EMPIRE
SOILS INVESTIGATIONS INC.

December 9, 1991

C.T. Male Associates, P.C.
50 Century Hill Drive
P.O. Box 727
Latham, N.Y. 12110

Attn: Gary Hoffman, P.E.

Re: Revision of Geotechnical Evaluation
for Proposed McDonald's Restaurant Sites
Modena, Port Byron, Warners, Guilderland
on New York State Thruway
ESI File No.: ATA-91-192

Dear Mr. Hoffman

As per your direction, we have revised our previous recommendations for allowable soil bearing capacities at the above proposed McDonald's Restaurant sites. According to our discussion, we understand that due to special architectural features of the proposed building design, the column loads will be somewhat higher than anticipated. Therefore, the McDonald's standard allowable bearing pressure of 2000 psf may be too conservative and uneconomical for these foundation designs.

We will assume that the maximum column loads will be 100 kips and that a maximum of one (1) inch of foundation settlement will be tolerable. Based on this criteria, we have re-evaluated the subsurface conditions and determined maximum allowable soil bearing capacities.

The following is a summary of our revised foundation soil bearing recommendations for each site.

SITE	MAXIMUM ALLOWABLE SOIL BEARING CAPACITY
Modena, N.Y.	4500 psf
Port Byron, N.Y.	2500 psf
Warners, N.Y.	2500 psf
Guilderland, N.Y.	3500 psf

Please call me if you have any questions regarding this letter or if I can be of any further assistance.

Sincerely,

EMPIRE SOILS INVESTIGATIONS, INC.

Paul DeStefano

Paul DeStefano, P.E.
Geotechnical Engineering Manager
Eastern Region

EMPIRE
SOILS INVESTIGATIONS INC.
105 CORONA AVENUE • GROTON, NY 13073 • 607/898-5881 • 315/475-0717 FAX 607/898-4760

GEOTECHNICAL ENGINEERING EVALUATION
FOR
PROPOSED MCDONALD'S RESTAURANT
NEW YORK STATE THRUWAY
WARNERS, NEW YORK

For

C. T. Male Associates, P. C.

Job No. ATA-91-192

October 1991

EMPIRE
SOILS INVESTIGATIONS INC.
105 CORONA AVENUE • GROTON, NY 13073 • 607/898-5881 • 315/475-0717 FAX 607/898-4760

November 8, 1991

C. T. Male Associates, P. C.
50 Century Hill Drive
P. O Box 727
Latham, NY 12110

Attention: Mr. Gary Hoffman, P.E.

Reference: Geotechnical Evaluation
Proposed McDonald's Restaurant
Warners Service Area
New York State Thruway
ESI File No.: ATA-91-192

Gentlemen:

We have completed our investigation and evaluation of the above proposed McDonald's restaurant site according to your directions and authorization. The purpose of our work was to evaluate the existing subsurface conditions and provide recommendations for the design and construction of building and pole foundations and surrounding pavements. We understand that the existing restaurant building and portions of the adjacent pavements located at this site will be demolished and replaced with a new, typical one-story McDonald's restaurant building (slab-on-grade construction), with surrounding parking areas, in the same approximate location.

Currently, the site is an active New York State Thruway rest area consisting of a restaurant and service station (see Drawing No. 2 in Appendix A). A portion of the service station, located directly under the office section, and under the entrance lobby and rest rooms reportedly contain a full basement. The refueling area is currently under construction with new gas islands and pumps being installed. Two utility buildings are located approximately 150 feet to the north of the existing restaurant and a small wastewater treatment facility is located approximately 450 feet northwest of the restaurant. An asphalt parking area for cars and campers, encompassing approximately 41,000 square feet, is located adjacent to and east of the existing restaurant. A limited amount of parking for large tractor trailer rigs is located adjacent to the north edge of an existing car parking area.

The site is relatively flat in the vicinity of the proposed building location. The site gently slopes from northwest to southeast at grades of approximately 2% to 6% beginning at the south wall of the existing building. Site grades in the proposed parking area located northwest of the proposed building are also relatively level. Grades in this area gently slope from northwest to southeast at a gradient of approximately 1% to 2% until reaching the southern edge of the

existing service road. The grades then begin to drop off rather sharply (15% to 16%) due to the presence of an existing drainage ditch which runs between the service road and driving lane. Upon reaching the bottom of the drainage ditch, the terrain begins to rise at grades of approximately 12% until reaching the edge of the driving lane pavement.

I. METHOD OF INVESTIGATION

The site's subsurface conditions were investigated through the advancement of test borings and visual classification of the recovered soil samples. A total of four (4) structure borings were advanced to a depth of 15 feet below existing site grades and two (2) pavement borings were advanced to a depth of 6 feet below existing site grades. A geotechnical engineer from our staff established their locations in the field through tape measurements from the existing building and structures. The structure borings were located about the perimeter of the existing structure. Based on conversations with Mr. Hoffman, the locations of the pavement borings were in an area of proposed asphalt pavement. At the time this report was issued, a final building location had not yet been established. It is our understanding that the building location may shift as much as 26 feet to the north and 15 feet to the east. Test boring B-4 was located in this area to obtain

subsurface information in the event of the relocation. The locations of all borings shown on Drawing No. 2, titled "Boring Location Plan", are contained in Appendix A.

