REPORT OF SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATION

FOR

PROPOSED
F.W. WEBB BUILDING
AMHERST, NY

PREPARED FOR

GREEN LEAF CONSTRUCTION
98 ADAMS STREET, SUITE 105
LEOMINSTER, MA 01453

ATTN: Mr. Jami Anderson, Senior Project Manager

PREPARED BY
JOHN P. STOPEN ENGINEERING LLP
450 SOUTH SALINA STREET, ROOM 400
SYRACUSE, NY 13201-0029

January 12, 2024
JPSLLP #223246.00

JOHN P. STOPEN ENGINEERING, LLP

PRINCIPALS: JAMES F. KAPLAN, P.E. / ROBERT J. COSSELMAN, P.E. / MATTHEW W. MCKEE, P.E., S.E. / JASON P. THORPE, P.E. / ERIK A. NELSON, P.E.
Consultant James P. Stewart, Ph.D., P.E.

January 12, 2024

via email to JAnderson@greenleafcm.com
Green Leaf Construction
98 Adams Street, Suite 105
Leominster, MA 01453

ATTN: Mr. Jami Anderson, Senior Project Manager

RE: Report of Subsurface Exploration and
Geotechnical Engineering Evaluation
Proposed F.W. Webb Building
Amherst, New York
JPSLLP #223246.00

Dear Mr. Anderson:

This documents subsurface explorations and geotechnical engineering evaluations for the Proposed F.W. Webb building in Amherst, New York. We determined the proposed expansion should be constructed on conventional foundations with concrete slab-on-grade floor.

SITE DESCRIPTION

The approximately 20-acre vacant site was at 669 S. Youngs Road in Amherst, NY (Figure 1). Based on historic aerial photographs, a wood-framed single family house was near the center of the site. The building was demolished sometime between 1985 and 1995. The site was bounded by Ellicott Creek to the south and west, S. Youngs Rd to the east and a field to the north. A recent survey indicated that the site sloped down from Elevation 695 ft at the northeast corner down to Elevation 678 ft along Ellicott Creek at the southeast corner of the site.

PROJECT DESCRIPTION

Current plans for the site include constructing an approximately 110,000 sq-ft one-story steel-framed warehouse building with the floor level at Elevation 393.0 ft with a loading dock along the south side of the building. Paved parking is planned along the west, south and east of the building with stormwater management areas to the west and south of the parking areas. Grades will have to be raised as much as 7 ft along the southwest building corner to meet the proposed floor level.

A Grading Plan indicated that grades in the western paved parking area will be raised by as much as 7 ft in some areas.

Building loads were not available, but we estimated maximum column loads of 250 kips and maximum wall loads of 2 kips per foot. Warehouse floor loads were not available, but we presume relatively light plumbing parts to be stored on racks.

GEOLOGY AND SEISMICITY

Based on local geology we believed the site was underlain by a shallow layer of dense glacial till over shallow bedrock. We expected the bedrock to be encountered at less than 10-ft-depth. Bedrock was expected to be Onondaga and Bois Blanc Limestone.

According to ASCE 7-16, the design earthquake is characterized by mapped spectral response accelerations S_s = 0.171 g, S_1 = 0.045 g, and PGA = 0.096 g.

PREVIOUS SUBSURFACE EXPLORATIONS

Explorations were performed by Terracon Consultants in November of 2021 for a different project just to the north of the subject site. It consisted of drilling 18 Test Boring (B-#) but Test Borings B-16, B-17 and B-18 were drilled within the subject site. Pertinent Test Boring logs are in Appendix A.

The explorations encountered between two to four feet of topsoil mixed with old fill consisting of silt, clay, sand, glass and limestone fragments. Standard Penetration Test (SPT) N-values in the topsoil/fill ranged from 5 to 29 blows/ft with an average of about 12 blows/ft, indicating an overall stiff state. Below the topsoil one to two feet of dense glacial till was encountered above Limestone bedrock. Standard Penetration Test (SPT) N-values in the fine sand ranged from 55 to 100+ blows/ft with an average of about 50 + blows/ft, indicating an overall very dense state. Sampler and Auger refusal was encountered between 3.5 and 5 ft below grade (Elevation 677.1 to 683 ft).

Groundwater was not encountered in the borings.

Bedrock was encountered between 3.5 and 5 ft below grade (Elevation 677.1 to 683 ft). Nearby rock cores indicated Rock Quality Designations between 55% to 78%. Rock core recovery was not recorded on the logs.

SUBSURFACE EXPLORATIONS AND FINDINGS

While the three test borings provided good detail on subsurface conditions, we planned additional explorations to confirm conditions across the rest of the site. We directed and oversaw the subsurface exploration on December 13, 2023 that consisted of excavating the 23 Test Pits shown on Figure 2. Test pits were excavated by our subcontractor Jerry's Contracting Enterprises, Inc. using a tracked excavator. Subsurface conditions were as shown on the Test Pit Logs in Appendix B. Our Engineer interpreted the results of the 2023 explorations and previous explorations to develop the soil profiles on Figures 3 and 4.

The test pits typically encountered 10 to 18 inches of topsoil. Below the topsoil, 0.5 to 4.5 ft of dense glacial till was encountered. Pocket Penetrometer readings indicated Unconfined Compressive Strength (UCS) of the silty soil of was typically from 2.5 to greater than 4.5 tsf which indicated a very stiff to hard consistency. Hard limestone was encountered below the topsoil and glacial till between 10 inches and 6.7 ft below grade (Elevation 680.75 ft to Elevation 690 ft). The excavator could not rip into the hard bedrock.

Groundwater was not encountered in any of the test pits.

