 & 6.0 ft.	(2'-4' u	ndercutti	ng
	of East and W	est walls).			
TEST PIT F	PLAN LEGEND	:   PROPORTIONS   ABBRE	VIATIONS	EXCAVA	TION
	BOULDER	<u> </u>		EFFOI	
3.5	SIZE RANG	E LETTER ITENCE (TR) 0 - 100/ C - COARS		E — EAS	
T	CLASSIFICATI	ON DESIGNATION	TO MEDIUM	DDIFI	ERATE FICULT
NORTH	18"- 36"	B   SOME (SQ) 20-35%   V- VERY		GROUNDW ELAPSED	ATER
	75" 4415 4 45	GER C   AND 35 - 50%   BN BROW	N	TIME TO Z	<u>Z</u> G.W.L
VOLUME = 13.7	cu.yd.	YEL YEL	LOW	(HRS.)	-

	TE	EST PI	T FIE	LD I	_OG			
	O & ASSOC., INC SEOHYDROLOGICAL		See locat	o Industr ion plan	rial Park	FILE No.	6-8-83	
GZA ENGINEER WEATHER SUNN		CONTRACTOR OPERATOR MAKE CAPACITY		พท		TIME START	ev. <u>≃603/</u> : red <u>11:</u> Leted <u>11:</u>	15
DEPTH	SOII	L DES	CRIPTI	ON	111	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
	Topsoil & Roc	ts						
'-  <b> </b>	Miscellaneous		ck sand and	cinders		E-M E-M		
2'						E-M		1
4'-	Miscellaneous	<u>Fill</u> , red	-brown, cla	y, some s	silt	E-M		
5'—						E-M		
— e, —	Miscellaneous	- ————— <u>: Fill</u> , grav	vel and san	d		E-M		
7' \	Miscellaneous lenses	Fill, brow	wn, clayey	silt with	n gray sil			
— в' — <b>XXXX</b>	<b></b>					E-M		
]	Layer of blac					E-M		
9' —	Clayey <u>SILT</u> , damp, very sl			lenses t	throughout	E-M		2
IO'		Bottom of	Hole 9.9 f	t.				
— I2' —	The stratific boundary between transition ma	veen soil ar	nd rock typ					
13'	Crans reron me	y be gradu						
   14'								
	<ol> <li>Groundwater s</li> <li>Moderate slou of test pit.</li> </ol>			20 minut	es after o	completio	n	
TEST PIT P    H 8'    3'   O   NORTH  VOLUME = 8.8	BOULDER	COUNT  E LETTER HON DESIGNATION  A  B	PROPOI US TRACE (TR LITTLE (LI. SOME (SQ.	<u>ED</u> ) 0 - 10% ) 10 - 20%	F - FINE M - MEDIUM C - COARSE F/M - FINE F/C - FINE V - VERY GR - GRAY	TO MEDIUM I TO COARSE	D	RT SY SERATE FICULT

	TE	ST PI	T FIEL	D L	.OG				
GOLDBERG · ZOING GEOTECHNICAL/GI CONSULTANTS	EOHYDROLOGICAL	LOCATION	PROJECT N Buffalo II See location	ndustri n_plan	al Park F	TEST PIT No. <u>49</u> FILE No. <u>R5613</u> DATE <u>5-31-83</u>			
GZA ENGINEER . WEATHER	overcast	OPERATOR	ATION EQUIP Boyd & Brown Tony Barbala Case MOD CUVOL REA	to EL5	T	IME STAR	EV. <u>≃610/</u> TED <u>14:</u> LETED <u>15:</u>	42	
DEPTH 0	SOIL	DESC	RIPTION	1		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARI No.	
	Topsoil & Roc	Fill, black				M			
2'	with numerous concrete bloc				, Dricks,	M			
3'						М			
4'	- Old buried	foundation (	(5'x2'x1')			М			
5'						M			
e,						М			
7'	<u>Miscellaneous</u>	Fill, yello	ow-tan, sandy	y silt		M		1_	
<b>8</b> ' —	Silty CLAY, r	red-brown to	race sand w	ith ora	v silt	M		<u> </u>	
- a, -	varves (some (CL)					M		_	
- 10' -		Bottom of B	Hole @ 9.7 f	t.		М		2	
II' I2'	The stratific boundary betw transition ma	een soil <mark>a</mark> nd	d rock types		oximate actual				
-13'-									
14'									
	1. Groundwater s 2. Moderate slou			n compl	etion.				
TEST PIT PI	LAN LEGEND  BOULDER SIZE RANG CLASSIFICATI 6"-18" 18"-36"  CL.yd. 36" AND LARG	COUNT E LETTER ON DESIGNATION A B	PROPORTI USED TRACE (TR.) O LITTLE (L1.) IC SOME (SQ.) 20 AND 35	- 10% ) - 20%	ABBREVI F - FINE M - MEDIUM C - COARSE F/M - FINE TO F/C - FINE TO V - VERY GR GRAY BN BROWN YEL YELLO	D MEDIUM D COARSE	EFFOI E — EAS M — MOD D — DIFI GROUNDW ELAPSED	RT SY DERATE FICULT	

		TE	ST	PIT	FIE	LD	LOG	}			
	S ZOINO & AS IICAL/GEOHYDI NTS	-	DESCR	IPTION	PROJE Buffalo		trial F	ark F		T No5 R5613 5-31-83	
	NEER R.	& cool	EX	CAVAT		vn	580C ~14	GI	ROUND EL	EV. <u>~609/</u> TED <u>8:4</u> LETED <u>9:</u>	10
DEPTH	•	SOIL	_ DE	SCF	RIPTIO	NC			EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARI No.
	XXXXX bri	cellaneous cks, brick onry block	fragme					th	E E		
2									Е		
<b>4</b> '									Е		_
5'	-wo	od timbers	~ 6' 10	ong					E		
— e, —									E		
7'X									E		1
8, — <u></u>									E		
9' —									<u>E</u>		2
10, —	V V V V V		Bottom	of Ho	le 9.8 f1	t.					
II'	bou	stratific ndary betw	een soi	l and i							
12'	tra	nsition mag	y be gra	adual.							
— 14' —											
REMAR		undwater f or sloughi							<u> </u>		
TEST F	) RTH	LEGEND BOULDER SIZE RANGI CLASSIFICATION 6"-18" 18"-36" 36" AND LARG	COUNT E LET ON DESIGN A B	TER T NATION T L	PROPOR USE RACE (TR.) ITTLE (LI.) SOME (SQ.)	0 - 109 10 - 209	F - F   M - N   C - O   F / M - N   F / C - O   F / C - O   G R	INE MEDIUM COARSE -FINE TO	MEDIUM COARSE	D — DIFI GROUNDW ELAPSED	RT SY DERATE FICULT

		TE	ST PI	T FIE	LD L	_OG			
	G · ZOINO & A NICAL/GEOHYD INTS	•	_	PROJE ON <u>Buffal</u> ~400' Wes	<u>ial Par</u> k ı				
GZA ENG WEATHER	INEER R.	<u>01 (</u>	EXCAV CONTRACTOR _ OPERATOR _ MAKE _ CAPACITY	Tony Barb Case	own alato		TIME STAR	EV. <u>≈606/≈</u> TED <u>8:2</u> LETED <u>8:</u> 4	20
DEPTH — 0 —		SOIL	DESC	CRIPTIO	NC		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARI No.
ı' 2'	XXXXX <u>bri</u>		Fill, black ne fragments s				E-M		
3'			Fill, rust	colored,	 silt and	clay with	E-M		
4' 5'	Var (so	me high ang	SILT, ligh gle) through damp, ver	hout, occas	sional po	ckets of	E-M		1
— е, —			Bottom of	Hole 6.0 f	t.		E-M		2
7' 8'	bou	ndary betwe	ation lines een soil and be gradua	d rock type					
— 10, — — a, —									
— II' —									
— 12' — — 13' —									
4'									
REMAR	of	3.8 ft.	lowing into	·			gpm at a	a depth	
3' /	PIT PLAN  9' →  RTH  6 cu.yd.	BOULDER SIZE RANGE CLASSIFICATIO 6"-18" 18"-36" 36" AND LARGE	COUNT E LETTER ON DESIGNATION A B	PROPOF US     TRACE (TR.)  LITTLE (LI.)  SOME (SQ.)  AND	ED 0 - 10% 10 - 20%	F - FINE M- MEDIUM C - COARSE F/M - FINE T F/C - FINE T V- VERY GR GRAY BN BROWN YEL YELL	TO MEDIUM TO COARSE	D DIFI GROUNDW ELAPSED	RT SY DERATE FICULT

	TEST	PIT FIE	LD L	OG			
GOLDBERG · ZOINO & A GEOTECHNICAL/GEOHYD CONSULTANTS	DROLOGICAL DESC	PROJE RIPTION Buffalo TION 100' S. o	<u>Industria</u>	1 Park FIL	E No.	T No5 _R5613 6-8-83	2
GZA ENGINEER R. R. WEATHER Sunny & V	Laport CONTRAC	XCAVATION EC TOR Boyd & Bro R Tony Barba John Deere Cuyd.	own alato MODEL 31	TIM	E START	EV. <u>~610/~</u> FED <u>8:45</u> ETED <u>9:10</u>	
DEPTH	SOIL DE	SCRIPTI	ON		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR!
i'Mi	psoil & Roots scellaneous Fill, ick fragments, coa agments				E E	_	
3' —					E E		_
XXXXXXX of	scellaneous Fill, rust colored grar 5' & 6.5'				E E		1, 2
- 8'	Botton	n of Hole @ 9.0	 ) ft.		E E		
boı	e stratification l undary between soi ansition may be gr	il and rock typ					
— 13' — — 14' —							
	erate groundwater ere sloughing of			ft. during	excava	ation.	
TEST PIT PLAN  3.5'  NORTH  VOLUME = 9.3 cu.yd.	6"-18"	TTER TRACE (TENATION LITTLE (LI	RTIONS   ED   1) 0 - 10%   1) 10 - 20%   2) 20 - 35%   35 - 50%	ABBREVIA  F - FINE M - MEDIUM C - COARSE F/M - FINE TO F/C - FINE TO V - VERY GR GRAY BN BROWN YEL YELLOW	MEDIUM COARSE	EFFOR  E — EAS  M — MOD  D — DIFF  GROUNDW  ELAPSED	Y ERATE

		TE	ST	PIT	FIE	LD	LOG					
l	G · ZOINO & A NICAL/GEOHYD NTS	· ·	DESCR	IPTION	PROJEC Buffalo See loca	Industr	rial Park	FIL		T No. <u>53</u> R5613 6-8-83	3	
	INEER R.	rm	EX CONTRACT OPERATOR	CAVATI OR BOY	ON EQU d & Brow y Barbal ere m	IPMENT		GRO	GROUND ELEV. $\frac{\sim 610/\sim 34}{9:20}$ TIME STARTED $\frac{9:20}{9:35}$			
DEPTH	•	SOIL	. DE	SCR	IPTIC	N			EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARI No.	
	Mis bri	cellaneous ck and wood ap metal,	Fill, I	ents, c	oncrete	piece (			E E E		1	
— 6' — — 7' — — 8' —	(so	ved clayey me high and fine sand	Je) thr	roughou	t, occās	ional p	ockets of		E E		2	
— 9' — — 10' — — 12' — — 13' —	bou	stratifica ndary betwe nsition may	ation li en soil	ines rep I and re		the app	roximate actual					
REMAR		nificant gr erate sloug						est	pit @	≃4.8 ft.		
5 NOF	PIT PLAN  0'   PITH  15.9 cu.yd	LEGEND: BOULDER SIZE RANGE CLASSIFICATIO 6" - 18" 18" - 36" 36" AND LARG	COUNT LETT N DESIGN A B	TER TRIATION	PROPOR USE ACE (TR.) TTLE (LI.) OME (SQ.)	0 - 10% 10 - 20%	F - FINE   M - MEDIUI   C - COARS   F/M - FINE   F/C - FINE   V - VERY   GR GRAY	M SE TO TO	MEDIUM COARSE	D	RT SY DERATE FICULT	

TE	ST PIT FIELD LOG			
GOLDBERG · ZOINO & ASSOC., INC GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT DESCRIPTION Buffalo Industrial Park	FILE No.		4
GZA ENGINEER R. Laport	EXCAVATION EQUIPMENT CONTRACTOR BOYD & Brown OPERATOR Tony Barbalato MAKE John Deere MODEL 310A CAPACITY CHYCLE REACH 714 ft	TIME STAR	EV. ≃609/≃33 TED 9:40 LETED 9:55	
_	DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
numerous brid concrete (6"-  3' —  4' —  6' — Layer of rust Layer of black pieces of tan Varved silty	Fill, brown, sand and silt with ks, scrap metal, several pieces of 36")  ed scrap metal k, granular fill with wood fibers,	E E E E E E E E		1
	Bottom of Hole 9.6 ft.  ation lines represent the approximate een soil and rock types. The actual y be gradual.	E		2
2. Moderate slove  TEST PIT PLAN  LEGEND  BOULDER  SIZE RANG	COUNT  E LETTER   TRACE (TR.) 0 - 10%   C - COARS ON DESIGNATION   LITTLE (LI.) 10 - 20%   F/C - FINE  B   SOME (SQ.) 20-35%   V - VERY GR GRAY	TO MEDIUM TO COARSE	EFFOI  E — EAS  M — MOD  D — DIFI  GROUNDW  ELAPSED —	RT SY SERATE FICULT

		TEST	PIT	FIELD	LOG			
	G · ZOINO & ASS NICAL/GEOHYDRO NTS	DLOGICAL DES	CRIPTION	PROJECT  Buffalo Indust  location plan			No R5613 6-13-83	
	INEER R. La	aport contra	EXCAVATI ACTOR BOYO OR Tony John Dee	ON EQUIPMEN 1 & Brown 7 Barbalato		GROUND E	LEV. <u>~604/</u> * RTED13 PLETED13	:10
DEPTH		SOIL D	ESCR	IPTION		EXCA\ EFFOR		REMARI No.
— o — — ı' —	XXXXXX brick	ellaneous Fill k fragments, so es, wood fragm	crap meta			s, <u>E</u>		
— 2' —						E		
4'	Misce	ellaneous Fill	, white an	nd orange, sar	nd and silt	E .		
— 5' — — 6' —	inter	rmixed with su	spected in	ndustrial fill	l <b>.</b>	E-M		
7'	>>>>> bott	ellaneous Fill les, rubbish, ughout				E-M		
— 8' —						<u>E</u>		2
— 10' —				10.5		Е		3
— II' — — I2' —	bound	Botto stratification dary between so sition may be o	oil and ro	resent the ap				
— ı <b>3'</b> —	truns	sicion may be s	graduar.					_
REMAR	2. Soil	ndwater seepage sample collect nt sloughing of	ted fr <b>o</b> m ≃	9.0 ft.		n.		
TEST 1	CONTRACTOR OF THE PROPERTY OF	LEGEND: BOULDER COUN SIZE RANGE LI LASSIFICATION DES 6"-18" 18"-36" 6" AND LARGER	T   ETTER   TR IGNATION   LIT	PROPORTIONS  USED  ACE (TR.) 0 - 104  TILE (LI.) 10 - 204  ME (SQ.) 20 - 354  ID 35 - 504	F - FINE   M - MEDIUII   C - COARS   F/M - FINE   F/C - FINE   V - VERY   GR GRAY	M TO MEDIUM TO COARSE	D DIF	RT SY DERATE FIGULT

		TE	ST PIT	FIELD	LOG			
	G·ZOINO & A NICAL/GEOHYD ANTS	· ·	DESCRIPTIO LOCATION	PROJECT N Buffalo Indu 200'S of Sto			No. <u>5</u> o. <u>R5613</u> 6-13-8	
1	R sunny & w	varm O	ONTRACTOR R	TION EQUIPMI Dyd & Brown Dny Barbalato Deere MODEL CUYD. REACH	310A 	TIME STA	ELEV. ≃604/ RTED 13: PLETED 13:	<u>35</u>
DEPTH	_	SOIL	DESC	RIPTION		EXCA' EFFOR		REMAR No.
	bri	cks, brick	fragments, b			E E		
4' 5' 6' 7' 8'	mat and Mis	erial (indu West faces	strial fill 	e-rust, sand w ?) intermixed ————————— , sand and gra	along South	E E E		
— 10' — — a' —						EE		2
— II' — — I2' — — I3' — — I4' —	bou	stratifica	tion lines en soil and			E		
REMAR				and North face upon completi				
3'	Д D <b>R</b> тн	LEGEND:  BOULDER SIZE RANGE CLASSIFICATION 6"-18" 18"-36" 36" AND LARGE	LETTER DESIGNATION A B	PROPORTION USED  TRACE (TR) 0 - 1 LITTLE (LI.) 10 - 2 SOME (SQ) 20 - 3 AND 35 - 5	F - FINE   M- MEDIU   C - COAR:   F/M - FINE   F/C - FINE	IM SE E TO MEDIUM E TO COARSE (	D DIF IGROUNDW IELAPSED	RT SY DERATE FICULT

