# EXHIBIT D

Geotechnical Report



August 8, 2023 File 1532.001

Mr. Casey Burch Solli Engineering, LLC 11 Vanderbilt Avenue, Suite 240 Norwood, Massachusetts 02042

Re: Geotechnical Engineering Report Montville Ground-Mounted Photovoltaic Array Montville, Connecticut

Dear Mr. Burch:

Siefert Associates, LLC (SALLC) is pleased to submit our geotechnical engineering report for the proposed ground-mounted photovoltaic array that will be located at 958 CT Route 163 (Oakdale Road) in Montville, Connecticut. Refer to Figure 1, Locus Plan, in Appendix 1 for the general location of the project.

Our recommendations are based in part on guidance from the 2022 Connecticut State Building Code, which includes the 2021 International Building Code (IBC) and Connecticut Amendment. Design recommendations are based on Allowable Stress Design Methods.

#### PURPOSE AND SCOPE

SALLC performed a geotechnical engineering evaluation for the proposed structure. Our services included characterizing the subsurface conditions, performing geotechnical engineering analyses, and providing geotechnical design and construction recommendations for the project.

Our services were provided in accordance with our proposal dated July 13, 2023, which was based in part on our review of a drawing titled "Site Layout Plan - Proposed Photovoltaic Array, 958 CT Route 163, Montville, Connecticut" by Solli Engineering dated June 5, 2023.

#### SITE DESCRIPTION AND PROPOSED CONSTRUCTION

The 30-acre site is located on the west side of CT Route 163 and is bordered by residential properties to the west, north and south. The site is predominantly an open grass field and is only occupied by a residential structure, a detached garage, and out-building. The existing structures are located along CT Route 163 and are outside the project area. Site grades slope up from south to north from approximately El. 450 to El. 490.

The project generally consists of a ground-mounted, photovoltaic array with a footprint of approximately 158,000 square feet located towards the west side of the site. We anticipate the array will follow the existing topography and that no significant regrading of the site will be performed.



We understand the preferred foundation type is piles that are installed to primarily resist uplift forces from the structures. Foundation loads have not been provided; however, we anticipate that pile lengths will be less than 15 feet.

## SUBSURFACE EXPLORATIONS

SALLC observed and documented eight test pits (TP-1 through TP-8) that were excavated by David M. Koch, LLC of Middlebury, Connecticut on July 27, 2023. The approximate locations of the test pits are depicted on Figure 2, Exploration Location Plan, in Appendix 1. The test pits were located in the field by taping from existing site features and the ground surface elevation at each was estimated from the referenced Solli Engineering, LLC drawing; the locations and elevations should be considered approximate. Logs of the test pits are included in Appendix 2.

The test pits were performed to explore the subsurface conditions in the area of the proposed array. The test pits were excavated to between 10 and 12 feet below existing grades with a Caterpillar 304E2 mini-excavator with a bucket capacity of approximately <sup>1</sup>/<sub>4</sub> cubic yards and reach of about 12 feet.

## SUBSURFACE CONDITIONS

#### Geology

Published surficial geological data (1:125,000 scale, *Surficial Material Map of Connecticut, Janet Radway Stone, 1992* and 1:125,000 scale, *Bedrock Geological Map of Connecticut, John Rodgers, 1985*) indicates the surficial material at the site is Thick Till and is described as soils that are moderately to very compact, commonly finer grained, and less stony that are greater than 15 feet thick.

#### **General Subsurface Profile**

The subsurface profile, as inferred from the test pit data, generally consists of topsoil and/or subsoil over glacial till to the depths explored. However, at one test pit location in the north-central portion of the site (e.g., Test Pit TP-8), fill was observed below the topsoil and above the glacial till.

In general, the effort to advance through the overburden soils increases with depth. The soils encountered in the test pits were consistent with the published geological information with regard to the glacial till (e.g. Thick Till). Cobbles were observed in the glacial till and boulders were observed occasionally at the ground surface and in the glacial till. The following are more detailed descriptions of the subsurface materials encountered:

#### Topsoil/Subsoil

Topsoil was encountered at the surface of each test pit and subsoil was encountered below except in Test Pit TP-8. The topsoil ranges between seven and 18 inches thick and consists of dark brown, fine sand and silt with some roots. Where encountered, the subsoil ranges between 11 and 18 inches thick and consists of orange brown, fine sand with some silt. The effort to advance through the topsoil and subsoil with the excavation equipment is generally easy to moderate.



# Fill

Fill was encountered below the topsoil and above the glacial till in Test Pit TP-8. Where encountered, the fill is approximately three feet thick and consists of brown, fine to coarse sand with little silt, trace gravel and boulders. The effort to advance through the fill with the excavation equipment is generally moderate.

# Glacial Till

Glacial till was encountered in each test pit below the materials described above. The glacial till was not fully penetrated; however, it was observed to be at least six to 10 feet thick. The glacial till generally consists of grey, fine to coarse sand with little to and silt, trace to little gravel, trace to little cobbles, and occasionally trace boulders. The effort to advance through the glacial till with the excavation equipment generally increases with depth from moderate to difficult.

# Groundwater

Groundwater was observed in Test Pits TP-1, TP-2, TP-5, and TP-7 between six and nine feet below existing grades. It appears the groundwater generally follows the topography; however, please note that groundwater levels may vary depending on factors such as temperature, season, precipitation, and other conditions, which may be different from those at the time of these observations.

# GEOTECHNICAL DESIGN RECOMMENDATIONS

# Pile Foundations

Foundation loads have not been provided; however, we understand that HP8x36 piles are typically used for these applications. We recommend adopting the following soil properties for the geotechnical design of the pile foundations:

Recommended Soil Properties								
Total Unit Weight         Effective Unit Weight         Drained Friction Ang								
Topsoil/Subsoil/Fill	-	-	-					
Glacial Till	$130 \text{ lb/ft}^3$	68 lb/ft <sup>3</sup>	36 degrees					

We recommend neglecting the topsoil, subsoil, and fill from contributing to the load carrying capacity of the piles. For axial loading, we recommend the piles be designed in accordance with Section 5.3.2, Bearing Capacity of a Single Pile, of the Naval Facilities Engineering Command Manual DM7.2 (NAVFAC). For lateral loading, we recommend the piles be designed in accordance with Section 5.7, Lateral Load Capacity, of NAVFAC.