Soil samples were recovered on a continuous basis for the first 10 feet of depth in all structure borings and then one sample was obtained from a depth 13 to 15 feet. Continuous sampling was performed to the termination depth of the pavement boring. The samples were obtained according to ASTM D-1586, Standard Method for Penetration Test and Split-Barrel Sampling of Soils. A Central Mine Equipment Model 45B drill rig equipped with hollow stem auger casing was used to advance the six (6) test borings.

Representative portions of the samples recovered in the field were transported to our office for visual classification by an engineering technician. On the basis of these classifications and the driller's field records and observations, a log was prepared for each test boring. The logs are presented in Appendix B together with a sheet which explains the terms and symbols used in their preparation.

II. SUBSURFACE CONDITIONS

Asphalt was penetrated in test borings B-1 through B-4 beginning at the ground surface and extending to depths ranging from 2 to 8 inches. Topsoil was encountered in boring B-5 beginning at the ground surface and extending to a depth of 6 inches. Below the asphalt or topsoil and beginning at the surface in boring B-6, a fill material consisting of a mixture of sand and gravel with varying amounts of silt and trace amounts of concrete fragments was found to a depth of approximately 1.0 foot in boring B-2 to 3.7 feet in boring B-6. Due to the similar consistency and composition of the fill material, it is our opinion that this material was placed in a controlled manner.

Beneath the fill material, the natural overburden was found to consist of a mottled silt containing varying amounts of clay and fine to coarse sand. These soils, as indicated by their standard penetration resistance, are generally loose to firm. Interbedded within this mottled silt are layers of sand or silt at depths noted on the test boring logs.

Damp to moist soil conditions prevailed in the upper 11 to 13 feet of the soil profile. Below this depth, wet soil conditions prevailed until boring termination. Upon completion of sampling, groundwater was noted at depths ranging from 11.0 feet (B-4) to 13.3 feet (B-2) below existing site grades in the area of the proposed building. Groundwater was also noted at approximately 5.2 feet (B-6) below existing grades in the proposed parking area. No groundwater was encountered during or at the completion of sampling in boring B-5. Our driller noted occasional isolated wet zones in boring B-3 from a depth of 3 to 5 feet. It is our opinion that the groundwater table will not be encountered within the zone of construction for foundations or pavements. However, perched water may be encountered within the granular fill material or the sand seams of the underlying silt deposit.

We note that the elevation of the groundwater table and the presence of perched water may vary depending on seasonal factors such as temperature and precipitation. Therefore, subsurface water conditions at other times may differ from those described in this report.

III. CONCLUSIONS AND RECOMMENDATIONS

A. Site Preparation

The existing building structure should be demolished and all debris removed to a minimum of two (2) feet below grade level in existing slab areas and to the top of existing footing levels. Any underground utilities which may interfere with the construction of the building foundation should also be completely removed and relocated, as necessary. The areas of removal should then be backfilled with a select granular material as specified in Section E entitled "Site Fill and Backfill Requirements".

Topsoil and vegetation should be stripped and existing pavements should be broken and removed to below the base course levels at a minimum, within the area of the proposed structure and pavement. We caution that the subgrade soils contain sufficient silt content to render them moisture sensitive. Due to their moisture sensitivity, surface water runoff must be controlled during earthwork and construction activities. These soils may become unstable during normal construction activities

when in the presence of excess moisture. Provisions should be made to dewater all excavations. This may be accomplished through the use of temporary pumps and sump pits. The excavation should be maintained in a drained condition at all times during foundation construction.

Prior to increasing grades in these areas or those of building demolition, the exposed subgrade should be proofrolled and compacted with a smooth drum compactor weighing at least 7 tons. The compactor should operate in only its static mode and complete at least five (5) passes across the subgrade. The proofrolling will aid in the densification of loose surficial soils/fill and detect any soft or unsuitable areas which may require undercutting and backfilling. Soft or unsuitable areas should be undercut at the direction of the project geotechnical engineer. The removed material should be replaced with a well compacted structural fill as recommended in Section E of this report.

B. Foundation Design and Construction

The site is suitable to support the planned structure on a conventional spread foundation. To minimize the risk of detrimental settlements, all fill material should

be removed beneath any proposed foundations. All foundations should be seated on the natural silt and sand or compacted structural fill directly overlying the natural soils. All continuous wall foundations should have a minimum width of eighteen (18) inches. Exterior foundations should be seated at least four (4) feet below final exterior grades for frost protection. Interior foundations may bear at two (2) feet below the top of the floor slab for bearing capacity considerations. Based on the above recommendations, conventional spread foundations proportioned according to the McDonald's standard net allowable bearing pressure of 2,000 pounds per square foot may be used to support the structure.

All bearing grades, upon their exposure, should be manually trimmed to remove any excess or loosened material. The final grades should be firm and stable, and free of any loose soil, mud, water or frost. Foundation wall backfill should consist of select granular material. Total foundation settlement is not expected to exceed one-half (1/2) of an inch. Settlement of the foundations

should occur relatively soon after application of structural loads. Differential settlements should be negligible.