		TE	ST	PIT	FIE	LD	LOG				
GOLDBER	G · ZOINO & A	ASSOC., INC			PROJE	CT		TE	ST PI	T No!	57
	NICAL/GEOHYD	ROLOGICAL	DESCF	RIPTION	<u>  Buffal</u>	o Indus	<u>trial Par</u> k	FIL	E No.	R5613	
CONSULTA	ANTS		LOCAT	<u> </u>	<u>ee locat</u>	ion pla	n	DAT	r <b>e</b>	6-13-83	
GZA ENG	INEER R.	Laport	E)	CAVA	TION EQ yd & Bro	UIPMEN	IT	GRO	UND EL	<b>EV</b> . ≃602/≃	
WEATHER	sunny & wa		OPERATOR	RIo	ny Barba	lato MODEL _	310A ~14 ft	TIME	E STAR	TED 14:0	
			CAPACITY		cu.yd.		~14 ft.	TIMI	E COMP	LETED 14:	<u> </u>
DEPTH		SOIL	_ DE	SCF	RIPTI	ON_			EXCAV. FFORT	BOULDER COUNT QTY. CLASS.	REMAI No.
	Тор	osoil & Roo	ts						Ε		
<u>├</u> -''-		scellaneous						$\neg$		2	$\vdash$
_ 2' _	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	od pieces (	b Tt. 1	n Teng	th), bri	CKS, SC	rap metal		Е	Ā	
									Ε		
3 -	<b>*****</b>								E		
_ 5, _	XXXXX met	scellaneous tal, intact	bottle	s, lea	ther sho	e; evid	ence of oi		E		1
e'		on water and in soil, material has a strong petroleum odor							E	_	2
6									E		
									E	_	
8, —	<b>*****</b>							╛	E		
9 —		cellaneous h wood fibe		gray,	silty cl	ay, into	ermixed		 E		3
10'	XXXXXX		Bottom	of Ho	Te @ 10.	2 ft.					
— ıı' →	The	· ctwatific	ation 1	inac n	annacant	the an	nwavimata	-			
— I2' —	bou	e stratifica undary betwo unsition may	een soi	1 and	rock typ						
13 <sup>'</sup>											
14'											
REMAR	KS: 1 Gro	oundwater le	- A [ Ave	4 0 ft	unon c	omaletio	on of excav	atio	n		<u> </u>
NEWAY.	2. Soi	il sample co nor sloughi	ollecte	d for	testing	@ ~ 6.0	) ft.	u 110			
TEST F	PIT PLAN	LEGEND:		ļ	PROPO	RTIONS	LABBRE	VIAT	IONS I	EXCAVA	TION
<u> </u>	)' <del> </del>	BOULDER	COUNT	 	<u>us</u>	ED	F - FINE	4	!	EFFOR	_
2. <u>7.5'</u>		SIZE RANGE	E LET	' NOITAN	TRACE (TR		6 C - COARS	Ε	ا ا		ERATE
1 6	9	6"-18"	A	, [L	LITTLE (L1.)		6   F/C - FINE		AADOE I	D DIFF	FICULT ATER
NOF		18"-36"	B		SOME (SQ) AND	20-359 35-509	GR GRAT	N.		ELAPSED	<sup>7</sup> G.W.L
VOLUME =	. 9.4 <b>cu.yd</b> .	36" AND LARG	ER C	1,	nitu	33 - 307	YEL YEL		ļ	READING	F

		TE	ST	PIT	FIE	_D	LOG				
l	G · ZOINO & A NICAL/GEOHYD ANTS	•		IPTION	ROJEO Buffalo ar Power	Indust	rial Park	FIL		T No. <u>58</u> <u>R5613</u> 6-13-83	
	INEER R. R sunny & wa	ırm	EX CONTRACT OPERATOR	CAVATI	ON EQU d & Brow y Barbal ere m	IPMEN		GRO	OUND EL	ev. <u>≃604/</u> :	≃28 :25
DEPTH	·			SCR	IPTIC				EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
0 ı'	bri	cellaneous ck fragmen	ts						E E		
3'	Mis fra	cellaneous agments, in	Fill, v	white anttles, i	nd orang bricks a	e,with nd bric	glass ck fragmer	nts	E	_	
4' 5'		_							E E		
6'		cellaneous rap metal;				lt and	clay with	n	E E		1
8'									E		2
— 10, — — a, —									E E		3
— 12' —	bou	e stratific undary betw ansition ma	ation l	ines re		the app					
— 13' — — 14' —								-			
REMAR	2. Soi	ter filled il sample c nor sloughi	ollecte	d for to	esting (	7.5 ft.	•				
3' NO	PIT PLAN  8'	BOULDER SIZE RANGI CLASSIFICATIO 6"-18" 18"-36" 36" AND LARG	COUNT E LET ON DESIGN A B	TER TRIATION LITE	PROPOR USE ACE (TR) TTLE(LI.) OME (SQ)	0 - 10% 10 - 20%	F - FINE   M - MEDIL   C - COAR   F/M - FINE   F/C - FINE   V - VERY   GR GRA	JM SE E TO ( E TO (	MEDIUM COARSE	D —— DIF GROUNDW ELAPSED	RT SY DERATE FICULT

TE	ST PIT FIELD LOG	_		
GOLDBERG . ZOINO & ASSOC., INC	PROJECT TE	ST PI	T No59	)
GEOTECHNICAL/GEOHYDROLOGICAL	DESCRIPTION Buffalo Industrial Park FII	LE No.	R5613	
CONSULTANTS			<u>6-13-83</u>	
D. Lanout	EXCAVATION EQUIPMENT GR	OUND FL	ev. ≃607/≃	31
GZA ENGINEER R. Laport			TED	
WEATHER sunny & warm	MAKEJOHN Deere MODEL31UA TI		LETED 15:	
1	CAPACITY CULYD. REACH~14 _ ft ''' _ DESCRIPTION	EXCAV.	BOULDER COUNT QTY, CLASS.	REMAI
	Fill, purple gravel contaminated with	E		
Miscellaneous	Fill, light gray sand and silt with	E		2
occasional in	tact bottles	E		
		E		
- scrap metal	, numerous strands of $\frac{1}{4}$ " wire	E		
_ 6'		E		
		E		1
e' —		E		
g'		E		
10,	Bottom of Hole 10 ft.	E		3
1 1	Boccom of flore to fer			
boundary betw	ation lines represent the approximate een soil and rock types. The actual y be gradual.			
13'	y ze gracia.			
			_	
2. Soil sample f	e of groundwater with oil on surface of w or testing from ~ 7.0 ft. tical and remained stable upon completion		avation.	
TEST PIT PLAN LEGEND		_		TION
I — — I — — I	HOED	1	EFFOI	
2.75 BOULDER SIZE RANG CLASSIFICATI 6"-18"	M - MEDIUM	COADCE I	E —— EAS M —— MOE D —— DIFI	 Y XERATE FICULT
NORTH 18"-36"	SOME (SQ) 20-35%   V- VERY	:	GROUNDW ELAPSED	MICH
VOLUME = 9.2 cu.yd. 36" AND LAR	GR GRAT	i		7 G.W.I

		T	EST	PIT	FIE	LD I	LOG				
	NICAL/GE	8 ASSOC., INC	DESC	RIPTION	See Loca	Industr tion Pla		TEST PIT NoII-1 FILE NoR5615.1 DATE11/8/83			
l .		R. Laport	CONTRAC OPERATO MAKE CAPACITY	CTOR <u>Be</u> DR Case	ella-Vis	MODEL	580C ≃14 ft	TIN	OUND EL ME STAR' ME COMP	EV. ~602/ TED 08:1 LETED 08:3	5
DEPTH		SOI	L DI	ESCF	RIPTIO	NC			EXCAV. EFFORT	BOULDER COUNT QTY, CLASS.	REMARI No.
ı'		TOPSOIL AND R Miscellaneous coal, cinders	Fill,	black, s	sand sil	t interm troleum	ixed with odor		_ E		A
3'									E		1
4' 5'		Clayey <u>SILT</u> , slightly plas	tic (ML	)			lay, mois	t,+	E E		
— e, —			Bott	om of Ho	ole 5.0	ft.					
7' 8'											
— 9' —											
— II' —											
— 12' —										· · · · · · · · · · · · · · · · · · ·	
13 14'											
REMAR	RKS:	A - Sample co 1 - Significa of water	nt grou	nd water	inflow	•			est pi	t with 3 i	ft.
<u>↓</u> ⊭— 3.5 ′	PIT PL 9'	LEGENI BOULDER SIZE RAN CLASSIFICA 6"-18" 18"-36' and Lai	COUNT GE LE FION DESIG	TTER TO THE TOTAL	ITTLE (LI.)		F - FINE   M - MEDIUI   C - COARS   F/M - FINE   I F/C - FINE   V - VERY   GR - GRAY	M SE TO TO	MEDIUM COARSE	D	RT SY DERATE FICULT

		TE	ST PI	T FIE	LD I	_OG				
GOLDBER	G · ZOINO	8 ASSOC., INC		PROJE	CT		TE	ST PI	T No	II-2
1		EOHYDROLOGICAL	DESCRIPTI	ON Buffa	o Industr	<u>rial Par</u> k	FIL	E No.	_R5615.	<u> </u>
CONSULTA	NTS		LOCATION	See Loca	tion Plar	<u>1                                     </u>	DA	TE	11-8- <u>83</u>	
GZA ENG	INEED	R. Laport	EXCAV	ATION EC	UIPMENT			DUND EL		
			OPERATOR	se se		580C			TED	
WEATHE			MAKECa: CAPACITY			14 ft.	TIM	AE COMP	LETED <u>09:</u>	10
DEPTH — 0 —		SOIL	DESC	CRIPTI	ON			EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARI No.
 		Miscellaneous cinders, ash,						D		1
.								D		
<b>├</b> ─ 2' ─	ŤĬĬĬĬĬ	Fine sandy <u>SIL</u>	T, brown, t	race clay	occurring	j in				
<b></b>	1111111	pockets, moist	<sup>+</sup> , slightly	plastic (	ML)			Е		
1 .								Ε		2
<b>├</b> ⁴	· V.a.LLLLLL.	-	Bottom of	Hole 4.0	ft.			L		
5'										
6 —										_
7'		1								_
_,										
8 —										
— 9' —										
io'										
- II, -										
- ı2' -										
L 13' —										
<u> </u>								_		
REMAR	KS:	1. Fills ceme	nted making	excavatio	n difficu	ılt				
		2. Cement pad the test p	and abando it	ned founda	tions loc	ated in t	he	vicini	ty of	
TEST !	PIT PL	AN LEGEND	<u>:</u>	1	RTIONS	ABBRE	/IΑ	TIONS	EXCAVA	TION
1 k-	8'	BOULDER	COUNT	<u>us</u>	ED	F - FINE	1	l	EFFOR	
3 /		SIZE RANG CLASSIFICATION	E LETTER ON DESIGNATION	N'	) 0 - 10%	C - COARSI	Ε	MEDIUM		ERATE
1 6	$\mathcal{D}$	6" - 18"	A	:	) 10 - 20%	F/C - FINE	TO	~~ . ~ ~	GROUNDW	ATER
	ŘTH	18"-36" 36" AND LARG	B	SOME (SO	) 20-35% 35-50%	GR GRAY	N	ļ	ELAPSED TIME TO READING	<sup>7</sup> G.W.L
VOLUME =	3.6	_cu.yd. 36 AND LARG	GER C	1 2110	55 50 /6	YEL YEL	_	, 1	READING =	-

TE	ST PIT FIELD LOG				
GOLDBERG . ZOINO & ASSOC., INC	PROJECT	TE	ST PI	T NoI	[-3
GEOTECHNICAL/GEOHYDROLOGICAL	DESCRIPTION Buffalo Industrial Park	FIL	E No.	R5615.	1
CONSULTANTS	LOCATION See Location Plan	DA	TE	11- <u>8-83</u>	
D I mout	EXCAVATION EQUIPMENT CONTRACTOR Bella-Vista	GPC	NIND EL	ev. <u>≃608/</u>	<del>-</del> ≃32
GZA ENGINEER R. Laport	OPERATOR	TIM	E STAR	red <u>14</u>	:00
WEATHER _overcast & cool	MAKE Case MODEL 580C CAPACITY CULYD REACH 214 ft	TIM	IE COMPI	ETED <u>14</u>	: 10
DEPTH SOIL	DESCRIPTION		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
TOPSOIL & ROOT		$\dashv$	E		
	Fill, orange-brown, silty clay organic material, no odor		E		
	•	_ †			
	Fill, brown silty clay, damp, slightly		Е		
			E		
Layer of coal	fragments with petroleum odor				Α
	rown, little fine sand, occasional		E		
	t with evidence of black contamination, ghtly plastic (ML)	•	Ε		
		Ì	_ <b>_</b>		
7' -	ence of black contamination beginning		E		
1 1111111			Ε		
8'	Bottom of Hole 8.0 ft.				1
9'		-			
10'					
12 <sup>'</sup>		ŀ			
I3'		-			
4'		-			
REMARKS: A - Sample col	lected for analytical testing at 4.0 ft	<del></del>			
	vertical and remain stable upon complet	tion			
TEST PIT PLAN LEGEND	PROPORTIONS LABBRE	VIA	TIONS	EXCAVA	TION
<u>↓</u> <del> ←</del> 10' <del>→</del> BOULDER	COUNT USED F-FINE		ļ	<u>EFF0</u>	<u> 17</u>
31 SIZE RANG	ON DESIGNATION IN THE LINE (IR.) O TO TO TO TO TO TO TO TO TO	Ε	\  	E — EAS	Y ERATE
6"-18"	A   LITTLE (LI.) 10 - 20%   F/C - FINE		COADCE I		ICULT
NORTH 18"-36"	B SOME (SQ.) 20-35%   V-VERY		j	ELAPSED	
VOLUME = 8.9 cu.yd. 36" AND LAR	GER C AND 35 - 50% BN BROW YEL YEL		l.	TIME TO PEREADING (HRS.)	G.W.L

		TE	ST PIT	r FIEI	_D L	.OG			
	NICAL/GE	8 ASSOC., INC	DESCRIPTIO LOCATION	See Locat	o Indu <u>str</u> ion Plan	<u>rial Pa</u> rk Fi			
		cast & cool	EXCAVA CONTRACTOR OPERATOR MAKECase CAPACITY	M	ODEL 58	T)	ME STAR	EV. <u>~608/</u> TED <u>14:</u> LETED <u>14:</u>	20
DEPTH 0		SOIL	DESC	RIPTIC	)N		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMAR No.
ı' ı'		TOPSOIL & ROOT  Miscellaneous frequent brick	 Fill, brown,	sand and wood and	silt, win	th tal	M		1
3' 4'		Note: Thin la	ver of black	contamina	tion wit	h	E E		
5' 6' 7'		petroleum odor Silty <u>CLAY</u> , br pockets of red (CL)	own, occasio	nal tan si	lt lense:	s and	E E E		
— 8' — — 9' — — 10' — — 12' — — 13' —			Bottom of				E		
REMAF	RKS:	1 - Buried fou	ndation alon	g west wal	1 of tes	t pit.			
4'	PIT PL  11'   S  RTH  = 13.1	BOULDER SIZE RANG CLASSIFICATI 6"-18" 18"-36"	COUNT E LETTER ON DESIGNATION A B	PROPOR USE TRACE (TR.) LITTLE (LI.) SOME (SQ.) AND	O - 10% 10 - 20%	ABBREVIA  F - FINE M - MEDIUM C - COARSE F/M - FINE TO F/C - FINE TO V - VERY GR GRAY BN BROWN YEL YELLO	MEDIUM COARSE	EFFOI E EAS M MOI D DIF GROUND W ELAPSED	RT SY DERATE FICULT

	TE	ST PI	T FIE	LD L	_OG			
GOLDBER	G · ZOINO & ASSOC., INC		PROJE	CT	T	EST PI	T NoI	I-5
	NICAL/GEOHYDROLOGICAL	DESCRIPTIO	N <u>Buffalo</u>	<u>Industr</u>	<u>ial Par</u> k F	ILE No.	R5615.1	L
CONSULTA		LOCATION				ATE	11/8/83	
GZA ENG	INEER R. Laport	EXCAVA CONTRACTOR	ATION EQU Bella-Vist	IPMENT a	GI	ROUND EL	.ev. <u>≃607/</u>	≃31
	overcast & cool	OPERATOR			TI		TED 09:1	
		CAPACITY			14 <u>ft</u>	ME COMP	LETED 10:1	T
DEPTH 0	SOIL	DESC	RIPTIO	)N		EXCAV. EFFORT		REMAI No.
	Crushed Stone   Industrial Fil	& Cinders   - Purple f	<u>ib</u> rous slu	dge		E		А
' 2'	Miscellaneous wood, scrap mer	tal, broken				M		
3'	Tragments, and	grass				E		
_ 'a _	Note: Layer o	f white ash	from 3.0 f	t. to 3.	5 ft.	E		
s'						M		В
_ s'						E		
_ 。						E		1
R' -	<b>****</b>	Bottom of		<del>-</del>				
8		BOLLOIII O1	note 7.5 i					
— a, —								
— io' —								-
'''						-		
— 12' —								
13'								
— 14' —								
REMAR	KS: A - Sample of	sludge colle	cted for a	nalytica	l testing f	rom .5	ft.	
	B - Sample col	lected for a	nalytical	testing				
	1 - Slight grou	und water se	epage from	≃7.0 ft	•			
TEST !	PIT PLAN LEGEND	<u>:</u>	PROPOR	TIONS	ABBREVIA	ATIONS	EXCAVA	TION
<u> </u>	.5 → BOULDER		UŞE	<u>D</u>	F - FINE		EFFOR	
3.5		E LETTER ON DESIGNATION	TRACE (TR.)		C - COARSE	MEDIUM		ERATE
1 G	6"-18"	A	LITTLE (LI.)		F/C-FINE TO	COARSE	GROUNDW	FICULT ATER
NOF VOLUME =	18"-36" - 7.3 cu.yd.	B SER C	SOME (SQ)	20 - 35% 35 - 50%	GR GRAY		ELAPSED TIME TO READING (HRS.)	G.W.L

		TE	ST PI	T FIEL	D L	.OG				
GOLDBER	G · ZOINO A	ASSOC., INC		PROJEC	Т		TES	T PI	T No I ]	[-6
	NICAL/GEOHY	•	DESCRIPTION	ON Buffalo		ial Park	FILE	E No.	R5615.	. 1
CONSULTA			LOCATION	See Locati		I			/8/83	
			EXCAV						<sub>EV.</sub> <u>≃</u> 605/	<u></u> ≃29
GZA ENG	INEER R.		CONTRACTOR	Bella-Vist	<u>a</u>				red <u>3007</u>	
WEATHE	R <u>overcast</u>	t & coo]	MAKECa		DDEL 5	80C			ETED 10:	
DEPTH		SOIL	DESC	RIPTIO	N			XCAV. FFORT	BOULDER COUNT QTY. CLASS.	REMARK No.
<u> </u>	XXXXXI TOE	PSOIL & ROOTS					$\dashv$		TI II GENGG	
L_ , _		scellaneous l	ill, brown,	, silty fine	sand,	trace		Ε		
'	Cla	ay, damp, nor	plastic							
2'	<b>********</b>						-	E		<u> </u>
		scellaneous		ruction debr	ris, bri	cks,		М		
3' —	Cor	ncrete, wood	, etc.				卜			<u> </u>
4'	Inc	dustrial Fill	-purple sl	ludge with p	ockets	of white	┪	E		Α
,	XXXXXX Mis	nalky" materi scellaneous I	Fill, consid	derable debr	is with	frequent	-	М		1
5' —		rge pieces of cavate	f concrete a	ind cobbles	difficu	lt to	F	141		
_ s'	XXXXXX ex		Dallam of	Hole 5.8 ft			ᆜ_	D		2
			BOLLOW OF	note 5.6 T	••					
7'							-			<del>                                     </del>
8'										
8										_
├─ 9' <i>─</i>							$\vdash$			
10'							ı			
<u></u> —п' —							-			
   12'										
13'										
<u> </u>										
REMAR	RKS: A-	- Sample of	sludge colle	ected from 4	.3 ft.	for analy	tica	ıl tes	ting	
	1 -	- Ground wate	er inflow 0	≃4.5 ft.						
	2 -	- <u>Minor unde</u>	rcutting of	sidewalls t	elow slu	udge laye	r			
TEST	PIT PLAN	LEGEND	<u>:</u>	PROPORT	TIONS	ABBRE	/IAT	IONS	EXCAVA	TION
<b>↓ ⊬</b> - 6	5' <del> </del>	BOULDER	COUNT	UŞE	<u>D</u>	F - FINE			<b>EFFO</b>	RT
3'		SIZE RANG	E LETTER	TRACE (TR.)	0 - 10%	C - COARSE	Ξ	 	E EAS	SY DERATE
1 7	3	6" - 18"	A	LITTLE (LI.)	10 - 20%	F/M - FINE		^*~~=		FICULT
NO	RTH	18"-36"	В	SOME (SQ)		GR GRAY			ELAPSED	
VOLUME	= 3.9 cu.v	d. 36" AND LARG	SER C	AND	35 - 50%	BN BROWI			READING	7 G.W.L