Specific testing for corrosion potential of the soils was not performed as part of this study. We anticipate the soils at the site are non-corrosive as they are predominantly natural; however, if desired, a nominal allowance can be included in the structural design of the piles as a precaution.



Frost susceptible soil in contact with foundations above frost depth and subject to significant moisture can transmit uplift forces to the piles. Given the nature of the soils above frost depth and the anticipated moisture conditions, it is our opinion that uplift forces due to frost heave are negligible.

#### Seismic Site Class and Liquefaction Potential

We recommend adopting a Site Class "D" (*Stiff Soil Profile*) per the IBC. The Connecticut State Building Code defines  $S_S$  and  $S_1$  for Montville, Connecticut as 0.198g and 0.054g respectively and we compute  $S_{MS}$  as 0.317g,  $S_{M1}$  as 0.130g,  $S_{DS}$  as 0.211g,  $S_{D1}$  as 0.087g. Based on the anticipated groundwater level and material types encountered, and expected peak ground acceleration at this locale, it is our opinion that site soils are not prone to liquefaction.

## **CONSTRUCTION CONSIDERATIONS**

#### Pile Foundation Installations

Dense glacial till containing cobbles and boulders was observed throughout the site. As such, difficult installation conditions and misalignments due to obstructions from boulders should be expected. To manage these potential situations, the contractor should be prepared to drill and grout piles that cannot reach design tip elevations during conventional installation. Other remedial measure may be available depending on the Contractor's capabilities, which should be reviewed prior to implementation.

#### Temporary Excavations

The on-site material is classified as OSHA Class "C" soil and can be cut at a maximum one vertical to one and half horizontal (1V:1.5H) and sloped up to a maximum excavation depth of 20 feet. This maximum slope and excavation depth assumes no surcharge load (i.e. stockpiles, construction equipment, etc.) at the top of the excavations or seepage (e.g. cuts below the groundwater table).

#### Dewatering

Groundwater is not expected to be encountered during construction. We expect that temporary groundwater or storm water control can be accomplished by means of shallow trenches and sumps, and grading the excavation to low points.

#### **CONSTRUCTION DOCUMENTS AND QUALITY CONTROL**

Project drawings should be provided to SALLC to review for conformance with the geotechnical recommendations contained herein. If changes are made to the locations or type of structure the recommendations in this report will need to be reviewed. We recommend that SALLC make field observations of foundation installations to monitor compliance with our recommendations and project specifications.



# LIMITATIONS

This report is subject to the limitations included in Appendix 3.

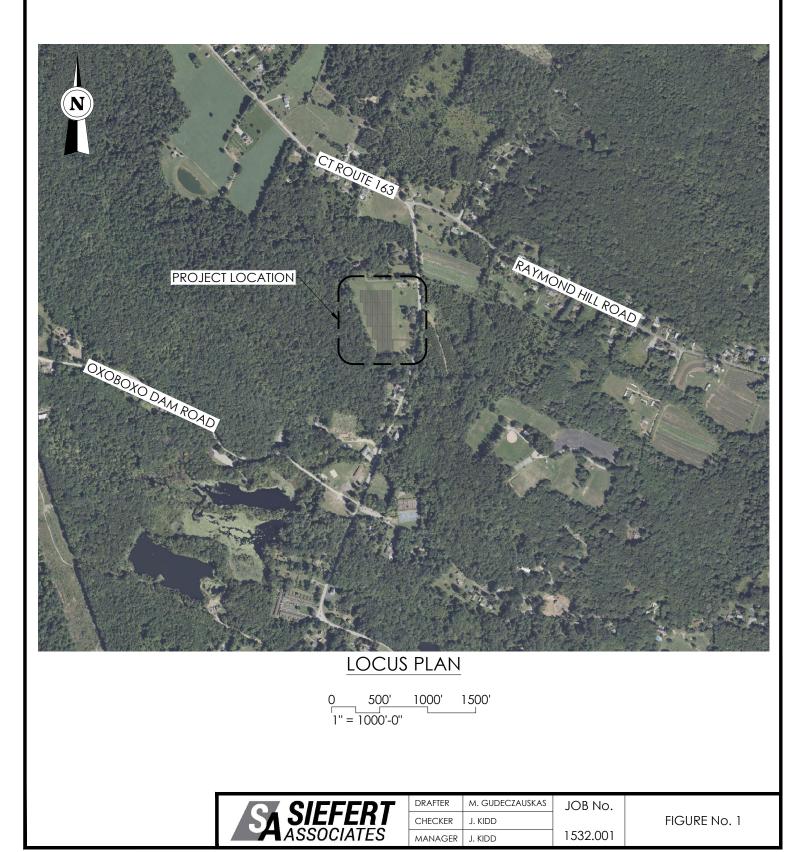
Thank you for the opportunity to be of service. Please feel free to call if you have questions.

