

## Subsurface Investigation Report

for

### Proposed New Headquarters and Drive-Through Tompkins Financial 118-119 East Seneca Street Ithaca, NY

Prepared for:

Mr. Greg Hartz  
Tompkins Trust Company  
121 East Seneca Street  
Ithaca, NY 14850



Provided By:

**Elwyn & Palmer Consulting Engineers PLLC**

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*July 2015*

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July 7, 2015

Mr. Greg Hartz  
Tompkins Trust Company  
121 East Seneca Street  
Ithaca, NY 14850

Re: Subsurface Investigation Report  
Tompkins Financial – New Headquarters and Drive Through Sites  
118-119 East Seneca Street  
Ithaca, NY

Dear Mr. Hartz:

This report will summarize the findings of a subsurface investigation that was performed at 118 and 119 East Seneca Street during May and June 2015. This report includes a description of the work performed, a discussion of the findings, and our recommendations for foundation design.

## **A. SCOPE OF WORK**

The scope of work included advancing two soil borings at 119 East Seneca Street for construction of a new drive through teller building and five borings at 118 East Seneca Street for construction of a new corporate headquarters building. Site plans showing the location of the borings are attached in the Appendix. Logs of each boring are included in the Appendix. The findings of the subsurface investigation and our recommendations for foundation design will be discussed in this report.

## **B. SITE AND PROJECT DESCRIPTION**

The project involves construction of a new single-story wood or light-gauge metal framed Drive-Through Teller building to be located in the current parking area beneath the existing office building at 119 East Seneca Street. The project also includes construction of a new seven-story steel-framed headquarters building at the site of the existing Trust Company drive through teller building at 118 East Seneca Street. This building will include a basement level that will be located 12-13 ft below grade. The sites are both very relatively flat with the majority of both sites currently asphalt paved parking area. We understand significant grade change is not planned at either site.

## **C. SUBSURFACE FINDINGS**

Soil borings were advanced using hollow stem augers. Split-spoon soil samples were taken in accordance with ASTM D1586. Site plans showing the boring locations is attached. Boring logs for each of the borings are attached.

Borings B1 and B2 (New Drive Through) were advanced to a depth of 20 ft at the site of the proposed new drive through teller building at 119 East Seneca Street. Both borings encountered 6 inches of asphalt pavement underlain by fill consisting of sand, gravel, cobbles,

and brick fragments to a depth of approximately 6.5-8ft. Below this level the borings encountered primarily medium dense sand and gravel with occasional cobbles to a depth of approximately 15 ft. Between 15 and 20 ft we encountered primarily loose to medium dense fine to coarse sand and fine gravel. Groundwater was encountered in both borings at a depth of approximately 15 ft.

Five borings (B1-B5) were advanced at the site of the proposed new headquarters building at 118 East Seneca Street to depths of 75-80 ft. The five borings encountered similar subsurface conditions. The borings encountered 5-8 ft of medium dense fill typical of that found in urban areas and consisting of gravel, sand, brick, coal cinders, asphalt, and some organic material. The fill was underlain by moist brown sand and silt of medium consistency that also contained occasional amounts of gravel, cobbles and peat to a depth of 12-16 ft. Below 12-16 ft we encountered moist to wet loose fine to coarse sand with occasional silt seams and amounts of peat. The N-values for this material ranged from 3 to 20 with the majority being less than 10. Beginning at a depth of between 55 and 60 ft the material becomes denser and consists of coarse sand and gravel with varying amounts of silt. The material continues to become denser with depth and below 65 ft becomes very hard and includes shale fragments. Borings were terminated between 75 and 80 ft. Groundwater levels were measured in each boring. Measurements were taken when groundwater was first encountered, at completion of drilling, and after drilling augers were removed from the borehole. Based on a review of the measurements, standing groundwater for the site is estimated to be 14.5-20 ft below grade.

One important finding to note is that near the northeast corner of the site boring B2ABC at auger refusal was reached after encountering concrete and the boring was move. The boring was ultimately moved 4 times with the boring completed as boring B2D. In B2A, B2B, and B2c refusal on concrete was encountered at depths of 7.2, 4, and 10.8 ft, respectively. We were not able to confirm the reason for concrete in this location and discussions with the Owner's representative revealed no known previous structures in that area. This concrete may be an issue during construction of the new building.

#### **D. GEOTECHNICAL ENGINEERING ANALYSIS**

We have completed an analysis of both sites for the proposed building construction. At the site of the proposed new drive through building the subsurface soils at the site of the proposed new buildings are primarily medium to dense sands and gravels to a depth of 15 ft with looser material beneath this depth. Based on the proposed building being single story and of light construction we believe this proposed structure can be supported on conventional shallow foundations and the proposed concrete floor may be constructed as a concrete slab-on-grade provided they are constructed in accordance with the recommendations detailed below.

Foundations for the new drive through building shall bear on sound natural subgrade that is approved by the Engineer or a qualified representative. In fill areas the subgrade shall be approved prior to fill placement and structural fill shall be compacted in accordance with the recommendations included in this report.

For the new headquarters building our analysis has determined that a deep foundation system will be required to support the large loads generated by a seven story building. In addition, the new headquarters building includes a basement that will be located 12-13 ft below grade which is only several feet from where the subsurface soils become loose in consistency and likely to settle under application of significant loads. We would recommend end bearing piles that would extend down to approximately 65-70 ft below the current ground elevation. The borings have shown the material encountered at and below this depth to be very competent which will allow each pile to support significant loads.

Due to the depth of excavation at this site and the compact site there will need to be a support of excavation plan created to allow excavation to the required depths and protection of adjacent structures and property. Also, dewatering of the site may be required to maintain a dry working area during construction of the basement.

#### **E. SEISMIC DESIGN**

Based on the soils encountered in the borings, the project sites can be classified as Seismic Site Class D according to the current edition of the Building Code of New York State. The subsurface exploration did not reveal soils vulnerable to liquefaction or collapse under seismic loading.

#### **F. RECOMMENDATIONS**

Based on the results of the subsurface investigation and engineering analyses, we have the following recommendations:

##### Site Preparation and Excavation

1. Clear, grub, and strip topsoil and remove significant root structures within new construction areas. Remove any remnants of any existing abandoned structures encountered from within the new footprint.
2. In areas where fill is required, compact subgrade before placing fill by making at least 4 overlapping passes in perpendicular directions with a self-propelled roller weighing at least 30,000 lbs. Soft or uncompactable areas should be excavated and replaced with granular structural fill approved by the Engineer. The structural fill should be placed to at least 95% of the maximum dry density as determined in accordance with ASTM D1557.
3. All excavation should be performed in accordance with all OSHA and other applicable safety standards.
4. Dewatering operations should be configured to route surface runoff and groundwater away from site and out of the excavation. Operations shall conform to applicable environmental regulations.