									_	
		TE	ST PIT	r FIE	LD L	.OG				
GOLDBER	G · ZOINO	8. ASSOC., INC		PROJE	 CT		TE	ST PI	T No. <u>II</u>	-7
		OHYDROLOGICAL	DESCRIPTIO	N Buffalo	Industri	ial Park	FIL	E No.	R5615.1	
CONSULTA			LOCATION		tion Plar				1/8/83	
										-20
GZA ENG	INEER _	R. Laport	EXCAVA	Bella-Vist	a			DUND ELI IE STARI	EV. <u>≃605/≃</u> TED 11:	
WEATHE	R <u>over</u>	cast & cool	CONTRACTOROPERATORCase			30C		AE COMPI		
			CAPACITY	<u>cu.vd.</u> R	EACH	<u>4</u> ft			BOULDER	
DEPTH		SOIL	_ DESC	RIPTIC	)N			EXCAV. EFFORT	COUNT QTY. CLASS.	REMAR No.
'	$\ggg$	Miscellaneous I	ood, brown,	silty fin	e sand wi	ith brick	<b>(S)</b>	М		
,	$\times\!\!\times\!\!\times\!\!\times$	Pocket of light	t gray indus	trial fill						
z'		Construction de	•			concrete	5	М		
3' —	$\otimes \otimes \otimes$	Miscellaneous I	ill, brown,	sand and	silt with	 າ		Е		
		occasional cond	crete and pi	eces of br	ick					
<u> </u>								E		
5'		Industrial Fill	- purple/gr	 reen fibro	us sludge	materia	1	E		Α
			,					-		
<del> </del> — е, —								E		
7'		Miscellaneous H		modium_co				E		1
۵' ا		cinders satura						Ε		
8							Ī			В
9' —								E		
10'			Bottom of	Hole 9.5 f	t.	_				
l										
— I2' —										
13'							ŀ			
— 14' —										
REMAR	KS:	A - Sample of s	ludge colle	cted from	5 N ft f	for analy	tic	al tes	tina	
		1 - Ground wate	_			•			onig	
				•						
TEST	OLT O	B - Sample coll							<b>-</b> 14-4	-1.5.
TEST !			_	PROPOR USE		1	VIA	HONS I	EXCAVAT	
±   <del>     </del>	0' -	BOULDER SIZE BANGS				F - FINE   M - MEDIUN		i	EFFOF	
5.5			LETTER ON DESIGNATION	TRACE (TR)		C - COARS		MEDIUM I	MMOD	ERATE
1 6	$\overline{}$	6" - 18"	A	LITTLE (LI.)	, =	F/C - FINE		COADEE	D	ATER
иої	RTH	18"-36"		SOME (SQ)		GR GRAY		ļį	LAPSED (2/	G.W.L
VOLUME :	<u> 19.4</u>	_cu.yd. 36" AND LARG	ER C	AND	35 - 50%	BN BROW YEL YEL		li li	READING =	- G.₩.L

		TE	ST PI	TFIE	LD L				
GOLDBERG	G · ZOINO & A	SSOC., INC		PROJE	OT .	Т	EST PI	T No	(I-8
GEOTECH	NICAL/GEOHYD	•	DESCRIPTION	N <u>Buffalo</u>	Industr	<u>ial Par</u> k FI	LE No.	<u>R5615</u> .	. 1
CONSULTA	NTS		LOCATION	See Locat	<u>ion Plan</u>	D	ATE	11/8/83	
			EXCAVA	ATION EQU	IPMENT	GF	OUND EL	ev. <u>≃6</u> 09/:	<u>~</u> 33
	INEER R. L	•	ODE BATOR			TI	ME STAR	TED 11	:25
WEATHER	₹ <u>overcast</u>		MAKE Cas	<u>cu.yd.</u> M	ODEL <u>58</u> EACH <u>≃</u> 1	0C 4 ft TI	ME COMP	LETED11	: 45
DEPTH		SOIL	DESC	RIPTIC	N		EXCAV. EFFORT		REMAR No.
- °	Wisc	ellaneous	Fill, brown,	silty cla	v mixed	with			
ı'	XXXXXXX conc	rete block	s, bricks, w and logs),	vire, plast	ic scrap	s, wood	D		
2'	frag	ments					D		1
3'							D		
4'-							М		
5' —							М		
6'	<del>/////</del> /// <del>/\</del>	ellaneous ent like od	F <u>ill, gr</u> ay <u>,</u> or	sandy mate	rial wit	<u>.h</u>	   M		
			ebris and la	arge rock 1	ragments		M		2
7			Bottom of	Hole 7.0 1	t.				
— 8, —									
— 9' —									
- IO' -									
II'									
ı2'								_	
13'									
14'			<u>_</u>						
REMAR	KS: 1 -	Ground wat prior to b	er seepage f ackfilling	from 2.0 fi	. fillin	g test pit	to 6.5	ft.	
	2 -	Sloughing	of side wall	ls during e	xcavatio	n			
TEST !	PIT PLAN	LEGEND	<u>:</u>	PROPOR		ABBREVIA	ATIONS		
1 14- 7	7' <del> </del>	BOULDER	COUNT	USE	<u>.D</u>	F - FINE		EFFOI	_
3.5		SIZE RANG	E LETTER ON DESIGNATION	TRACE (TR.)	0 - 10%	C - COARSE	MEDIIM	_	DERATE
17 (	<u> </u>	6" - 18"	A	LITTLE (LI.)		F/C - FINE TO	COADCE	GROUNDW	FICULT ATER
NO	RTH	18"-36"	В	SOME (SQ)		; GR GRAY		ELAPSED	7 G.W.I
VOLUME =	: <u>6.4</u> cu.yd.	36" AND LARG	GER C	AND	35 - 50%	BN BROWN YEL YELLO	w	TIME TO READING (HRS.)	. G.W.L

	TE	EST PI	r FIELD	LOG			
GOLDBERG · ZOI	NO & ASSOC., INC		PROJECT		TEST P	IT NoI	I-9
	GEOHYDROLOGICAL	DESCRIPTION	N Buffalo Ind	l <u>ustrial Par</u> k	FILE No	R5615.	1
CONSULTANTS		LOCATION	See Location	Plan_	DATE _	11/8/83	
	D. Lawrent	EXCAV	ATION EQUIPMI Bella-Vista	ENT	GROUND FI	_ <b>EV</b> ≃604,	/≃28
		OPERATOR			TIME STAF	TED 12	:30
WEATHER _OV	ercast & cool	MAKE(	ase MODEL REACH	<u>580C</u> ≃14 ft	TIME COM		:55
DEPTH	SOIL		RIPTION		EXCAV EFFORT		REMAI No.
o	TOPSOIL & ROOT	S with black	staining			Q11. OLASS.	<b>-</b>
ı'	M		n, fine-medium	sand	E		
_ 2'		) with brick	s, scrap metal		M		А
I ~ ‱	$\otimes$						1
3' <del></del>	×			0. 61	E_		╀-
I . ₩₩	<u> </u>		<u>13.0 ft. to 4</u> . fine sand wit		—   <sub>E</sub>		
4 <sup>-</sup>	material, ash	and occasion	nal pockets of	white			<del> </del>
L_ 5'XXX	granular indus	trial fill			E		
I	$\otimes$				_		
<u> — 6</u> ' — ₩	Miscellaneous	Fill, brown.	silty clay wi	 th	— <u>E</u>		1
I ‱	occasional bri				E		
	$\otimes$						2
— в' — XXXX	<b>4</b>				E		<u> </u>
		Bottom of	Hole 8.0 ft.				
9 —							
<u> </u>							
11'							
— I2' —							
— ı3' —							
14'							
REMARKS:	A - Sample col	lected from	1.0 ft. for ana	alvtical test	ina		
I TEMPATOR			er reading of	-	ring		
	_	•	flow @ 7.5 ft.	оо ррш			
TEST PIT P			PROPORTION	S ARRES	VIATIONS	I EXCAVA	TION
1 4 11 -	BOULDER		USED	F-FINE	TITITONS	EFFOI	
11/1/1/1/	SIZE RANG	E LETTER	TRACE (TR) 0 - I	I M - MEDIUN		E EAS	_
1 - C	CLASSIFICATI	ON DESIGNATION	LITTLE (L1.) 10 - 2	F/M-FINE	TO MEDIUM TO COARSE	D DIF	DERATE FICULT
NORTH	18"-36"	В	SOME (SQ.) 20-3	117011112	IO WARSE	GROUNDW ELAPSED	ATER
VOLUME = 9.8	76" AND 1 AD	GER C	AND 35-5	50%   BN BROW YEL YEL			G.W.L

TE	ST PIT FIELD LOG				
GOLDBERG . ZOINO & ASSOC., INC	PROJECT  DESCRIPTION Buffalo Industrial Park			T NoI	
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	LOCATION See Location Plan			1/8/83	<u> </u>
GZA ENGINEER R. Laport	EXCAVATION EQUIPMENT CONTRACTOR Bella-Vista	GROU	IND EL	ev. ≃605/≃	29
WEATHER _overcast & cool	OPERATOR Case MODEL 580C		START		: 30 : 50
	CAPACITY cu.yd. REACH \times 14 ft	1		BOULDER	
DEPTH SOII	_ DESCRIPTION		FFORT	COUNT QTY. CLASS.	REMAR No.
TOPSOIL & ROOT	'S				
of concrete, b	Fill, black, medium sand, with pieces pricks, wood fragments, and organics ft.), damp, nonplastic				
					Α
5'-					
- e,					
7'					1
	Bottom of Hole 7.0 ft.				
8				-	
9' <del> </del>					
10'					
11' —					
i2'					_
13'					
14'		$\vdash$		-	_
REMARKS: A - Sample co	lected for analytical testing from 3.0	ft.			
1 - No ground	water encountered during excavation				
TEST PIT PLAN LEGEND		VIAT	IONS	EXCAVA	TION
BOULDER	M - MEDIUI		l l	EFFOR	_
	ON DESIGNATION F/M -FINE	TO M			TERATE
6"-18"	A   LITTLE (LI.) 10 - 20%   F/C - FINE B   SOME (SQ.) 20-35%   V- VERY	το α		GROUNDW ELAPSED	
NORTH 18 - 36 36" AND LAR	GR GRAY		i	TIME TO PER	G.W.L

## APPENDIX D

Ground Water Level Data



## SUMMARY OF WATER TABLE OBSERVATION

PROJECT:	New Buffalo Industrial Park		
		FILE:	R5613
	TABLE NO		

				•					1
WELI	_ NO.	B-1		[	WELL	NO.	в-2		
SURFAC	CE ELEV.	30.4	48		SURFAC	E ELEV.	31.	22	
MONITO	RING PT.	31.5	54		MONITO	RING PT.	35.	00	
TIP (	ELEV.	4.9	99		TIP E	LEV.	_13.	73	
DATE	TIME	G W DEPTH FROM SURFACE	GW ELEV.	REMARKS	DATE	TIME	GW DEPTH FROM SURFACE	GW ELEV.	REMARKS
5/30/83	09:07	13.59	16.89		6/3/83	16:02	8.42	22.8	
5/30/83	09:07 09:25			Bail 12 Bailers & Sample	6/9/83	14:16	8.09	23.13	
6/3/83	15:22	15.47	15.01		6/10/83	12:39	8.20	23.02	Casing kinked bailed 10x
6/9/83	14:25	15.20	15.28		6/22 <b>/</b> 83		9.45	21.77	
6/10/83	14:07	15.70	14.78	Bail dry (20x+) Water Sample	7/28 <i>[</i> 83	11:21	9.83	21.39	
7/28/83	11:45	15.85	14.63		8/1/83	13:09	9.49	21.73	
8/1/83	14:20	15.73	14.75		10/17 <i>[</i> 83	14:57	9.39	21.83	
10/17/83	14:42	16.19	14.29		10/31 <i>/</i> 83	10:15	9.10	22.12	
10/31/83	11:45	16:03	14.45						
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SHEET\_\_\_OF \_\_\_

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PROJECT:	New Buffalo Industrial Park		
		FILE:	R5613
	TABLE NO		

				1	<u> </u>				ı
WELL		B-5				. NO.	в-6		
_	E ELEV.	33.	84			E ELEV.	32.9		
MONITO		34.	95			RING PT.	35.1	L7	
TIP E	LEV.	18.	10		TIP E	LEV.	26.4	43	
DATE	TIME	G W DEPTH FROM SURFACE	GW ELEV.	REMARKS	DATE	TIME	G W DEPTH FROM SURFACE	GW ELEV.	REMARKS
6/3/83	16:06	14.63	19.21		6/9/83	14:49	5.86	27.06	
6/9/83	14:45	14.64	19.20		6/10/83	13:26	6.00	26.92	Bailed 16x & Samp. for Cond.
6/10/83	12:59	14.70	19.14	Bailed 10x+ Sample	7/28/83	11:31	7.63	25,29	
6/22/83	15:28	15.92	17.92	Perm. Test	8/1/83	13:17	7.43	25.49	_
7/28/83	11:25	16.26	17.58						
8/1/83	14:03	16.02	17.82						
10/17/83	15:06	16.03	17.81						
10/31/83	10:20	17.79	16.05					ļ	
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PROJECT: New Buffalo Industrial Park

FILE: R5613

TABLE NO.\_\_\_\_\_

				1					
WELL	. NO.	B-7			WELL	. NO.	в-8		
SURFAC	E ELEV.	29.3	34		SURFAC	E ELEV.	25.9	92	
MONITO	RING PT.				MONITO	RING PT.	28.	17	
TIP E	LEV.	12.6			TIP E	ELEV.	14.	18	
DATE	TIME	G W DEPTH FROM SURFACE	GW ELEV.	REMARKS	DATE	TIME	G W DEPTH FROM SURFACE	GW ELEV.	REMARKS
5/24/83	09:10	17.2		Measured through augers	5/30/83	11:58	6.48	19.44	Bail 25 & sample
5/30/83	09:52	6.65	22.69		6/3/83	15:00	6.61	19.31	
5/30/83	09:52- 10:20			Bail 15+ Bailers	6/13/83	11:21	6.63	19.29	Bail 27x & sample
6/3/83	15:13	6.76	22,58		7/28/83	12:27	7.25	18.67	
6/9/83	14:29	6.89	22.45		8/1/83	14.57	7.21	18.71	
6/10/83	15:04	6.84	22.50	Rail 17x+ Sample					
7/28/83	11:55	7.81	21.53						
8/1/83	14:27	7.19	22.15						
10/17/83	14:48	6,22	23.12						
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PROJECT: New Buffalo Industrial Park

FILE: R5613

TABLE NO.\_\_\_\_

WELI	NO.	В-9	-	1	WELL	. NO.	B-1	0	1
SURFAC	CE ELEV.				SURFAC	E ELEV.	30.		
MONITO	RING PT.			1		RING PT.			
TIP E	ELEV.	-7 <b>.</b>		1	TIP E		13.		
DATE	TIME	G W DEPTH FROM SURFACE	GW ELEV.	REMARKS	DATE	TIME	GW DEPTH FROM SURFACE	GW ELEV.	REMARKS
5/30/83	14:10	4.02			6/9/83	14:54	4.32	26.29	
5/30/83	14:10- 14:25			Bail 19+ Bailers & Samp			4.30	26.31	Bail Dry 15x & Sample
6/3/83	14:42	9.30	12.93		6/22/83		4.73	25.88	1
6/9/83	13:31	9.19	13.04		7/28/83		5.55	25.06	
6/13/83	11:53	9.26	12.97	Bail 19x+ & Sample	8/1/83	13:37	5.26	25.35	
7/28/83	12:33	9.69	12.54		10/17/83	15:20	4.56	26.05	
8/1/83	15:12	9.42	12.81		10/31/83	10:41	4.74	25.87	
10/17/83	14:39	9.58	12.65		11/1/83	10:55	4.65	25.96	
10/31/8:	10:56	9.80	12.43						
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GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

SHEET\_\_\_OF \_\_\_

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PROJECT:	New Buffalo Industrial Park		
		FILE:	R5613
	TABLE NO.		

