MEMORANDUM

DATE: May 15, 2014

TO: Mandel Group, Inc.
Attn: Bob Zeller; Bob Monnat

FROM: GZA GeoEnvironmental, Inc.
Jesse Graham, P.E.
Patrick Harrison, P.E.

SUBJECT: Adventure Rock/River Crest Phase II
Southeast Corner of Commerce Street and North Avenue
Initial Slope Stability Analysis
Milwaukee, Wisconsin

GZA FILE: 20.0154044.00

In accordance with your May 12, 2014 request, GZA GeoEnvironmental, Inc. (GZA) prepared this Memorandum outlining our methods and results for the initial slope stability analysis conducted for the proposed Adventure Rock/River Crest Phase II development located at the southeast corner of North Commerce Street and East North Avenue in Milwaukee, Wisconsin ("Site"). A Site Location Map is provided as Figure 1. Please note that this Memorandum is subject to the Limitations provided in Attachment 1.

As part of our geotechnical evaluation of the Site, GZA utilized the slope stability computer program SLOPE/W© developed and distributed by Geo-Slope International, Ltd. to conduct an initial slope stability evaluation of the Site for both current and proposed conditions. Information collected from the soil borings conducted at the Site was used in our analysis. It is the opinion of GZA that the soil and loading conditions used in the initial analysis were conservative and indicate very limited (near negligible) reduction of the stability of the slope related to the proposed building. Furthermore, the predicted slope "failure" for the Site is confined to the upper shallow fill soils and does not represent a deep seated global stability failure. Most of these shallow fill soils are proposed to be removed as part of the building excavation. Details regarding data acquisition and analysis are presented below. In summary, the proposed development does not appear to have a negative influence on the existing slope on the east side of the Site.

Soil Borings/Soil Classification and Characterization

A total of three soil borings were drilled at the Site, as shown on Figures 2 and 3. Soil borings were drilled by Subsurface Explorations Services (SES) of Green Bay, Wisconsin under subcontract with GZA. Soil borings were drilled using a Diedrich D-

50 drill rig and a combination of solid-stem auger and mud-rotary drilling techniques. Soil borings ranged in depth from 35.4 to 36.5 feet below ground surface (bgs) to an approximate elevation of 22+/- 1 foot (City of Milwaukee Datum). Soil samples were obtained using split-spoon samplers and Standard Penetration Testing (SPT) methods outlined in the American Society for Testing and Materials (ASTM) test method D-1586. Soil samples were generally taken at 2.5-foot intervals in the upper 20 feet and at 5-foot intervals thereafter. Soil sampling was performed under the supervision of a GZA employee and soil classifications and field data were used to develop the field boring logs. Soil samples were returned to GZA for further review and selection of soil samples for further laboratory testing.

Selected soil samples were tested for moisture content, gradation testing and plasticity testing (Atterberg Limits) for further classification and to aid in the characterization of the soil properties for engineering analysis. Results of the laboratory testing are presented on the boring logs provided in Attachment 2.

Slope Stability Analysis

The results of the field and laboratory soil testing were incorporated with the survey data provided by the Client to create a subsurface cross-section of the existing conditions at the Site (Figure 4). Soils were broadly classified into two categories: Miscellaneous "Urban Fill" soils and Native "Hard Pan."

Fill soils generally consisted of urban debris mixed with sand and clay. Fill materials were generally in a very loose to loose state and extended to about 15 feet bgs, to an approximate elevation of 42.5 feet (City of Milwaukee Datum). Fill materials were underlain by dense to very dense, clayey sands and hard, sandy, lean clays, extending from the bottom of the fill to the end of the boring at approximately 35 feet bgs. Other soil borings completed on nearby adjacent sites indicate that the native hard pan likely extend for several tens of feet below the bottom of the current soil borings and are present within the zone of influence for the current work.

The shear strength characteristics of each soil type are provided in the slope stability outputs and summarized in the Table below:

Soil Type	Unit Weight (pcf)	Cohesion (psf)	Phi Angle (Deg.)
Urban Fill	115	0	15
Native Hard Pan	125	1500	25

The above soil shear strength characteristics and survey data were used to develop an initial slope stability model using the Slope/W computer program. Printouts of the program output are provided in Attachment 3.

A second model was created to simulate the removal of the upper fill materials and the addition of loading conditions similar to those expected to be imparted on the soil by

the proposed structure. It should be mentioned that the loading characteristics utilized are considered conservative, as they were applied within the existing fill zone. Given our understanding of the size and location of the proposed structure, we have been informed that the structural engineer intends to recommend deep foundations or soil improvement methods as part of the foundation system. The use of these foundation methods will improve the soils below the building and also transfer loads into the deeper native hard pan soils, thus further reducing an impact of the building on the existing slope. When structural loading and foundation plans are finalized, GZA could re-evaluate the slope stability and update the factor of safety.