5. When structural fill is required beneath foundations it shall consist of an engineered mix of crushed ledge rock conforming to the following gradation:

Sieve Size	Percent Passing
2"	100
1"	80-95
½"	45-75
#4	30-60
#40	10-40
#200	0-7

#### Foundation Design and Construction-New Drive Through Building

1. The foundations for the proposed new drive through building should bear on stable natural subgrade or compacted select fill that is approved by the Engineer. Foundations shall be set not less than 4 ft below finished grade to provide protection against frost.
2. Foundation subgrade to be free of loose or disturbed material. The loose soil at subgrade level should be compacted during a dry period prior to placing of forms.
3. Foundations for the proposed new building may be sized using an allowable bearing pressure of 1500 psf.
4. The slab on grade shall be placed on 8 inches of compacted select material. The subgrade below the select material shall be proofrolled in accordance with the above recommendations on Site Preparation. The slab should be reinforced against cracking in accordance with ACI design standards. Concrete slab-on-grade shall be designed using a modulus of subgrade reaction of 150 pci.
5. Minimum width of column footings to be 30 inches, minimum width of wall footings to be 24 inches.
6. We anticipate total and differential settlements of less than 1 and ½ inch, respectively for these foundations.
7. Select granular fill for beneath the slab shall be clean bank run gravel conforming to the following gradation:

Sieve Size	Percent Passing
2"	100
¼"	35-65
#200	0-10

#### Foundation Design and Construction- New Headquarters Building

1. The recommended foundation system for the proposed new headquarters building. The system would consist of end bearing piles supported in the dense material located approximately 65-70 ft below existing grade. We recommend that the basement slab be a structural slab.
2. The piles should be tested by and experienced and reputable testing company to confirm and ultimate pile capacity of twice the intended service load for the pile.

3. We recommend drainage and a waterproofing system for the basement walls. The borings have shown that groundwater may be at levels above the proposed basement floor level. The contractor should be prepared for dewatering during construction.
4. A support of excavation plan (SOE) prepared and stamped by a NYS professional engineer will be required for this project. The SOE system will allow excavation to the required depths with near vertical side slopes and prevent damage to the adjacent buildings and property.

#### **H. CLOSING**

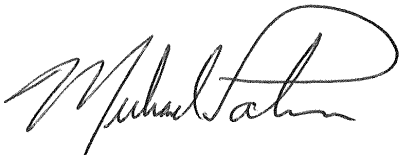
Elwyn & Palmer has prepared this report based on our interpretation of the subsurface conditions at the project sites and our understanding of the proposed project. Changes in scope, location, structure type, or loads should be brought to our attention for review to allow us to make changes as necessary to the recommendations provided.

Elwyn & Palmer has performed these services in a manner consistent with the standard methods and level of care exercised by members of the geotechnical engineering profession. No warranty, expressed or implied, is made in connection with the providing of geotechnical engineering services.

We appreciate the opportunity to be of service on this project. Please call if you have any questions or require additional information.

Sincerely,

**ELWYN & PALMER CONSULTING ENGINEERS PLLC**



Michael C. Palmer, PhD, PE  
Partner

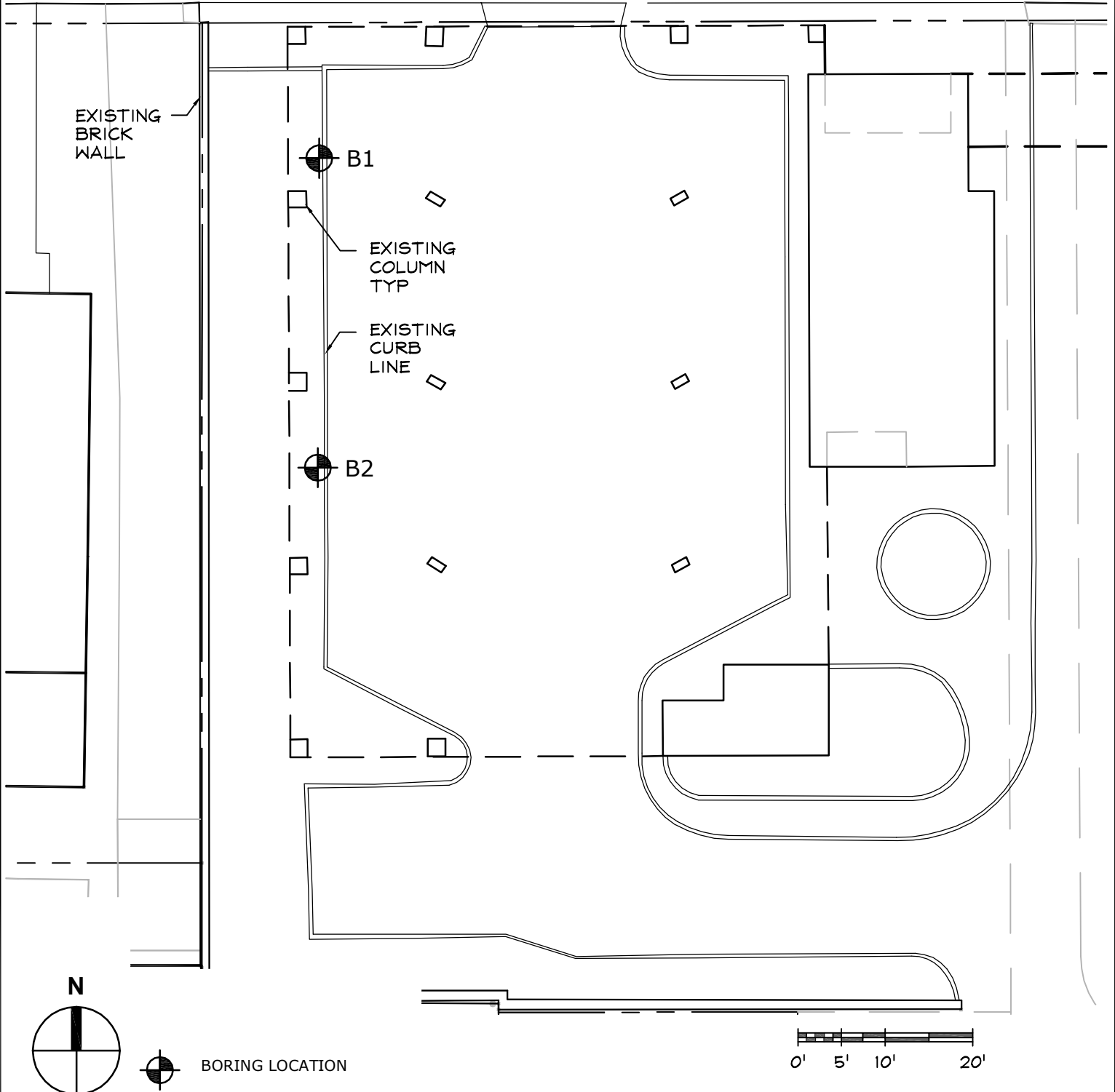
Attachments

**APPENDIX**

**BORING LOCATION PLANS**



EAST SENECA STREET  
(NYS ROUTE 79)