				_					•
WELL NO.		B- :	11		WELL	NO.	B-12	2	
SURFAC	E ELEV.	25	.07	]	SURFAC	E ELEV.	24.6	56	
MONITO	RING PT.	26.	.74		MONITO	RING PT.	27.0	)2	
TIP ELEV.		12.	.58		TIP E	LEV.	15.	71	
DATE	TIME	G W DEPTH FROM SURFACE	GW ELEV.	REMARKS	DATE	TIME	GW DEPTH FROM SURFACE	GW ELEV.	REMARKS
5/30/83	11:08	3.50	21,57		5/30/83	11:20	1.30	23.36	
/30/83	11:08- 11:25			Bail 22 bailers		15:06	1.50	23.16	Bail 25x & Sample
/3/83	15:08	3.68	21.39	_	6/9/83	14:35	1.49	23,17	
/9/83		3.85	21.22		6/10/83	14:39	1.60	23.06	Bail 16x & Sample
/10/83	14:17	3.85	21,22	Bafl 19x & Sample	7/28/83	12:05	2.67	21.99	
//28/83	12:01	5.33	19.74		8/1/83	14:40	2.24	22.42	
3/1/83	14:35	5.14	19.93		11/21/83	15:43	1.12	23.53	Bail 15x & Sample
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PROJECT:	New Buffalo Industrial	Park	
			R5613
	TABLE NO		

WELI	NO.	<u>, , , , , , , , , , , , , , , , , , , </u>	2	]	WELL	NO.		-	1
	E ELEV.	B-1		1		E ELEV.	B-1 25,		1
	RING PT.	23.		1		RING PT.	27.		1
TIP E		24. 4.		1	TIP E			68	1
DATE	TIME	G W DEPTH FROM SURFACE	GW ELEV.	REMARKS	DATE	TIME	GW DEPTH FROM SURFACE	GW ELEV.	REMARKS
6/9/83	13:36	2.27	20.77		5/17/83	9:20	15.10	10.57	Through Augers
6/22 <i> </i> 83	11:36	2.88	20.16	Perm. Test	5/30/83		15.37	10.30	
7/28 <i>/</i> 83		4.76	18,28		5/30/83	15:29- 15:45			Bail 15x & Sample
8/1/83		4.27	18.77		6/3/83		15.44	10.23	
11/1/83	11:34	3.76	19.28		6/9/83	13:41	15.39	10.28	
•					6/10/83	16:01	15.54	10.13	Bail 16x & Sample
				_	6/22/83		15.54	10.13	
					7/28/83	13:00	16.64	9.03	
					8/1/83	15:37	15.30	10.37	
					10/17/83	14:01	15.65	10.02	
					10/31/83	11:30	15.96	9.71	
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PROJECT:	New Buffalo Industrial Park		
		FILE:	R5613
	TABLE NO		

WEL									1
SURFACE ELEV.		В	18			. NO.	B-1	.9	
SURFA	CE ELEV.	25	.49	[	SURFAC	E ELEV.	29.	69	ļ
MONITO	RING PT.	27	.68		MONITO	RING PT.	31.	19	
TIP	ELEV.	-6	0		TIP E	LEV.	4.	2	
DATE	TIME	G W DEPTH FROM SURFACE	GW ELEV.	REMARKS	DATE	TIME	G W DEPTH FROM SURFACE	GW ELEV.	REMARKS
5/30/83	14:45	9.35	16.14		6/3/83	15:54	17.87	11,82	Grout settled bckfld, w nat.
5/30/83				Bail 22 bailers & Sample			17.82	11.87	soil
6/3/83		9.37	16.12		6/13/83		18,00	11.69	
6/9/83	13:51	9.36	16.13		6/22 <b>/</b> 83	9:29	19.56	10.13	Perm. Test
6/10/83	16:07	9.40	16.09	Bail 17x & Sample	7/28/83	13:05	19.83	9.86	
6/22/83	10:27	9.58	15,91	Perm Test.	8/1/83	15:43	19.43	10.26	
7/28/83	12:44	10.05	15.44		10/17/83	14:11	19.59	10.10	
8/1/83	15:30	9.79	15.70		10/31/83	11:35	19.44	10,25	
10/17/8	14:32	9.82	15.67						
10/31/8	11:17	9.79	15.70						
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SHEET\_\_\_OF \_\_\_

PROJECT:	New Buffalo Industrial Park	
•		FILE: R5615
•	TABLE NO	

WELL	NO.	B-2	i		WELL	NO.	_B-2	2	
SURFAC	E ELEV.	26.	16		SURFAC	E ELEV.	34.	87	
MONITO	RING PT.				MONITO	RING PT.			
TIP E	LEV.	5.6	57		TIP E	LEV.	5.	88	
DATE	TIME	G W DEPTH FROM SURFACE	GW ELEV.	REMARKS	DATE	TIME	GW DEPTH FROM SURFACE	GW ELEV.	REMARKS
10/31/83	11:22	3.19	22.97		10/31/83	10:29	8.67	26.20	
11/1/83	11:55	3.13	23.03	Well Purged ≃6 volumes	11/1/83	10:24	8.53	26.34	Well Purged ≃5 volumes
11/21/83		2.89	23.27	Well Purge ≃7 vol. & samp.	11/21/83	16:05	7.82	27.05	Purged ≃6 vol. & sample
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PROJECT:	New Buffalo Industrial Park		
		FILE:	R5615
•	TABLE NO		_

							_		•
WELI	L NO.	B-2	23	·	WEL	L NO.			
SURFA	CE ELEV.	23.	80		SURFA	CE ELEV.			
MONITO	RING PT.				MONITO	RING PT.			
TIP I	EL <b>EV</b> .				TIP	ELEV.			
DATE	TIME	G W DEPTH FROM SURFACE	GW ELEV.	REMARKS	DATE	TIME	GW DEPTH FROM SURFACE	GW ELEV.	REMARKS
10/31/83	11:03	10.13	13.67						
11/1/83	11:10	10.26	13.54	Well Purged ≃3 volumes					
1 <u>1/21/83</u>	14:55	9.59	14.21	Well Purged ≃5 Vol. & Samp.					
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# APPENDIX C

Soils Laboratory Test Results



# LABORATORY DATA SUMMARY

PROJECT - New Buffalo Industrial Park

PROJECT NO.- R5613

CAMPI E	DENTU		IDE	NTIFICAT	ION TES	STS	
NO.	FT.	WATER CONTENT %	LL %	PL %	SIEVE -200 %	HYD -2 µ %	G S
TP-9	5.0	15.5	25.4	16.8	61.0	15.0	2.65 Assumed
TP-20	5.0	14.1	-		59.0	14.5	2.65 Assumed
TP-21	5.0	12.9	-	_	59.5	15.0	2.65 Assumed
TP-30	5.0	12.8	1	-	57.0	15.0	2.65 Assumed
	.,						
	TP-9 TP-20 TP-21	NO. FT.  TP-9 5.0  TP-20 5.0  TP-21 5.0	NO.     FT.     WATER CONTENT       TP-9     5.0     15.5       TP-20     5.0     14.1       TP-21     5.0     12.9	SAMPLE NO.         DEPTH FT.         WATER CONTENT %         LL %           TP-9         5.0         15.5         25.4           TP-20         5.0         14.1         -           TP-21         5.0         12.9         -	SAMPLE NO.         DEPTH FT.         WATER CONTENT %         LL %         PL %           TP-9         5.0         15.5         25.4         16.8           TP-20         5.0         14.1         -         -           TP-21         5.0         12.9         -         -	SAMPLE NO.         DEPTH FT.         WATER CONTENT %         LL %         PL -200 %           TP-9         5.0         15.5         25.4         16.8         61.0           TP-20         5.0         14.1         -         -         59.0           TP-21         5.0         12.9         -         -         59.5	NO.       FT.       WATER CONTENT %       LL %       PL -200 %       HYD -2μ %         TP-9       5.0       15.5       25.4       16.8       61.0       15.0         TP-20       5.0       14.1       -       -       59.0       14.5         TP-21       5.0       12.9       -       -       59.5       15.0



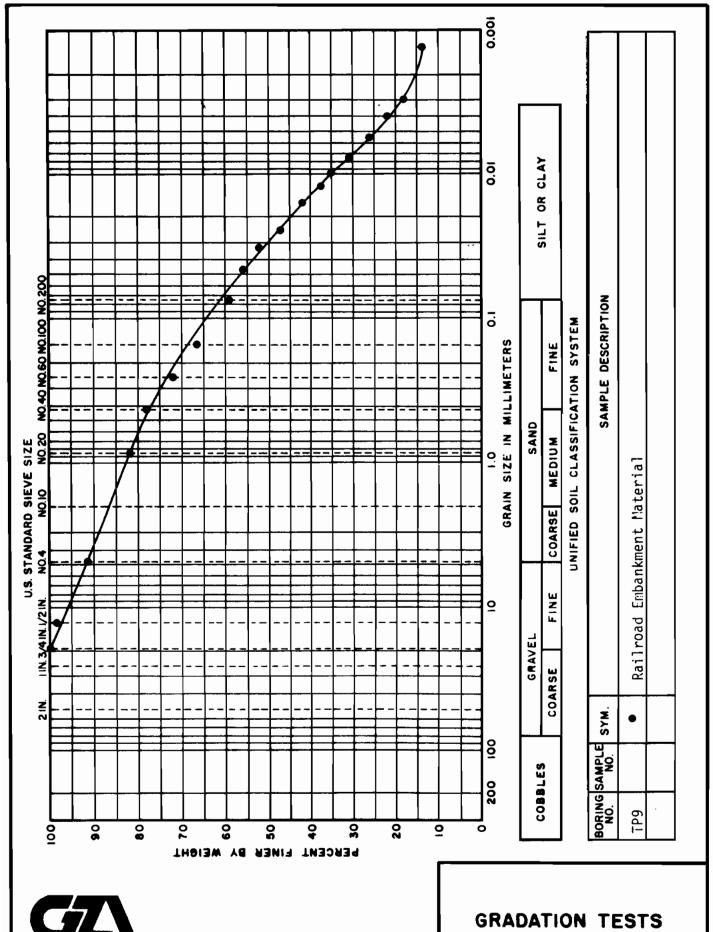
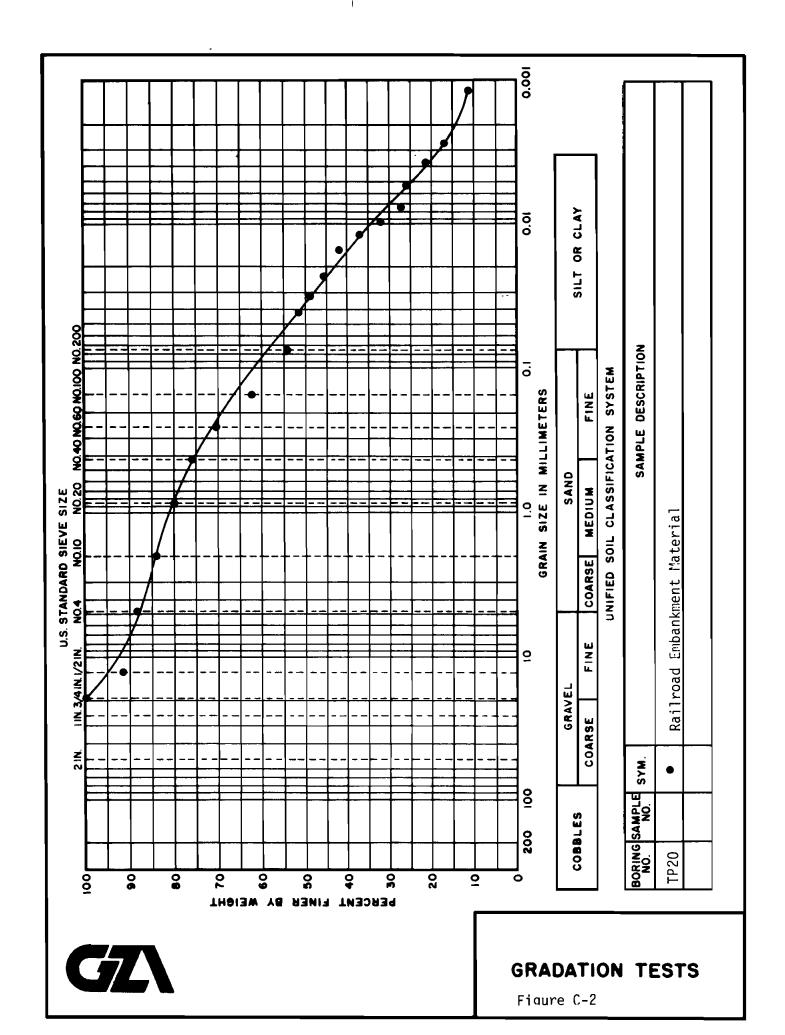
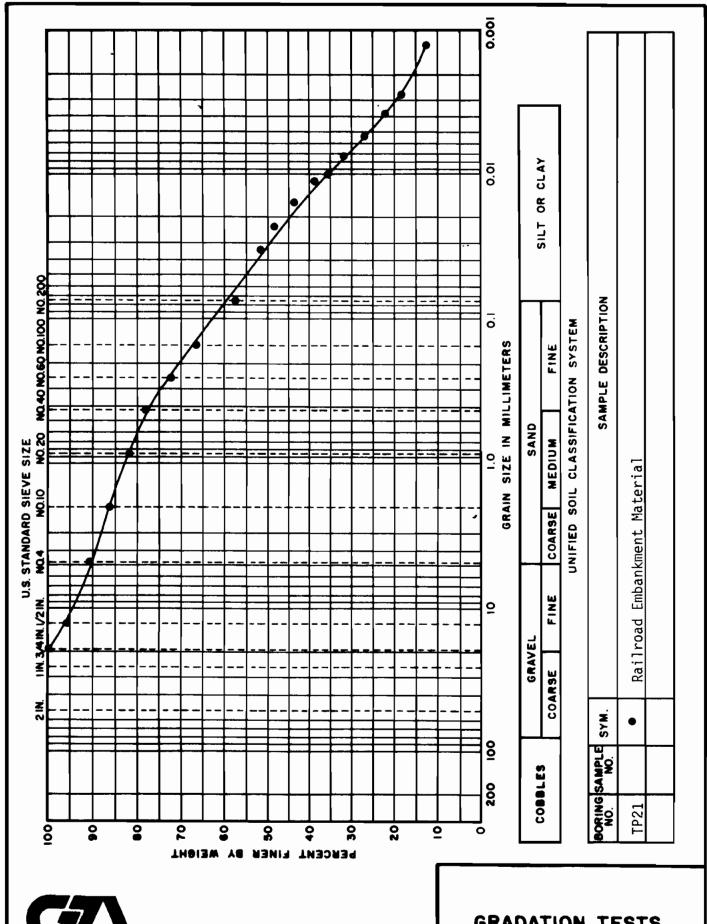




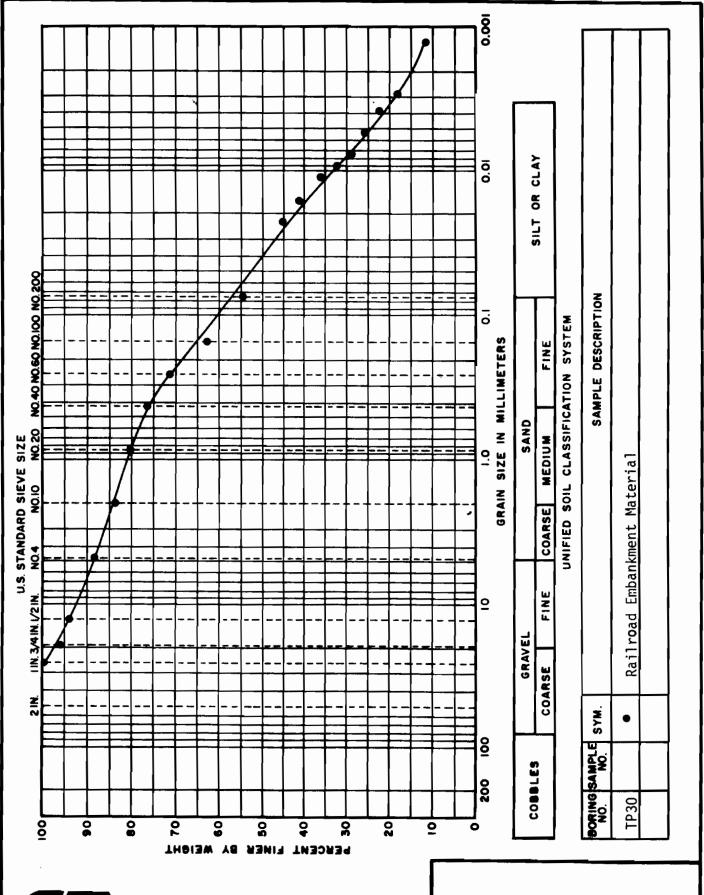
Figure C-1





**GRADATION TESTS** 

Figure C-3





**GRADATION TESTS** 

Figure C-4

# APPENDIX E

Analytical Test Results



## LOG OF ANALYTICAL TESTING

PROJECT: NEW BUFFALO INDUSTRIAL PARK

FILE: R5615

PHASE 1

Sampling Date: 5-30-83

Sample Locations: B-1, B-7, B-8, B-11, B-12, B-16, & B-18
Test Parameters: In-situ tests for pH, specific conductance

and temperature. Samples screened

with a Century Systems model OVA-128 organic vapor analyzer with gas chroma-

tograph option.

Tested by: GZA

Sampling Date: 6-6-83

Sample Locations: TP-4, TP-13, TP-16A, TP-33, TP-59 (soil

samples), B-12 and B-18 (ground water

samples)

Test Parameters; All soil samples extracted, concentrated

and analyzed by infra-red spectroscopy.

TP-4 tested for Arsenic, chromium,

lead and pH.

TP-13 tested for PCB's

TP-59 tested for aniline and substituted

anilines and nitro-aromatics

 B-12 and B-18 tested for COD, pH, Phenols, TOC, Arsenic, Chromium, Lead, Mercury, Benzene, Toluene, Xylene, Ethylbenzene

and PAH's

B-12 and B-18 also tested in the field

for temperature and specific conductance

Tested by: GZA representatives collected the samples and did in-situ tests; ARO Corporation Buffalo

Division did all remaining tests.

Sampling Date: 6/10/83

Sample Locations: B-1, B-15, B-7, B-11, B-12, B-16 (ground

water samples) Pond (surface water

sample)

Test Parameters: B-1, B-11 tested for COD, pH, Phenols,

TOC, Arsenic, Chromium, Lead, Zinc

- B-5, B-7, B-16, and pond tested for

COD, pH, TOC, Chromium, Lead and Zinc.



 All samples tested in the field for specific conductance and temperature

Tested by:

GZA representatives collected samples and did in-situ testing; ARO Corporation Buffalo Division did all remaining tests.

Sampling Date: 6/13/83

Sample Locations: B-8, B-9 and B-19 (ground water samples)

Test Parameters: B-8 tested for COD, pH, Phenols, TOC, Arsenic, Chromium, Lead, and Zinc.

 B-9 and B-19 tested for COD, pH, and TOC

 B-8, B-9 and B-19 in-situ specific conductance and temperature.

Tested by:

GZA representatives collected samples and did in-situ testing; ARO Corporation Buffalo Division did all remaining tests

## PHASE 2

Sampling Date: 11/9/83

Sample Locations: Soil samples from the following:

TPII-1 (1.5 ft.), TPII-3 (4.0 ft.), TPII-5 (0.4 ft.), TPII-5 (6.0 ft.), TPII-6 (4.0 ft.), TPII-6 (4.4 ft.), TPII-7 (5.0 ft.), TPII-7 (7.5 ft.), TPII-9 (1.0 ft.), and TPII-10 (3.0 ft.)

Test Parameters:

TPII-1 (1.5 ft.), TPII-3 (4.0 ft.) and TPII-7 (7.5 ft.) tested for PCB's

- TPII-5 (6.0 ft.), TPII-7 (5.0 ft.), and TPII-7 (7.5 ft.) tested for reactivity
- TPII-7 (5.0 ft.) and TPII-9 (1.0 ft.) tested for metal fraction of EP Toxicity Test
- TPII-5 (0.4 ft.), TPII-6 (4.0 ft.), TPII-6 (4.4 ft.), TPII-10 (13.0 ft.) tested for pH
- TPII-5 (6.0 ft.), TPII-6 (4.0 ft.), TPII-6 (14.4 ft.) and TPII-10 (3.0 ft.) screened for valatile organics with a GC

Tested by: GC screening by GZA, all other testing by

ARO Corporation Buffalo Division.