The sliding and overturning stability of any laterally loaded structures should be analyzed. The following parameters should be used for these analyses together with a factor of safety of at least 1.50.

- o Maximum Allowable Foundation Edge Pressure = 3000 psf
- o Equivalent Fluid Weight of Level Backfill
  - Active Pressure = 33 pcf
  - Passive Pressure = 150 pcf
- o Coefficient of Sliding Friction
  - Along Base of Foundation = 0.35

Depth of embedment for pole foundations should be analyzed utilizing the following parameters:

- o Maximum Allowable Lateral Soil Bearing Capacity = 275 psf/ft. of depth
- o Horizontal subgrade reaction constant (n_h) = 20 tons/ft^3

C. Floor Slab Design and Construction

The building floor slab should be constructed over a base course of processed sand and gravel which conforms to the gradation requirements specified for Type 4 material in Section 304-2.02 of the NYSDOT Standard Specifications. The base course layer should be at least six (6) inches in depth and compacted according to the 95 percent ASTM D-1557 density specification.

The slabs may be designed and constructed following the procedures of the American Concrete Institute or Portland Cement Association using 100 pounds per cubic inch as a modulus of subgrade reaction.

D. Pavement Design

The entrance drive and parking lot for the new restaurant may be constructed as flexible pavements. Prior to constructing the pavement sections, the subgrade should be regraded to remove ruts and any loose soil. As stated previously, we recommend that all areas at or below final design grades within the proposed pavement areas be proofrolled to detect any soft or unsuitable areas. If soft or unsuitable areas are detected, undercutting and replacement should be as directed by the geotechnical engineer.

In areas where the select granular base or subbase course is placed directly on a silty subgrade, we recommend that a geotextile filter fabric be placed between the processed sand and gravel subbase or base course and the natural silty soils to minimize the migration of the fines from the natural silty soils into the granular material. The geotextile filter fabric should have a minimum puncture strength of 50 pounds per square inch (ASTM D 3787), a minimum Mullen Burst resistance of 150 pounds per square inch (ASTM D 3786) and an apparent opening size equal to or less than the No. 70 U.S. standard sieve size (ASTM D 4751). The use of this geotextile fabric should be limited to areas subjected to truck traffic and need not be incorporated in areas designated to receive automobile traffic.

Assuming any truck traffic is confined to a specific area and will not cross parking lot areas, two pavement sections may be employed; a section for areas restricted to automobile parking and a heavier section for areas subject to truck traffic. It should be understood that the following pavement sections are typical for the previously mentioned loading conditions and use, and are not based on actual traffic load design data. The following materials and specifications are recommended for each:

COURSE	MATERIAL DESCRIPTION	THICKNESS	NYSDOT SPECS.
Truck Traffic-Entrance Drive			
Top	Asphaltic Concrete	1-1/2"	Section 401 Type 6
Binder	Asphaltic Concrete	3"	Section 401 Type 3
Base	Crusher-Run Stone	6"	Section 304 Type 2
Subbase	Processed Sand & Gravel	12"	Section 304 Type 4
Auto Traffic - Parking Lot			
Top	Asphaltic Concrete	1-1/2"	Section 401 Type 6
Binder	Asphaltic Concrete	2-1/2"	Section 401 Type 3
Base	Processed Sand & Gravel	12"	Section 304 Type 4

The base and subbase courses should be compacted to the 95 percent ASTM D-1557 density specification. Placement and compaction of the asphaltic concrete should be in accordance with the requirements of Section 400 of the NYSDOT Standard Specifications.

E. Site Fill and Backfill Requirements

Fill and backfill for the site should meet the following specifications:

TYPE	APPLICATION	COMPACTION REQ.
Select Granular Fill NYSDOT Spec. Section 203-2.02C	Under Foundations, and adjacent to structures	95% ASTM D-1557 6 inch lifts (Max)

TYPE	APPLICATION	COMPACTION REQ.
Select Fill NYSDOT Spec. Section 203-2.02C	Under grassed areas	90% ASTM D-1557 12 inch lifts (Max)
Select Granular Fill NYSDOT Spec. Section 203-2.02C	Under pavements and slabs	95% ASTM D-1557 8 inch lift (Max)

Existing on site excavated soils may be used for fill and backfill if they are tested and meet the above specified gradation requirements. As stated previously, the soils at this site contain sufficient silt content to render them moisture sensitive. These soils may become unstable in the presence of excess moisture during the compaction process of the overlying granular material.

IV. CLOSURE

This report has been prepared to assist in the design and construction of a McDonald's Restaurant to be located in the Town of Warners, New York. The recommendations are presented on the basis of our understanding of the project as described herein and through the application of generally accepted soil and foundation engineering practices. No other warranties, expressed or implied, are made. Should there be any modifications in the building location as presented on the

Subsurface Investigation Plan, we should be notified so that we may review the changes and modify our recommendations as required.

Important information concerning the use and interpretation of this report is contained in Appendix C.

Sincerely,

EMPIRE SOILS INVESTIGATIONS, INC.