**Elwyn & Palmer**

CONSULTING ENGINEERS, PLLC

Ithaca, New York

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SOIL BORING LOCATION PLAN

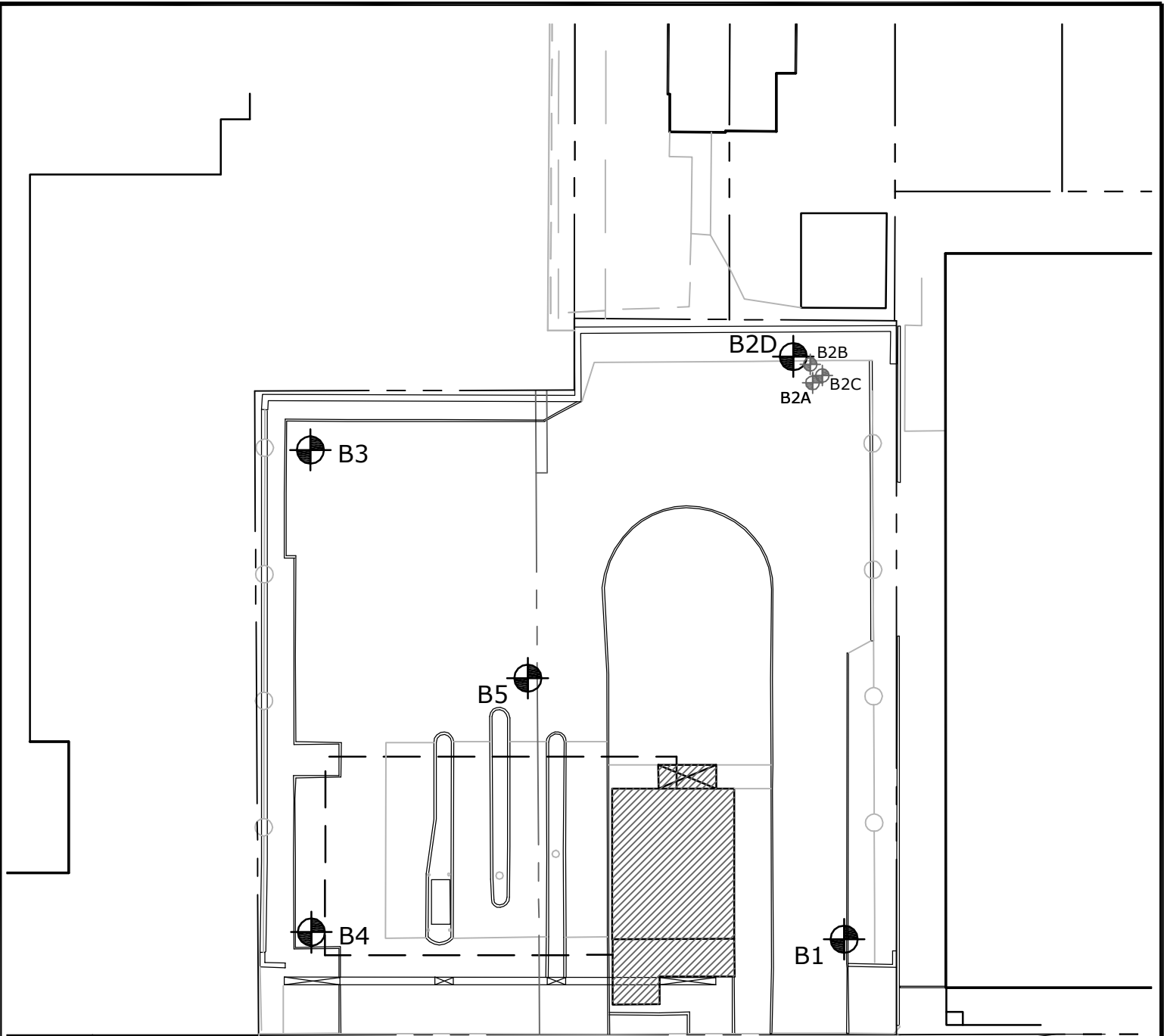
TOMPKINS TRUST COMPANY  
NEW DRIVE THROUGH BUILDING  
119 E. Seneca Street  
Ithaca, NY

ISSUE DATE: 6/11/15

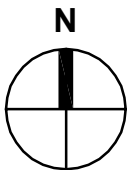
PROJECT No.: 15014

DWG. NO.

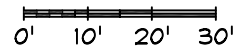
**S1**



EAST SENECA STREET  
(NYS ROUTE 79)



 BORING LOCATION  
 ABANDONED BORING LOCATION



**Elwyn & Palmer**

CONSULTING ENGINEERS, PLLC

Ithaca, New York

607.272.5060

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SOIL BORING LOCATION PLAN

TOMPKINS TRUST COMPANY  
 CORPORATE HEADQUARTERS BUILDING  
 118 E. Seneca Street  
 Ithaca, NY

ISSUE DATE: 6/11/15

PROJECT No.: 15014

DWG. NO.

**S2**

**BORING LOGS**

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## General Information and Key to Subsurface Logs

The subsurface logs attached to this report present the observations and mechanical data collected by the driller at the site, supplemented by classification of the material removed from the boring as determined through visual identification by technicians in the laboratory. It is cautioned that the materials removed from the borings represent only a fraction of the total volume of the deposits at the site and may not necessarily be representative of the subsurface conditions between adjacent borings or between sampled intervals. The data presented on the subsurface logs together with the recovered samples will provide basis for evaluating the character of the subsurface conditions relative to the project. The evaluation must consider all the recorded details and their significance relative to each other. Often analyses of standard boring data indicate the need for additional testing or sampling procedures to more accurately evaluate the subsurface conditions. Any evaluation of the contents of this report and the recovered samples must be performed by Professionals. The information presented in the following list defines some of the procedures and terms used on the subsurface logs to describe the conditions encountered.