Results of the Slope Stability Analysis

The results of the slope stability analyses are provided on the Slope/W output (Attachment 3). The slope stability analysis determined a Factor of Safety of 1.56 for the existing conditions and 1.56 for the proposed conditions.[1]

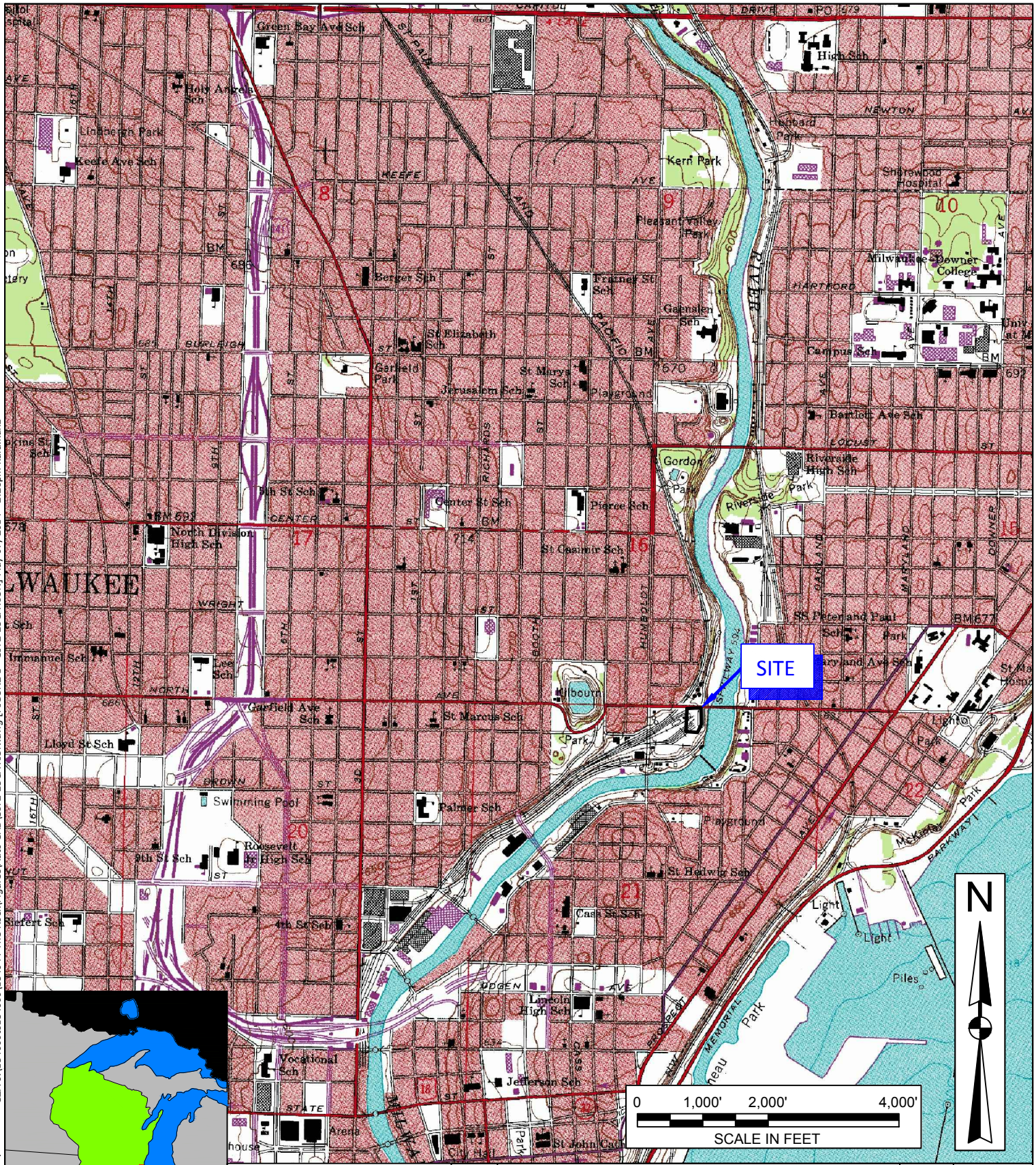
As the results also show, the "failure" envelope in both models is limited to the upper loose fill soils present at the Site. The removal of the fill soils and transfer of the structural loads of the proposed building will likely further improve the slope from a global stability standpoint. Further analysis can be conducted by GZA after the foundation loading and geometries have been determined.

Conclusions

The nearly negligible changes in slope stability analysis results at the Site indicate that the proposed structure will not negatively impact the slope from a stability standpoint. The removal of the existing fill soils and the transfer of the structural loads through the use of deep foundations or soil improvement methods will likely improve the existing slope from a global stability standpoint.

[1] A minor change was calculated to the thousandths place in the Factor of Safety calculation and is shown on the output sheets. It is standard practice in geotechnical engineering to present numbers to no greater than the hundredths place, as the soil conditions are not well-enough defined in native soil conditions to accurately predict stability to such a fine degree.

FIGURES



SOURCE: U.S.G.S. MILWAUKEE, WIS.
QUADRANGLE MAP (1958)
PHOTOREVISED (1971)

NO.	ISSUE/DESCRIPTION	BY	DATE

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
20900 SWENSON DRIVE, SUITE 150
WAUKESHA, WISCONSIN 53186
(262) 754-2560

PREPARED FOR:

SITE LOCATION MAP

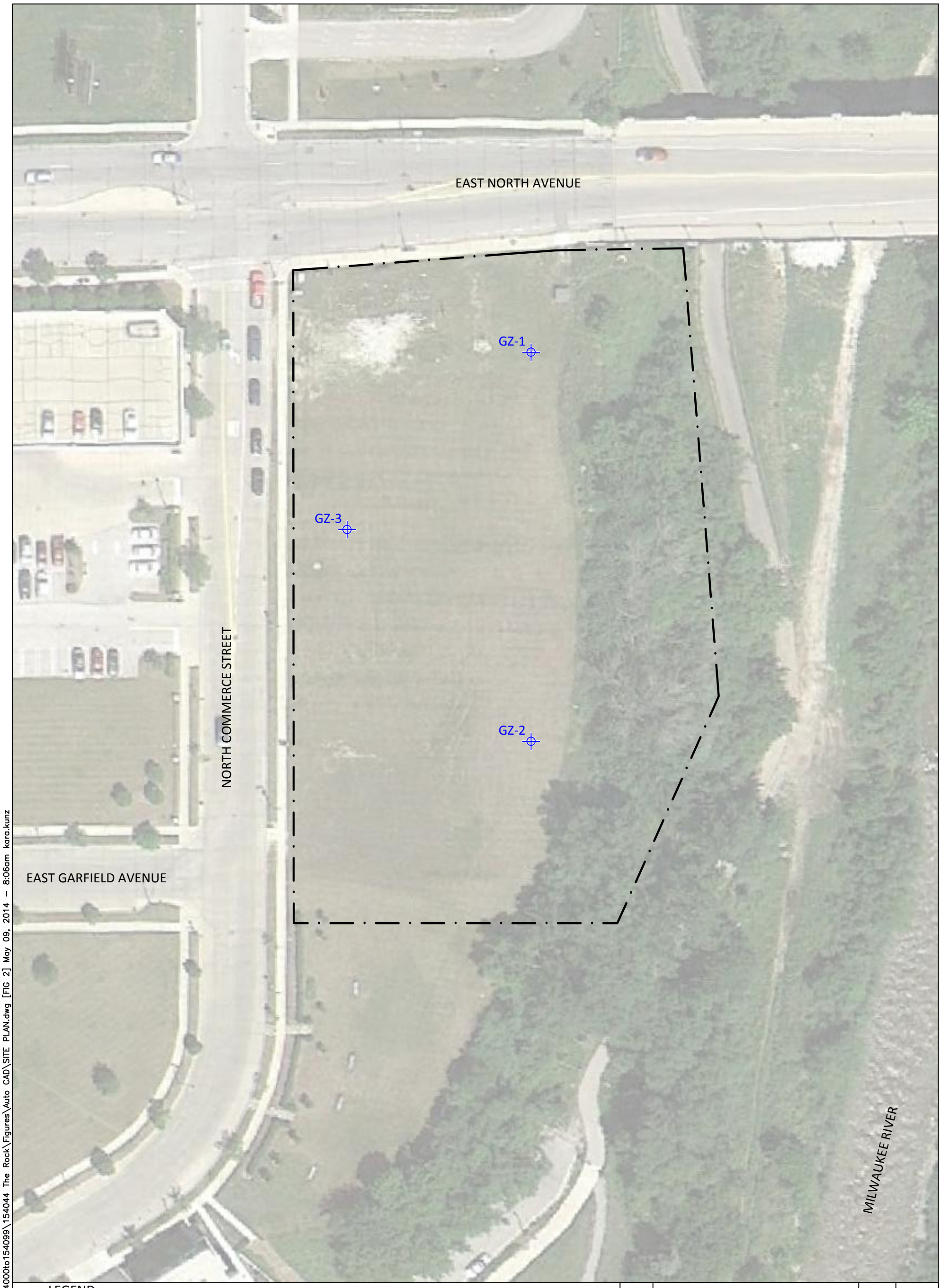
THE ROCK/RIVER CREAST
SE CORNER OF NORTH AVENUE AND COMMERCE STREET
MILWAUKEE, WI

FIGURE 1

SHEET NO.

PROJ MGR: PJH	REVIEWED BY: PJH	CHECKED BY: JDG	DATE 5/7/14	PROJECT NO. 20.0154044.00	REVISION NO.
DESIGNED BY: JDG	DRAWN BY: KLK	SCALE: 1 : 24000			

GZA-J:\154000to154099\154044 The Rock\Figures\Auto CAD\SITE LOCATION.dwg [FIGURE 1 - SITE LOCATION] May 07, 2014 - 2:28pm kara.kunz



LEGEND

APPROXIMATE SITE BOUNDARY

GZ-1 SOIL BORING LOCATION

NOTES

1. BASE MAP DEVELOPED FROM A GOOGLE PROFESSIONAL ELECTRONIC IMAGE FILE. DIGITAL AERIAL ORTHOPHOTOGRAPHY WAS PUBLISHED BY THE U.S.G.S.
2. THE USE OF AERIAL PHOTOGRAPHY CAN OFTEN MAKE BUILDINGS AND OTHER SITE FEATURES APPEAR TO BE OVERLAPPING AND DISTORTED WHEN OVERLAID WITH ACTUAL SITE FEATURES.
3. THE LOCATION OF THE EXPLORATIONS WERE APPROXIMATELY DETERMINED BY LINE OF SIGHT AND/OR TAPE MEASUREMENTS FROM EXISTING TOPOGRAPHIC FEATURES. THESE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
4. THE APPROXIMATE LOCATION OF THE SITE BOUNDARY WAS OBTAINED THROUGH MANDEL GROUP'S ARCHITECTURAL SITE PLAN .DWG FILE CREATED BY JOHNSEN SCHMALING DATED 4/01/14.

0 25' 50' 100'

APPRO□IMATE SCALE IN FEET

N

NO.	ISSUE/DESCRIPTION	BY	DATE

□ORIN□ LOCATION MAP

THE ROCK/RIVER CREST
SE CORNER OF NORTH AVENUE AND COMMERCE STREET
MILWAUKEE, WI

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
20900 SWENSON DRIVE, SUITE 150
WAUKESHA, WISCONSIN 53186
(262) 754-2560

PREPARED FOR:

PROJ MGR:	PJH	REVIEWED BY:	PJH	CHECKED BY:	JDG	FIGURE	2
DESIGNED BY:	JDG	DRAWN BY:	KLK	SCALE:	see above		
DATE	5/6/14	PROJECT NO.	20.0154044.00	REVISION NO.		SHEET NO.	