Sampling Date: 11/21/83

Sample Locations: B-12, B-21, B-22, and B-23 (ground

water samples)

Test Parameters: filtered samples tested for Arsenic,

Barium, Cadmium, Hexavalent Chromium,

Lead, Mercury, Selenium and Silver

- in-situ tests for specific conductance

and temperature

- all samples screened via a GC

for volatile organics.

Tested by: In-situ testing and GC screened by GZA,

all other tests by ARO Corporation Buffalo

Division.

Historical Summary of Analytical Test Results



New Buffalo Industrial Park/ Buffalo, New York

PROJECT:

GZA FILE R5615

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TEST PARAMETER	UNITS	QUALITY	1-9		ا ا				٠L		0-0	
		STANDARD	5/30/83	6/10/33	6/10/83	6/22/83	6/10/83	5/30/83	6/10/83	5/30/83	6/10/83	6/13/83
Ha	Standard Units	6.5 - 8.5 (1)	7.35	7.45	7.28			7.15	6.89		7.16	
Specific Conductivity	umhos/cm		1000		1200	066	009	730	1470	820		1070
Chemical Oxygen Demand (COD)	mg/1			47.0	4.0				32.0		11.0	
Total Organic Carbon (TOC)	mg/1			18.0	2.0				12.0		4.0	
Phenols (total)	mg/1	0.001 (1)		0.002							0.006*	
Arsenic	mq/1	0.025 (1)		$^{\mathrm{LT}_{0.001}}$							LT 0.001	
Barium	mg/1	1.0 (1)										
Cadmium	mg/1	0.01 (1)										
Chromium	mq/1			0.011	LT 0.001				0.001		0.071*	
Chromium (Hexavalent)	mg/1	0.05 (1)										
Lead	mg/1	0.025 (1)		0.033*	0.00				0.021		0.220	
Mercury	mg/1	0.002 (1)										
Selenium	1/bm	0.02 (1)										
Silver	mg/1	0.05 (1)										
Zinc	mq/1	5.0 (1)		0.112	0.011				090.0		1.83	
Benzene	1/6п											
Toluene	1/6π											
Xylene	1/6n											
Ethylbenzene	μg/1											
Polynuclear Aromatic Hydrocarbon	µg/1											
							,				,	
	•											



1. New York Department of Environmental Conservation Class GA ground water standards

Page 1 of 5

New Buffalo Industrial Park/Buffalo, New York

PROJECT .\_

GZA FILE: R5615

				6		0	Q.		=		B-12	
TEST DABAMETER	۲ <u>۲</u>	YTI INIO		2,5		۵	2				3,5	
			5/30/83	6/13/83	6/22/83	6/10/83	6/22/83	5/30/83	6/10/83	5/30/83	6/10/83	11/21/83
	Standard Units	6.5 - 8.5 (T)		7.89					6.98		7.62	
Specific Conductivity	umhos/cm		430	429	440	260	345	1580	1090	910	910	096
Chemical Oxygen Demand (COD)	l/bm			4.0					22.0		29.0	
Total Organic Carbon (TOC)	mg/1			1.0					8.0		11.0	
Phenols (total)	1/gm	0.001							0.004*		.004*	
Arsenic	L/6m	0.025 (1)							LT. 001			LT0.001*
Barium	mg/1	1.0										0.332*
Cadmium	L/bw	0.01										0.005*
Chromium	1/bm								0.009		0,192*	
Chromium (Hexavalent)	T/gm	0.05 (1)										$^{\mathrm{LT}}_{\mathrm{0.001}}$
Lead	mg/1	0.025 (1)							0.042		0.240	LT0.001*
Mercury	1/gm											$^{\mathrm{LT}}_{\mathrm{0.002}}$
Selenium	l/gm	(1) 0.02										LT0.001*
Silver	l/gm	0.05										LT0.001*
Zinc	mg/1	(I) 5.0							0.045			
Benzene	1/61									,	LT1.0	
Toluene	1/bn										LT1.0	
Xylene	1/6n										2.0	
Ethylbenzene	1/611										LT1.0	
Polynuclear Aromatic Hydrocarbon	1/bn										N.D.	
							,				•	
	•								-			



Page 2 of 5

New Buffalo Industrial Park/Buffalo, New York

PROJECT .

GZA FILE: R5615

			B-13		R-16		R-18		B_10	R-21	R-22	B_23
TEST PARAMETER	ONITS	QUALITY	Â							13-0	77-0	22-5
		STANDARD	5/30/83	6/10/83	6/22/83	6/10/83	6/22/33	6/13/83	6/22/83	11/21/83	11/21/83	11/21/83
	Standard Units	6.5 - 8.5 (1)		7.75		7.80		7.60				
Specific Conductivity	umhos/cm		0628	290	290	420	421	002	720			
Chemical Oxygen Demand (COD)	1/Bm			4.0		19.0		4.0				
<u> Iotal Organic Carbon (TOC)</u>	mg/1			1.0		0.8		1.0				
Phenols (total)	. mg/1	0.001 (1)				0.011						
Arsenic	mq/1	0.025 (1)								LT 0.001*	LT 0.001*	LT 0.001*
Barium	mg/1	1.0 (1)								0.351*	0.165*	0.133*
Cadmium	mg/]	0.01 (1)									l	LT 0.001*
Chromium	[/вш	(1) 90.0		LT 0.001		650.0					ı	
Chromium (Hexavalent)	mg/1	0.05	•							LT 0.001*	0.001*	LT 0.001*
	mq/1	0.025 (1)		0.002		0.108				LT 0.001*		LT 0.001*
Mercury	mg/1	0.002 (1)								LT 0.0002*	LT 0.0002	LT 0.0002*
Selenium	mq/1	0.02								LT 0.001*	LT 0.001*	LT 0.001*
Silver	mq/1	0.05 (1)								LT 0.001*	LT 0.001*	LT 0.001*
	mq/1	5,0 (1)		0.007								
Benzene						LT 1.0				•		
Toluene	ng/1					LT 1.0						
Xvlene	uq/1					300						
Ethylbenzene						LT 1.0						
Polynuclear Aromatic Hydrocarbons	ug/]					ND						
												•
	•											



Page 3 of 5

<sup>\*</sup> Sample passed through 0.45  $\mu$  filter prior to analysis  $_{\rm 1}$  New York Department of Environmental Conservation Class GA ground water standards

New Buffalo Industrial Park/Buffalo, New York

PROJECT

GZA FILE: R5615

TEST BABANETED	TINITE	V#1 1410	Pond	TP-4	TP-13	TPII-1(1,5')	TPII-3(4.0')	TP-11-5	TPII-5(4.0')		TPII-6(4.6')TPII-7(5.0') TPII-7(7.5')	PII-7(7.5')
TANAMETER	CHIES	STANDARD		6/6/83	6/6/83	11/8/83	11/8/83	11/8/83	11/8/83		11/8/83	11/8/83
pH	Standard Units	6.5 - 8.5 (1)	7.95									
Specific Conductivity	μπhos/cm		100									
Chemical Oxygen Demand (COD)	ma/1		32.0									
Total Organic Carbon (TOC)	[/bu		13.0									
Chromium	mq/1	0.05 (1)	LT 0,001									
Lead	mg/1	(1)	0,010									
Zinc	mq/]	5.0 (1)	0,005									
Arsenic	ma/ka			LT 0.001								
Chromium	mg/kg			21.0							48.6	
Lead	mg/kg			399.0								1.0
PCB's	mg/kg				LT 1.0	LT 1.0	LT 1.0					
pH (50% slurry)	Standard Units			4.8				6.40	5.12	4.41	2.6	
EP - Toxicity Procedure												
Arsenic	mq/1	5.0 (2)								•	0.004	
Barium	mq/]										0.288	
Cadmium	mg/1	1.0 (2)									0.002	
Chromium	ma/1	5.0 (2)									LT0.001	
Lead	mg/1										0.177	
Mercury	mg/1										0.0002	
Selenium	mg/1	1.0 (2)									0.895	
Silver	l/bm	5.0 (2)									LT0.001	
Reactivity												
Cyanides .	mg/1							0.003			0.002	
Sulfides	mq/kg							LT 1.0			-11.0	



2 Maximum concentration of contaminants for characteristic of EP toxicity

Page 4 of 5

<sup>1</sup> New York Department of Environmental Conservation Class GA ground water standards

	HISTOR	HISTORICAL SUMMARY OF ANALYTICAL	MARY	OF ANAL	-YTICA	TEST	RESULTS				·
PROJECT	New B	New Buffalo Industrial Park/Buffalo, New York	Park/Buffalo,	, New York				GZA	GZA FILE: R5615	915	
TEST PARAMETER	UNITS	QUALITY	TPII-9(1.0')	1.0') TPII-10(3.0')							
На	Standard Units	DUNADATO			<del> </del>		-				
Specific Conductivity	mhos/cm										
Chemical Oxygen Demand (COD)	l/gm										
Total Organic Carbon (10C)	mg/1										
Chromium	mq/1										
Lead	l/pm										
Zinc	mq/1										
Arsenic	mg/kg										
Chromium	mg/kg		,								
Lead	mg/kg										
PCB's	mg/kg										
рн (50% slurry)	Standard Units		7.49	8.20							
EP - Toxicity Procedure											
Arsenic	mq/1	5.0 (2)	0.008				-		,		
Barium	L/gm	100.0 (2)	0.564								
Cadmium	mq/1	1.0 (2)	LT 0.001								
Chromium	mg/1	5.0 (2)	LT 0.001				-				
Lead	mg/1	5.0 (2)	0.012								
Mercury	mg/1	.2 (2)	LT 0.0002				_				
Selenium	mq/l	1.0 (2)									
Silver	ma/1	5.0 (2)	LT 0.001								
							_				
Reactivity											
Cvanides .	mg/1		0.006		1		_				
Sulfides	mg/kg		LT 1.0								
				-	1	_					

1 New York Department of Environmental Conservation Class GA ground water standards

 $2\ \mbox{Maximum}$  concentration of contaminants for characteristic of EP toxicity

Page 5 of 5



Test Results Submitted By The ARO Corporation Buffalo Division

Mr. Raymond Laport Goldberg Zoino Associates of New York, P.C. Suite 1000, Rand Building 14 Lafayette Square Buffalo, New York 14203

June 21, 1983

te: File R 5615

Dear Mr. Laport:

Samples TP-4, TP-33, TP-13, and TP-16 were extracted, concentrated and analyzed by infra-red (IR) spectroscopy to determine the presence of major (>0.1%) constituents via func-This was verified by gas chromatographic (GC) analysis of the tional group classification. The IR spectra did not show any major constituents to be present other than hydrocarbons. concentrated extracts. The GC curves show the presence of what appears to be either a severely weathered diesel fuel and/or a motor oil type material. A similar GC pattern was also obtained for the extract of TP-59.

and substituted anilines. None were detected at levels greater than 10.ppb. TP-59 was further analyzed for the presence of nitro-aromatics (nitro-benzene, etc.) Again, none Sample TP-59 was analyzed for the presence of aniline were detected at levels greater than 10.ppb.

that if originally a diesel fuel was present, the more volatile constituents (carbon #8-12) have volatilized off leaving a isolated by extraction from the various TP samples; it appears more complex material enriched in the higher boiling constituents. This is similar in appearance to a motor oil type In reference to the hydrocarbon nature of the material product and makes differentiation impossible.

cause concern except for the presence of the high levels of In our work to date, we have found little evidence to

Sincerely, The ARO Corporation/Buffalo Division

Bernard J / Gracza / Ph.D. Director, Environmental Laboratory

# environmental testing laboratory

The ARO Corporation, Buffalo Division • 3895 Broadway, Buffalo, NY 14227 • Telephone (716) 663-0440 • Telex 9-1260

BUFFALO DIVISION 3695 BROADWAY, BUFFALO, N.Y. 14227



# ANALYTICAL RESULTS

Customer: GOLDBERG	ZOINO ASSOC	ATES OF N.Y	P.C. Attn:	Ray Laport	
DATE: COLLECTED:	6/10/83	RECEIVED:	6/10/83	COMPLETED:	6/21/83
P.O. NO. <u>File</u> R	5615	ARO W.O.	20,825W		
TEST	B-1	B-11	 B-9	B-19	B - 8
Chemical Oxygen Demand, mg/L	47.	22.	4.	4.	11.
рН	7.45	6.98	7.89	7.60	7.16
Phenols, ppm	0.002	0.004			0.006
Total Organic Carbon, mg/L	18.	8.	1	1.	4.
Asenic, ppm	<0.001	< 0.001			<0.001
Chromium, ppm	0.011	0.009			0.071
Lead, ppm	0.033	0.042			0.220
Zinc, ppm	0.112	0.045			1.83
	-			-	
<del></del>					
			A)		

Bernard J. Grucza // Ph.D.

Director, Environmental Laboratory

BUFFALO DIVISION 3695 BROADWAY, BUFFALO, N.Y. 14227



# ANALYTICAL RESULTS

Customer:	GOLDBERG	ZOINO ASSO	CIATES OF N.Y.	P.C. Attn	: Ray Laport	
DATE: COL	LECTED:	6/10/83	RECEIVED:	6/10/83	COMPLETED:	6/21/83
P.O. NO	File R	5615	ARO W.O.	20,825W		

_	·				
TEST	B - 5	B - 7	 В-16	Pond	
Chemical Oxygen Demand, mg/L	4.	32.	4.	32.	
рН	7.28	6.89	7.75	7.95	
Total Organic Carbon, mg/L	2.	12.	1.	13.	
Chromium,ppm	< 0.001	0.001	<0.001	< 0.001	
Lead, ppm	0.009	0.021	0.002	0.010	
Zinc, ppm	0.011	0.060	0.007	0.005	
		<b>_</b>			
·					
	-				

Demand f. Junga

Bernard J./Grucza, Th.D.
Director, Environmental Laboratory

BUFFALO DIVISION 3695 BROADWAY, BUFFALO, N.Y. 14227



# ANALYTICAL RESULTS

ustomer: GOLDBERG	ZOINO ASSOC	IATES OF N.Y.,	P.C. Att	n: Ray Lapor	t ·
ATE: COLLECTED:	6/10/83	RECEIVED:	6/10/83	COMPLET	ED: 6/21/83
O.O. NO File R	5615	ARO W.O.	20,825W		<del></del>
	<u>-</u>				
TEST	B-12	B-18	.,		
Chemical Oxygen Demand, mg/L	29.	19.			
Нд	7.62	7.80			
Phenols, ppm	0.004	0.011			
Total Organic Carbon, mg/L	11	8.			
Arsenic, ppm	< 0,001	<0.001			
Chromium, ppm	0.192	0.039			
Lead, ppm	0.240	0.108			
Mercury, ppm	0.0009	0.0002			
Benzene, ppb	<1	<1.			
Toluene, ppb	<1.	<1.			
Xylene, ppb	2.	300.			
Ethylbenzene, ppb	<1.	<1.			
Polynuclear					
Aromatic Hydro- Carbons	None detect	ed - individua	l limits al	1 <b>(1.</b> ppb	

Bernard N. Grucza Ph. D

Director, Environmental Laboratory

BUFFALO DIVISION 3695 BROADWAY, BUFFALO, N.Y. 14227



# ANALYTICAL RESULTS

Customer: GOLDBERG					6/21/83
DATE: COLLECTED:				COMPLETED	0/01/00
P.O. NOFile R	5615	ARO W.O.	20.825W		
<del></del>		1	<u> </u>		
TEST	TP-4	TP-13			
Arsenic, mg/Kg	<0.001				
Chromium, mg/Kg	21.0		ļ		
Lead, mg/Kg	399.				
PCB's, mg/Kg		<1.			
pH (50% Slurry)	4.8				

Bernard J. Gruzza, Th.D. Director, Environmental Laboratory

FILE NO. 75615 COLLECTOR LA PROJECT BUFFALL

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SEQUENCE NUMBER	E DATE	TIME	SERIAL NUMBER	STATION LOCATION	SAMPL	SAMPLE TYPE	REMARKS
			098		20.7		Dee xiss la Callect
			198		/ز، می		while dison
			298		50:1		1.7 0.7.8
			398		1:08		5/31/83-6/2183
100	247/9		004	near Minter , 26"			1607716
200	46/83	1433	500	DEAK NES,			160741
	_						
						No. OF CONTAINERS	KERS 2
RELINQUISHED BY:	BY: (Signature)	DATE	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature) 2.	DATE/TIME	RECEIVED BY:(Signoture)
RELINGUISHED BY: (Signahura) DATE/T 3.	(Signature)	DATE	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signohura)	DATE/TIME	RECEIVED BY: (Signoture)
RELINGUISHED BY: (Signature) 5.	Signature)	DATE	DATE/TIME	RECEIVED BY: (Signature)	RELANGUISHED BY (Signatura)	RECEIVED FOR LAB BY:	1 LAB BY: 100TE/THE
RETURN TO: Gold	Goldberg- Zoins Assoc	11 A 9500	3 d' A.N Po :	85 23200 5640 pel 5	Sx + p 1000 120 120	11 Gold Blagg 14	1 502/11

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FILE NO. (356/5

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SHEET OF

- COLLECTOR Laymond Lapart ()

STATION	SEQUENCE	DATE	TIME	SERIAL NUMBER	STATION LOCATION	SAMPL	SAMPLE TYPE	REMARKS
3-5	100	410/8	410/8 130C	001	1 44/109	50:1	6.2	16000
18	002	Suk?	1407	200	· · ·	//		3 602545
11-8	500	15.60	14/22	300		<i>''</i>		244/65
8-12	004	14/2/83/4	14/47	400		//		56.HHC
SW-P1	500	6/10/63		6618	Dand waster box'y	//		14.91
8-7		6251 BAN/2	15.51	500	Box #3	//		1 6024/6
16	200	8/0/4	1001	009	h#209	"		" /
11-0	800	:	1000	700				5 6000
	,							
								,
					*			
		24.					No. OF CONTAINERS	
RELINOU	RELINGUISHED BY: (Signatura)	gnoture)	DATE/TIME	3/10	RECEIVED BY: (Signglure)		DATE/TIME RECEIVED	RECEIVED BY:(Signature)
RELINGUR	RELINGUISMED BY: (Sig 3.	Signoture			RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	CAS MA	MEGENED BY (Signature)
RELINOUR	RELINOUISHED BY (Signature) 5.	acture)	DATE/TIME		RECEIVED BY (Signature)	RELINQUISHED Br (Signature)	RECEIVED FOR LAB 67" $b$ 7	6-10-83
RETURN TO	ğ							

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PROJECT \_

FILE NO. A5615

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SHEET / OF. PROJECT Buttale Industrial LOCATION BUFFALCY, New YACK

COLLECTOR Layound Lower

8-8 00' 8-9 002 6-19 003					SIATION LOCATION		•	
8-7		6/15/15	11.16	00	adi to NFS Portinglet	90:00	20	3400E
6/-9		55/1/13/64	53/	200	Boo ' N. Of NFS		Ž,	1 Bo HIC
		279/1 1851/		300		ba. ler	6	/ //
	·							
			-					
	,							
			_					
	_							
		-				TOTAL	TOTAL No. OF CONTAINERS	RS
RELINQUISHED BY: (Signature)	BY: (Sign	afura)	DATE/TIME		RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
1. Carm 2 Town 6/13/83	1/2	474	6	188	1645	2		
RELINGUISHED B	Y: (Sig	ohure)	DATE	•	RECEIVED BY: (Signature)	RELINGUISHED BY: (Signature)	DATE/TIME	RECEIVED BY (Signature)
RELINQUISHED BY: (Signature) 5.	Y: (Sign	Others)	DATE/TIME		RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	RECEIVED FOR LAB BY	C/13/83
RETURN TO:								

# THE ARO CORPORATION BUFFALO DIVISION

3695 BROADWAY, BUFFALO, N.Y. 14227



# RECEIVED

DEC 1 2 1983

December 8, 1983

Goldberg -- Zoino Assoc. of New York, P.C.