Sincerely,

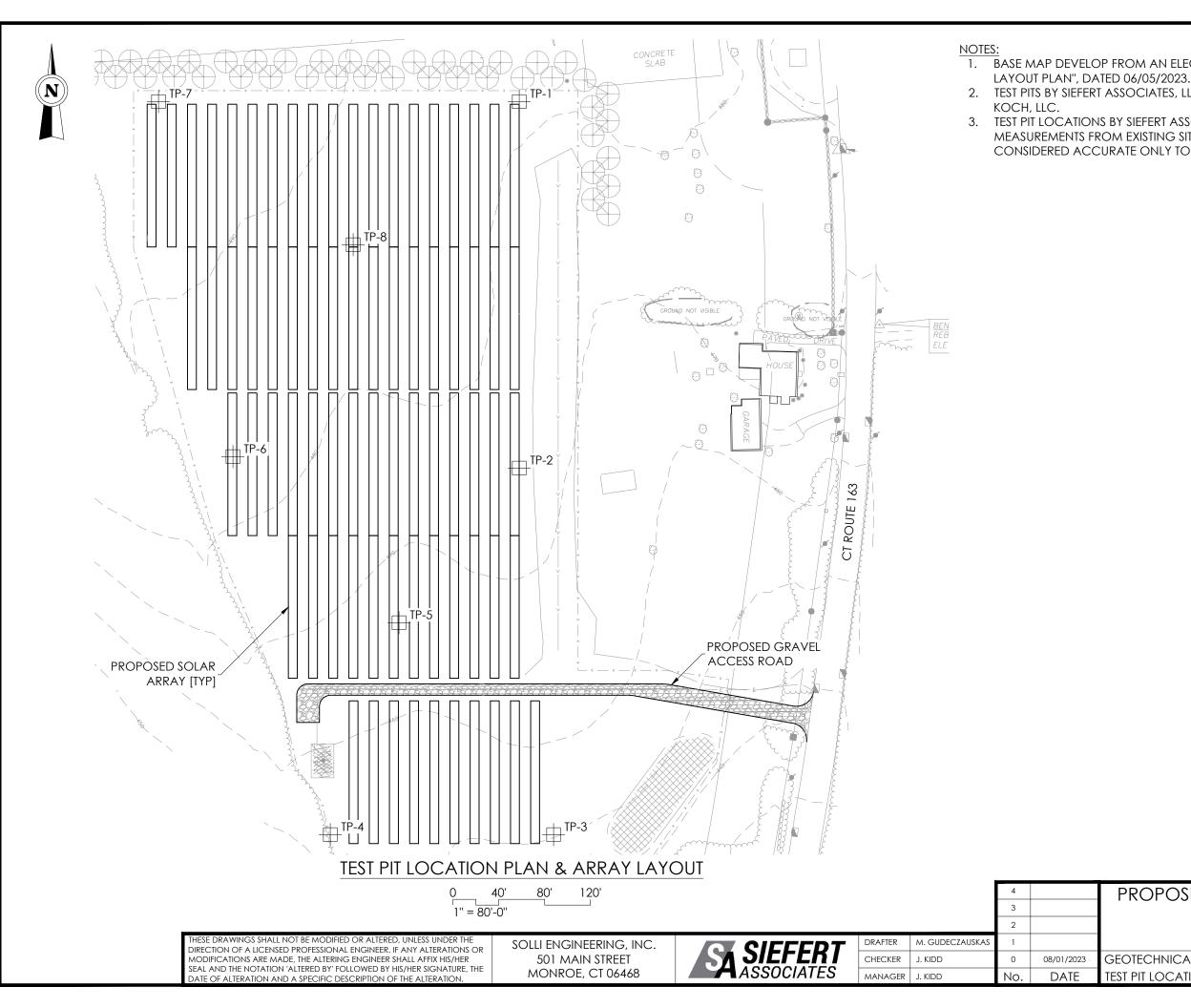
Joseph W. Kidd, P.E. Senior Project Manager

Attachments: Appendix 1 – Figures Appendix 2 – Boring Logs Appendix 3 – Limitations Appendix 1

Figures



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1. BASE MAP DEVELOP FROM AN ELECTRONIC FILE BY SOLLI ENGINEERING TITLED "SITE LAYOUT PLAN", DATED 06/05/2023.

TEST PITS BY SIEFERT ASSOCIATES, LLC PERFORMED ON JULY 27, 2023 BY DAVID M.

TEST PIT LOCATIONS BY SIEFERT ASSOCIATES, LLC WERE LOCATED USING FIELD MEASUREMENTS FROM EXISTING SITE FEATURES. THESE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

LEGEND:	
⊕ <sup>TP-X</sup>	TEST PIT LOCATION

Appendix 2

**Test Pit Logs** 

		PROIECT	INFORMATION		Test Pit No: T	'P-1		
	DIEFERI	-	Excavation Log		Sheet: 1 of 1			
	SSOCIATES		ar Photovoltaic Arr	ay	SA Job No. 15	32.001		
27 Sien Wate	non Company Road ertown, CT 06795	•	CT Route 163	5	SA Rep.: J. Ki			
( www.s	888) 960-7992 <u>iefertassociates.com</u>	Montvi	lle, Connecticut		Checked By:			
Client: Solli Eng		Make: Caterp	illar		Ground Elev:	± 481		
Exc. Contractor	: David M. Koch, LLC	Model: 304E2			Date: 07/27/20	)23		
Exc. Operator: l	David Koch	Bucket Capac	ity: 1/4 CY		Start Time: 7:	35A		
-	y (Partly Cloudy) 80's	Reach: ±12ft	-		End Time: 7:5	60A		
Depth Below	Strata Change & Water	Subarri	face Description		Excavation	Boulder	Notes	
Grade (ft)	Level				Effort	Qty/Class	notes	
1	Topsoil	10" Dark brown, fine SAND and Orange brown, fine SAND, some			E E			
2	Subsoil	Orange brown, nine SAIND, some	5111.		L M			
		Grey, fine to coarse SAND and SI	LT, trace Gravel, trac	e Cobbles.	М			
3					М			
4					M			
5					М			
7					М			
8	Glacial Till				М		1	
9					М			
10					М			
10					М			
12					М		2	
12		Bottom of I	Excavation at ± 12.0'					
13								
15								
16								
17								
18								
19								
20								
	ndwater seepage at 8 ft B ration terminated at 12 ft	GS (El. 473±). due to reach of equipment.				<u>Vater Symbols</u> = Groundwate	er	
Test Pit Dime	nsions & Orientation	BOULDER COUNT	PROPORTIO		EXCA	VATION EFFC	<u>DRT</u>	
		Boulder Class	< 10%	Trace		E = Easy		
8.0 ft		12"-24" A	10-20%	Little		A = Moderate		
2.5 ft	N	24"-36" B	20-35%	Some		D = Difficult		
		>36" C	35-50%	And				