LEGEND

APPROXIMATE SITE BOUNDARY

GZ-1 SOIL BORING LOCATION

0 25' 50' 100'

APPRO□IMATE SCALE IN FEET

N

NOTES

1. BASE MAP DEVELOPED FROM A GOOGLE PROFESSIONAL ELECTRONIC IMAGE FILE. DIGITAL AERIAL ORTHOPHOTOGRAPHY WAS PUBLISHED BY THE U.S.G.S.
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NO.	ISSUE/DESCRIPTION	BY	DATE

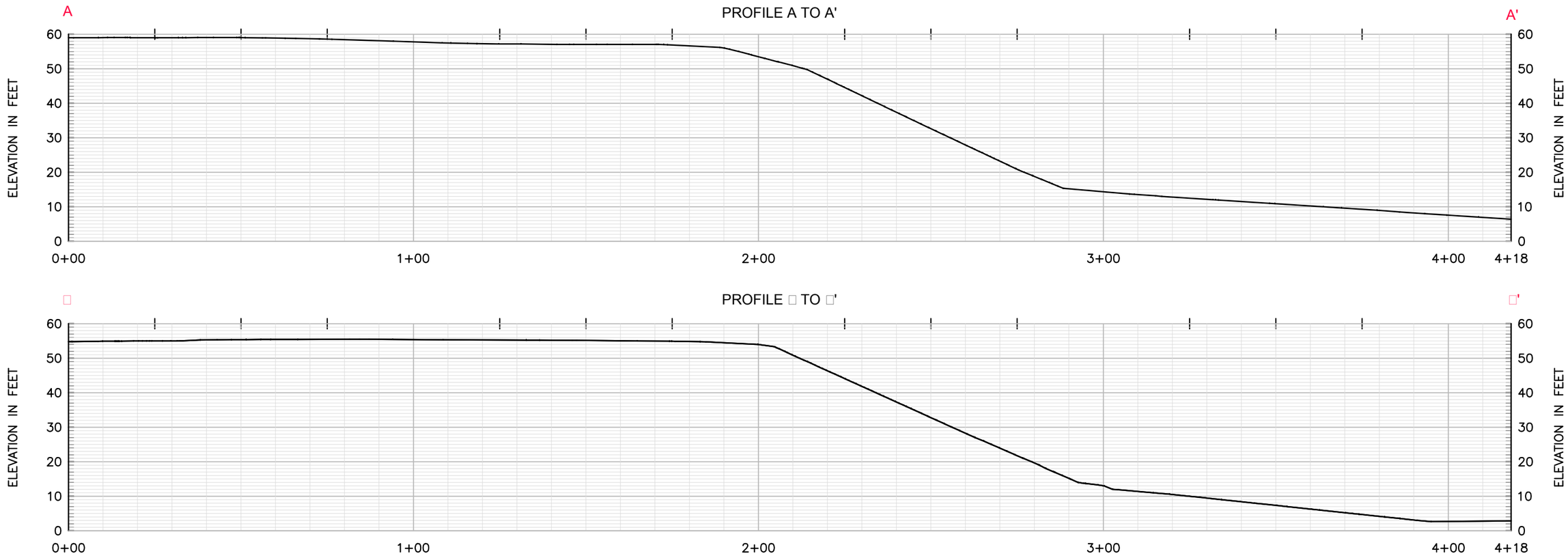
SITE PLAN AND □ORIN□ LOCATION MAP

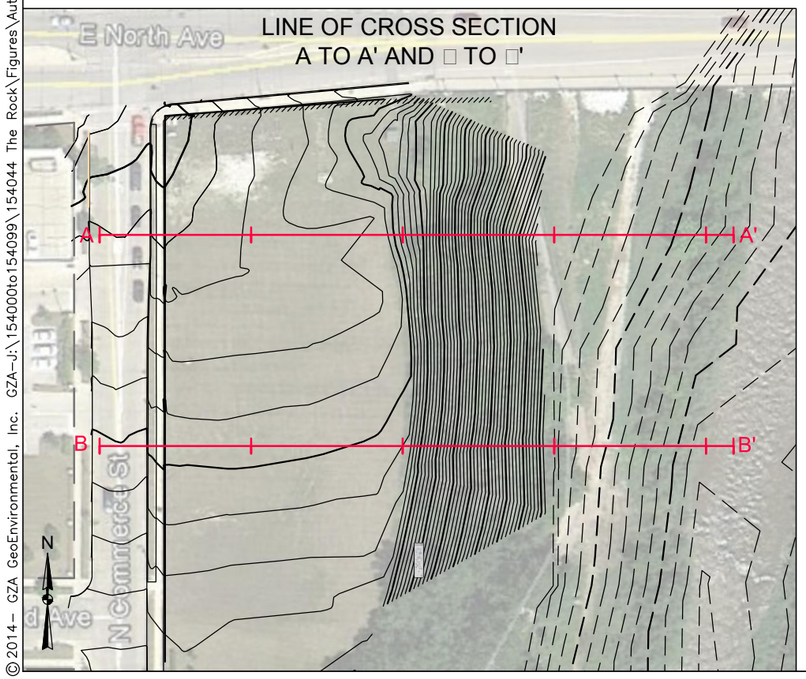
THE ROCK/RIVER CREST
SE CORNER OF NORTH AVENUE AND COMMERCE STREET
MILWAUKEE, WI

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
20900 SWENSON DRIVE, SUITE 150
WAUKESHA, WISCONSIN 53186
(262) 754-2560

PREPARED FOR:

PROJ MGR: PJH	REVIEWED BY: PJH	CHECKED BY: JDG	FIGURE 3
DESIGNED BY: JDG	DRAWN BY: KLK	SCALE: see above	
DATE 5/6/14	PROJECT NO. 20.0154044.00	REVISION NO.	SHEET NO.