Mr. Ray Laport Goldberg-Zoino Associates Suite 1000 Rand Building Buffalo, NY 14203

Re: Soil Samples - Buffalo Industrial Park

Dear Mr. Laport:

Enclosed are the results for the above referenced samples. From the tests performed, the materials would be classed as non-toxic and non-reactive. Sample #6 may present corrosion problems because of the low pH. Also, #6 and #8 have fairly high selenium values but they are not above the limit (1.0ppm) for this procedure.

Please contact me if you have any questions or require additional information.

Sincerely,

The ARO Corperation/Buffalo Division

Bernard J. Frudza, PA.D.

Director, Environmental Laboratory

BJG/skg

Enc.

## THE ARO CORPORATION **BUFFALO DIVISION**

3695 BROADWAY, BUFFALO, N.Y. 14227



## ANALYTICAL RESULTS

CUSTOMER: GOLDBER	RG-ZOINO ASSO	CIATES OF NY, P	.c			
DATE COLLECTED:	11/8/83	RECEIVED:	11/9/83	COMPLETED:	12/5/8	3
P.O. NO		ARO W.O.	20,955W-801	9/23		
SOIL SA	AMPLES - BUFF	ALO INDUSTRIAL	PARK			
	TPII-11151)	#3	TPII-7 (5.0')	TPII-7	TPII-9 (1.01)	TPII. 14.0
TEST	#1	# 3	#6	#7	#8	#1
PCB's, mg/Kg	<1.			<b>∠</b> 1.		<b>\</b> 1
(1) Cyanides; ppm		0.003	0.002		0.006	
Sulfides; mg/Kg		<1.	< 1.		∠1.	
senic, ppm			0.004		0.008	
Barium, ppm			0.288		0.564	
Cadmium, ppm			0.002		<b>(</b> 0.001	
Chromium, ppm			<0.001		<b>(</b> 0.001	
Lead, ppm			0.177		0.012	
Mercury, ppm			0.0002		0.0002	
Selenium			0.895		0.94	
Silver			<0.001		0.001	<u> </u>
	rry		2.60	11-0	7.49	

(1) EP-Toxicity Procedure - Distilled Water Note: Metals reported on EP-Toxicity Procedure

Bernard J.

FILE NO. 25615.)

- SHEET - OF C PROJECT SEOHYDROLOGIC STUDIES FOR JOB No. 25615.1 LOCATION \_

(

COLLECTOR Laymond daged !

	NUMBER NUMBER	DATE		SERIAL NUMBER	STATION LOCATION	SYMBI	SAMPLE TYPE		REMARKS
7-44	100	11/6/83	850	200		1,05	Soil Samole	1/	160+116
77-1	)	"	o.KI	707			, , , , ,	"	,,
TOT	003	11	086			*	•	•	,,
II. did	900	"	271			,,	*	,,	,,
H. o'L	600	"	W21	704	•	"		"	,,
T. S.	800		5421	725		· ·		"	
						•			
		-							
					•				
							No. OF CONTAINERS	₽2	
RELINOU	RELINGUISHED BY: (Sign		DATE/TIME	\ y	RECEIVED BY: (Signature)	RELINGUISHED BY: (Signature)	DATE/TIME R	RECEIVED BY:(Signature	Y:(Signoture)
RELINGUISHED 3.	SHED BY ASIG	(Bank)			RECEIVED BY: (Signatura)	RELINGUISHED BY: (Signohura) 4.	DATE/TIME P	RECEIVED BY (Signature)	r (Signoture)
RELINOUIS 5.	RELINGUISHED BY: (Signature 5.	<b>(2</b>	DATE/TIME		RECEIVED BY: (Signature)	RELINGUISHED By: (Signature) 6.	RECEIVED FOR LAB BY:	A8 87:	DATE/TIME
RETURN TO	ē								

### THE ARO CORPORATION

BUFFALO DIVISION 3695 BROADWAY, BUFFALO, N.Y. 14227



### RECEIVED

DEC -7 1983

Goldberg - Zolno Assoc. of New York, P.C.

### ANALYTICAL RESULTS

	A	NALYTICAL RESU	<u>JLTS</u>		• • • - •
	_	<u> </u>		n: Ray Lapor	t
CUSTOMER: GOLDBER	G-ZOINO ASSOCI	ATES Suite 10	00, Rand Bldg	. Buffalo	14203
DATE COLLECTED: _	11/21/83	RECEIVED:	11/21/83	COMPLETED:	12/2/83
P.O. NO. File RS	615.1	ARO W.O	20,965W-80	68/71	
	B-12	, <i>B</i> -21	13-22	<i>B-2</i> 3	
TEST	Groundwater #1	Groundwater #2	Groundwater #3	Groundwate #4	
Arsenic	<0.001	<0.001	<0.001	< 0.001	
Barium	0.332	0.351	0.165	0.133	
Cadmium	0.005	0.001	<0.001	<0.001	
Curomium (+6)	<0.001	<0.001	0.001	<0.001	
Lead	<b>&lt;</b> 0.001	< 0.001	<0.001	<0.001	
Mercury	< 0.0002	<u> </u>	<0.0002	<0.0002	
Selenium	< 0.001	<0. <u>0</u> 01	< 0.001	<0.001	
Silver	< 0.001	< 0.001	<0.001	< 0.001	
		_			
	ALL RESULT	S IN PPM (mg/L	)		_
	ALL SAMPLE	FILTERED THR	U 0.45MFILTE	R PRIOR TO A	NALYSIS
		_			
)					

Bernard

ucza/ Ph.D.

FILE NO. 185615.

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, | | COLLECTOR A. PROJECT Sco. LOCATION A

(

STATION	SEQUENCE	DATE	TIME	SERIAL	STATION LOCATION	SAMPLE TYPE	REMARKS	
8-12	/00	12/163	12/18=1547			Second woter - hoiler	10G2A#1	
8-21	000	*	1435			Chound woter - Oil 1)	Ch sund GEA#2	
8-22	003	"	1623			11 6204	11 620#3	
8-23	400	"	1517			"	11 6244	
					•			
	,							
							1	
					,			_
							NTAINERS	
RELINGING	MOUNSHED BY: (SIE	3	DATE/TIME		RECEIVED BY: (Signature)	MELINGUISHED BY: (Signature) DATE/TIME	E RECEIVED BY: (Signature)	
11	Engel	7	12/183	19	.42			
нешноиянер 3.	HED BY: (Sip		DATE/TIME		RECEIVED BY: (Signature)	RELINGUISHED BY: (Signofun) DATE/TRAE	RECEIVED BY	
	AELHOUSHED BY (SIGN S.		DATE/TIME		RECEIVED BY (Signature)	RELINGUISHED BY (Signatura) RECEIVE	4. Holmen 11/21/83 4:40	
RETURN T	10							

(

### THE ARO CORPORATION BUFFALO DIVISION

3695 BROADWAY, BUFFALO, N.Y. 14227



### TERECEIVE

JAN 1 6 1984

Goldberg -- Zoino Assoc. of New York, P.C.

### ANALYTICAL RESULTS

Attn: Ray Laport

TE COLLECTED:	?	RECEIVED:1	10/84	COMPLETED:	1/11/8
0. NO. <u>N/C</u>		ARO W.O			
TEST	рН				
GZA # 2	6.40	TPII-5			
4	5.12	TPII-6 (4.0 ft.)			
5	4.41	TPII-6 (4.4.4.4)			
9	8.20	TPII-10 (3.0+4)			
					<u> </u>
			-		
			<del></del>		
			$\alpha$		

APPENDIX F

Limitations

### APPENDIX F

### LIMITATIONS

### **Explorations**

- The analyses and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations and field test results. The nature and extent of variations between these explorations or results may not become evident, until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.
- The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the boring logs.
- 3. Water level readings have been made in the drill holes at times and under conditions stated on the boring logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature and other factors occurring from the time measurements were made.

### <u>Analysis</u>

4. The analysis and conclusions submtted in this report are based in part upon chemical test data provided by others and are contingent upon their validity. These data have been reviewed and interpretations made in the text and on the figures included with this report. It should also be noted that fluctuations in the types and levels of contaminants and variations in their flow paths will occur due to changes in seasonal water table fluctuations, alteration of disposal characteristics, as well as other factors.

### Review

5. In the event that any changes in the nature, design, or location of the proposed roads and utilities are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by Goldberg-Zoino Associates of New York, P.C. It is recommended that this firm be provided the opportunity for a general review of final design and specifications



in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design and specifications.

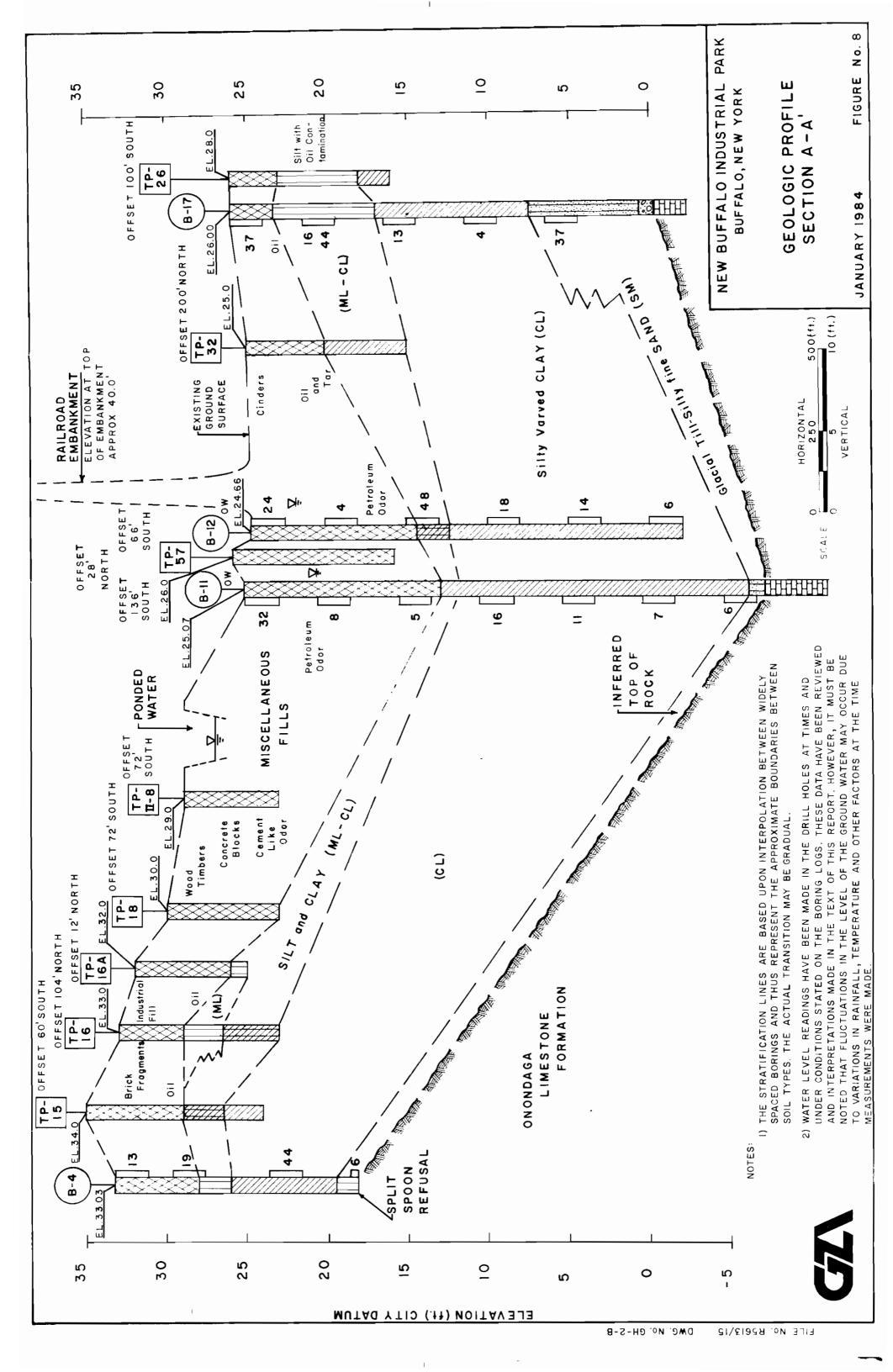
### Construction

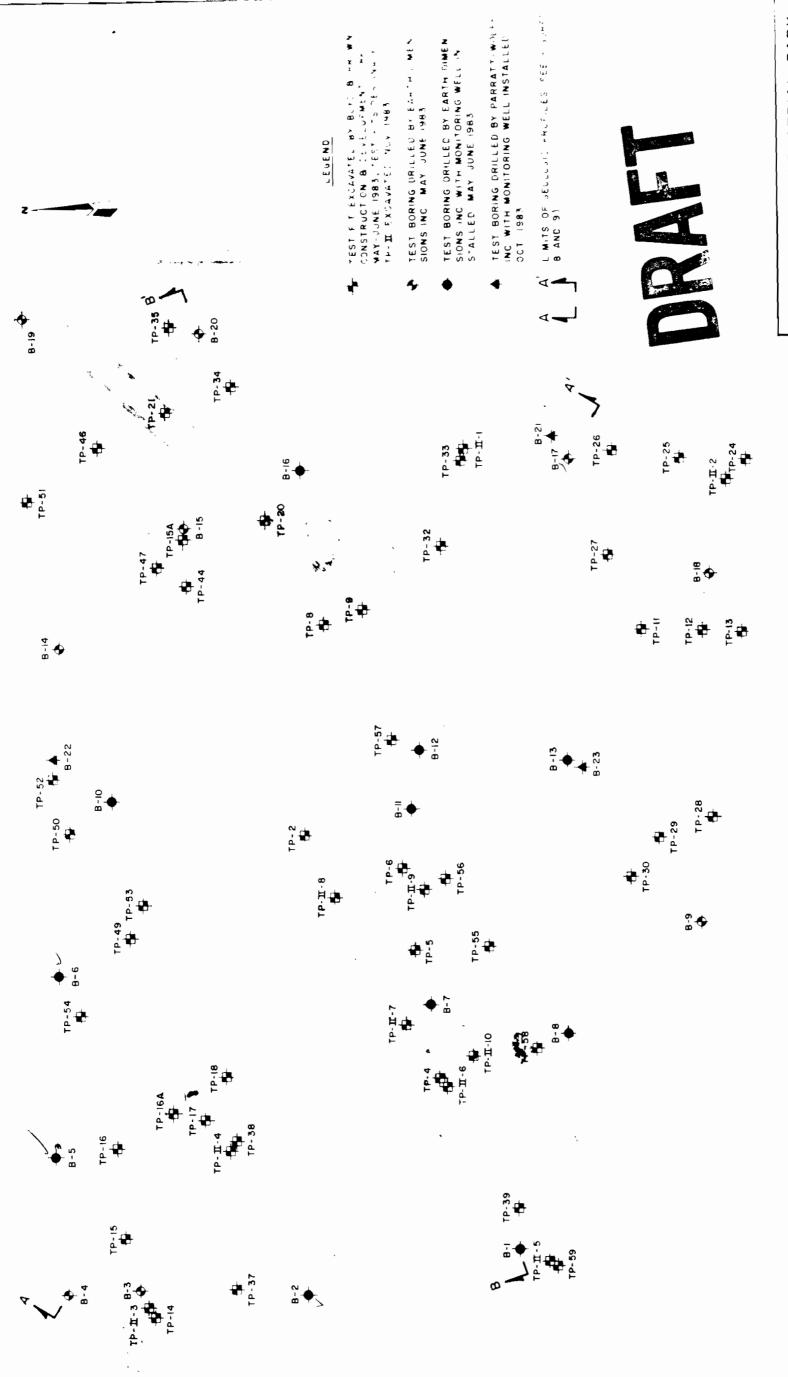
6. It is recommended that this firm be retained to provide soil engineering and geohydrologic monitoring services during construction of the excavation and foundation phases of the work. This is to observe compliance with the design concepts, specifications, or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

### Use of Report

- 7. This report has been prepared for the exclusive use of Olson & Terzian, P.C. for specific application to the New Buffalo Industrial Park in Buffalo, New York, in accordance with generally accepted soil, foundation and ground water engineering practices. No other warranty, expressed or implied, is made.
- 8. This engineering report has been prepared for this project by Goldberg-Zoino Associates of New York, P.C. This report was for design purposes only and may not be sufficient to prepare an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to design considerations only.
- 9. The information presented in this Report, is not of sufficient detail for individual parcel development. A subsequent geotechnical engineering program should be implemented to provide recommendations and designs with regard to foundation systems, associated subsurface installations, and site modifications for the development of each parcel or portion thereof.