		PROIECT	INFORMATION		Test Pit No: T	P-2			
	SIEFEKI	-	Excavation Log		Sheet: 1 of 1				
	SSOCIATES		ar Photovoltaic Arra	ıy	SA Job No. 15	532.001			
27 Sier Wat	non Company Road ertown, CT 06795	958 C	CT Route 163	-	SA Rep.: J. Ki	dd			
www.s	(888) 960-7992 siefertassociates.com	Montvi	lle, Connecticut		Checked By:				
Client: Solli Eng	gineering, LLC	Make: Caterp	villar		Ground Elev:	± 474			
Exc. Contractor	r: David M. Koch, LLC	Model: 304E2	2		Date: 07/27/20	023			
Exc. Operator:	David Koch	Bucket Capac	rity: 1/4 CY		Start Time: 7:	56A			
Weather: Sunn	y (Partly Cloudy) 80's	Reach: ±12ft			End Time: 8:1	.8A			
-	Strata Change & Water	Subsurf	Subsurface Description			Boulder	Notes		
Grade (ft)	Level Topsoil		Dark brown, fine SAND and SILT, some Roots.			Qty/Class			
1	10000	Orange brown, fine SAND, some			E E				
2	Subsoil	-							
3		Grey, fine to coarse SAND, little S Boulders.	Silt, little Gravel, trace	Cobbles, trace	М				
4					М				
5					D				
6					D				
7	Glacial Till				D				
8					D	1A	1		
9					D				
10					D				
11					D		2		
12		Bottom of I	Excavation at $\pm 12.0$ '		2		-		
13			2.cu / ulion ul _ 12.0						
14									
15									
16									
17									
19 20									
	ndwater seepage at 8 ft B	GS (El. 466±)			TA TA	Vater Symbols			
		due to reach of equipment.				' = Groundwate	r		
Test Pit Dime	ensions & Orientation	<u>BOULDER COUNT</u> Boulder <u>Class</u>	<u>PROPORTIC</u> < 10%	<u>DNS USED</u> Trace	EXCA	VATION EFFC E = Easy	<u>DRT</u>		
10.0 ft		12"-24" A	10-20%	Little	N	A = Moderate			
	N	24"-36" B	20-35%	Some		D = Difficult			
2.5 ft	IN	>36" C	35-50%	And					

		PROI	ECT INFORMATION		Test Pit No: T	°P-3	
	DIEFEKI	-	t Pit Excavation Log		Sheet: 1 of 1	-	
	SSOCIATES		Solar Photovoltaic Ar	rav	SA Job No. 15	532.001	
27 Sien Wat	non Company Road ertown, CT 06795	•	958 CT Route 163	5	SA Rep.: J. Ki		
	(888) 960-7992 siefertassociates.com		ntville, Connecticut		Checked By:		
Client: Solli Eng		Make: Ca			Ground Elev:	± 450	
	: David M. Koch, LLC		-		Date: 07/27/20	023	
Exc. Operator:			apacity: 1/4 CY		Start Time: 8:		
-	y (Partly Cloudy) 80's	Reach: ±1			End Time: 8:4	4A	
	Strata Change & Water	G.,1	osurface Description		Excavation	Boulder	Natas
Grade (ft)	Level				Effort	Qty/Class	Notes
1		7" Dark brown, fine SAND a Orange brown, fine SAND, s			E		
1	Subsoil	Orange brown, fine SAND, s	some siit.		Е		
2		Grey, fine to coarse SAND, li	ittle Silt, little Gravel, littl	e Cobbles.			
					М		
3							
4					М		
					М		
5					141		
6	Glacial Till				D		
					D		
7					D		
8					D		
0							
9					D		
					D		1
10		Botton	n of Excavation at ± 10.0'				
11		Dotton	i of Excuvation at 2 10.0				
10							
12							
13							
14							
15							
16							
17							
18							
19							
20							
Notes: 1. Excav	vation terminated at 10 ft	due to difficult excavation ef	tort.			<u>Vater Symbols</u> ' = Groundwate	er
Tect Pit Dimo	nsions & Orientation	BOULDER COUNT	PROPORT	IONS USED	EXCA	VATION EFFC	DRT
	noiono & Onemation	Boulder Class	< 10%	Trace		E = Easy	
11.0 ft		12"-24" A	10-20%	Little	Ν	A = Moderate	
2.5 ft	N	24"-36" B	20-35%	Some		D = Difficult	
∠.J II	IN	>36" C	35-50%	And			

	CIECEDT	PROIECT	INFORMATION		Test Pit No: T	TP-4			
	Test Pit Excavation Log				Sheet: 1 of 1				
	SSOCIATES		ar Photovoltaic Arra	av	SA Job No. 1532.001				
27 Sien Wat	non Company Road ertown, CT 06795	•	CT Route 163	5	SA Rep.: J. Ki				
(	(888) 960-7992 siefertassociates.com		lle, Connecticut		Checked By:				
Client: Solli Eng		Make: Caterp			Ground Elev:	± 451			
	: David M. Koch, LLC	-			Date: 07/27/20	023			
Exc. Operator: 1		Bucket Capac	rity: 1/4 CY		Start Time: 8:				
-	y (Partly Cloudy) 80's	Reach: ±12ft	5		End Time: 9:0	)6A			
	Strata Change & Water	Subsurface Description			Excavation	Boulder	N		
Grade (ft)	Level				Effort	Qty/Class	Notes		
1	Topsoil	Dark brown, fine SAND and SIL	Г, some Roots.		Е				
2		Orange brown, fine SAND, some	Silt.						
	Subsoil	, , , , , , , , , , , , , , , , , , ,			М				
3									
4		Grey, fine to coarse SAND, little S	Silt, little Gravel, trace	e Cobbles.	М				
5					М				
6					М				
7					М				
8	Glacial Till				D				
9					D				
10					D				
11					D				
12					D		1		
13		Bottom of I	Excavation at ± 12.0'						
14									
15									
16									
17									
18									
19									
20									
	vation terminated at 12 ft	due to reach of equipment.				Vater Symbols ' = Groundwate	er		
Test Pit Dime	nsions & Orientation	BOULDER COUNT	PROPORTIO		EXCA	VATION EFFC	<u>DRT</u>		
10.0.0		Boulder <u>Class</u>	< 10%	Trace		E = Easy			
10.0 ft	<b></b>	12"-24" A	10-20%	Little		M = Moderate			
2.5 ft	Ν	24"-36" B	20-35%	Some		D = Difficult			
		>36" C	35-50%	And					