1. The figures in the depth column define the scale of the subsurface log.
2. The sample column shows the depth range from which the sample was recovered. The sample type column will show an "S" for split spoon sample, a "T" for a tube sample and a "C" for a rock core sample.
3. The sample number is used for identification on sample containers and in laboratory reports.
4. The Blows on Sampler column shows results of the Standard Penetration Tests and indicates the number of blows required to drive a split spoon sampler into the soil. The number of blows required for each six inches of penetration is recorded. The first six inches of penetration is considered the seating drive. The number of blows required for the second and third six inches of penetration is termed the penetration resistance, N. The sampler diameter, hammer weight, and length of drop are noted on the log.
5. All recovered soil samples are reviewed in the laboratory by an engineering technician, geologist, or geotechnical engineer unless noted otherwise. The visual descriptions are made on the basis of a combination of the driller's field descriptions and observations and the sample as viewed in the laboratory. The method of visual classification is based primarily on the Unified Soil Classification System (ASTM D2487) with regard to particle size and plasticity. The relative portion by weight by weight of two or more soil types is described for granular soils in accordance with "Suggested Methods of Test for Identification of Soils" by D.M. Burmister (ASTM Special Technical Publication No. 479, June 1970). The description of relative soil density or consistency is based on Penetration Test results. The description of soil moisture is based upon relative wetness of the soil as recovered and is described as dry, damp, moist, wet, and saturated. The presence of boulders and large gravel is sometimes, but not necessarily, detected by an evaluation of sampler blows or the behavior of the drill rig.
6. The description of rock is based on the recovered rock core and the driller's observations.
7. The stratification lines present the approximate boundary between soil types. Actual boundaries may vary between sampling intervals and the transition may be gradual. Solid stratification lines are based on the driller's field observations.
8. Miscellaneous observations and procedures noted by the driller are shown on the logs, including water level observations. It is important to realize the reliability of the water level observations depends upon the soil type (water does not readily stabilize in a hole through fine grained soils) and that drill water used to advance the boring may influence the observations. The groundwater level typically will fluctuate seasonally. One or more perched or trapped water levels may exist in the ground seasonally. All the available readings should be evaluated. If definite conclusion cannot be made, it may be necessary to examine the conditions more thoroughly through test pit excavations or observation wells.
9. The length of rock core run is defined as the length of penetration of the core barrel. Core recovery is the length of core recovered divided by the core run. The RQD (Rock Quality Designation) is the total pieces of NX core exceeding 4 inches in length divided by the core run. Fresh, irregular or drilling induced breaks are ignored and the pieces counted as intact lengths. RQD values are valid only for NX size cores (2.125" diameter). The barrel size is noted in the logs.

## Definition of Descriptors used in Boring Logs

### Soil Type and Particle Size

<u>Type</u>	<u>Size</u>
Boulder	>12"
Cobble	12"-3"
Gravel	
Coarse	3"- ¾"
Fine	¾"-#4
Sand	
Coarse	#4-#10
Medium	#10-#40
Fine	#40-#200
Silt	<#200
Clay	<#200

### Soil Type Proportions

<u>Term</u>	<u>Percent of Sample</u>
"and"	35-50
"some"	20-35
"little"	10-20
"trace"	1-10

### Relative Compactness or Consistency

#### Granular Soils

<u>Descriptor</u>	<u>Blows/ft (N)</u>
Loose	<11
Med-Dense	11-30
Dense	31-50
Very Dense	>51

#### Fine Grained Soils

<u>Descriptor</u>	<u>Blows/ft (N)</u>
Very Soft	0-2
Soft	2-4
Medium	4-8
Stiff	8-15
Very Stiff	15-30
Hard	>30

### Stratification Description

Varved – Horizontal uniform layers or seams

Layer – Soil deposit more than 6" thick

Seam – Soil deposit less than 6" thick

Parting – Soil deposit less than 1/8" thick

### Rock Classification Terms

<u>Quality</u>	<u>Terms</u>	<u>Definition</u>
Hardness	Soft	Scratched by fingernail
	Medium hard	Scratched easily by penknife
	Hard	Scratched with difficulty by penknife
	Very hard	Cannot be scratched with penknife
Weathering	Very weathered	Judged by the relative amounts of disintegration, iron staining, core recovery, clay seams, etc.
	Weathered	
	Sound	
Bedding	Laminated/Fissile	Less than 0.08"
	Thinly bedded	½" to 2"
	Medium bedded	2" to 2ft
	Thickly bedded	2 ft to 4 ft
	Massive	More than 6 ft





Client ELWYN PALMER  
 CONSULTING ENGINEERS  
 Project TOMPKINS CO  
 TRUST COMPANY  
 Location 119 EAST SENECA ST,  
ITHACA, NY



**LYON DRILLING CO.**  
**BORING LOG**

Boring No. B1  
 Project No. \_\_\_\_\_  
 Sheet 1 of 2  
 Date Started 06/04/15  
 Date Completed 06/04/15  
 Driller HARRY LYON

Drill Rig CME 55  
 Casing 3 1/4" I.D. HOLLOW STEM AUGERS  
 Casing Hammer: Wt. \_\_\_\_\_ lb. Fall \_\_\_\_\_ in.  
 Soil Sampler 2" SPLIT SPOON  
 Sample Hammer: Wt. 140 lb. Fall 30 in.  
 Rock Sampler: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Weather Conditions: 75 SUNNY

Boring Location AS STAKED, BY CLIENT

Surface Elevation \_\_\_\_\_

Ground Water Observations				
Date	Time	Casing at	Hole at	Water at
<u>06/04/15</u>	<u>1:45PM</u>	<u>17.5</u>	<u>20.0</u>	<u>17.5</u>
<u>06/04/15</u>	<u>6:10 PM</u>	<u>73.5</u>	<u>76.0</u>	<u>22.3</u>
<u>06/04/15</u>	<u>7:15 PM</u>	<u>OUT</u>	<u>19.5</u>	<u>17.4</u>