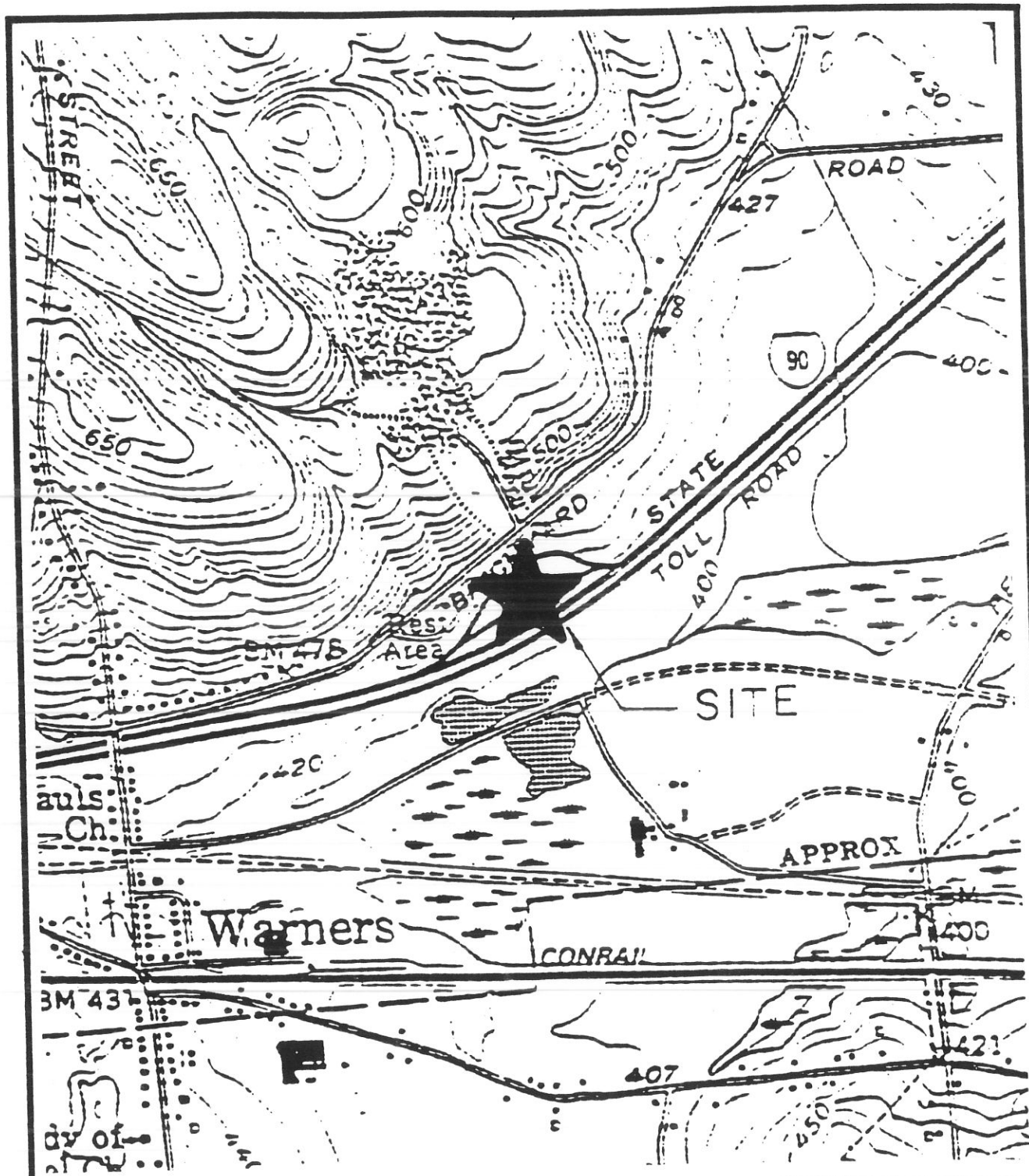
Nicholas P. Patriarco

Nicholas P. Patriarco
Geotechnical Project Engineer

Reviewed by:

Gilbert N. Camp, Jr., P. E.
Geotechnical Group Manager

APPENDIX A

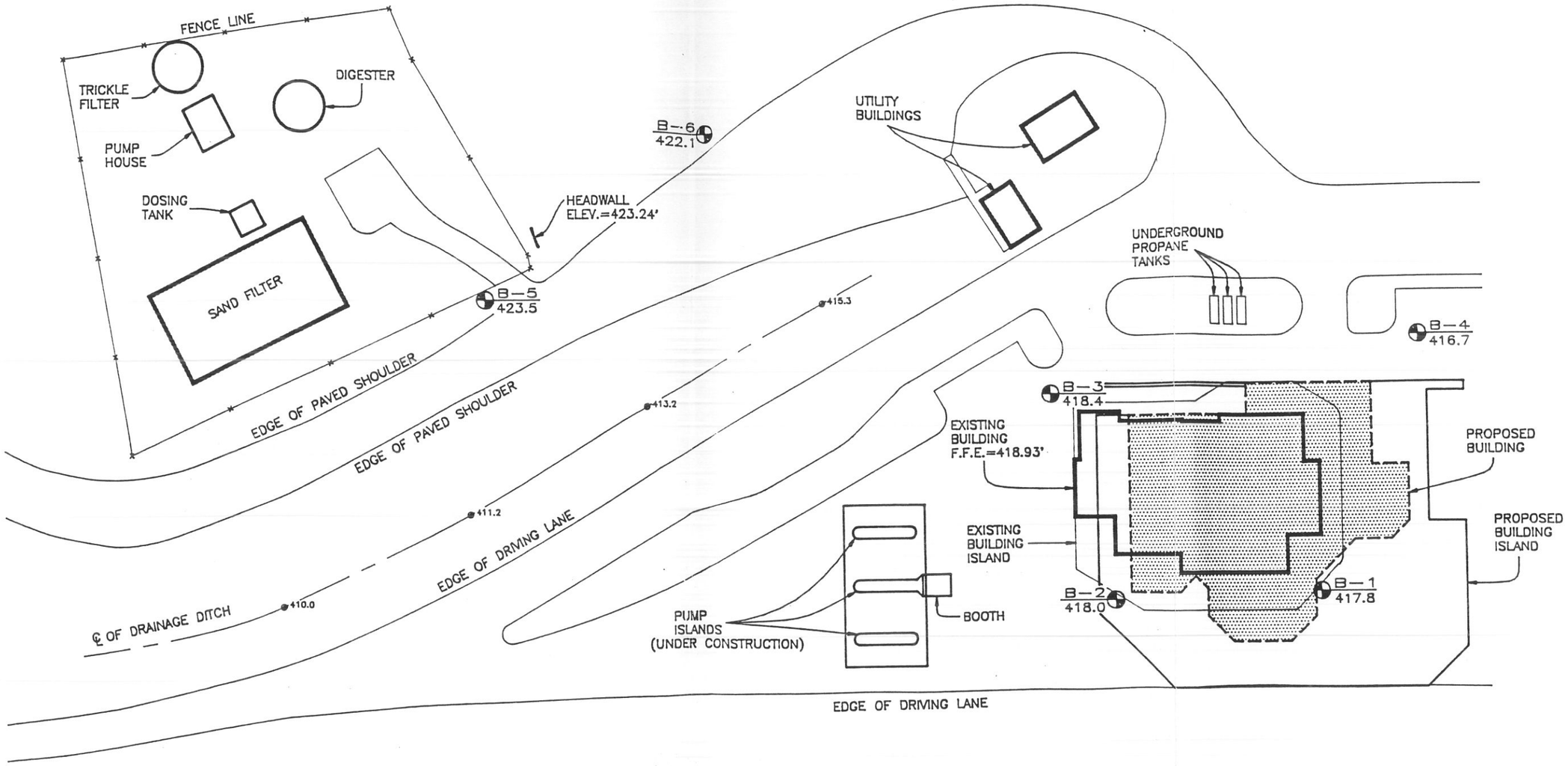


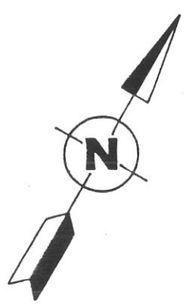
EMPIRE
SOILS INVESTIGATIONS, INC.

CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

SCALE: 1" = 1000'	
DATE: OCT, 1991	
DRAWN BY: JVM	
PROJ. NO.: ATA-91-192	
DWG. FILE: GA91192B	
REV'D BY:	
DRAWING NO.:	1

SITE LOCATION MAP
PROPOSED McDONALD'S REST.
N.Y.S. THRUWAY
WARNERS SERVICE AREA





LEGEND:

B-1 / 417.8 — BORING LOCATION AND GROUND SURFACE ELEVATION

⊕ 410.0 — SPOT ELEVATION

NOTES:

— PLAN BASED ON DRAWING PREPARED BY C.T. MALE ASSOCIATES, P.C., TITLED "TOPOGRAPHIC SURVEY–N.Y.S. THRUWAY AUTHORITY, WAVERLY SERVICE AREA", DATED JULY 2, 1991.

— BENCHMARK: F.F.E. AT THE SOUTHEAST CORNER OF THE EXISTING BUILDING, AND THE TOP OF OF THE CONCRETE HEADWALL LOCATED 108' EAST OF THE EXISTING SAND FILTER.

EMPIRE SOILS INVESTIGATIONS, INC.
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

BORING LOCATION PLAN
PROPOSED McDONALD'S REST.
N.Y.S. THRUWAY
WARNERS SERVICE AREA

SCALE: 1" = 60'
DATE: OCT, 199
DRAWN BY: JVN
PROJ. NO.: ATA-91-19
DWG. FILE: GA91192
REV'D BY: N.P.P.
DRAWING NO.: 2

APPENDIX B

ATE

STARTED 5-1-86

FINISHED 5-1-86

ET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-175

SURF. ELEV. 325.6

G. W. DEPTH See Note #1

Project

LOCATION

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	BLOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
0									
		1	2	2	3	5	10	TOPSOIL 3"	NOTE #1 G.W. at 2.0' completion G.W. at 2.2' 24 hrs. after completion
							15	Brown SILT, some Sand, trace clay (Moist - Loose)	
							50/.5'		
								Gray SHALE, medium hard weathered, thin bedded some fractures	Run #1, 2.5' - 5.0' 95% Recovery 50% RQD
5									

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

TABLE I

	Split Spoon Sample
	Shelby Tube Sample
	Auger or Test Pit Sample
	Rock Core

TABLE II

Identification of soil type is made on basis of an estimate of particle sizes, and in the case of fine grained soils also on basis of plasticity.