We interpreted results of the explorations to develop the bedrock surface on Figure 2.

PREVIOUS LABORATORY TESTING

Compression strength testing was performed previously by Terracon on the limestone bedrock from Run #1 of B-8 (between 7.0 to 7.3 ft). The uniaxial compressive strength (UCS) from the testing was about 12,000 psi. Results are in Appendix C.

GEOTECHNICAL ENGINEERING EVALUATION

Based on the findings of the explorations, we determined that the building should be constructed on conventional shallow foundations. The floor can be constructed as a concrete slab-on-grade.

Foundations bearing on the native glacial till should be proportioned for a net allowable bearing pressure of 3 ksf. Foundations bearing on the rock should be proportioned for a net allowable bearing pressure of 10 ksf. A higher bearing pressure on rock could be justified on a case-by-case basis, but minimum practical footing sizes and/or footing sizes required to resist uplift loads may govern. Based on the finished floor Elevation at 693 ft, we expect foundation bearing level from Elevation 688 ft to 690 ft. Where bedrock is deeper than expected foundation bearing level it might be practical to excavate deeper (anticipated 2 to 4 ft below bearing level) to found footings on bedrock or lean concrete placed on rock. Foundations requiring protection frost should bear at least 48 inches below final adjacent grade. Footings required frost protection that bear on rock above this level may be acceptable but should be approved by the engineer at the time of construction.

Four-foot-high retaining walls may be required at loading docks. Conventional cantilever walls may be most compatible with the proposed type of construction. Design cantilevered stem walls for active earth pressure. For seismic design, the seismic resultant force increment should be applied at a distance of 0.3H above the bottom of the wall and calculated according to the Mononobe-Okabe method. The traffic vertical surcharge should be taken as at least 300 psf to account for both potential construction and long term loads. The horizontal component of surcharge should be determined by multiplying the vertical value by 0.5. Walls should be backfilled with free-draining crushed stone or sand and gravel having less than 10 percent passing the #200 sieve.

We determined that Site Class B should be used for Seismic Design in accordance with Section 1613 of the NYS Building Code (NYSBC) based on the previous shear wave velocity measurements taken at the site.

The 10 to 18-inch-thick layer of topsoil should be removed from building and pavement areas and to at least 5 ft beyond. This material is not suitable for re-use as structural fill.

The native glacial till soil is moisture sensitive and has a narrow range of moisture content for compaction and will lose strength if disturbed when wet and is susceptible to frost-heave. You should plan to import granular structural fill.

The silty subgrade soils will be sensitive to construction traffic. It may be advantageous to provide a working mat of an 18-inch-thick layer of crushed stone in areas of pavements or on-grade floors in these areas. The tops of the mat should be cleared of contaminated stone before placing required additional subbase.

Water is not expected to be encountered during excavation work for foundations. Water from precipitation can probably be handled with sumps and pumps.

GEOTECHNICAL ENGINEERING RECOMMENDATIONS

Based on our evaluations, we recommend constructing the proposed structure on conventional foundations with a concrete slab-on-grade floor according to:

A. Site Preparation

1. Remove vegetation and topsoil from building and pavement areas and to at least 5 ft beyond.

2. Repair test pit excavations by removing disturbed soil at test pit locations and backfilling with compacted structural fill.

3. If necessary, lower grades further to 12 inches below bottom of the proposed floor slab in building area and pavement areas and to 5 ft beyond.

4. Proof-roll subgrade in building and pavement areas in condition of low soil moisture, by making at least 4 overlapping passes of a self-propelled vibrating drum compactor having static weight of at least 10 tons. Proofrolling is to have the effects of compacting the subgrade and exposing unstable areas. This requirement can be waived where bedrock is exposed. The silty glacial till layer below the topsoil is moisture-sensitive and will lose strength if disturbed when wet. Therefore, after subgrade approval by the Engineer's representative, subgrade should be covered with imported granular structural fill without delay to protect it.

5. Repair unstable or un-compactable areas disclosed by proofrolling and as directed by the engineer's representative, by undercutting unsuitable soil and replacing with well-compacted structural fill.

6. After subgrade approval by the Engineer's representative, compact structural fill and backfill in building area to at least 93 percent of the maximum modified Proctor density as determined by ASTM D1557 procedure. Place fill with lift thicknesses compatible with compaction equipment and testing laboratory capabilities, but no thicker than 12-inch loose thickness.

7. Use structural fill conforming to the gradation requirements of NYSDOT 733-04 Type 2. Consideration may be given to substituting other moisture insensitive, less expensive material, for structural fill if it has less than 10 percent passing the #200 sieve, is well graded, and has no particles greater than 4 inches.

B. Foundation Design and Construction

1. Set foundations to bear on undisturbed natural subgrade or structural fill on stable natural subgrade.

2. Proportion footings for net allowable bearing pressure of 3 ksf for footing bearing on undisturbed natural glacial till or structural fill on stable native soils. For footings bearing on bedrock proportion footings for net allowable bearing pressure of 10 ksf.

3. Use minimum column footing width of 36 inches; use minimum wall footing width of 24 inches.

4. Construct footings requiring protection from frost heave at least 48 inches below finished grade. Footings bearing directly on hard rock may bear above this depth if approved by the Engineer at the time of construction.

5. Construct footings on stable subgrade free of loose or disturbed material after approval by the Engineer's representative.

6. If unsuitable subgrade is encountered at bearing level, undercut subgrade as directed by the Engineer's representative and replace with well compacted structural fill.

7. For seismic design use Site Class B in accordance with NYSBC Section 1613.

C. Concrete Slab-on-Grade Floor

1. Construct concrete slab-on-grade floor on subbase consisting of at least 4 inches of well compacted crushed stone or crushed gravel conforming to NYSDOT Standard Specification Item 733-04 Type 2.