Depth	Sample Number	Sample Depth		Sample Type	SOIL				RQD	Sample Recovery	MATERIAL DESCRIPTION	REMARKS	
		From (Ft)	To (Ft)		Blows on Sampler								N
					0/0.5'	0.5/1.0'	1.0/1.5'	1.5/2.0'					
					Rock Recovery								
					Ft.	%				Depth of Change			
1	1.0	2.0	S	9	10					1.0 BLACKTOP	0.7		
2	2.0	4.0	S	7	8	4	4	12		MOIST BROWN FIRM FINE GRAVEL AND COARSE TO FINE SAND	3.0		
5	3	4.8	S	5	50/3					MOIST BROWN LOOSE FINE TO COARSE SAND SOME FINE GRAVEL. TRACE BRICK (FILL)	5.2		
4	6.0	8.0	S	5	8	6	8	14		MOIST BROWN FIRM FINE TO COARSE SAND AND FINE GRAVEL. TRACE SILT	4.7-5.2 PROBABLE CONCRETE		
5	8.0	10.0	S	9	10	14	14	24					
10	6	12.0	S	12	12	11	5	23		MOIST WET BROWN FINE TO COARSE SAND LITTLE SILT	11.5		
7	12.0	14.0	S	2	2	5	5	7		WET BROWN SOFT SILT AND FINE SAND	12.0		
15	8	15.0	S	6	10	8	7	18		MOIST BROWN FINE TO MEDIUM SAND. SOME COARSE SAND. LITTLE SILT	13.0		
9	18.0	20.0	S	1	2	4	4	6		SATURATED BROWN LOOSE COARSE TO FINE SAND AND FINE GRAVEL. TRACE SILT WITH OCCASIONAL COBBLES	17.5		
20	10	23.0	S	4	3	4	4	7					
25	11	28.0	S	4	4	5	5	9					
30	12	33.0	S	7	6	4	4	10					
35	13	38.0	S	5	6	5	5	11					
40	14	43.0	S	10	10	11	10	21					
45	15	48.0	S	3	5	14	11	19		SATURATED BROWN LOOSE FINE SAND	46.0		
50										SATURATED BROWN FIRM COARSE TO FINE SAND AND FINE GRAVEL	49.0		



Client ELWYN PALMER  
 CONSULTING ENGINEERS  
 Project TOMPKINS CO  
 TRUST COMPANY  
 Location 119 EAST SENECA ST,  
ITHACA, NY



**LYON DRILLING CO.**  
**BORING LOG**

Boring No. B1  
 Project No. \_\_\_\_\_  
 Sheet 2 of 2  
 Date Started 06/04/15  
 Date Completed 06/04/15  
 Driller HARRY LYON

Drill Rig CME 55  
 Casing 3 1/4" I.D. HOLLOW STEM AUGERS  
 Casing Hammer: Wt. \_\_\_\_\_ lb. Fall \_\_\_\_\_ in.  
 Soil Sampler 2" SPLIT SPOON  
 Sample Hammer: Wt. 140 lb. Fall 30 in.  
 Rock Sampler: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Weather Conditions: 75 SUNNY

Boring Location AS STAKED, BY CLIENT  
 Surface Elevation \_\_\_\_\_  
 Ground Water Observations  

Date	Time	Casing at	Hole at	Water at

Depth	Sample Number	Sample Depth		Sample Type	SOIL				N	RQD	Sample Recovery	MATERIAL DESCRIPTION	REMARKS
		From (Ft)	To (Ft)		Blows on Sampler								
					0/0.5'	0.5/1.0'	1.0/1.5'	1.5/2.0'					
55	16	55.0	57.0	S	4	3	2	4	5	1.7	SATURATED GREY SOFT SILT. LITTLE CLAY TRACE PEAT	52-54.5 AUGERS VERY COBBLY	
60	17	60.0	62.0	S	19	12	6	19	18	1.2	SATURATED GREY LOOSE FINE SAND SATURATED BROWN GREY FINE TO COARSE SAND. SOME FINE GRAVEL. LITTLE SILT		
65	18	65.0	67.0	S	22	19	22	25	41	1.4	SATURATED GREY BROWN FIRM FINE TO COARSE SAND AND FINE GRAVEL. TRACE SILT WITH OCCASIONAL COBBLES	AUGERS VERY HARD AT 67.0'	
70	19	70.0	72.0	S	22	19	28	34	77	0.9	SATURATED GREY VERY COMPACT FINE TO COARSE SAND. SOME FINE GRAVEL WITH SUBANGULAR SHALE FRAGMENTS. TRACE SILT. TILL LIKE MATERIAL		
75	20	74.0	76.0	S	42	42	24	22	66	0.9			
80													
85													
90													
95													
100													

Client ELWYN PALMER  
 CONSULTING ENGINEERS  
 Project TOMPKINS TRUST  
 COMPANY  
 Location 119 EAST SENECA ST,  
ITHACA, NY



**LYON DRILLING CO.**  
**BORING LOG**

Boring No. B2ABC  
 Project No. \_\_\_\_\_  
 Sheet 1 of 1  
 Date Started 06/05/15  
 Date Completed 06/05/15  
 Driller HARRY LYON

Drill Rig CME 55  
 Casing 3 1/4" I.D. HOLLOW STEM AUGERS  
 Casing Hammer: Wt. \_\_\_\_\_ lb. Fall \_\_\_\_\_ in.  
 Soil Sampler 2" SPLIT SPOON  
 Sample Hammer: Wt. 140 lb. Fall 30 in.  
 Rock Sampler: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Weather Conditions: \_\_\_\_\_

Boring Location AS STAKED, BY CLIENT

Surface Elevation \_\_\_\_\_

Ground Water Observations				
Date	Time	Casing at	Hole at	Water at
<u>06/05/15</u>	_____	_____	_____	<u>DRY</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Depth	Sample Number	Sample Depth		Sample Type	SOIL				N	Sample Recovery	MATERIAL DESCRIPTION	REMARKS
		Blows on Sampler				RQD						
		0/0.5'	0.5/1.0'		1.0/1.5'		1.5/2.0'					
		Rock Recovery										
From (Ft)	To (Ft)	Ft.	%					Depth of Change				
	1	0.5	2.0	S	9	10	10		20	0.6 BLACKTOP	0.5	
	2	2.0	4.0	S	10	12	10	12	24	MOIST BROWN FIRM FINE TO COARSE SAND		
										1.6 SOME FINE GRAVEL		
5	3	4.0	6.0	S	4	5	5	3	10			
										1.1 _____	5.5	
	4	6.0	7.1	S	3	3	50/1			MOIST BROWN LOOSE FINE TO COARSE SAND		
										0.5 SOME FINE GRAVEL WITH BRICK AND COAL (FILL)	8.0	
10	5	8.0	10.0	S	WOR	WOR	WOR	1				
										0.3 LOOSE FINE TO COARSE SAND AND ROTTEN WOOD		
	6	10.0	10.7	S	3	50/2						
										0.0 _____		
										BORING TERMINATED AT 10.8		
15												
20												
25												
30												
35												
40												
45												
50												