(i <u>www.si</u> Client: Solli Eng Exc. Contractor: Exc. Operator: I Weather: Sunny	: David M. Koch, LLC David Koch 7 (Partly Cloudy) 80's Strata Change & Water Level Topsoil Subsoil	Proposed Sola 958 C Montvil Make: Caterpi Model: 304E2 Bucket Capac Reach: ±12ft	ity: 1/4 CY ace Description 7, some Roots.	Sheet: 1 of 1 SA Job No. 1 SA Rep.: J. K Checked By: Ground Elev Date: 07/27/2 Start Time: 9 End Time: 9: Excavation Effort E	idd :: ± 465 2023 :11A	Notes
(i <u>www.s</u> Client: Solli Eng Exc. Contractor: Exc. Operator: I Weather: Sunny Depth Below Grade (ft) 1 2 3	888) 960-7992 <u>iefertassociates.com</u> gineering, LLC : David M. Koch, LLC David Koch 7 (Partly Cloudy) 80's Strata Change & Water Level Topsoil Subsoil	958 C Montvil Make: Caterpi Model: 304E2 Bucket Capac Reach: ±12ft Subsurf Dark brown, fine SAND and SILT Orange brown, fine SAND, some	T Route 163 le, Connecticut illar ity: 1/4 CY ace Description	SA Rep.: J. K Checked By: Ground Elev Date: 07/27/2 Start Time: 9 End Time: 9: Excavation Effort	idd :: ± 465 2023 :11A 34A <b>Boulder</b>	Notes
(i <u>www.s</u> Client: Solli Eng Exc. Contractor: Exc. Operator: I Weather: Sunny Depth Below Grade (ft) 1 2 3	888) 960-7992 <u>iefertassociates.com</u> gineering, LLC : David M. Koch, LLC David Koch 7 (Partly Cloudy) 80's Strata Change & Water Level Topsoil Subsoil	Montvil Make: Caterpi Model: 304E2 Bucket Capaci Reach: ±12ft <b>Subsurf</b> Dark brown, fine SAND and SILT Orange brown, fine SAND, some	le, Connecticut illar ity: 1/4 CY <b>ace Description</b>	Checked By: Ground Elev Date: 07/27/2 Start Time: 9 End Time: 9: Excavation Effort	r: ± 465 2023 :11A 34A Boulder	Notes
www.s Client: Solli Eng Exc. Contractor: I Exc. Operator: I Weather: Sunny Depth Below Grade (ft) 1 2 3	iefertassociates.com gineering, LLC : David M. Koch, LLC David Koch 7 (Partly Cloudy) 80's Strata Change & Water Level Topsoil Subsoil	Make: Caterpi Model: 304E2 Bucket Capac Reach: ±12ft <b>Subsurf</b> Dark brown, fine SAND and SILT Orange brown, fine SAND, some	illar ity: 1/4 CY <b>ace Description</b> 7, some Roots.	Ground Elev Date: 07/27/2 Start Time: 9 End Time: 9: Excavation Effort	:: ± 465 2023 :11A 34A <b>Boulder</b>	Notes
Exc. Contractor: Exc. Operator: I Weather: Sunny Depth Below Grade (ft) 1 2 3	: David M. Koch, LLC David Koch 7 (Partly Cloudy) 80's Strata Change & Water Level Topsoil Subsoil	Model: 304E2 Bucket Capac Reach: ±12ft Subsurf Dark brown, fine SAND and SILT Orange brown, fine SAND, some	ity: 1/4 CY ace Description 7, some Roots.	Date: 07/27/2 Start Time: 9 End Time: 9: Excavation Effort	2023 :11A 34A Boulder	Notes
Exc. Operator: I Weather: Sunny Depth Below Grade (ft) 1 2 3	David Koch 7 (Partly Cloudy) 80's Strata Change & Water Level Topsoil Subsoil	Bucket Capac Reach: ±12ft <b>Subsurf</b> Dark brown, fine SAND and SILT Orange brown, fine SAND, some	ity: 1/4 CY ace Description 7, some Roots.	Start Time: 9 End Time: 9: Excavation Effort	:11A 34A Boulder	Notes
Weather: Sunny Depth Below Grade (ft) 1 2 3	7 (Partly Cloudy) 80's Strata Change & Water Level Topsoil Subsoil	Reach: ±12ft Subsurf Dark brown, fine SAND and SILT Orange brown, fine SAND, some	ace Description	End Time: 9: Excavation Effort	34A Boulder	Notes
Depth Below Grade (ft) 1 2 3	Strata Change & Water Level Topsoil Subsoil	<b>Subsurf</b> Dark brown, fine SAND and SILT Orange brown, fine SAND, some	, some Roots.	Excavation Effort	Boulder	Notes
Grade (ft) 1 2 3	Level Topsoil Subsoil	Subsurf Dark brown, fine SAND and SILT Orange brown, fine SAND, some	, some Roots.	Effort		Notes
2 3	Subsoil	Orange brown, fine SAND, some		E		
3	Subsoll	Ŭ			1	
		Grey, fine to coarse SAND, little S		Е		
4			ilt, little Gravel, little Cobble	s. M		
				М		
5				М		
6				М		
7	Glacial Till			D		
8				D		
9				D		1
10				D		
11				D		2
12		Bottom of E	excavation at ± 11.0'			1
13						
14						
15						
16						
17						
18						
19						
20						L
	ndwater seepage at 9 ft B ation terminated at 11 ft	GS (El. 456±). due to excavation effort.			<u>Water Symbols</u> = Groundwate	er
Test Pit Dime	nsions & Orientation	BOULDER COUNT	PROPORTIONS US		AVATION EFFC	<u>)RT</u>
11.0 ft		<u>Boulder</u> <u>Class</u> 12"-24" A		race ittle	E = Easy M = Moderate	
11.0 It	▲					
2.5 ft	N	24"-36" B >36" C		ome And	D = Difficult	