SCALE | 150 300 450 (ft)

NEW BUFFALO INDUSTRIAL PARK BUFFALO, NEW YORK

EXPLORATION LOCATION PLAN

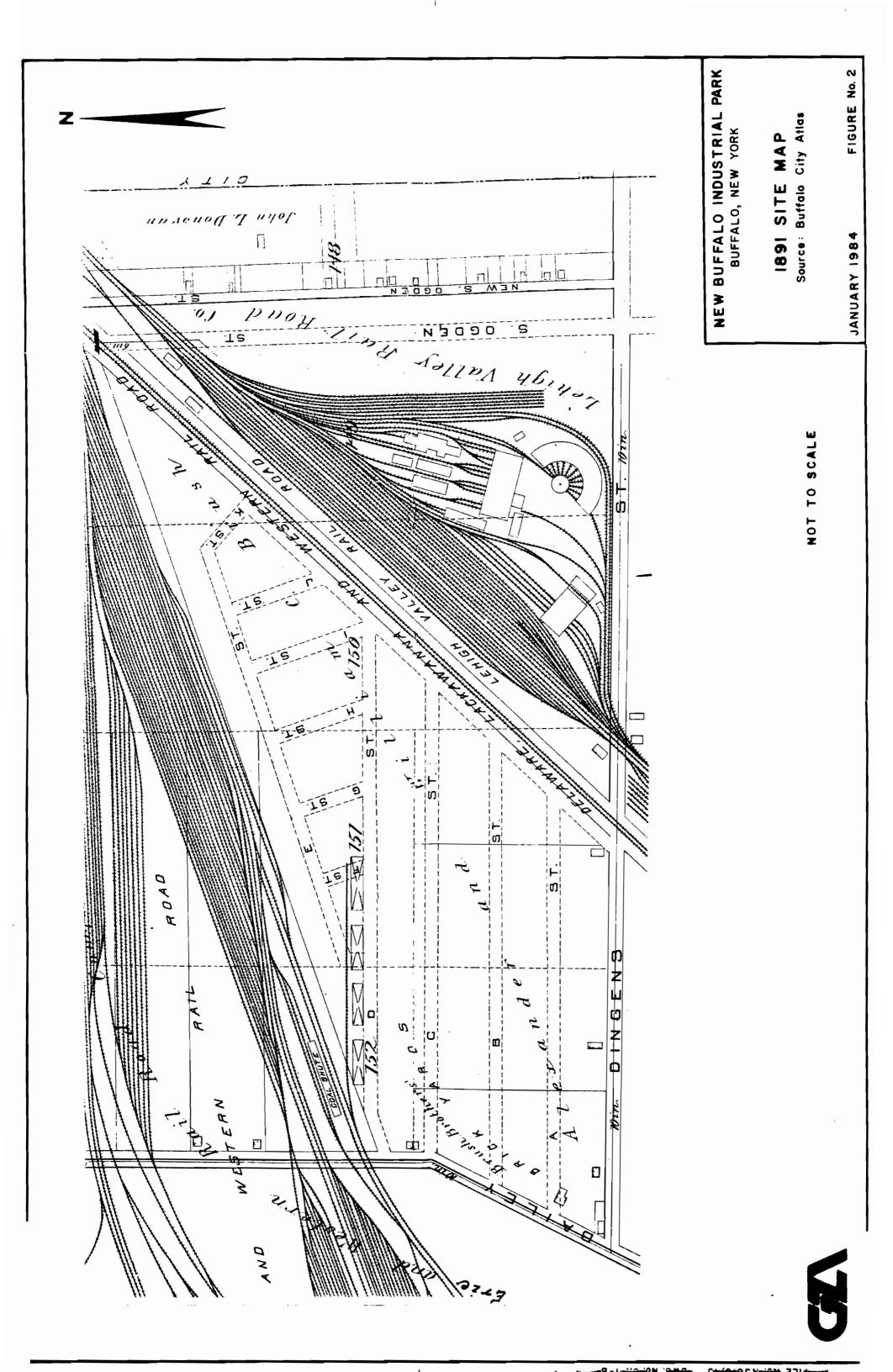
1983 SAMPLING PROGRAM

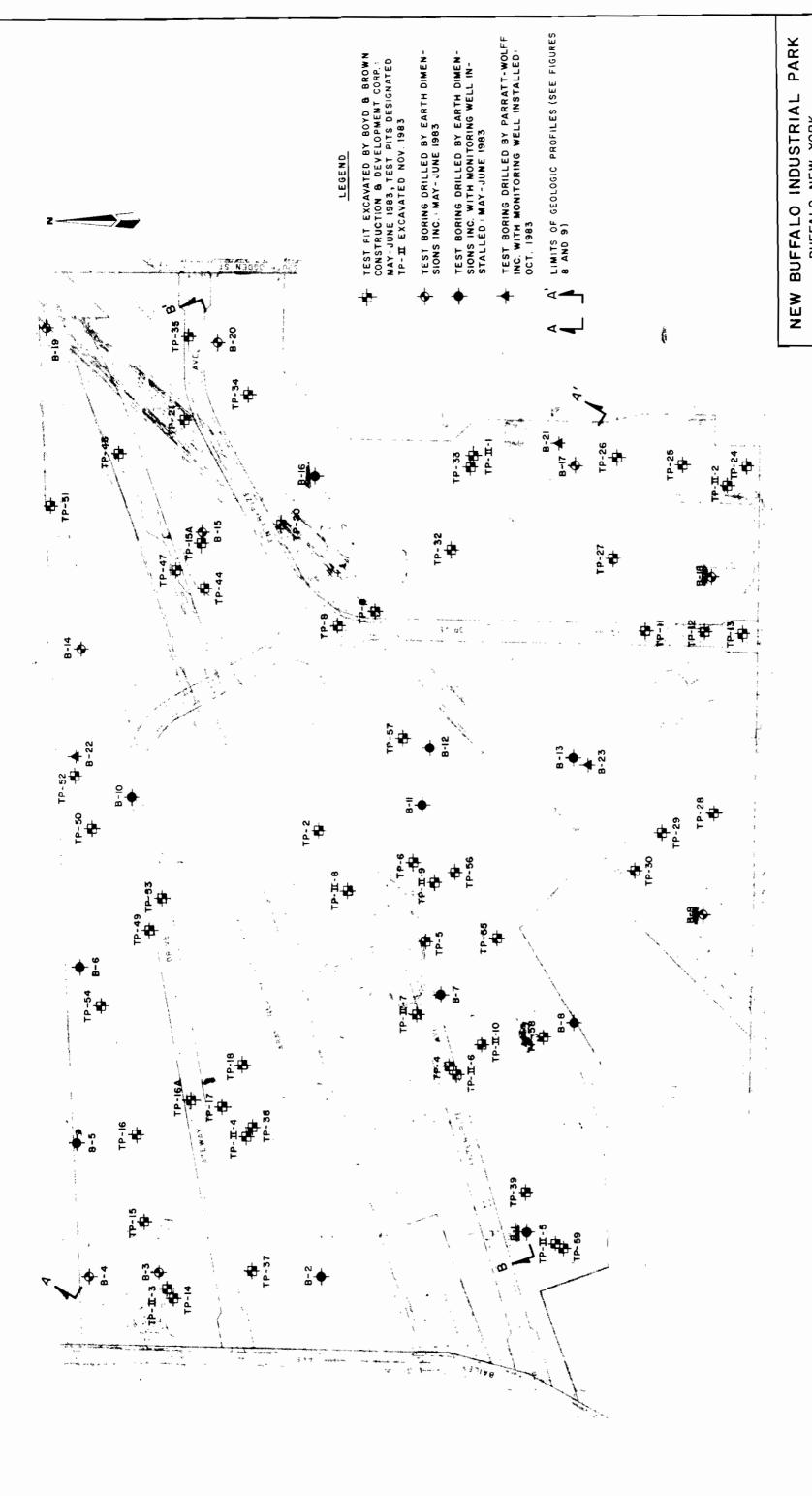
JANUARY 1984

FIGURE No 3

NOTES I) EXPLORATIONS WERE LOCATED IN THE FIELD BY GZA AND PLOTTED ON BASE PLAN MAP PREPARED BY OLSON B. TERZIAN, P.C. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED

2) THIS DRAWING WAS ADAPTED FROM BASE PLAN MAP PREPARED BY OLSON B. TERZIAN, P.C.





BUFFALO, NEW YORK

EXPLORATION LOCATION

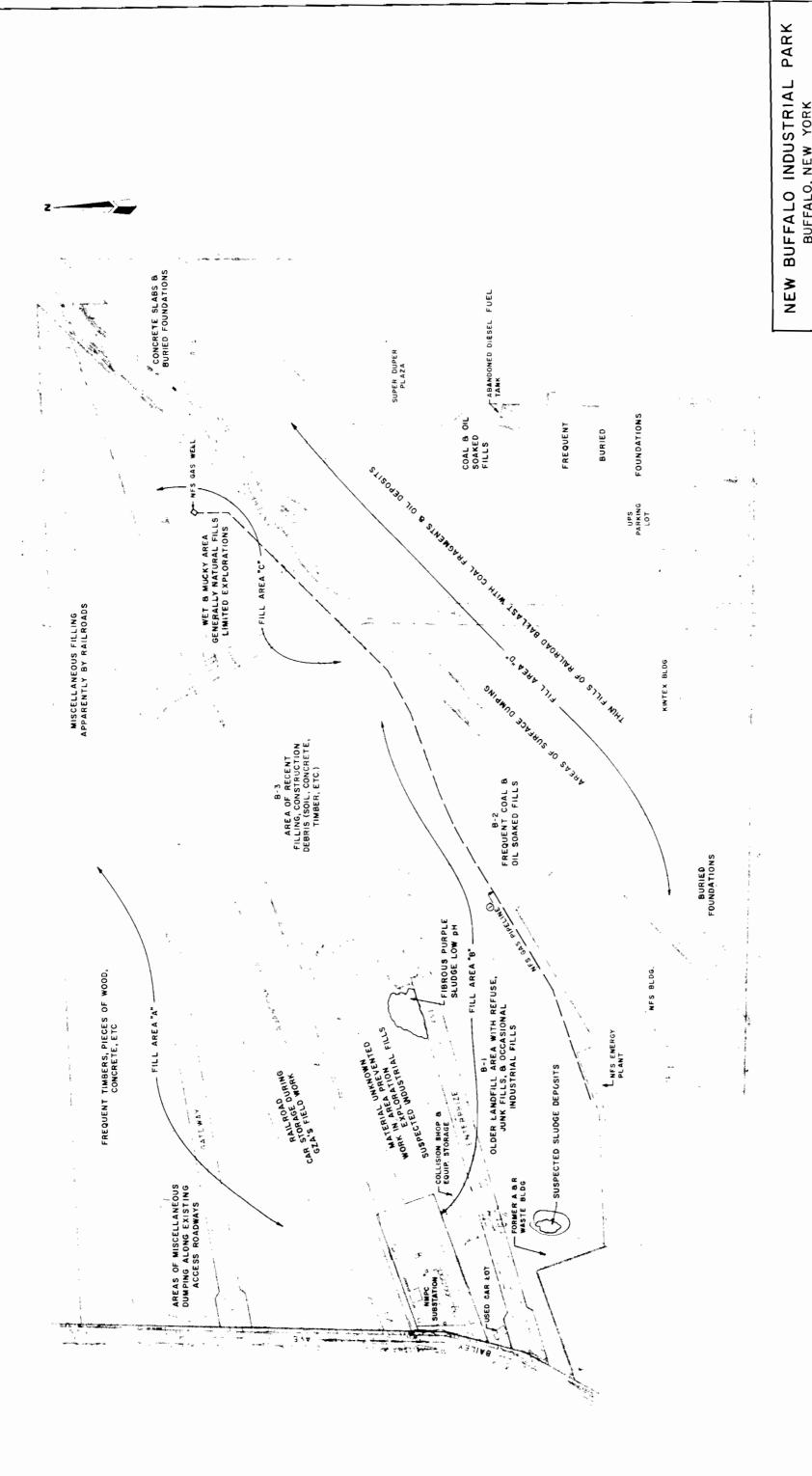
PLAN

JANUARY 1984

FIGURE No.

TIONS WERE LOCATED IN THE FIELD BY GZA AND PLOTTED ON BASE PLAN MAPD BY OLSON & TERZIAN, P.C. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE THE DEGREE IMPLIED BY THE METHOD USED. 2) THIS DRAWING WAS ADAPTED FROM BASE PLAN MAP PREPARED BY OLSON & TERZIAN, P.C.

NOTES: 1) EXPLORATIO PREPARED ONLY TO TI



BUFFALO, NEW YORK

### EXISTING LAND USES AREAS AND FILL

JANUARY 1984

450 (ft)

SCALE 0

FIGURE No. 5

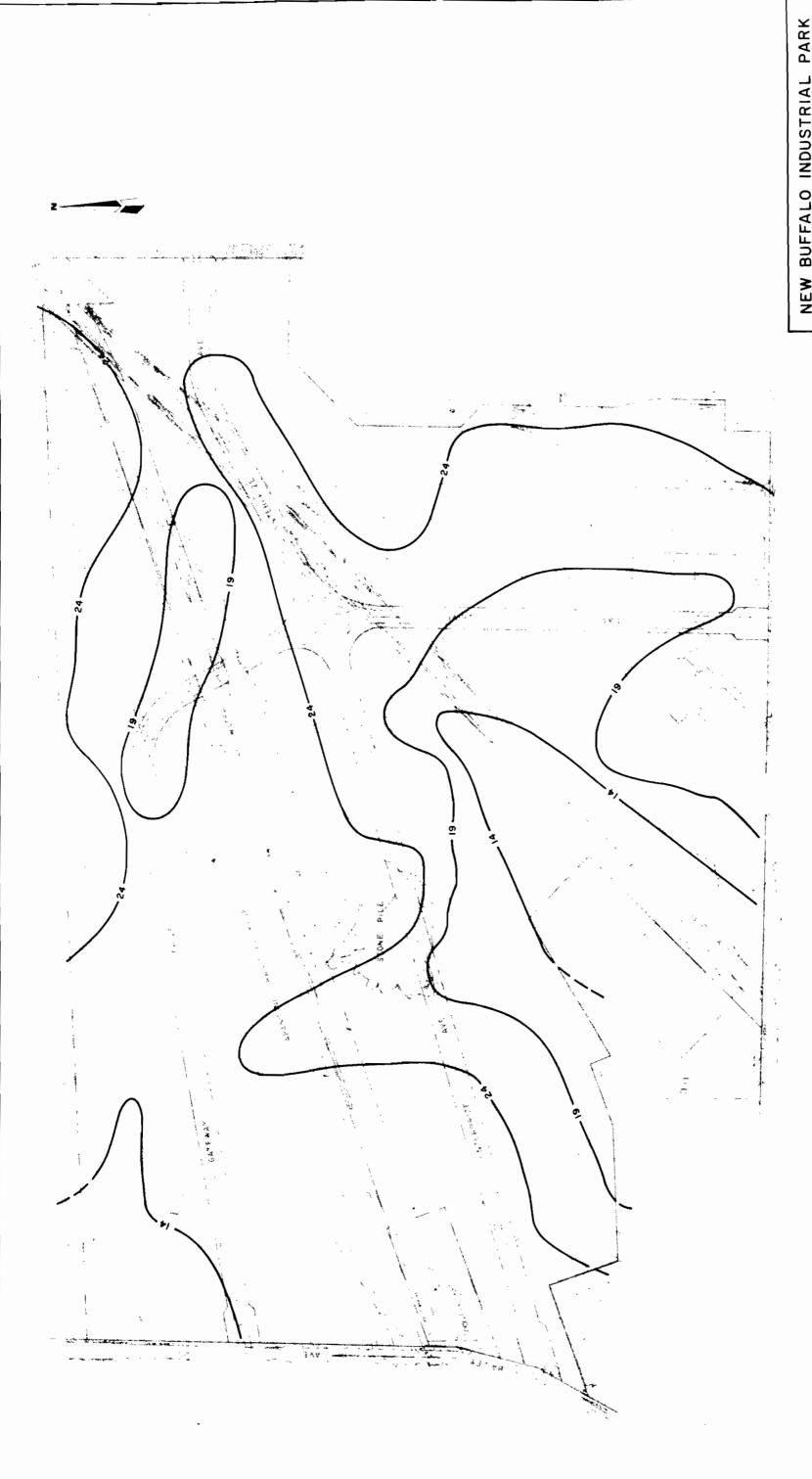
WAS ADAPTED FROM BASE PLAN MAP PREPARED BY 01 SON & TERZIAN, PC 2) FILL TYPES ARE GENERALIZED BASED ON A LIMITED NUMBER OF EXPLORATIONS AND VARIATIONS MAY OCCUR DURING CONSTRUCTION. 3) THIS DRAWING

I) GAS WELL AND PIPELINE LOCATIONS SHOWN ARE APPROXIMATE AND ACTUAL LOCATIONS SHOULD BE VERIFIED WITH NFS PRIOR TO CONSTRUCTION

FILE No. R5613/15

NOTES

DMC' NO' CH-8-C



NEW BUFFALO INDUSTRIAL PARK BUFFALO, NEW YORK

ESTIMATED BOTTOM OF ILL ELEVATION CONTOURS FILL

WAS ADAPTED FROM BASE PLAN MAP PREPARED BY OLSON & TERZIAN, P.C.

2) ELEVATION CONTOURS ARE PRESENTED AS CITY OF BUFFALO DATUM 3) THIS DRAWING WAS ADAPTED FROM BASE PLAN MAP PREPARED BY O

I) BOTTOM OF FILL ELEVATIONS WERE ESTIMATED BY INTERPOLATING WIDELY SPACED EXPLORATION DATA, ACTUAL CONDITIONS MAY DIFFER.

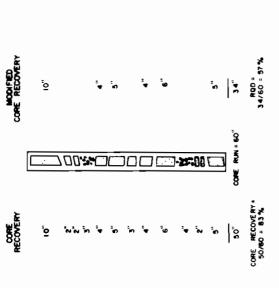
450 (ft.)

JANUARY 1984

FIGURE No. 6

NOTES

ROCK QUALITY DESIGNATION (RQD)



0 25 50 75 90 100

wery poor | poor | fair | good excellent

EFE RENCE U DETTE, n Resh Mechanics in Minoering Frustics, Stepp &

NOTES:

- Descriptions and classifications are based on visual inspection of samples and boring operations, unless otherwise noted in the text.
- 2) The stratum lines are based upon interpolation between borings and may not represent actual subsurface conditions.
- 3) Water level readings have been made in the drill holes at times ond under conditions stated an the boring logs. Fluctuations in the level of the ground water may occur due to other factors than those present at the time measurements were made.
- For a more detailed description of soil and rock types see the boring logs in Appendix A.
- 5) For boring locotions see figure 4, Exploration Locatian Plan.