0 15' 30' 60'

VERTICAL SCALE IN FEET

0 15' 30' 60'

HORI□ONTAL SCALE IN FEET

NOTES
1. A□□□□□□□□□□ □□□□ □r□ r□□r□□□□d □□ M□□□□□□□ D□□□□.
2. T□□ □□r□□□□ □□□□□□□□□□ □r□ r□□□r□□□□d □r□□ "Ar□□□□□□□r□□ S□□□ P□□□" □r□□□□d □□ □□□□□□□ S□□□ □□□□□ D□□□d 4/01/14.

NO.	ISSUE/DESCRIPTION	BY	DATE

CROSS SECTION

THE ROCK/RIVER CREST
SE CORNER OF NORTH AVENUE AND COMMERCE STREET
MILWAUKEE, WI

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
20900 SWENSON DRIVE, SUITE 150
WAUKESHA, WISCONSIN 53186
(262) 754-2560

PREPARED FOR:

PROJ MGR: PJH	REVIEWED BY: PJH	CHECKED BY: JDG	FIG 4
DESIGNED BY: JDG	DRAWN BY: KLK	SCALE: see above	SHEET NO.
DATE 5/8/14	PROJECT NO. 20.0154044.00	REVISION NO.	

ATTACHMENT 1

Limitations

GEOTECHNICAL LIMITATIONS

Use of Memorandum

1. GZA GeoEnvironmental, Inc. (GZA) prepared this Memorandum on behalf of, and for the exclusive use of Mandel Group, Inc. ("Client") for the stated purpose(s) and location(s) identified in the proposal for services and/or Memorandum. Use of this Memorandum, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

Standard of Care

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the proposal for services and/or Memorandum and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. If conditions other than those described in this Memorandum are found at the subject location(s) or the design has been altered in any way, GZA shall be so notified and afforded the opportunity to revise the Memorandum, as appropriate, to reflect the unanticipated changed conditions.

3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

Subsurface Conditions

4. The generalized soil profile(s) provided in our Memorandum are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and were based on our assessment of subsurface conditions. The composition of strata and the transitions between strata may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs.

5. In preparing this Memorandum, GZA relied on certain information provided by Client, state and local officials, and other parties referenced therein which were made available to GZA at the time of our evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.

6. Water level readings have been made in test holes (as described in the Memorandum) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Memorandum. Fluctuations in the level of the groundwater, however, occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The water table encountered in the course of the work may differ from that indicated in the Memorandum.

7. GZA's services did not include an assessment of the presence of oil or hazardous materials at the property. Consequently, we did not consider the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities or the use of structures on the property.

8. Recommendations for foundation drainage, waterproofing and moisture control address the conventional geotechnical engineering aspects of seepage control. These recommendations

may not preclude an environment that allows the infestation of mold or other biological pollutants.

Compliance with Codes and Regulations

9. GZA used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various and possibly contradictory interpretations. Compliance with codes and regulations by other parties is beyond our control.

Additional Services

10. GZA recommends that we be retained to provide services during any future site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

ATTACHMENT 2

Boring Logs

GZA
GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, WI 53186

The Rock/River Crest
SE Corner of North Avenue and Commerce Street
Milwaukee, Wisconsin

Boring No. GZ-1
Page 1 **of** 2
File No. 20.0154044.00
Check JDG

		Auger/ Casing	Sampler
Drilling Co.	SES		
Foreman	Randy Tremel	**Type:**	HSA	SS
GZA Rep.	CJA / CMB	**O.D. / I.D.**	6"	2" OD
Date Start/Finish	4-24-14 / 4-24-14	**Hammer Wt.**		140#
Drill Rig	Diedrich D-50	**Hammer Fall**		30"
GS Elev.	**Datum**	**Other**		

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
4/24/14	NE	NE	NE	

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Sample Description & Classification	Notes	N	Qp (tsf)	Qu (tsf)	Tv (tsf)	Wn (%)	Atterberg Limits (%): LL	PL	PI
	1	18/12	0-1.5	4-4 5	2" TOPSOIL Stiff to very stiff, lean CLAY (CL), low plasticity, with Sand, medium to coarse; trace Gravel; brown, moist, organics		9	1-3						
	2	18/14	2.5-4	4-5 6	Stiff, lean CLAY (CL) with Sand, low plasticity, medium to coarse; trace Gravel; brown, moist, brick fragments (FILL)		11	1-5						
5	3	18/12	5-6.5	6-6 5	Medium-dense, poorly-graded SAND (SP), fine to coarse; some Clay; trace Gravel; brown to black, dry (FILL)		11				10.7			
	4	18/18	7.5-9	31-23 20	Dense, poorly-graded SAND (SP), fine to coarse; little Gravel; trace Clay; trace Silt; brown to black, dry, possible foundry Sand (FILL)		43							
10	5	18/18	10-11.5	3-11 16	Loose, poorly-graded SAND (SP), fine to coarse; trace Gravel; black, dry, foundry Sand (FILL)		27							
	6	18/10	12.5-14	2-2 8	Medium-dense, poorly-graded SAND (SP), fine to medium; some Clay; trace Gravel; rust-colored, dry (FILL)		10				14.6			
15	7	18/11	15-16.5	14-11 9	Medium-dense, poorly-graded SAND (SP), fine to coarse; some Clay; little Gravel; trace Silt; brown to tan, dry (FILL)		20							
	8	15/15	17.5-18.8	33-47 50/3"	Very dense, CLAYEY SAND (SC), fine; trace Silt; trace Gravel; reddish-brown, dry						6.0			