Soil Type	Soil Particle Size	
Boulder	> 12"	Coarse Grained (Granular)
Cobble	3" - 12"	
Gravel - Coarse	3" - ¾"	
- Fine	¾" - #4	
Sand - Coarse	#4 - #10	
- Medium	#10 - #40	
- Fine	#40 - #200	
Silt-Non Plastic (Granular) Clay-Plastic (Cohesive)	<#200	Fine Grained

TABLE III

The following terms are used in classifying soils consisting of mixtures of two or more soil types. The estimate is based on weight of total sample.

Term	Percent of Total Sample
"and"	35 - 50
"some"	20 - 35
"little"	10 - 20
"trace"	less than 10

(When sampling gravelly soils with a standard split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter.)

TABLE IV

The relative compactness or consistency is described in accord with the following terms.

Granular Soils		Cohesive Soils	
Term	Blows per Foot, N	Term	Blows per Foot, N
Loose	< 11	Very Soft	< 3
Firm	11 - 30	Soft	3 - 5
Compact	31 - 50	Medium	6 - 15
Very Compact	> 51	Stiff	16 - 25
		Hard	> 26

(Large particles in the soils will often significantly influence the blows per foot recorded during the Penetration Test.)

TABLE V

Varved	- Horizontal uniform layers or seams of soil(s).
Layer	- Soil deposit more than 6" thick.
Seam	- Soil deposit less than 6" thick.
Parting	- Soil deposit less than ⅛" thick.
Laminated	- Irregular, horizontal and angled seams and partings of soil(s).

TABLE VI

Rock Classification Terms Term		Meaning
Hardness	Soft	Scratched by fingernail
	Medium Hard	Scratched easily by penknife
	Hard	Scratched with difficulty by penknife
	Very Hard	Cannot be scratched by penknife
Weathering	Very Weathered	Judged from the relative amounts of disintegration iron staining, core recovery, clay seams, etc.
	Weathered	
	Sound	
Bedding	Laminated	Natural breaks in Rock Layers (<1")
	Thin bedded	(1" - 4")
	Bedded	(4" - 12")
	Thick bedded	(12" - 36")
	Massive	(>36")

(Fracturing refers to natural breaks in the rock oriented at some angle to the rock layers.)

DATE
STARTED 10/23/91
FINISHED 10/23/91
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-1
SURF. ELEV. 417.8
G. W. DEPTH See Notes

PROJECT Proposed McDonald's Restaurant
ESI #ATA-91-192

LOCATION N.Y.S. Thruway Service Area
Warners, NY

DEPTH FT	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	Rec.	SOIL OR ROCK CLASSIFICATION	NOTES
0								ASPHALT 4"	
		1	21	18	13	31	1.0'	FILL: Brown fine-coarse SAND & GRAVEL trace silt, concrete (Damp)	
		2	13	12	5	17			
			5				1.2'	Reddish Brown Mottled, SILT, little fine-coarse sand, clay, trace fine-coarse gravel (Moist-Loose)	Piece coarse gravel in Sample #3.
5		3	5	4	4	8			
			5				1.1'		
		4	5	4	4	8			
			4				1.2'		
		5	3	3	19	22		becomes firm	
			31				1.0'		
10									
		6	14	14	15	29	1.2'	becomes wet w/rock fragments	
10			14						
								Boring Terminated @ 15.0'	Upon completion of sampling, water @13.2' w/augers @ 13.0'. After augers removed, boring caved to 7.2'. No water encountered.

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow

METHOD OF INVESTIGATION 2¼" ID Hollow Stem Augers

CLASSIFICATION Visual by Driller (F & Engineering Technician (JVM

WPP

R T Form H

DATE
STARTED 10/22/91
FINISHED 10/22/91
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC. SUBSURFACE LOG

HOLE NO. B-2
SURF. ELEV. 418.0
G. W. DEPTH See Notes

PROJECT Proposed McDonald's Restaurant
ESI #ATA-91-192

LOCATION N.Y.S. Thruway Service Area
Warners, NY

DEPTH FT	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	Rec.	SOIL OR ROCK CLASSIFICATION	NOTES
0								ASPHALT 6"	
		1	15	10	8	18	1.3'	FILL: Brown fine-coarse SAND & GRAVEL, trace silt (Damp) 1.0'	
		2	5	5	10	15	1.4'	Reddish Brown Mottled SILT, little fine-coarse sand, clay, trace fine-coarse gravel (Damp-Firm)	
			9						
5		3	4	6	6	12	0.3'		
			5						
		4	5	6	6	12	0.9'	grades to Some fine-coarse Sand and becomes moist	
			5						
		5	5	6	7	13	1.3'	grades to little fine-coarse gravel	
10			8						
								Brownish Green Mottled fine-coarse SAND, Some Silt, trace gravel (Wet-Firm)	
		6	11	7	12	19	1.7'		
15			11						
								Boring Terminated @ 15.0'	Water first encountered @ 14.4' w/augers @13.0' 10/23 A.M. Water @ 13.3', w/augers @ 13.0'. After augers removed, boring caved to 9.3'. No water encountered.