Client ELWYN PALMER  
 CONSULTING ENGINEERS  
 Project TOMPKINS TRUST  
 COMPANY  
 Location 119 EAST SENECA ST,  
ITHACA, NY



**LYON DRILLING CO.**  
**BORING LOG**

Boring No. B2D  
 Project No. \_\_\_\_\_  
 Sheet 1 of 2  
 Date Started 06/05/15  
 Date Completed 06/08/15  
 Driller HARRY LYON

Drill Rig CME 55  
 Casing 3 1/4" I.D. HOLLOW STEM AUGERS  
 Casing Hammer: Wt. \_\_\_\_\_ lb. Fall \_\_\_\_\_ in.  
 Soil Sampler 2" SPLIT SPOON  
 Sample Hammer: Wt. 140 lb. Fall 30 in.  
 Rock Sampler: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Weather Conditions: 80 SUNNY

Boring Location AS STAKED, BY CLIENT

Surface Elevation \_\_\_\_\_

Ground Water Observations				
Date	Time	Casing at	Hole at	Water at
06/05/15	1:00 PM			19.5
06/05/15	7:30 PM	73.5	26.0	24.2
06/08/15	9:30 AM	58.0	58.0	13.8
06/08/15	10:30 AM	OUT	31.0	23.5

Depth	Sample Number	Sample Depth		Sample Type	SOIL				N	RQD	Sample Recovery	MATERIAL DESCRIPTION	REMARKS
		From (Ft)	To (Ft)		Blows on Sampler								
		0/0.5'	0.5/1.0'		1.0/1.5'	1.5/2.0'	Rock Recovery						
		Ft.	%			Depth of Change							
5											MOIST BROWN SOFT SILT		
												4.0	
											MOIST BROWN LOOSE FINE TO COARSE SAND AND FINE GRAVEL (FILL)		
												8.0	
10	1	10.0	12.0	S	5	7	5	5	12		0.6	MOIST BROWN LOOSE COARSE TO FINE SAND AND FINE GRAVEL WITH OCCASIONAL COBBLES	
15	2	14.0	16.0	S	7	6	7	6	13		0.8		
												18.0	
20	3	19.0	21.0	S	WOR	WOR	7	3	7		0.6	SATURATED BROWN LOOSE COARSE TO FINE SAND AND FINE GRAVEL. TRACE SILT WITH OCCASIONAL COBBLES	
25	4	24.0	26.0	S	5	5	5	3	10		0.9		
												26.5	
												SATURATED BROWN LOOSE FINE SAND	
30	5	29.0	31.0	S	10	4	2	1	6		1.3		
												30.0	
												SATURATED GREY SOFT SILT. LITTLE FINE SAND WITH OCCASIONAL GREY CLAY SEAMS UP TO 2" THICK	
												32.5	
35	6	34.0	36.0	S	1	1	3	2	4		1.7	ORGANIC SILT	
												35.0	
												SATURATED GREY LOOSE FINE SAND	
												35.5	
												SATURATED GREY SOFT ORGANIC SILT. TRACE PEAT WITH OCCASIONAL BLACK FINE SAND SEAMS	
40	7	39.0	41.0	S	2	4	1	2			1.7		
												1.7	
45	8	44.0	46.0	S	3	2	2	2	4		1.6		
												47.5	
												SATURATED BROWN COMPACT COARSE TO FINE SAND AND FINE GRAVEL WITH OCCASIONAL COBBLES	
50	9	49.0	51.0	S	8	17	17	15	32		1.8		

Client ELWYN PALMER  
 CONSULTING ENGINEERS  
 Project TOMPKINS TRUST  
 COMPANY  
 Location 119 EAST SENECA ST,  
ITHACA, NY



**LYON DRILLING CO.**  
**BORING LOG**

Boring No. B2D  
 Project No. \_\_\_\_\_  
 Sheet 2 of 2  
 Date Started 06/05/15  
 Date Completed 06/08/15  
 Driller HARRY LYON

Drill Rig CME 55  
 Casing 3 1/4" I.D. HOLLOW STEM AUGERS  
 Casing Hammer: Wt. \_\_\_\_\_ lb. Fall \_\_\_\_\_ in.  
 Soil Sampler 2" SPLIT SPOON  
 Sample Hammer: Wt. 140 lb. Fall 30 in.  
 Rock Sampler: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Weather Conditions: 80 SUNNY

Boring Location AS STAKED, BY CLIENT  
 Surface Elevation \_\_\_\_\_  
 Ground Water Observations  

Date	Time	Casing at	Hole at	Water at

Depth	Sample Number	Sample Depth		Sample Type	SOIL				N	RQD	Sample Recovery	MATERIAL DESCRIPTION	REMARKS
		From (Ft)	To (Ft)		Blows on Sampler								
					0/0.5'	0.5/1.0'	1.0/1.5'	1.5/2.0'					
55		54.0	56.0	S	15	17	17	17	34	1.5		AUGERS HARDER AT 56.0' WITH COBBLES	
60		59.0	61.0	S	27	28	48	18	76	1.2			
65		64.0	66.0	S	16	17	23	30	40				
70		69.0	71.0	S	19	26	34	19	60	1.3			
75		74.0	76.0	S	15	19	23	31	42	1.0			
80													
85													
90													
95													
100													

Client ELWYN PALMER  
 CONSULTING ENGINEERS  
 Project TOMPKINS TRUST  
 COMPANY  
 Location 119 EAST SENECA ST,  
ITHACA, NY



**LYON DRILLING CO.**  
**BORING LOG**

Boring No. B3  
 Project No. \_\_\_\_\_  
 Sheet 1 of 2  
 Date Started 06/08/15  
 Date Completed 06/08/15  
 Driller HARRY LYON

Drill Rig CME 55  
 Casing 3 1/4" I.D. HOLLOW STEM AUGERS  
 Casing Hammer: Wt. \_\_\_\_\_ lb. Fall \_\_\_\_\_ in.  
 Soil Sampler 2" SPLIT SPOON  
 Sample Hammer: Wt. 140 lb. Fall 30 in.  
 Rock Sampler: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Weather Conditions: 80 SUNNY

Boring Location AS STAKED, BY CLIENT - RELOCATED 5' NE OF  
MARKED LOCATION  
 Surface Elevation \_\_\_\_\_  
 Ground Water Observations

Date	Time	Casing at	Hole at	Water at
<u>06/08/15</u>	<u>11:00 AM</u>	<u>19.5</u>	<u>22.0</u>	<u>18.3</u>
<u>06/09/15</u>	<u>9:45 AM</u>	<u>48.5</u>	<u>48.5</u>	<u>18.5</u>
<u>06/09/15</u>	<u>10:45 AM</u>	<u>OUT</u>	<u>20.5</u>	<u>15.5</u>