NOTES

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: GZ-1

GZA
GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, WI 53186

The Rock/River Crest
SE Corner of North Avenue and Commerce Street
Milwaukee, Wisconsin

Boring No. GZ-1
Page 2 **of** 2
File No. 20.0154044.00
Check JDG

Depth	Sample Information				Sample Description & Classification	Notes	N	Qp (tsf)	Qu (tsf)	Tv (tsf)	Wn (%)	Atterberg Limits (%)		
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")								LL	PL	PI
	9	12/12	20-21	24-52	Very dense, CLAYEY SAND (SC), fine; trace Silt; trace Gravel; reddish-brown, dry									
25	10	12/12	25-26	31-53	Poorly-graded SAND (SP), fine to coarse; little Silt; trace Gravel; beige to light brown, wet						11.4			
30	11	12/12	30-31	45-60	Hard, lean CLAY (CL) with Silt; trace Sand; light brown, dry									
35	12	9/9	35-35.8	38-50/3"	Hard, lean CLAY (CL) with Silt; trace Sand; light brown, dry									
					END OF BORING AT 35.8'									
40														

NOTES

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: GZ-1

GZA
GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, WI 53186

The Rock/River Crest
SE Corner of North Avenue and Commerce Street
Milwaukee, Wisconsin

Boring No. GZ-2
Page 1 **of** 2
File No. 20.0154044.00
Check JDG

		Auger/ Casing	Sampler
Drilling Co.	SES		
Foreman	Randy Tremel	**Type:**	HSA	SS
GZA Rep.	CJA / CMB	**O.D. / I.D.**	6"	2" OD
Date Start/Finish	4-24-14 / 4-24-14	**Hammer Wt.**		140#
Drill Rig	Diedrich D-50	**Hammer Fall**		30"
GS Elev.	**Datum**	**Other**		

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
4/24/14	14:12		Cave	

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Sample Description & Classification	Notes	N	Qp (tsf)	Qu (tsf)	Tv (tsf)	Wn (%)	Atterberg Limits (%): LL	PL	PI
	1	18/11	0-1.5	3-3 6	3" TOPSOIL 6" Poorly-graded SAND (SP), fine to coarse; trace Silt; trace Gravel; black, dry, possible foundry Sand, cinders (FILL) 3" Stiff, lean CLAY (CL), slightly plastic; trace Sand, fine; dark gray, dry (FILL)		9	1						
	2	18/10	2.5-4	7-10 10	Medium-dense, poorly-graded SAND (SP), fine to coarse; trace Silt; trace Gravel; black, dry, possible foundry Sand (FILL)		20				8.9			
5	3	18/9	5-6.5	5-6 2	5" Medium-dense, poorly-graded SAND (SP), fine to coarse; trace Silt; trace Gravel; black, dry, possible foundry Sand (FILL) 3" Stiff, lean CLAY (CL), medium plasticity; brown, dry (FILL)		8	1.0						
	4	18/10	7.5-9	13-26 4	Medium-dense, poorly-graded SAND (SP), fine to coarse, with Gravel; brown, gray, dry (FILL)		30							
10	5	18/11	10-11.5	1-2 2	Medium-stiff to stiff, sandy lean CLAY (CL), low plasticity; trace Gravel; brown, dry (FILL)		4	.75-1.75			20.2	32	16	16
	6	18	12.5-14	2-2 2	Medium-stiff to stiff, lean CLAY (CL), slightly plastic; trace Sand, fine to medium; trace Gravel; brown, dry (FILL)		4	.5-1.5						
15	7	18/12	15-16.5	3-5 4	Loose, poorly-graded SAND (SP), fine to medium; trace Silt; trace Clay; dark brown to black, dry, cinders, possible old railroad tie (FILL)	1	9	1.5-1.75			22.4			
	8	18/18	17.5-19	4-11 16	Medium-dense, poorly-graded SAND (SP), fine to medium; trace Gravel, slightly cemented; some Silt; light brown, dry		27	4-4.5						

NOTES

1. PID = 43 ppm in cinder wood material.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: GZ-2

GZA
GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, WI 53186

The Rock/River Crest
SE Corner of North Avenue and Commerce Street
Milwaukee, Wisconsin

Boring No. GZ-2
Page 2 **of** 2
File No. 20.0154044.00
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Depth	Sample Information				Sample Description & Classification	Notes	N	Qp (tsf)	Qu (tsf)	Tv (tsf)	Wn (%)	Atterberg Limits (%)		
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")								LL	PL	PI
	9	18/18	20-21.5	9-16 26	Dense, poorly-graded SAND (SP), fine to medium, slightly cemented, with Silt; little Clay; trace Gravel; brown, dry		42							
25	10	18/18	25-26.5	18-30 45	Very dense, poorly-graded SAND (SP), fine to medium, slightly cemented, with Silt; little Clay; trace Gravel; brown, dry		75				6.1			
30	11	18/18	30-31.5	23-36 60	Very dense, poorly-graded SAND (SP), fine to medium, slightly cemented, with Silt; little Clay; trace Gravel; brown, dry		96							
35	12	4/2	35-35.3	50/4"	Very dense, poorly-graded SAND (SP), fine to medium, slightly cemented, with Silt; little Clay; trace Gravel; brown, dry END OF BORING AT 35.4'									
40														

NOTES

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: GZ-2

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Waukesha, WI 53186

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SE Corner of North Avenue and Commerce Street
Milwaukee, Wisconsin