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow

CLASSIFICATION Visual by Driller (I & Engineering Technician (JVM)

METHOD OF INVESTIGATION 2¼" ID Hollow Stem Augers

✓N.P.P.

R.T. Form H

DATE
STARTED 10/23/91
FINISHED 10/23/91
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC. — **SUBSURFACE LOG**

HOLE NO. B-3
SURF. ELEV. 418.4
G. W. DEPTH See Notes

PROJECT Proposed McDonald's Restaurant
ESI #ATA-91-192

LOCATION N.Y.S. Thruway Service Area
Warners, NY

DEPTH FT	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	Rec.	SOIL OR ROCK CLASSIFICATION	NOTES
0								ASPHALT 1"	
								CONCRETE 1.0'	
		1	10	10	9	19	1.3'	FILL: Brown fine-coarse SAND, Some fine-coarse Gravel, trace silt (Moist) 2.0'	
			8						
		2	4	3	3	6	1.6'	Reddish Brown Mottled SILT & fine-coarse SAND, trace clay, fine-coarse gravel (Moist-Loose to Firm)	
5			4						
		3	3	4	3	7	1.7'		
			4						
		4	5	7	7	14	1.3'		
			7						
10		5	9	9	6	15	1.7'	10.4'	Petroleum odor noted in Sample S-5
			6					Brown fine SAND, trace silt (Wet-Firm) 12.5'	
		6	9	9	15	24	1.3'	Reddish Brown Mottled SILT, little fine-coarse sand, trace fine gravel (Wet-Firm) 14.2'	Petroleum odor noted in Sample S-6
15			18					Brown SILT, trace fine sand (Wet-Firm)	Water first encountered @ 12.9', w/augers @ 13.0'.
								Boring Terminated @ 15.0'	Upon compeltion of sampling, water @12.9' w/augers @ 13.0'.
									After 1/2 hour, water @ 12.6'

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow

CLASSIFICATION Visual by Driller (F & Engineering Technician (JVN

METHOD OF INVESTIGATION 2¼" ID Hollow Stem Augers

/ N.PP

B-T Form H

DATE
STARTED 10/23/91
FINISHED 10/23/91
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC. SUBSURFACE LOG

HOLE NO. B-4
SURF. ELEV. 416.7
G. W. DEPTH See Notes

PROJECT Proposed McDonald's Restaurant
ESI #ATA-91-192

LOCATION N.Y.S. Thruway Service Area
Warners, NY

DEPTH-FT	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	Rec.	SOIL OR ROCK CLASSIFICATION	NOTES
0								ASPHALT 8"	
		1	17	13	13	26	0.7'	FILL: Brown fine-coarse SAND & GRAVEL trace silt (Damp) 1.5'	
		2	10	8	10	18	0.0'	Reddish Brown SILT, little fine-coarse sand, trace fine-coarse gravel, clay (Damp-Firm)	
			17						
5		3	8	10	15	25	1.4'	grades to little fine-coarse gravel (Damp-Firm)	
			16						
		4	10	15	17	32	1.0'	Reddish Brown Mottled SILT & fine-coarse SAND, Some fine-coarse Gravel (Damp-Firm to Compact)	
			15						
		5	8	12	13	25	0.8'		
10			15						
								12.8'	
		6	9	11	10	21	1.4'	Reddish Brown Mottled fine-coarse SAND, Some fine-coarse Gravel, little silt (Wet-Firm)	
15			10						
								Boring Terminated @ 15.0'	Water first encountered @ 10.9', w/augers @ 13.0'. After augers removed, boring caved to 8.0'. No water encountered.

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow

CLASSIFICATION Visual by Driller (F & Engineering Technician (JVM)

METHOD OF INVESTIGATION 2¼" ID Hollow Stem Augers

✓N.P.P.

B.T. Form H

DATE
STARTED 10/23/91
FINISHED 10/23/91
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-5
SURF. ELEV. 423.5
G. W. DEPTH See Notes

PROJECT Proposed McDonald's Restaurant
ESI #ATA-91-192

LOCATION N.Y.S. Thruway Service Area
Warners, NY

DEPTH FT	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	Rec.	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	2	6	12	18	1.7'	TOPSOIL 6"	
			12					Brown SILT, Some fine-coarse Gravel, Sand (Damp-Firm)	
		2	9	10	12	22	1.5'	grades to little fine-coarse sand & gravel and becomes reddish brown and	
			8						
5		3	9	12	13	25	1.6'	mottled (Damp-Firm)	
			15						
								Boring Terminated @ 6.0'	No water encountered during or at the completion of sampling.
10									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow

CLASSIFICATION Visual by Driller (I & Engineering Technician (JVM

METHOD OF INVESTIGATION 2¼" ID Hollow Stem Augers

/N.P.P

B.T. Form H

DATE
STARTED 10/23/91
FINISHED 10/23/91
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC. SUBSURFACE LOG