KEY TO DENSITY & CONSISTENCY DESCRIPTION OF GRANULAR & COHESIVE SOILS

Comistency	Wary soft	ž	Medium	SHIF	Very stiff	Herd
Number of Bless per ft, N	9 <b>04</b> m 2	5-4	<b>0</b> - <b>+</b>	80 10 10	15 – 30	OF 30
Relative Deneity		Very loose	Losse	Medium	Dense	Very deser
Number of Blues per ft, A		<b>+-0</b>	01−♦	06-01	30-30	Over 50



SOIL CLASSIFICATION CHART (UMFIED SOIL CLASSIFICATION SYSTEM)

M	MAJOR DIVISIONS		GRAPH SYMBOL	LETTER	TYPICAL DESCRIPTIONS
		Clean Grovels		<b>A</b> 9	Well-graded gravels, gravel-setti misteres, litte or no finan
	GRAVELS	no fines)		GP .	Poorly-graded gravels, gravid-sided ministeres, listle or no fines
	Mers than 50% of coarse fraction larger than NO 4 sieve	Grove is with		M9	Sity & crols, grovel sand-eft exxteres
COARSE – GRAINED Soils		of thres		၁၅	Cieyey grovels, gravel-send-cky mixtures
<u>Mars</u> then 50% of meternal larger than NO.200 serva		Citton		AS	Wed-graded sands, gravelly sands, little or no fines
	SQIMPS	Ottle or no fines)		SP	Poorly-graded sands, gravelly sands, little or no fines
	Less than 50% of coorse fraction larger than NO 4 sieve	Sonds with		NS.	Silty sands, send-silt mixtures
		appreciable omounts of fines		၁၄	Clayey sends, send-clay mixtures
	7	GTS AND CLAYS		¥.	Inorganic sits and very fine sends, nock flow, sulty or clayey fine sends or clayey alth with alight plankelty
	Logurd Limit <	Low Plasticity Logue Limit < 30%		S.	inorganic clays of low to madium planticity gravely clays, sandy clays, sity clays, lean clays
FINE - GRAINED Soils				9	Organic sitts and organic sitty slays of tow pleaticity
<u>Less</u> than 30% of moterial larger than NO 200 sieve		SILTS AND CLAYS		I	horganic silfs, micacsous or diatemaceous fine send or silfy solls
	High Plasticity Liquid Limit > 5	High Plasticity Liquid Limit > 50%		5	Inorganic clays of high plasticity, for clays
			X	¥.	Organic clays of madiom to high pharticity, organic sitts
	Highly O	Highly Organic Soils		ŧ	Peot, humes, swamp soils with high organic contents
	Miscelloneous	Per Fill		FILL	Muscellaneous fill may belong in any divison but is identified as FI'L.
		Morte. Duni sumbols is	de Porderius	diam'r.	

Note: Deal symbols indicate borderline soils clossifications

## OCK CLASSIFICATION CHART

On Onondaga Limestone Farmation

LEGEND FOR BORINGS

32 Split Spaon Sample with Standard Penatration Test (S.P.T.) N-Value

Water Level-Well sealed within Misc. Fill materials in Misc. Fill materials

Water Level-Well sealed within Glacial Till

BX Care Run; All NX size unvingation Gare otherwise

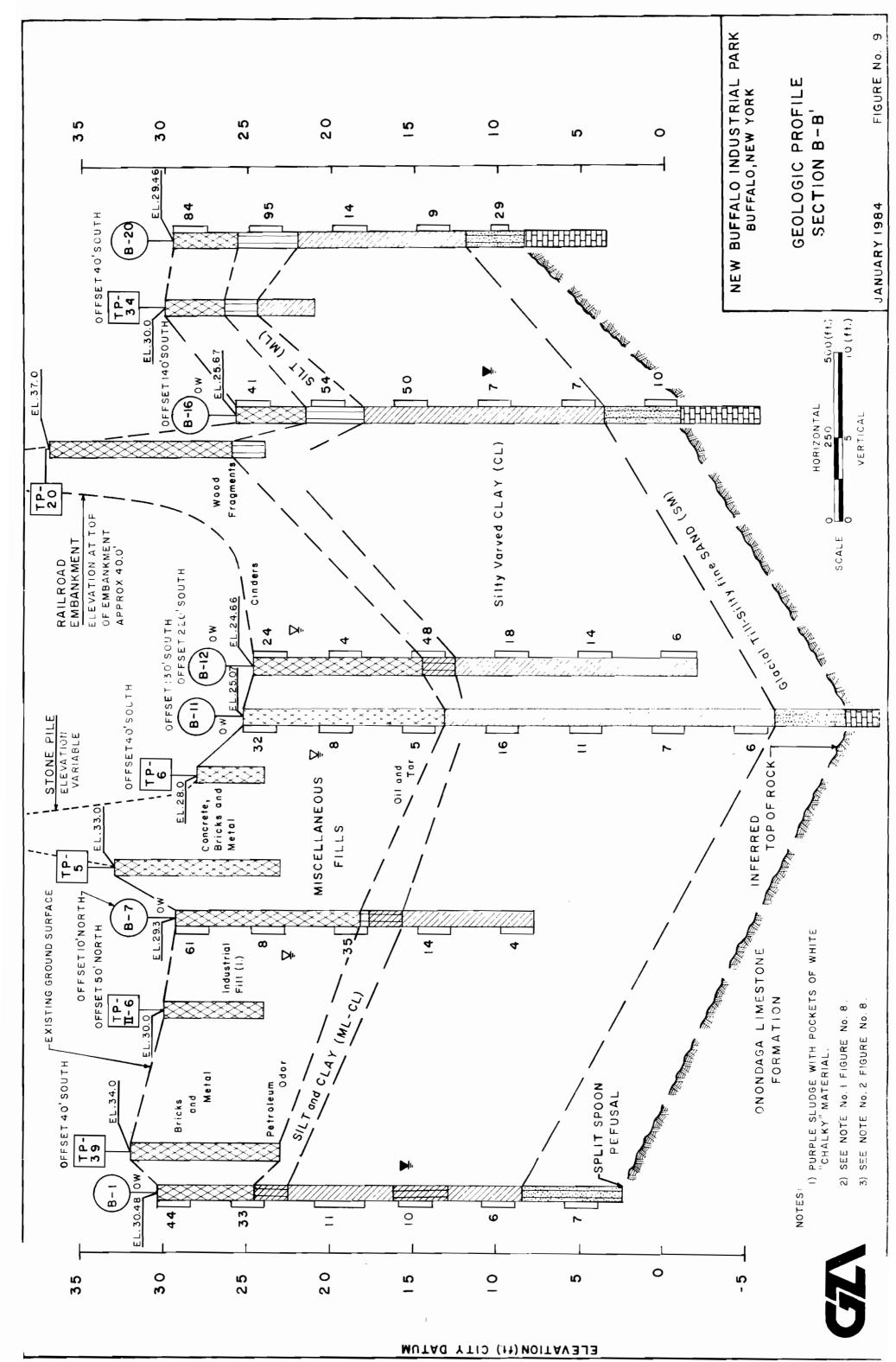
100-90 Water Level-Well sealed within Glacial Till

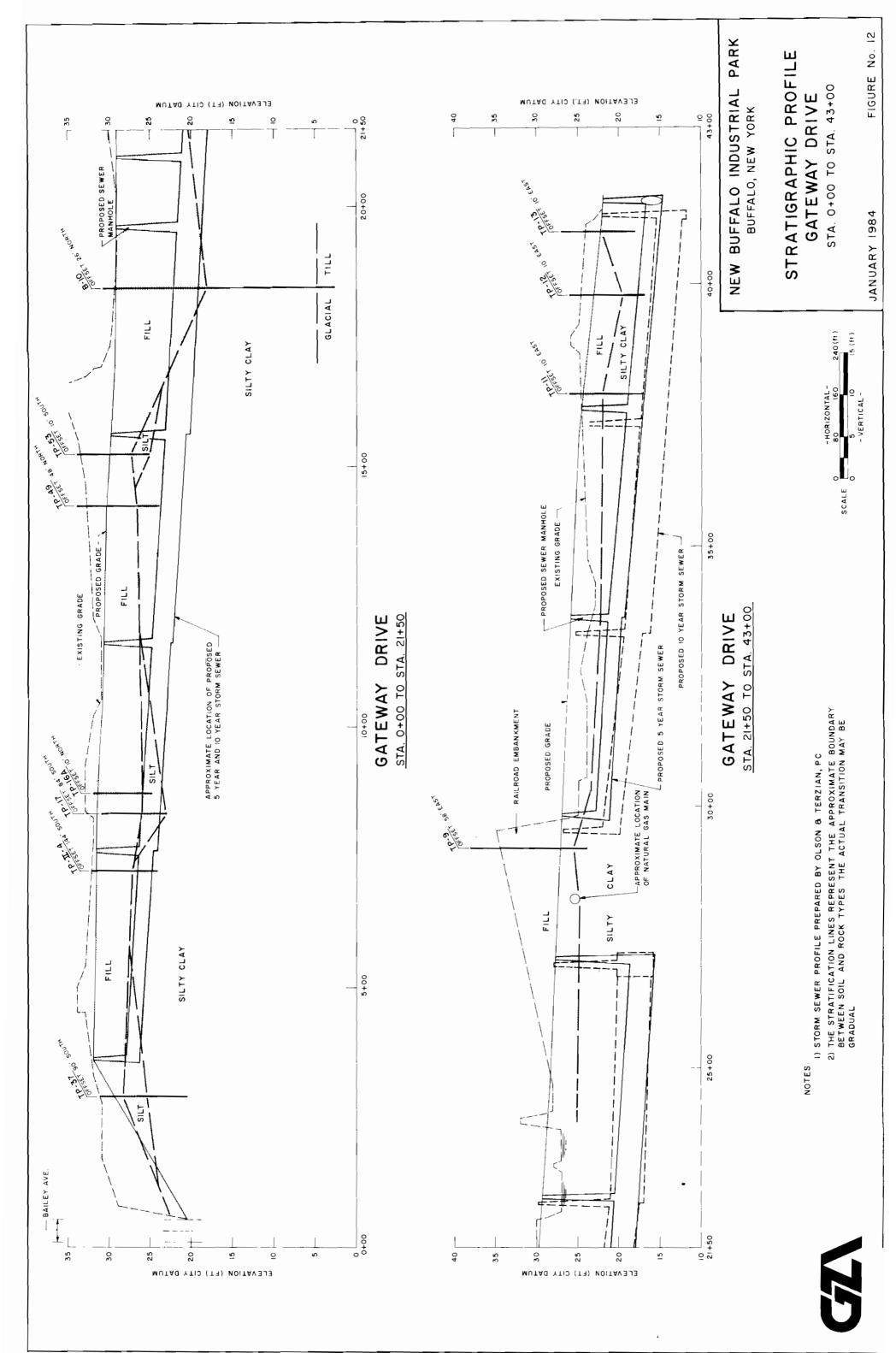
BX Designation (RQD)

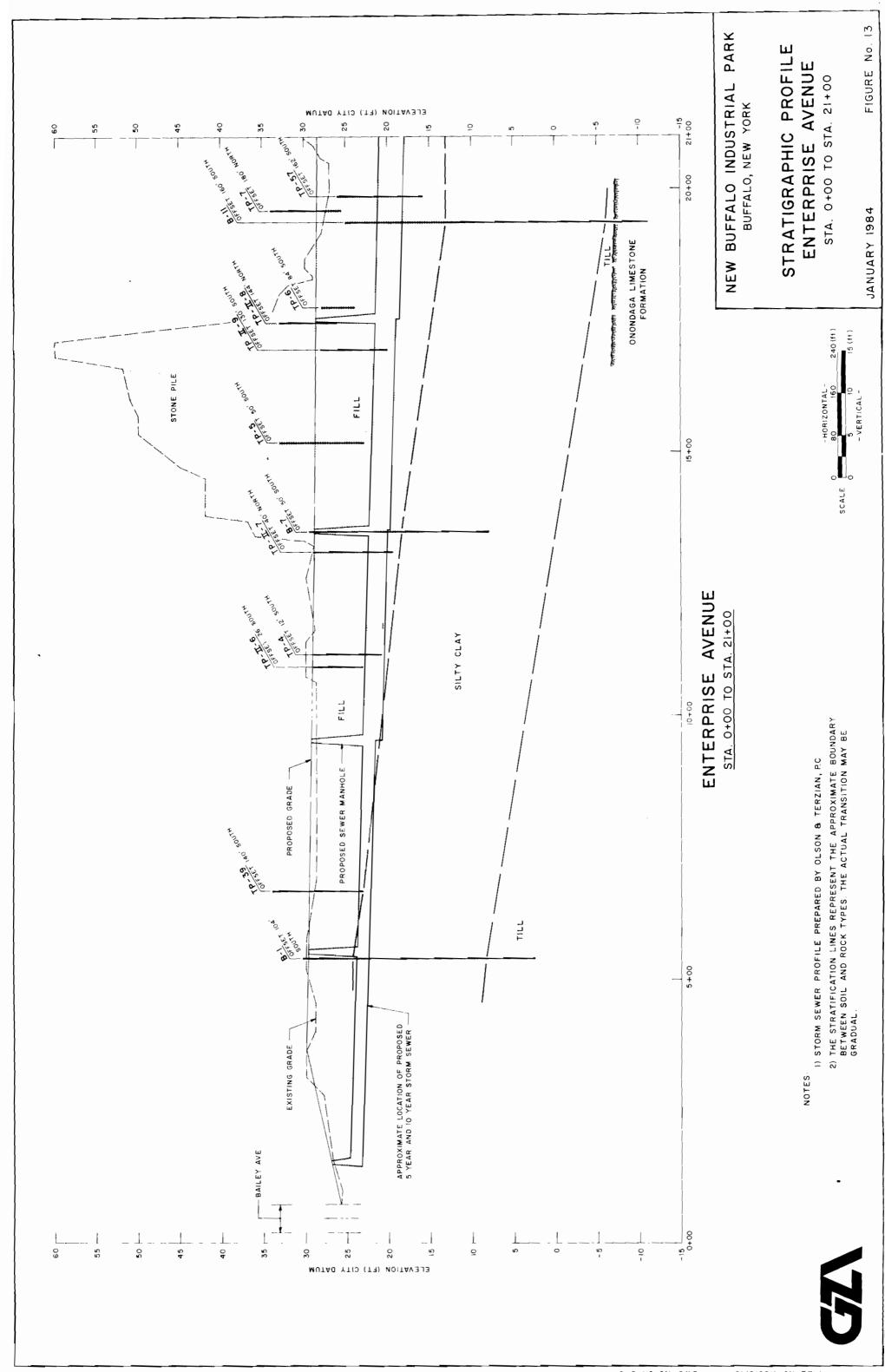
NEW BUFFALO INDUSTRIAL PARK BUFFALO, NEW YORK

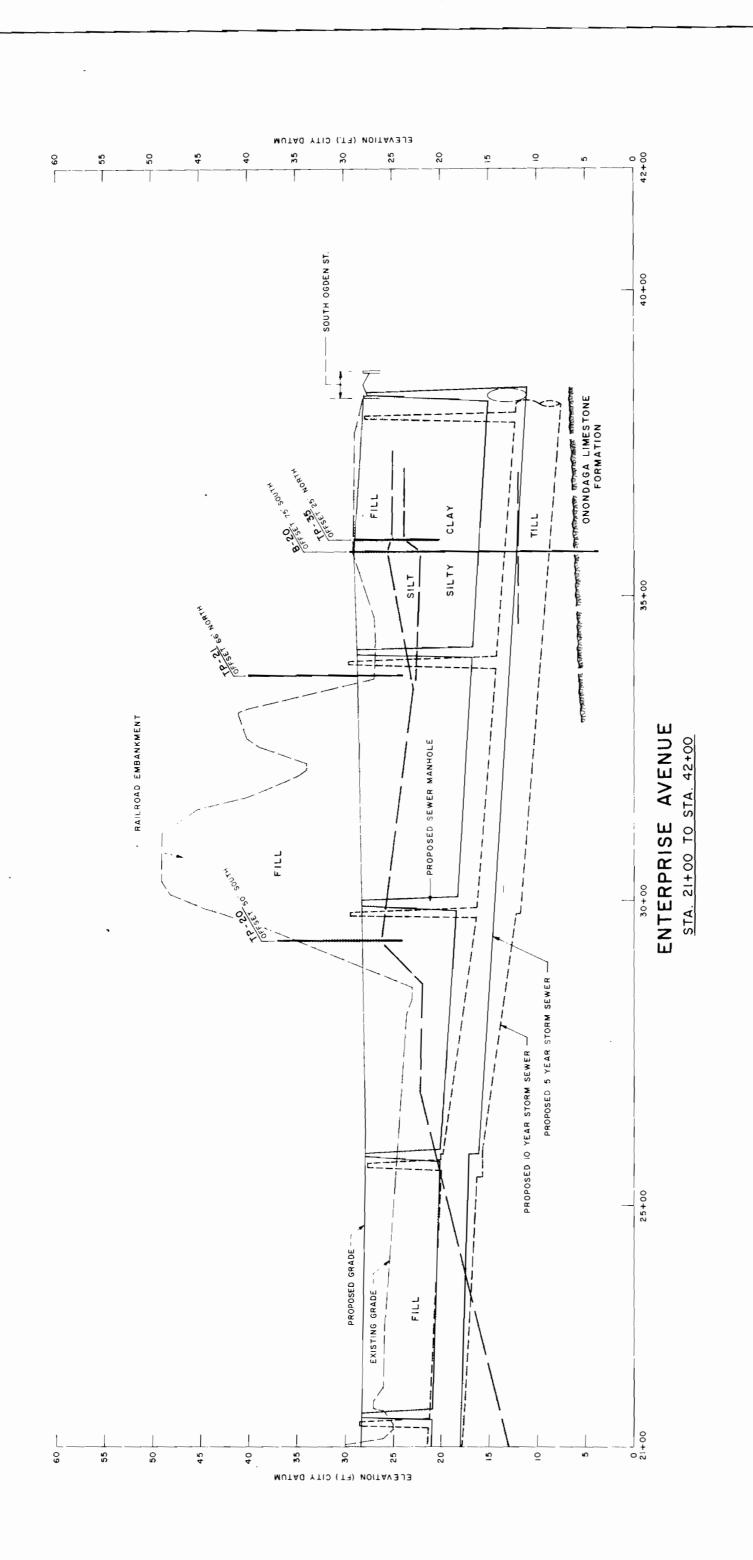
LEGEND FOR GEOLOGIC PROFILES AND BORING LOG

SHEETS









PARK

# NEW BUFFALO INDUSTRIAL BUFFALO, NEW YORK

STRATIGRAPHIC PROFILE ENTERPRISE AVENUE STA. 21+00 TO STA, 42+00

JANUARY 1984

FIGURE No. 14

-HORIZONTAL-80 160

2) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL AND ROCK TYPES. THE ACTUAL TRANSITION MAY BEGRADUAL.

I) STORM SEWER PROFILE PREPARED BY OLSON & TERZIAN, P.C.

NOTES