Boring No. GZ-3
Page 1 **of** 2
File No. 20.0154044.00
Check JDG

		Auger/ Casing	Sampler
Drilling Co.	SES		
Foreman	Randy Tremel	**Type:**	HSA	SS
GZA Rep.	CJA / CMB	**O.D. / I.D.**	6"	2" OD
Date Start/Finish	4-24-14 / 4-25-14	**Hammer Wt.**		140#
Drill Rig	Diedrich D-50	**Hammer Fall**		30"
GS Elev.	**Datum**	**Other**		

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
4/25/14	8:09	33.7'	Cave	

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Sample Description & Classification	Notes	N	Qp (tsf)	Qu (tsf)	Tv (tsf)	Wn (%)	Atterberg Limits (%): LL	PL	PI
	1	18/10	0-1.5	3-9 8	3" TOPSOIL 6" Organic SILT (OL); trace Sand; dark brown, dry, roots (FILL) 4" Medium-dense, poorly-graded SAND (SP), fine to medium; little Silt; trace Gravel; brown, dry, concrete fragments (FILL)		17							
	2	18/18	2.5-4	7-14 10	3" Hard, lean CLAY (CL); trace Sand; trace Gravel; brown, dry (FILL) 18" Medium-dense, poorly-graded SAND (SP), fine to medium; trace Gravel; black, dry, cinders (FILL)		24	>4						
5	3	18/18	5-6.5	10-10 15	Poorly-graded SAND (SP), fine to coarse; trace Silt; trace Gravel; black to brown, dry, cinders, brick fragments, metal shard (FILL)		25				13.3			
	4	18/11	7.5-9	7-16 32	Dense, poorly-graded SAND (SP), fine to coarse; trace Gravel; black, dry, 3" lean Clay layer, cinders, wood fragments (FILL)		48							
10	5	18/8	10-11.5	4-6 8	Medium-dense, poorly-graded SAND (SP), fine to coarse; trace Gravel; black, dry, cinders, wood fragments (FILL)		14				19.2			
	6	18/13	12.5-14	11-14 17	Dense, poorly-graded SAND (SP), fine; trace Silt; olive-colored, dry (FILL)		31							
15	7	18/12	15-16.5	20-32 18	Dense, poorly-graded SAND (SP), fine to medium, with Gravel; brown, dry, concrete fragments (FILL)		50							
	8	18/18	17.5-19	13-12 14	Hard, sandy lean CLAY (CL), medium plasticity, fine sand; brown, dry	1	26	>4			11.6	19	11	8

NOTES

1. Drilled through a hard layer, possibly concrete.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: GZ-3

GZA
GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, WI 53186

The Rock/River Crest
SE Corner of North Avenue and Commerce Street
Milwaukee, Wisconsin

Boring No. GZ-3
Page 2 **of** 2
File No. 20.0154044.00
Check JDG

Depth	Sample Information				Sample Description & Classification	Notes	N	Qp (tsf)	Qu (tsf)	Tv (tsf)	Wn (%)	Atterberg Limits (%)		
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")								LL	PL	PI
	9	18/18	20-21.5	16-14 15	6" Medium-dense SAND (SC), fine to coarse; some Gravel, fine; brown, wet 12" Medium-dense, poorly-graded SAND (SP), fine, with Silt; trace Clay; brown, moist		29							
25	10	18/18	25-26.5	8-15 33	Dense, poorly-graded SAND (SP), fine, with Silt; trace Gravel; brown, moist		48				10.1			
30	11	18/18	30-31.5	30-45 52	Very dense, poorly-graded SAND (SP), fine, with Silt; little Gravel; brown, dry		97				6.3			
35	12	18/18	35-36.5	35-40 49	Very dense, poorly-graded SAND (SP), fine, with Silt; little Gravel; brown, dry		89				6.2			
					END OF BORING AT 36.5'									
40														