HOLE NO. B-6
SURF. ELEV. 422.1
G. W. DEPTH See Notes

PROJECT Proposed McDonald's Restaurant
ESI #ATA-91-192

LOCATION N.Y.S. Thruway Service Area
Warners, NY

DEPTH-FT	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	Rec.	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	22	26	22	48	1.7'	FILL: Brown fine-coarse SAND, little fine-coarse gravel, silt (Damp)	
			20						
		2	10	17	12	29	1.6'	grades to Some Silt, trace fine gravel (Damp) 3.7'	
			12						
		3	12	22	29	51	1.7'	Brown fine SAND, trace fine gravel 4.6'	
5			39					Brown fine-coarse SAND, Some Silt, trace fine gravel (Wet-Very Compact)	Water first encountered @ 5.2'
								Boring Terminated @ 6.0'	

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow

CLASSIFICATION Visual by Driller (R & Engineering Technician (JVM

METHOD OF INVESTIGATION 2¼" ID Hollow Stem Augers

✓N.P.P.

H T Form H

APPENDIX C

IMPORTANT INFORMATION
ABOUT YOUR
GEOTECHNICAL ENGINEERING REPORT

More construction problems are caused by site subsurface conditions than any other factor. As troublesome as subsurface problems can be, their frequency and extent have been lessened considerably in recent years, due in large measure to programs and publications of ASFE/ The Association of Engineering Firms Practicing in the Geosciences.

The following suggestions and observations are offered to help you reduce the geotechnical-related delays, cost-overruns and other costly headaches that can occur during a construction project.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

A geotechnical engineering report is based on a subsurface exploration plan designed to incorporate a unique set of project-specific factors. These typically include: the general nature of the structure involved, its size and configuration; the location of the structure on the site and its orientation; physical concomitants such as access roads, parking lots, and underground utilities; and the level of additional risk which the client assumed by virtue of limitations imposed upon the exploratory program. To help avoid costly problems, consult the geotechnical engineer to determine how any factors which change subsequent to the date of the report may affect its recommendations.

Unless your consulting geotechnical engineer indicates otherwise, *your geotechnical engineering report should not be used*:

- When the nature of the proposed structure is changed, for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one;
- when the size or configuration of the proposed structure is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership, or
- for application to an adjacent site.

Geotechnical engineers cannot accept responsibility for problems which may develop if they are not consulted after factors considered in their report's development have changed.

MOST GEOTECHNICAL "FINDINGS" ARE PROFESSIONAL ESTIMATES

Site exploration identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are extrapolated by geotechnical engineers who then render an opinion about overall subsurface conditions, their likely reaction to proposed construction activity, and appropriate foundation design. Even under optimal circumstances actual conditions may differ from those inferred to exist, because no geotechnical engineer, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. *Nothing can be done to prevent the unanticipated, but steps can be taken to help minimize their impact.* For this reason, *most experienced owners retain their geotechnical consultants through the construction stage*, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

SUBSURFACE CONDITIONS CAN CHANGE

Subsurface conditions may be modified by constantly-changing natural forces. Because a geotechnical engineering report is based on conditions which existed at the time of subsurface exploration, *construction decisions should not be based on a geotechnical engineering report whose adequacy may have been affected by time.* Speak with the geotechnical consultant to learn if additional tests are advisable before construction starts.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical report. The geotechnical engineer should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS

Geotechnical engineers' reports are prepared to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor, or even some other consulting civil engineer. Unless indicated otherwise, this report was prepared expressly for the client involved and expressly for purposes indicated by the client. Use by any other persons for any purpose, or by the client for a different purpose, may result in problems. *No individual other than the client should apply this report for its intended purpose without first conferring with the geotechnical engineer. No person should apply this report for any purpose other than that originally contemplated without first conferring with the geotechnical engineer.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical engineering report. To help avoid these problems, the geotechnical engineer should be retained to work with other appropriate design professionals to explain relevant geotechnical findings and to review the adequacy of their plans and specifications relative to geotechnical issues.

BORING LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT

Final boring logs are developed by geotechnical engineers based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples. Only final boring logs customarily are included in geotechnical engineering reports. *These logs should not under any circumstances be redrawn* for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimize the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

To minimize the likelihood of boring log misinterpretation, *give contractors ready access to the complete geotechnical engineering report* prepared or authorized for their use. Those who do not provide such access may proceed under the *mistaken* impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes which aggravate them to disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY

Because geotechnical engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical consultants. To help prevent this problem, geotechnical engineers have developed model clauses for use in written transmittals. These are *not* exculpatory clauses designed to foist geotechnical engineers' liabilities onto someone else. Rather, they are definitive clauses which identify where geotechnical engineers' responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your geotechnical engineering report, and you are encouraged to read them closely. Your geotechnical engineer will be pleased to give full and frank answers to your questions.

OTHER STEPS YOU CAN TAKE TO REDUCE RISK

Your consulting geotechnical engineer will be pleased to discuss other techniques which can be employed to mitigate risk. In addition, ASFE has developed a variety of materials which may be beneficial. Contact ASFE for a complimentary copy of its publications directory.

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