Compact the subbase to at least 95 percent of the maximum modified Proctor density as determined by ASTM D1557.

2. Before placing subbase, proofroll subgrade by making at least 4 overlapping passes in each of 2 perpendicular directions using a smooth-drum, vibratory roller having static weight of at least 10 tons. Cover subgrade with subbase without delay after approval of proofrolling by Engineer's representative.

3. For approved floor subgrade, use subgrade modulus of 150 pci for slab thickness design.

4. Furnish a vapor barrier beneath slabs in conditioned or moisture sensitive spaces, and especially if impermeable floor finishes are used. Vapor barrier is to conform to Stego 10 mil, or equivalent.

D. Building Entries

1. Construct pavements and slabs at out-swinging doors within 5 ft of the building over non-frost-heave susceptible soil to a depth of 4 ft, such as NYS DOT Standard Specification Item 733-04 Type 2.

E. Retaining Walls at Loading Docks

1. For retaining walls, use design parameters in Table 1:

Table 1. Values for Retaining Walls

Table 1. Values for retaining walls backfilled with structural fill over rock	
Unit weight (γ)	135 pcf
Internal Friction Angle	34°
K_a	0.28
K_p	3.54
Vertical Surcharge	300 psf for traffic loads (if applicable)
Seismic Resultant Force	$\Delta P_{ae}=0.5\gamma H^2 0.75 a_h$
a_h= peak ground acceleration	0.096 g

F. Pavement Design and Construction

1. Construct all pavements on a subbase course for drainage. Proofroll the subgrade as described in Section C above.

2. Repair unstable areas by over-excavating and replace with well-compacted structural fill as directed by Engineer's representative. Compact structural fill to a minimum of 95 percent of the maximum modified Proctor dry density.

3. After results of proofrolling are approved by engineer's representative, place pavement subbase without delay.

4. Pavement subbase to consist of crushed stone conforming to NYSDOT Specification Item 733-04 Type 2 or 4 and compacted to at least 95 of the maximum modified Proctor maximum density as determined by ASTM D 1557 procedures without correction for oversized particles.

5. Design pavements based on CBR = 10 for pavements constructed on at least 6 inches of imported granular structural fill provided subgrade is stable during proofrolling, compacted at moisture content dryer than 1 percent wet of optimum, and the following thicknesses given in Table 2:

TABLE 2

Pavement Type	Max. ESALs	Top Course Thickness (in)	Binder Course Thickness (in)	Subbase Thickness (in)
Standard Duty	141,600	2.0	2.0	4
Heavy Duty	220,000	2.0	2.0	5

If the design ESALs exceed those shown in Table 2, these values will have to be re-evaluated and adjusted accordingly. All asphalt should conform to NYS DOT Standard Specifications.

6. For concrete pavements, use 6 inches of unreinforced concrete over 8 inches of well compacted subbase designed based on a subgrade modulus of 150 pci.

G. Special Inspections

In accordance with Chapter 17 of the New York State Building Code, these special Geotechnical Inspections should be provided:

1. Subgrade approval by Engineer's representative for building area before placing structural fill, and for footing subgrade and floor subgrade.

2. Verification of structural fill and backfill materials and documentation of the degree of relative compaction.

Thank you for the opportunity to be of service to Green Leaf Construction. Please contact us if you have questions or if we can be of further service.

Respectfully submitted,

JOHN P. STOPEN ENGINEERING LLP

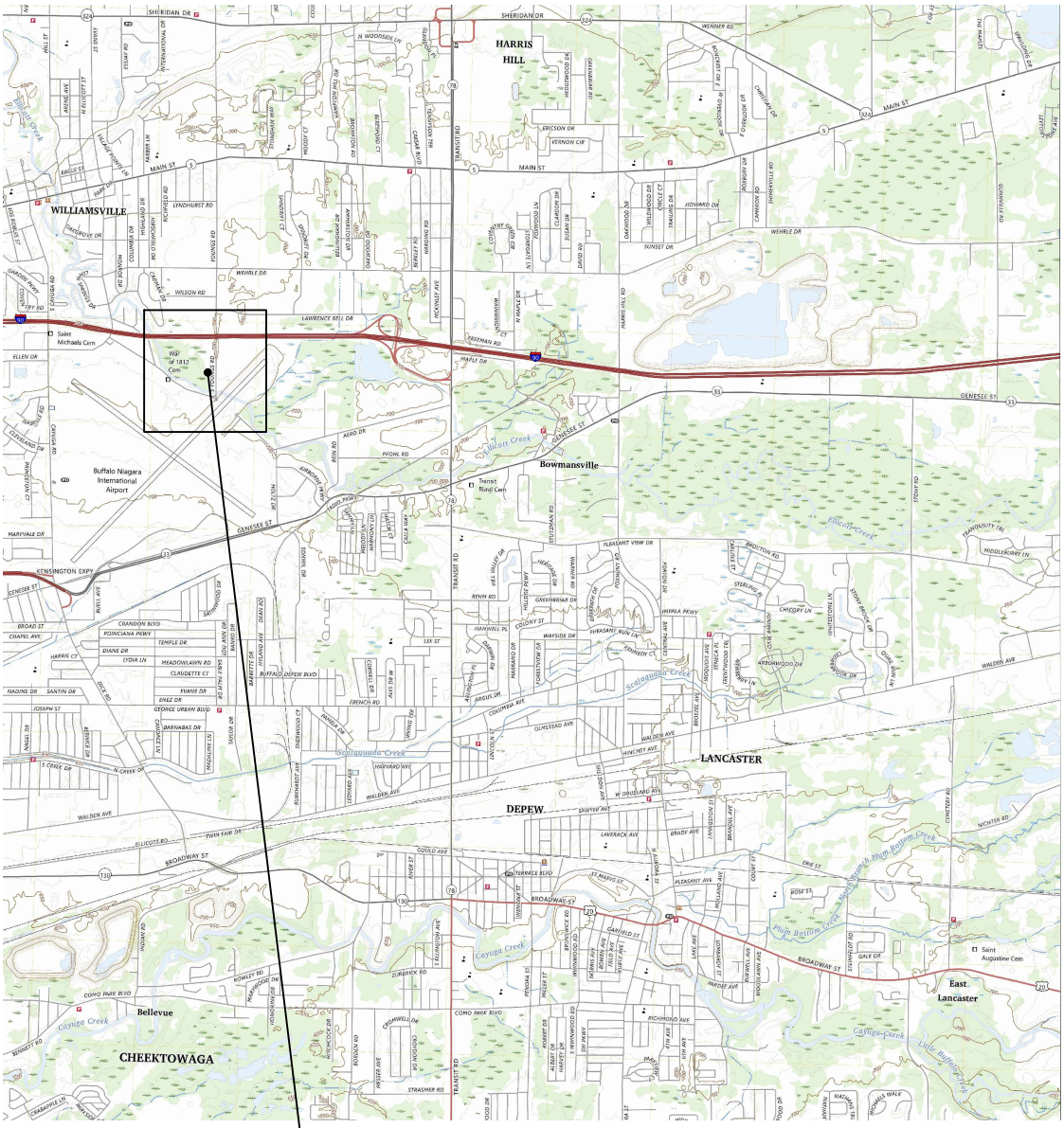
EDIN HURTIC, E.I.T.
Geotechnical Engineer