Depth	Sample Number	Sample Depth		Sample Type	SOIL					Sample Recovery	MATERIAL DESCRIPTION	REMARKS
		From (Ft)	To (Ft)		Blows on Sampler				RQD			
					0/0.5'	0.5/1.0'	1.0/1.5'	1.5/2.0'				
	1	0.5	2.0	S	5	7	7		14	1.2 BLACKTOP	0.4	
	2	2.0	4.0	S	7	9	9	12	18	MOIST BROWN FIRM COARSE TO FINE SAND AND FINE GRAVEL		
5	3	4.0	6.0	S	15	15	8	14	23	1.1 MOIST BROWN FINE TO COARSE SAND. LITTLE FINE GRAVEL. TRACE BRICK. ASPHALT. TRACE HAIR SIZE ROOT FIBERS	5.0	
	4	6.0	8.0	S	12	7	12	12	19	1.2 MOIST BROWN FIRM COARSE TO FINE SAND AND FINE GRAVEL	7.0	
10	5	8.0	10.0	S	11	6	11	7	17	0.1 MOIST BROWN LOOSE COARSE TO FINE SAND AND FINE GRAVEL. TRACE SILT	12.0	
	6	10.0	12.0	S	12	11	8	15	19	1.4 MOIST GREY BROWN FINE SAND. SOME SILT	15.0	
15	8	15.0	17.0	S	2	3	3	6	6	1.0 LITTLE MEDIUM TO COARSE SAND. TRACE PEAT	16.5	
										MOIST BROWN FINE SAND	18.5	
20	9	20.0	22.0	S	4	3	1	1	4	0.8 SATURATED BROWN LOOSE COARSE TO FINE SAND AND FINE GRAVEL		
25	10	25.0	27.0	S	5	4	3	3	7	1.0		
30	11	30.0	32.0	S	3	2	1	1	3	1.7 SATURATED GREY SOFT SILT. SOME CLAY TRACE FINE SAND	30.5	
35	12	35.0	37.0	S	2	2	2	3	4	1.6 GRADES TO SATURATED GREY SOFT ORGANIC SILT. LITTLE CLAY. TRACE PEAT WITH OCCASIONAL FINE SAND. SEAMS UP TO 2" THICK	33.0	
40	13	40.0	42.0	S	4	10	7	8	17	0.8 SATURATED BROWN FIRM FINE TO COARSE SAND AND FINE GRAVEL. TRACE SILT WITH OCCASIONAL COBBLES	40.5	
45	14	45.0	47.0	S	6	6	7	6	13	1.5		
50	15	50.0	52.0	S	9	7	7	7	14	0.8		

Client ELWYN PALMER  
 CONSULTING ENGINEERS  
 Project TOMPKINS TRUST  
 COMPANY  
 Location 119 EAST SENECA ST,  
ITHACA, NY



**LYON DRILLING CO.**  
**BORING LOG**

Boring No. B3  
 Project No. \_\_\_\_\_  
 Sheet 2 of 2  
 Date Started 06/08/15  
 Date Completed 06/08/15  
 Driller HARRY LYON

Drill Rig CME 55  
 Casing 3 1/4" I.D. HOLLOW STEM AUGERS  
 Casing Hammer: Wt. \_\_\_\_\_ lb. Fall \_\_\_\_\_ in.  
 Soil Sampler 2" SPLIT SPOON  
 Sample Hammer: Wt. 140 lb. Fall 30 in.  
 Rock Sampler: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Weather Conditions: 80 SUNNY

Boring Location AS STAKED, BY CLIENT - RELOCATED 5' NE OF  
MARKED LOCATION  
 Surface Elevation \_\_\_\_\_  
 Ground Water Observations  

Date	Time	Casing at	Hole at	Water at

Depth	Sample Number	Sample Depth		Sample Type	SOIL				N	RQD	Sample Recovery	MATERIAL DESCRIPTION	REMARKS
		From (Ft)	To (Ft)		Blows on Sampler								
					0/0.5'	0.5/1.0'	1.0/1.5'	1.5/2.0'					
					Rock Recovery								
					Ft.	%							
55	16	55.0	57.0	S	7	7	7	7	14	1.4		AUGERS SLIGHTLY HARDER WITH MORE COBBLES AT 57	
60	17	60.0	62.0	S	12	8	10	10	18	1.0			
65	18	65.0	67.0	S	9	6	11	14	17	1.1			
										67.5			
70	19	70.0	70.9	S	38	50/4				0.5	SATURATED BROWN COMPACT FINE TO COARSE SAND AND FINE GRAVEL. TRACE SILT WITH COBBLES	AUGERS VERY HARD AND COBBLY AT 70.0	
75	20	75.0	76.3	S	17	26	50/3			0.7			
											BORING TERMINATED AT 76.3		
80													
85													
90													
95													
100													

Client ELWYN PALMER  
 CONSULTING ENGINEERS  
 Project TOMPKINS TRUST  
 COMPANY  
 Location 119 EAST SENECA ST,  
ITHACA, NY



**LYON DRILLING CO.**  
**BORING LOG**

Boring No. B4  
 Project No. \_\_\_\_\_  
 Sheet 1 of 2  
 Date Started 06/09/15  
 Date Completed 06/10/15  
 Driller HARRY LYON

Drill Rig CME 55  
 Casing 3 1/4" I.D. HOLLOW STEM AUGERS  
 Casing Hammer: Wt. \_\_\_\_\_ lb. Fall \_\_\_\_\_ in.  
 Soil Sampler 2" SPLIT SPOON  
 Sample Hammer: Wt. 140 lb. Fall 30 in.  
 Rock Sampler: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Weather Conditions: 80 SUNNY

Boring Location BORING RELOCATED 3.0' NE OF  
MARKED LOCATION

Surface Elevation \_\_\_\_\_

Ground Water Observations				
Date	Time	Casing at	Hole at	Water at
06/09/15	2:00 PM	19.5	22.0	17.3
06/10/15	9:00 AM	73.5	76.0	27.5
06/10/15	11:30 AM	78.0	79.0	22.3
06/10/15	1:30 PM	OUT	18.1	16.7
06/11/15	10:45 AM	OUT	17.1	16.8