		PROIFCT	INFORMATION		Test Pit No: T	'P-6	
	SIEFEKI		Excavation Log		Sheet: 1 of 1	1-0	
	SSOCIATES		ar Photovoltaic Array		SA Job No. 15	32 001	
27 Sier Wat	non Company Road ertown, CT 06795	=	CT Route 163		SA Rep.: J. Ki		
	(888) 960-7992 siefertassociates.com		lle, Connecticut		Checked By:	uu	
	gineering, LLC	Make: Caterp			Ground Elev:	± 484	
	:: David M. Koch, LLC	-			Date: 07/27/20		
Exc. Operator:		Bucket Capac			Start Time: 9:		
-	y (Partly Cloudy) 80's	Reach: ±12ft			End Time: 9:5		
	Strata Change & Water	I			Excavation	Boulder	
Grade (ft)	Level	Subsur	face Description		Effort	Qty/Class	Notes
1	Topsoil	9" Dark brown, fine SAND and S	SILT, some Roots.		Е		
2		Grey, fine to coarse SAND, little	Silt, little Gravel, little Co	obbles.	М		
					М		
3					М		
4					M		
5	Glacial Till				D		
7					D		
					D		
8					D		
9					D		1
10		Bottom of	Excavation at ± 10.0'				
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
Notes: 1. Excav	vation terminated at 10 ft	due to excavation effort.				<u>/ater Symbols</u> = Groundwate	r
Test Pit Dime	nsions & Orientation	BOULDER COUNT	PROPORTION		<u>EXCA</u>	VATION EFFC	<u>DRT</u>
10.0 ft		<u>Boulder</u> <u>Class</u> 12"-24" A	< 10% 10-20%	Trace Little	N	E = Easy A = Moderate	
10.0 It	<b>→</b>	24"-36" B	20-35%	Some		D = Difficult	
2.5 ft	Ν	24 -36 B >36" C	20-35% 35-50%	And			
	—	C			1		

	CIEFENT	PROJECT	INFORMATION		Test Pit No: T	TP-7	
	SIEFERI ASSOCIATES	-	Excavation Log		Sheet: 1 of 1		
		Proposed Sola	ar Photovoltaic Arr	ay	SA Job No. 15	532.001	
Wat	mon Company Road tertown, CT 06795	958 (	CT Route 163		SA Rep.: J. Ki	dd	
www.	(888) 960-7992 siefertassociates.com	Montvi	lle, Connecticut		Checked By:		
Client: Solli En	gineering, LLC	Make: Caterp	illar		Ground Elev:	± 495	
Exc. Contractor	r: David M. Koch, LLC	Model: 304E2			Date: 07/27/20	023	
Exc. Operator:	David Koch	Bucket Capac	ity: 1/4 CY		Start Time: 10	):00A	
Weather: Sunn	y (Partly Cloudy) 80's	Reach: ±12ft			End Time: 10	:31A	
Depth Below Grade (ft)	Strata Change & Water Level	Subsurf	Subsurface Description			Boulder Qty/Class	Notes
1	Topsoil		Dark brown, fine SAND and SILT, some Roots.				
2	Subsoil	Orange brown, fine SAND, some			М		
3		Grey, fine to coarse SAND, little S Boulders.	Silt, little Gravel, little	e Cobbles, trace	М		
4	1				М		
5					М		
6	Glacial Till 🔻				D		
7					D	1B	1
8					D		
9	-				D		
10					D		2
11	-	Bottom of F	Excavation at ± 10.0'				
12	-						
13							
14							
15	-						
16	4						
17	4						
18	4						
19	-						
20							
	indwater seepage at 6 ft B vation terminated at 10 ft					Vater Symbols ' = Groundwate	er
	Test Pit Dimensions & Orientation		R COUNT PROPORTIONS USED EX			EXCAVATION EFFORT	
Test Pit Dime	ensions & Orientation	BOULDER COUNT			EACA		
		<u>Boulder</u> <u>Class</u>	< 10%	Trace		E = Easy	<u> </u>
Test Pit Dime 16.0 ft					И		<u> </u>