JASON THORPE, M.Sc., P.E.
Partner, Geotechnical Engineer

EH/JT

Attachments:

- Figure 1. Site Location Plan
- Figure 2. Subsurface Exploration Plan
- Figure 3. Soil Profile A
- Figure 4. Soil Profile B
- Appendix A: 2021 Test Boring Logs
- Appendix B: 2023 Test Pit Logs
- Appendix C: 2021 Laboratory Testing



JOHN P STOPEN ENGINEERING, LLP

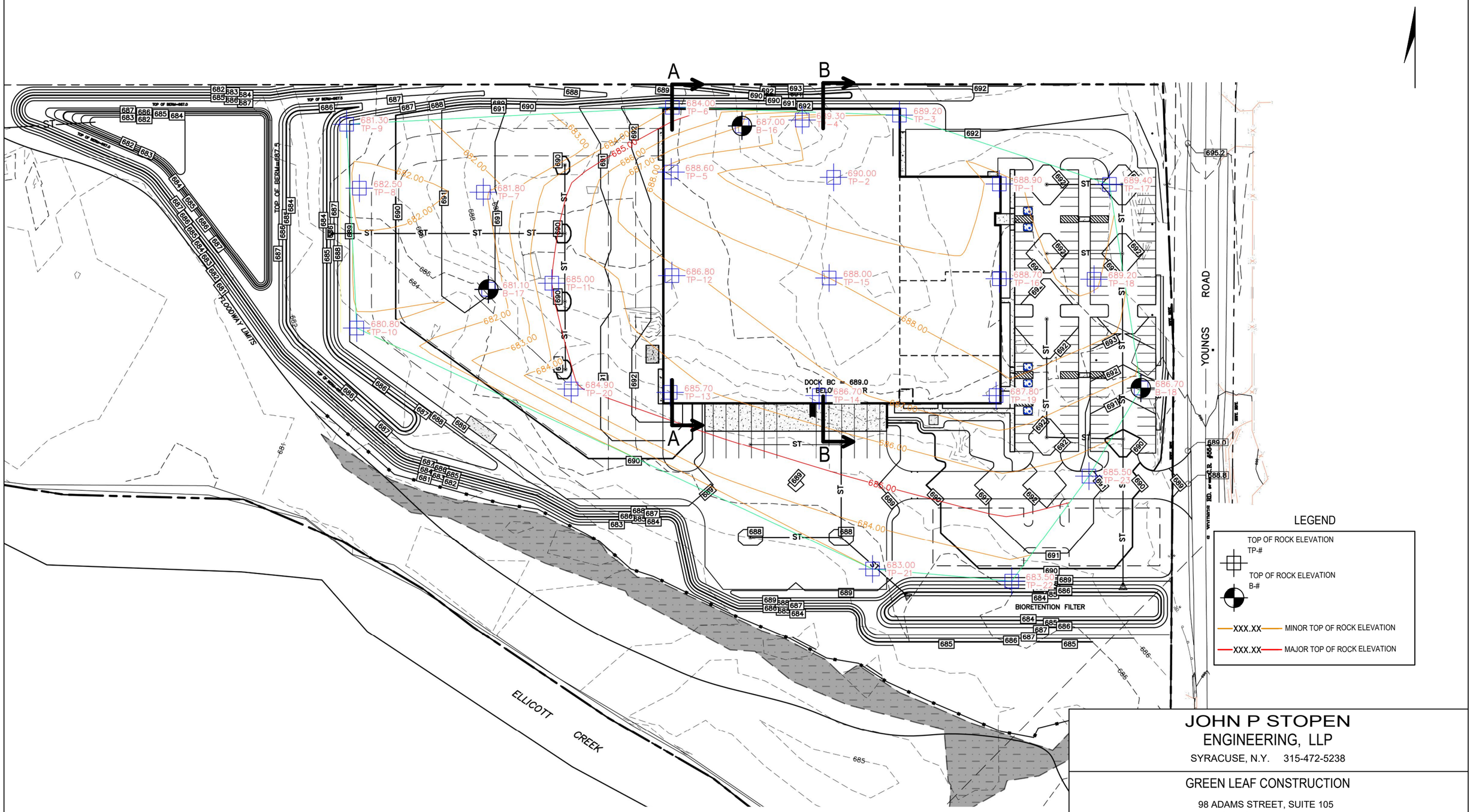
SYRACUSE, N.Y. 315-472-5238

GREEN LEAF CONSTRUCTION

98 ADAMS STREET, SUITE 105
LEOMINSTER, N.Y. 01453

PROJECT LOCATION PLAN
PROPOSED F.W. WEBB BUILDING
AMHERST, N.Y.