Depth	Sample Number	Sample Depth		Sample Type	SOIL				RQD	Sample Recovery	MATERIAL DESCRIPTION	REMARKS	
		From (Ft)	To (Ft)		Blows on Sampler								N
					0/0.5'	0.5/1.0'	1.0/1.5'	1.5/2.0'					
	1	0.5	2.0	S	9	9	7		16	1.0 BLACKTOP	0.4		
	2	2.0	4.0	S	5	4	5	5	9	1.1 FINE GRAVEL (FILL)	2.5		
5	3	4.0	6.0	S	5	7	7	6	14	0.5 LITTLE FINE GRAVEL. LITTLE BRICK (FILL)	4.0		
	4	6.0	8.0	S	8	12	5	4	17	0.9 MOIST BROWN FIRM FINE SAND	6.5		
10	5	8.0	10.0	S	5	4	6	12	10	1.1 FINE GRAVEL. LITTLE BRICK (FILL)	8.0		
	6	10.0	12.0	S	8	5	3	8	8	0.8 MOIST BROWN LOOSE FINE TO COARSE SAND			
	7	13.0	15.0	S	WOR	1	3	8	4	0.3 SOME FINE GRAVEL (POSSIBLE FILL) "LOOKS CLEAN"			
15	8	15.0	17.0	S	8	10	3	4	13	1.1	17.5		
	9	20.0	22.0	S	7	3	2	2	5	1.4 SATURATED BROWN LOOSE FINE TO MEDIUM SAND			
25	10	25.0	27.0	S	2	6	4	4	10	1.5			
	11	30.0	32.0	S	2	1	2	6	3	1.0	31.5		
	12	35.0	37.0	S	6	7	6	4	13	1.3 SATURATED BROWN LOOSE FINE SAND. SOME SILT. LITTLE MEDIUM TO COARSE SAND	33.5		
40	13	40.0	42.0	S	5	21	12	12	33	1.0			
	14	45.0	47.0		9	8	5	8	13	1.0			
50	15	50.0	52.0		5	5	8	8	13	1.1			

Client ELWYN PALMER  
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 Project TOMPKINS TRUST  
 COMPANY  
 Location 119 EAST SENECA ST,  
ITHACA, NY



**LYON DRILLING CO.**  
**BORING LOG**

Boring No. B4  
 Project No. \_\_\_\_\_  
 Sheet 2 of 2  
 Date Started 06/09/15  
 Date Completed 06/10/15  
 Driller HARRY LYON

Drill Rig CME 55  
 Casing 3 1/4" I.D. HOLLOW STEM AUGERS  
 Casing Hammer: Wt. \_\_\_\_\_ lb. Fall \_\_\_\_\_ in.  
 Soil Sampler 2" SPLIT SPOON  
 Sample Hammer: Wt. 140 lb. Fall 30 in.  
 Rock Sampler: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Weather Conditions: 80 SUNNY

Boring Location BORING RELOCATED 3.0' NE OF  
MARKED LOCATION  
 Surface Elevation \_\_\_\_\_  
 Ground Water Observations

Date	Time	Casing at	Hole at	Water at

Depth	Sample Number	Sample Depth		Sample Type	SOIL				N	Sample Recovery	MATERIAL DESCRIPTION	REMARKS
		From (Ft)	To (Ft)		Blows on Sampler							
					0/0.5'	0.5/1.0'	1.0/1.5'	1.5/2.0'				
55	16	55.0	57.0	S	10	10	7	7	17	1.0	AUGERS HARDER AT 57.5' (BUT NOT REAL HARD)	
60	17	60.0	62.0	S	18	30	32	40	64	1.2		
65	18	65.0	67.0	S	30	18	12	18	30	0.7	AUGERS HARDER AT 72.0'	
70	19	70.0	72.0	S	15	16	19	24	35	1.2		
75	20	74.0	76.0	S	29	22	19	15	41	1.6	AUGER REFUSAL AT 79.0	
80	21	78.5	78.6	S	50/1					0.0		
85												
90												
95												
100												





Client ELWYN PALMER  
 CONSULTING ENGINEERS  
 Project TOMPKINS TRUST  
 COMPANY  
 Location 119 EAST SENECA ST,  
ITHACA, NY



**LYON DRILLING CO.**  
**BORING LOG**

Boring No. B5  
 Project No. \_\_\_\_\_  
 Sheet 2 of 2  
 Date Started 06/10/15  
 Date Completed 06/11/15  
 Driller HARRY LYON

Drill Rig CME 55  
 Casing 3 1/4" I.D. HOLLOW STEM AUGERS  
 Casing Hammer: Wt. \_\_\_\_\_ lb. Fall \_\_\_\_\_ in.  
 Soil Sampler 2" SPLIT SPOON  
 Sample Hammer: Wt. 140 lb. Fall 30 in.  
 Rock Sampler: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Weather Conditions: 80 SUNNY

Boring Location AS STAKED, BY CLIENT

Surface Elevation \_\_\_\_\_

Ground Water Observations				
Date	Time	Casing at	Hole at	Water at
<u>06/11/15</u>	<u>2:20 PM</u>	<u>74.5</u>	<u>77.2</u>	<u>22.5</u>
<u>06/11/15</u>	<u>3:45 PM</u>	<u>OUT</u>	<u>19.0</u>	<u>16.4</u>

Depth	Sample Number	Sample Depth		Sample Type	SOIL				N	RQD	Sample Recovery	MATERIAL DESCRIPTION	REMARKS
		From (Ft)	To (Ft)		Blows on Sampler								
					0/0.5'	0.5/1.0'	1.0/1.5'	1.5/2.0'					
14	50.0	52.0	S	7	6	4	4	10	1.6	50.5	GRADES TO SATURATED BROWN LOOSE FINE GRAVEL. SOME COARSE TO FINE SAND		
55	15	55.0	57.0	S	16	11	10	10	21	1.0	54.0	GRADES TO SATURATED BROWN FIRM COARSE TO FINE SAND AND FINE GRAVEL TRACE SILT WITH OCCASIONAL COBBLES	AUGERS HARDER AT 58.0'
60	16	60.0	62.0	S	17	17	25	17	42	1.0			AUGER REFUSAL AT 64.0'
65	17	65.0	67.0	S	30	19	16	20	35	1.2			AUGERS EASIER 68'-69' -POSSIBLE FINE SAND
70	18	70.0	72.0	S	33	25	20	19	45	1.1			
75	19	75.0	77.0	S	14	21	30	19	51	1.0	76.7	SATURATED GREY POSSIBLE SHALE BEDROCK	AUGERS HARDER AT 76.7'
80	20	77.0	77.2	S	50/2					0.1		BORING TERMINATED AT 77.2	AUGER REFUSAL AT 77.0'
85													
90													
95													
100													