Sector     Test Pit Econvation Log     Sheet: 1 of 1       2     30 of 100 No. 1532.001     Sh Job No. 1532.001       2     Montrille, Connection:     Concelded By:       2     Model: 2042     Date: C0272203       2     Model: 2042     Date: C0272203       2     Model: 2042     Date: C0272203       2     Date: C0272203     Start Time: 10:30A       2     Reach: 322     Date: C0272203       3     Till     Start Time: 10:30A       2     Reach: 322     Concellor:       1     Topold     Start Start Goog & Weter       2     Reach: 322     Concellor:       3     Till     Start Goog & Weter       4     M     In       3     Till     Grade (ff)       4     M     In       5     Grade (ff)     M       6     D     In       7     Glacial Till     Grade (ff)       9     In     D       10     In     In       11     Grade (ff)     In       12     Grade (ff)     In </th <th></th> <th>ALCECDT</th> <th>PROIECT</th> <th>INFORMATION</th> <th></th> <th>Test Pit No: T</th> <th>`P-8</th> <th></th>		ALCECDT	PROIECT	INFORMATION		Test Pit No: T	`P-8		
Proposed Star Photovolutic Array Watchow, CT 8995 were Ukformedite.com       SA Ids No. 152.00.1         1000000000000000000000000000000000000		SIEFEKI							
"Weak words of CT by Sub 2002"         "More Ville_Connecticut"         Checked By:           Cleart Solit Engineering, LLC         Make: Caterpillar         Cound Elev: ± 485           Exc. Contractor: David M. Koch, LLC         Made: Caterpillar         Caterpillar           Weather: South Engineering, LLC         Made: Caterpillar         Caterpillar           Sec. Operator: David M. Koch, LC         Made: Caterpillar         End Time: 11:03A           Weather: South (Caterpillar         Subset/Capacity: 1/4 CY         End Time: 11:03A           Depth Helw         State Change & Waterpillar         Subset/Capacity: 1/4 CY         End Time: 11:03A           1         Topold         Notes         Effort         Overastion           1         Topold         Notes         Effort         Overastion           2         Fill         Notes         Effort         Overastion           3         Fill         Notes         Effort         Overastion           4         Topold         Notes         Effort         Overastion           5         Solid Capacity in the Capacity in the Site inter Capacity in the Capacity in the Capacity in the Site inter Capacity in the Capac				-			32 001		
Set 000-2002-200         Montrylile, Connecticut         Checked By:         Control Event Set 0000000000000000000000000000000000	27 Sien Wat	non Company Road ertown, CT 06795	-	•					
Clent: Solli Engineering, LLC Make: Caterpillar Ground Elev: $z = 485$ Dec: Contractor: David M. Koch, LLC Model: 20122 Dec: David M. Koch, LLC Model: 20122 Dec: David M. Koch, LLC Model: 20122 Dec: David M. Koch, LLC Model: 20122 State Change & Water Level Change & Water Conde (th) Level State Change & Water Conde (th) Level Maker Description 1 Topooll 8" Dark bowwn. fine SAND and SLT, some Roots. 1 Topooll 8" Dark bowwn. fine SAND and SLT, some Roots. 1 Topooll 8" Dark bowwn. fine SAND, little Sill, time Gravel, time: Boulders. 4 Maker Same 5 Boulders. 5 Group fine to come: SAND, little Sill, time Gravel, time: Boulders. 6 Group fine to come: SAND, little Sill, time Gravel, time Cobles, trace 8 Boulders. 6 Group fine to come: SAND, little Sill, little Cravel, little Cobles, trace 8 Boulders. 6 Group fine to come: SAND, little Sill, little Cravel, little Cobles, trace 8 Boulders. 6 Group fine to come: SAND, little Sill, little Cravel, little Cobles, trace 8 Boulders. 6 Group fine to come: SAND, little Sill, little Cravel, little Cobles, trace 8 Boulders. 7 Glacial Till 10 Boulders. 9 Boulders. 9 Boulders. 9 Boulders. 9 Boulders. 10 Boul	(	(888) 960-7992				-	uu		
Exe: Contractor: David M. Koch, LLC Model: 304E2 Date: 07.27.2023 FXe: Operator: David Koch, LLC Backy: 1/4 CY Star Time: 1.03A Wetter: Sumy Party Cloudy 80's Read: 1/27 Depth Holm State Change 4 Water Subserface Description Exercision Star Time: 1.03A Depth Holm State Change 4 Water Subserface Description Exercision State Change 4 Water Sumserface Description State Change 4 Water State Descriptin State Chang			· · · · · · · · · · · · · · · · · · ·				± 485		
Exc. Operator: Lowid Koch         Bucket Capacity: 1/4 CY         Start Time: 10:344           Operate Relay         Test Change & Water         Substrance Description         Scavaion         Boulact         Notes           1         Topsol         ** Dark hence, & Karvaion         Scavaion         Boulact         Notes           2         1         Topsol         ** Dark hence, & SAND and SIL 7, some Roots.         E         18         -           3         Fill         Brown, fine to course SAND, little Sit, trace Cavel, trace Boulders.         M         M         18           4         M         M         18         -			-						
Weather: Summy (Partly Cloudy) 80's         Reach: ±12ft         End Time: 11:03A           Deptiliation         Strate Change & Water Laved         Subsurface Description         Excertifient (Part)         Notes           1         Topseil         8' Dark brown, fine: 5AND and SLT, some Roots.         E         18									
Depth fullow Grade (ff)     Strate Charge & Water Level     Subsurface Description     Excountion (Iffort     Boulder OryClass     Notes       1     Toppoil     8" Dark brown, fine SAND and SLT, some Roots.     E     18     18       2     Brown, fine to coarse SAND, little Silt, trace Gravel, trace Boulders.     M     18     M       3     Fill     Grey, fine to coarse SAND, little Silt, little Cobbles, trace     M     18       4     Grey, fine to coarse SAND, little Silt, little Cobbles, trace     M     18       6     D     D     10       7     Glacial Till     Grey, fine to coarse SAND, little Silt, little Cobbles, trace     M       9     0     18     D     10       10     Roulders.     D     11       12     Boulders.     Bottom of Excavation at ± 10.0"     1       11     Bottom of Excavation at ± 10.0"     Image: Second addition at ± 10.0"     Image: Second addition	-		-						
Grade (ft)     Level     Subscription     Friant     QuyClass     Notes       1     Topseil     8" Dark brown, fine SAND and SLT, some Roots.     E     18        2	-								