JOB No.:	DESIGNED BY:	DATE:	FIG:
223246.00	E.H.	01/10/2024	1



NOTES:

1. SUBSURFACE CONDITIONS HAVE BEEN DETERMINED AT EXPLORATION LOCATIONS ONLY. CONDITIONS BETWEEN THESE LOCATIONS REPRESENT THE ENGINEER'S INTERPRETATION.
2. TOP OF ROCK CONTOURS ARE INTERPRETED BETWEEN EXPLORATION LOCATIONS AND ARE NOT EXACT.

JOHN P STOPEN
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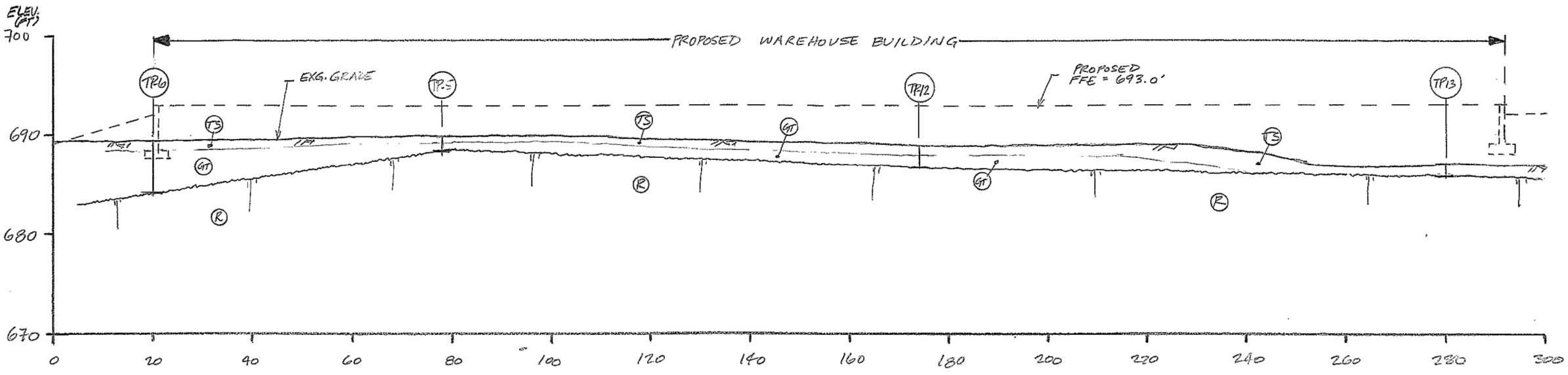
GREEN LEAF CONSTRUCTION

98 ADAMS STREET, SUITE 105
LEOMINSTER, N.Y. 01453

SITE LAYOUT AND SUBSURFACE EXPLORATION PLAN
PROPOSED F.W. WEBB BUILDING
AMHERST, N.Y.

JOB No.:	DESIGNED BY:	DATE:	FIG:
223246.00	E.H.	01/10/2024	2



SCALE:
VERTICAL 1"=10'
HORIZONTAL 1"=20'

(TS) TOPSOIL

(GT) DENSE GLACIAL TILL

(R) LIMESTONE BEDROCK

NOTES:
1. SUBSURFACE CONDITIONS HAVE BEEN DETERMINED AT EXPLORATION LOCATIONS ONLY. CONDITIONS BETWEEN THESE LOCATIONS REPRESENT THE ENGINEER'S INTERPRETATION.

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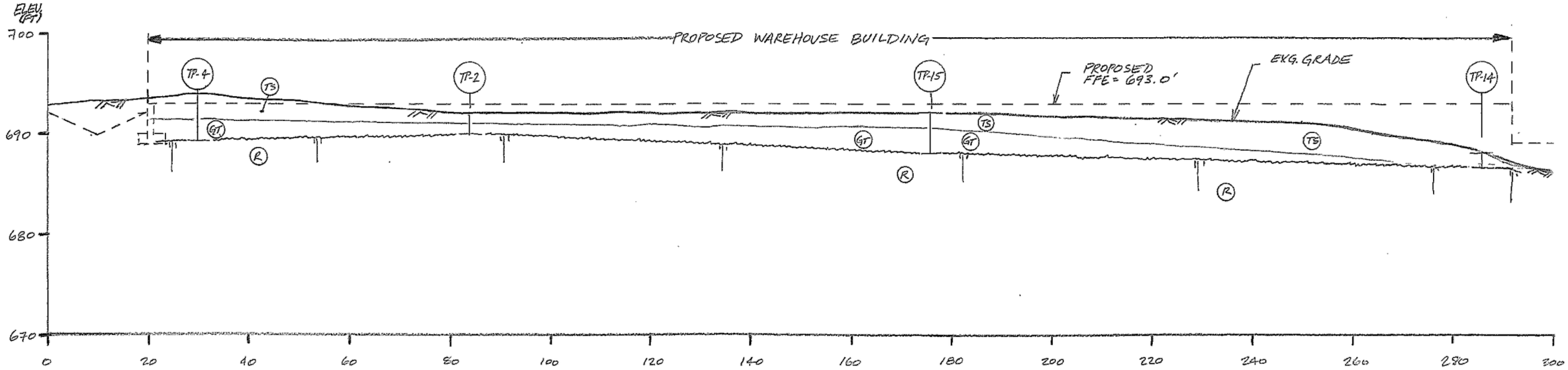
GREEN LEAF CONSTRUCTION
98 ADAMS STREET, SUITE 105
LEOMINSTER, N.Y. 01453

SOIL PROFILE A
PROPOSED F.W. WEBB BUILDING
AMHERST, N.Y.