NOTES

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

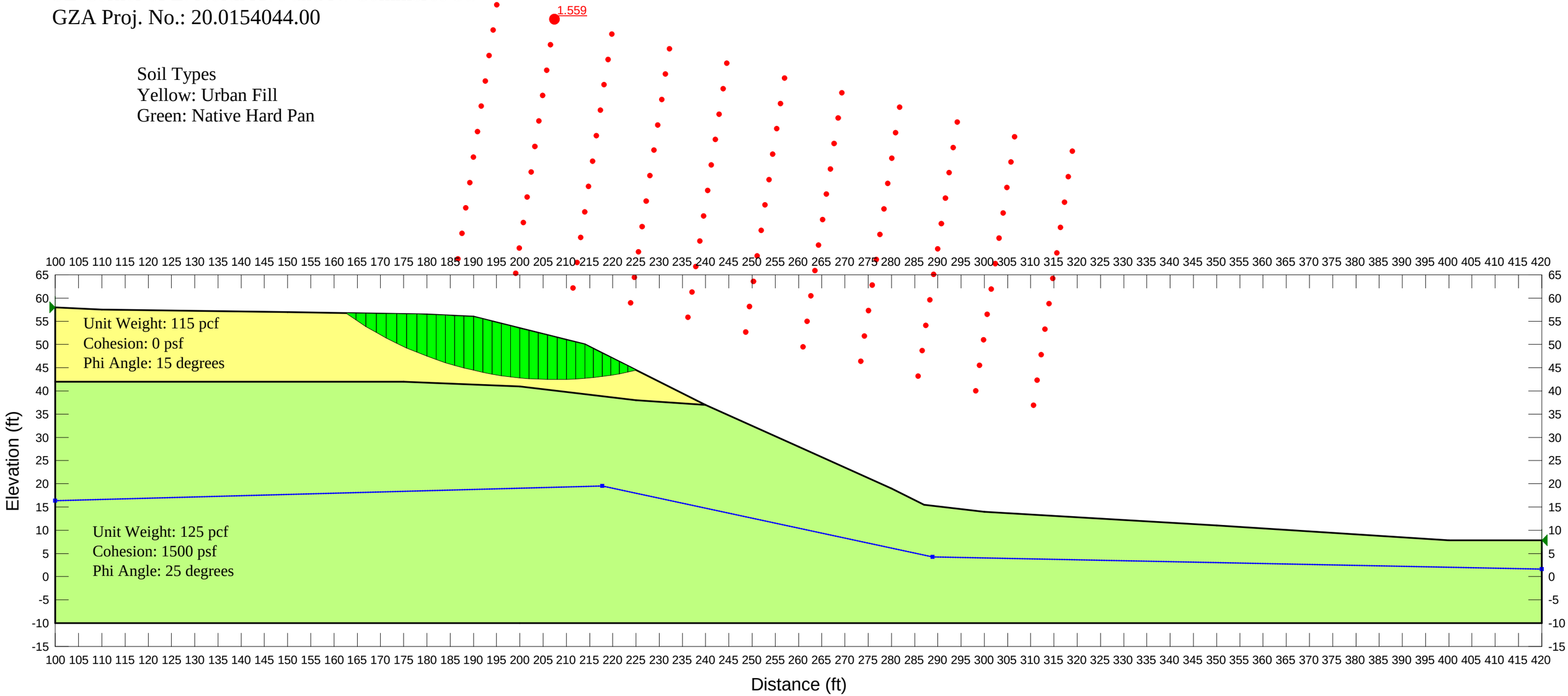
Boring No.: GZ-3

ATTACHMENT 3

Slope/W Output

The Rock/River Crest Development
SE Corner of E. North Ave and N. Commerce St.
GZA Proj. No.: 20.0154044.00

Soil Types
Yellow: Urban Fill
Green: Native Hard Pan

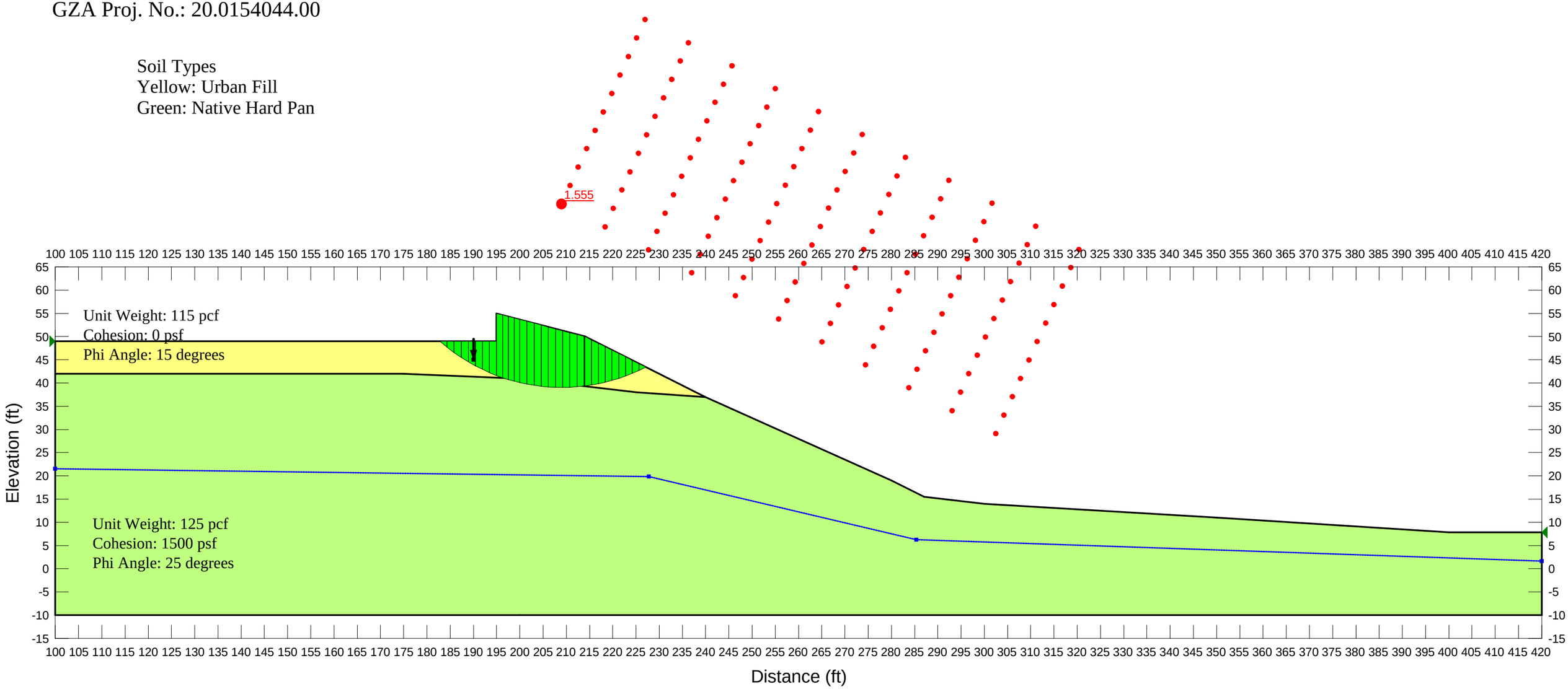


Existing Conditions

Minimum Factor of Safety = 1.559

The Rock/River Crest Development
SE Corner of E. North Ave and N. Commerce St.
GZA Proj. No.: 20.0154044.00

Soil Types
Yellow: Urban Fill
Green: Native Hard Pan



Proposed Conditions

Min Factor of Safety = 1.555