JOB No.:	DESIGNED BY:	DATE:	FIG:
223246.00	E.H.	01/10/2024	3



SCALE:
VERTICAL 1"=10'
HORIZONTAL 1"=20'

(TS) TOPSOIL

(GT) DENSE GLACIAL TILL

(R) LIMESTONE BEDROCK

NOTES:
1. SUBSURFACE CONDITIONS HAVE BEEN DETERMINED AT EXPLORATION LOCATIONS ONLY. CONDITIONS BETWEEN THESE LOCATIONS REPRESENT THE ENGINEER'S INTERPRETATION.

JOHN P STOPEN
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GREEN LEAF CONSTRUCTION
98 ADAMS STREET, SUITE 105
LEOMINSTER, N.Y. 01453

SOIL PROFILE B
PROPOSED F.W. WEBB BUILDING
AMHERST, N.Y.

JOB No.:	DESIGNED BY:	DATE:	FIG:
223246.00	E.H.	01/10/2024	4

APPENDIX A:
2021 TEST BORING LOGS

BORING LOG NO. B-16

PROJECT: 669 Youngs Road

CLIENT: The Krog Group
Orchard Park, NY

SITE: 669 Youngs Road
Amherst, NY

LOCATION See Exploration Plan

Latitude: 42.9483° Longitude: -78.7266°

Approximate Surface Elev.: 688 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)
1		0.6	687.5+/-	**TOPSOIL**						
2		2.0	686+/-	**SILTY CLAY (CL-ML)**, trace sand, red-brown, medium stiff				17	1-2-3-2 N=5	21.8
		4.0	684+/-	**SANDY SILTY CLAY (CL-ML)**, trace gravel, brown, stiff				17	4-4-6-6 N=10	10.0
		5.0	683+/-	**SANDY SILT (ML)**, trace gravel, trace clay, red-brown, hard				9	6-40-50/0"	11.6
				Sample Spoon Penetration refusal encountered at 5 Feet	5					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Hollow Stem Augers and 2 inch OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from Google Earth.

Notes:

WATER LEVEL OBSERVATIONS

None encountered at completion of sampling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-17-2021 | Boring Completed: 11-17-2021

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5215072

BORING LOG NO. B-17

PROJECT: 669 Youngs Road

CLIENT: The Krog Group
Orchard Park, NY

SITE: 669 Youngs Road
Amherst, NY

LOCATION See Exploration Plan

Latitude: 42.9477° Longitude: -78.7278°

Approximate Surface Elev.: 681 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
1		0.6	680.5+/-					
		TOPSOIL						
2		**FILL - SILTY SAND**, trace limestone fragments, trace glass fragments, black					17	4-10-19-14 N=29
		2.0	679+/-					
3		**SILTY CLAY WITH HIGHLY WEATHERED LIMESTONE FRAGMENTS (CL-ML)**, orange brown, hard					14	18-25-30-50/5" N=55
		3.9	677+/-					
		Sample Spoon Penetration refusal encountered at 3.9 Feet						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Hollow Stem Augers and 2 inch OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from Google Earth.

Notes:

WATER LEVEL OBSERVATIONS

None encountered at completion of sampling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-17-2021 | Boring Completed: 11-17-2021

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5215072

BORING LOG NO. B-18

PROJECT: 669 Youngs Road

CLIENT: The Krog Group
Orchard Park, NY

SITE: 669 Youngs Road
Amherst, NY

LOCATION See Exploration Plan

Latitude: 42.9475° Longitude: -78.7254°

Approximate Surface Elev.: 684 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
1		0.6	683.5+/-					
		TOPSOIL						
2		2.0	682+/-				19	1-1-9-5 N=10
		SANDY SILT (ML), trace gravel, trace clay, red-brown, stiff						
3		3.5	680.5+/-				2	50/4"
		WEATHERED LIMESTONE, brown-gray						
		Sample Spoon penetration refusal encountered at 2.3' BGS. Auger penetration refusal encountered at 3.5 Feet						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Hollow Stem Augers and 2 inch OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from Google Earth.

Notes:

WATER LEVEL OBSERVATIONS

None encountered at completion of sampling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-17-2021 | Boring Completed: 11-17-2021

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5215072

APPENDIX B:
2023 TEST PIT LOGS

JOHN P. STOPEN ENGINEERING, LLP

450 South Salina Street P.O. Box 29 Syracuse, NY 13201 (315)472-5238

TEST PIT LOGS

Client	Green Leaf Construction	Date	12/13/2023
Project	F.W. Webb Amherst	Datum	
Location	Amherst, N.Y.	Weather	
Job No.	223247.00	Observer	Brandon Rhea, P.E.

Test Pit No. 1 Elevation ±690.5 ft Water None

depth	moisture	pocket pen	w	Description
	Moist			14" Topsoil with organics/roots Dark Br. CLAY Loam
	↓	0.5 TSF		6" Dark Red/Br. Silty CLAY, tr. roots
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

Test Pit No. 2 Elevation ±692 ft Water None

depth	moisture	pocket pen	w	Description
	Moist			12" Topsoil with organics/roots Dark Br. Clay Loam
	↓	1.5 TSF		12" Red/Br. Silty CLAY, tr. roots, tr. f sand
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

JOHN P. STOPEN ENGINEERING, LLP

450 South Salina Street P.O. Box 29 Syracuse, NY 13201 (315)472-5238

TEST PIT LOGS

Client	Green Leaf Construction	Date	12/13/2023
Project	F.W. Webb Amherst	Datum	
Location	Amherst, N.Y.	Weather	
Job No.	223247.00	Observer	Brandon Rhea, P.E.

Test Pit No. 3 Elevation ±691.5 ft Water None

depth	moisture	pocket pen	w	Description
	Moist	0.5 TSF		12" Topsoil Dark Br. Silty CLAY Loam
	↓	1.0 TSF		6" Light Br. Clayey SILT with roots
	↓	2.0 TSF		10" Reddish Br. Stiff Clayey SILT
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

Test Pit No. 4 Elevation ±694 ft Water None

depth	moisture	pocket pen	w	Description
	Moist	0.5 TSF		12" Topsoil Dark Br. Sandy SILT Loam
	↓	0.75 TSF		12" Red/Br. SILT some Clay (Possible Fill)
	↓	4.0 TSF		Red/Br. Very Stiff Clayey SILT with Gravel, and
	↓			cobbles, tr. organics (Glacial Till)
5'	↓			Bedrock
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

JOHN P. STOPEN ENGINEERING, LLP

450 South Salina Street P.O. Box 29 Syracuse, NY 13201 (315)472-5238

TEST PIT LOGS

Client	Green Leaf Construction	Date	12/13/2023
Project	F.W. Webb Amherst	Datum	
Location	Amherst, N.Y.	Weather	
Job No.	223247.00	Observer	Brandon Rhea, P.E.

Test Pit No. 5 Elevation ±690 ft Water None

depth	moisture	pocket pen	w	Description
	Moist			10" D. Brown Sandy SILT Loam with tree roots
	↓			7" Light Br. Medium Dense Silty F. SAND
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

Test Pit No. 6 Elevation ±689.5 ft Water None

depth	moisture	pocket pen	w	Description
	Moist			12" Topsoil Dark Br. Sandy SILT Loam with organics
				and roots
		2.5 TSF		18" Light Br. Clayey SILT, tr. roots
		>4.5 TSF		Light Br. Very Hard Sandy SILT, with gravel
5'				and cobbles
	↓			Bedrock
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

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450 South Salina Street P.O. Box 29 Syracuse, NY 13201 (315)472-5238

TEST PIT LOGS

Client	Green Leaf Construction	Date	12/13/2023
Project	F.W. Webb Amherst	Datum	
Location	Amherst, N.Y.	Weather	
Job No.	223247.00	Observer	Brandon Rhea, P.E.

Test Pit No. 7 Elevation ±688.5 ft Water None

depth	moisture	pocket pen	w	Description
	Moist			D. Brown Sandy SILT Loam with tree roots
				Light Brown Silty SAND tr. roots
				Red/Brown Stiff Silty CLAY, tr. f sand
5'		2.5-3.5 TSF		
				Light Brown Hard Silty CLAY with cobbles and
				boulders (Glacial Till)
				Bedrock
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

Test Pit No. 8 Elevation ±685.5 ft Water None

depth	moisture	pocket pen	w	Description
	Moist			6" D. Brown Sandy SILT Loam with organics/roots
				6" Light Brown f SAND some roots
				Red/Brown Stiff Silty CLAY
		2.5-3.5 TSF		Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

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TEST PIT LOGS

Client	Green Leaf Construction	Date	12/13/2023
Project	F.W. Webb Amherst	Datum	
Location	Amherst, N.Y.	Weather	
Job No.	223247.00	Observer	Brandon Rhea, P.E.

Test Pit No. 9 Elevation ±684.3 ft Water None

depth	moisture	pocket pen	w	Description
	Moist	0.5 TSF		D. Brown Sandy SILT Loam with roots
	↓	0.75 TSF		Light Brown Silty CLAY some Sand
	↓			Red/Brown Stiff Silty CLAY tr. f sand
		2.5 TSF		Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

Test Pit No. 10 Elevation ±682.75 ft Water None

depth	moisture	pocket pen	w	Description
	Moist	0.5 TSF		14" Topsoil D. Br. Sandy SILT Loam with roots/org.
	↓			10" Light Brown Soft f. Sandy SILT (Old Fill)
		0.5 TSF		Old 1" Steel Line
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

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TEST PIT LOGS

Client	Green Leaf Construction	Date	12/13/2023
Project	F.W. Webb Amherst	Datum	
Location	Amherst, N.Y.	Weather	
Job No.	223247.00	Observer	Brandon Rhea, P.E.

Test Pit No. 11 Elevation ±688.5 ft Water None

depth	moisture	pocket pen	w	Description
	Moist	0.5 TSF		9" Topsoil D. Brown Sandy SILT Loam with
				with roots/organics
		2.5 TSF		10" Red/Brown Sandy SILT tr. roots
				Red/Brown Sandy SILT some Gravel
5'		4.0TSF		Bedrock
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

Test Pit No. 12 Elevation ±689 ft Water None

depth	moisture	pocket pen	w	Description
	Moist	0.5 TSF		12" Topsoil D. Brown Sandy SILT Loam with
		1.75 TSF		with roots/organics
				18" Light Brown f. Sandy SILT, tr. roots
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

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TEST PIT LOGS

Client	Green Leaf Construction	Date	12/13/2023
Project	F.W. Webb Amherst	Datum	
Location	Amherst, N.Y.	Weather	
Job No.	223247.00	Observer	Brandon Rhea, P.E.

Test Pit No. 13 Elevation ±687 ft Water None

depth	moisture	pocket pen	w	Description
	Moist			16" Topsoil/Organics/Roots mixed with #2 Stone
				(OLD FILL)
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

Test Pit No. 14 Elevation ±688 ft Water None

depth	moisture	pocket pen	w	Description
	Moist			12" Topsoil D. Brown Clayey SILT Loam
				4" Brown Loose Silty f SAND (Possible Fill)
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

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TEST PIT LOGS

Client	Green Leaf Construction	Date	12/13/2023
Project	F.W. Webb Amherst	Datum	
Location	Amherst, N.Y.	Weather	
Job No.	223247.00	Observer	Brandon Rhea, P.E.

Test Pit No. 15 Elevation ±692 ft Water None

depth	moisture	pocket pen	w	Description
	Moist	0.5 TSF		18" Topsoil D. Brown Silty Clayey Loam
		2.5 TSF		Light Brown Sandy SILT with organics (Glacial Till)
		4.0 TSF		
5'				Bedrock
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

Test Pit No. 16 Elevation ±690ft Water None

depth	moisture	pocket pen	w	Description
	Moist			12" Topsoil D. Brown Silty Clayey Loam
				4" Red Soft Silty Clay
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

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TEST PIT LOGS

Client	Green Leaf Construction	Date	12/13/2023
Project	F.W. Webb Amherst	Datum	
Location	Amherst, N.Y.	Weather	
Job No.	223247.00	Observer	Brandon Rhea, P.E.

Test Pit No. 17 Elevation ±691 ft Water None

depth	moisture	pocket pen	w	Description
	Moist	0.75 TSF		14" Topsoil D. Brown Silty Clayey Loam
	▼	0.75 TSF		5" Red Soft Silty Clay
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

Test Pit No. 18 Elevation ±690.5 ft Water None

depth	moisture	pocket pen	w	Description
	Moist	0.5 TSF		12" Topsoil D. Brown Silty Clay Loam w/ roots
	▼	1.0 TSF		4" Light Brown Soft Silty Clay tr. roots
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

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TEST PIT LOGS

Client	Green Leaf Construction	Date	12/13/2023
Project	F.W. Webb Amherst	Datum	
Location	Amherst, N.Y.	Weather	
Job No.	223247.00	Observer	Brandon Rhea, P.E.

Test Pit No. 19 Elevation ±689 ft Water None

depth	moisture	pocket pen	w	Description
	Moist	0.5 TSF		14" Topsoil D. Brown Silty Clayey Loam
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

Test Pit No. 20 Elevation ±685.75 ft Water None

depth	moisture	pocket pen	w	Description
	Moist			10" D. Brown SILT/GRAVEL angular (FILL)
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

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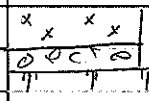
TEST PIT LOGS

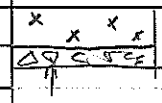
Client	Green Leaf Construction	Date	12/13/2023
Project	F.W. Webb Amherst	Datum	
Location	Amherst, N.Y.	Weather	
Job No.	223247.00	Observer	Brandon Rhea, P.E.

Test Pit No. 21 Elevation ±684.5 ft Water None

depth	moisture	pocket pen	w	Description
	Moist			 12" Topsoil D. Brown Silty Clayey Loam (Fill)
				6" Light Brown Mottled large cobbles (Fill)
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

Test Pit No. 22 Elevation ±685 ft Water None

depth	moisture	pocket pen	w	Description
	Moist			 12" Topsoil D. Brown Silty Clayey Loam (Fill)
				6" Angular Rock (Fill)
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

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TEST PIT LOGS

Client	Green Leaf Construction	Date	12/13/2023
Project	F.W. Webb Amherst	Datum	
Location	Amherst, N.Y.	Weather	
Job No.	223247.00	Observer	Brandon Rhea, P.E.

Test Pit No. 23 Elevation ±687 ft Water None

depth	moisture	pocket pen	w	Description
	Moist	0.5 TSF		12" Topsoil D. Red Silty Clay Loam w/ roots
		0.75 TSF		6" Light Brown Sandy SILT with roots
				Bedrock
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

Test Pit No. _____ Elevation _____ Water _____

depth	moisture	pocket pen	w	Description
5'				
10'				

pa x"/y# = advancement of ½-inch diameter tile probe under stated force

APPENDIX C:
2021 LABORATORY TESTING

ASTM D7012 (Method C) Standard Test Method for Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

Boring No.:	B-8	Lithology :	Limestone
Sample No.:	Run #1	Moisture Content :	0%
Sample Depth:	7.0'-7.3'	Lab Temperature :	75° F
Sampling Date:	11/16/21	Loading Rate:	42 psi/s

Diameter:	1.975 in	**Maximum Axial Load at Failure:**	**39290 lb**
Length:	4.08 in	**Compressive Strength:**	**12,825 psi**
L/D:	2.1	**Compressive Strength:**	**88.43 Mpa**
End Area:	3.06 in^2	**Unit Weight of Rock:**	**167 pcf**

Before the Test

After the Test

Project:	699 Youngs Road	Terracon	Technician:	K. Lemcke
Project No.:	J5215072		Test Date:	12/02/2021
Location:	Orchard Park, NY		Reviewed By :	M. Fiorillo
Client :	The Krog Group	15 Marway Circle Suite 2B Rochester, New York	Review Date :	12/02/2021