1       Lopsal       Lo         2       Brown, fine to coarse SAND, little Silt, trace Cravel, trace Boulders.       M       1B         3       Full       M       1B         4       M       M       1B         5       Grey, fine to coarse SAND, little Silt, fittle Gravel, little Cobbles, trace       M       M         6       D       D       1B       M       D         7       Glacial Till       Boulders.       D       D       1B         9       O       D       1B       D       1B         10       D       D       1B       D       1B         11       Bottom of Excavation at ± 10.0"       D       1       1         12       13       Bottom of Excavation at ± 10.0"       I       I       I         13       I       I       I       I       I       I       I         13       I	-	-	Subsur			Effort	Qty/Class	Notes	
2     M     M     1B       3     Fill     M     1B       4     M     1B       5     Grey, fine to coarse SAND, little Sit, little Gravel, little Cobbles, trace     M       6     D     D       7     Clacial Till     D       8     D     D       9     D     D       10     D     1B       11     Bottom of Excavation at ± 10.0"     D       12     Bottom of Excavation at ± 10.0"     I       13     Hotom of Excavation at ± 10.0"     I       14     I     I     I       19     I     I     I       20     I     I     I       Nets: 1. Excavation terminated at 10 fi due to excavation effort.       Test Pit Dimensions & Orientation       14.0 ft     I     Classic       14.0 ft     I     Classic       14.0 ft     I     Classic       14.0 ft     I     I       14.0 ft     I     I       14.0 ft     I     I	1	Topsoil	8" Dark brown, fine SAND and S	ILT, some Roots.		Е	1B		
3	2		Brown, fine to coarse SAND, little	e Silt, trace Gravel, trace Boulde	ers.	М			
4	3	Fill				М	1B		
5     Boulders.     D     D       6     D     D     B       7     Clacial Till     D     D       8     D     D     D       9     D     D     1       10     D     D     1       11     D     D     1       12     Bottom of Excavation at ± 10.0"     L     L       13     H     H     H     H       14     H     H     H     H       16     H     H     H     H       17     H     H     H       18     H     H     H       19     D     H     H       20     L     E     E       Notes:     1. Excavation terminated at 10 ft due to excavation effort.     Vater Symbols       Test Pit Dimensions & Orientation     Boulder:     Class     Clo%       14.0 ft     12".34"     A     10-20%     Little       14.0 ft     12".34"     A     10-20%     Little       14.0 ft     12".34"     B     20-35%     Some     D = Difficult	4					М			
6       0       1B         7       Glacial Till       D       1B         9       0       D       1         10       D       D       1         11       12       1       Bottom of Excavation at z 10.0°       1         11       12       1       1       1         13       14       15       1       1         16       17       1       1       1         18       19       1       1       1         20       Note:       1. Excavation terminated at 10 ft due to excavation effort.       Watter Symbols         Test Pit Dimensions & Orientation       Boulder       Class       10/20%       1         14.0 ft       12'-24"       A       10/20%       1       E <ecay< td="">         14.0 ft       24'-36"       8       20-35%       Some       D = Difficult</ecay<>	5		-	Silt, little Gravel, little Cobbles,	trace	М			
7       Glacial Till       D       D       D       D       D       D       1         9       10       D       D       1       D       1       1       1       D       1	6					D			
8       0       0       0       0       0       1         10       0       0       1       0       1       1         11       12       13       14       15       16       1       <	7	Glacial Till							
9       D       1         10       Bottom of Excavation at ± 10.0"       D       1         11       12       13       14       15       16       1         15       16       17       18       19       20       1       12       13         19       20       1       Excavation effort.       Water Symbols       Image: Class in the image:	8					D			
10       Bottom of Excavation at ± 10.0"         11       Bottom of Excavation at ± 10.0"         12       13         13       14         15       16         17       18         19       20         Notes:       1. Excavation terminated at 10 ft due to excavation effort.         Water Symbols         Test Pit Dimensions & Orientation         BOULDER COUNT       PROPORTIONS USED         Particular       4.10%         14.0 ft       12°.24"         14.0 ft       10°.20%         N       24°.36"         8       20.35%	9					D			
$11 \\ 12 \\ 13 \\ 14 \\ 15 \\ 16 \\ 17 \\ 18 \\ 19 \\ 20 \\ Note: 1. Excavation terminated at 10 ft due to excavation effort.  Test Pit Dimensions & Orientation  Test Pit Dimensions & Orientation  Test Pit Dimensions & Orientation  14. 0 ft  12. 2. ft  N  14. 0 ft  12. 2. 4" A 10-20% Little  N  14. 0 ft  12'-24" A 10-20% Little  N  14. 0 ft  12'-24" A 10-20% Little  M = Moderate  D = Difficult  14. 0 ft  12'-24" B 20-35% Some  D = Difficult  14. 0 ft  15  16  17  18  19  20  14. 0 ft  12'-24" A 10-20% Little  15  16  17  17  17  18  19  10  10  10  10  10  10  10  10$	10					D		1	
13       14         14       15         15       16         17       18         19       20         Notes:       1. Excavation terminated at 10 ft due to excavation effort.         Water Symbols $\checkmark$ = Groundwater         Test Pit Dimensions & Orientation       BOULDER COUNT       PROPORTIONS USED       EXCAVATION EFFORT         14.0 ft       12"-24"       A       10-20%       Little       M = Moderate         2.5 ft       N       12"-24"       B       20-35%       Some       D = Difficult	11		Bottom of I	Excavation at $\pm 10.0^{\circ}$					
14       15         15       16         17       18         19       20         Notes:       1. Excavation terminated at 10 ft due to excavation effort.         Water Symbols         Test Pit Dimensions & Orientation         BOULDER COUNT       PROPORTIONS USED         Soundwater         14.0 ft       12°-24″         14.0 ft       24°-36″         2.5 ft       N	12								
15       16         16       17         18       19         20       Notes: 1. Excavation terminated at 10 ft due to excavation effort.         Water Symbols         Test Pit Dimensions & Orientation         Boulder       Class         14.0 ft       12"-24"         14.0 ft       12"-24"         N       24"-36"         B       20.35%         Some       D = Difficult	13								
1617181920Notes:1. Excavation terminated at 10 ft due to excavation effort.Water Symbols $\checkmark$ = GroundwaterTest Pit Dimensions & OrientationBOULDER COUNT BoulderPROPORTIONS USED   (14.0 ft)14.0 ft 12"-24"24"-36"14.0 ft 2.5 ft24"-36"N24"-36"B20-35%SomeD = Difficult	14								
17181920Notes:1. Excavation terminated at 10 ft due to excavation effort.Mater SymbolsTest Pit Dimensions & Orientation $BOULDER COUNT$ BoulderClass14.0 ft12"-24"14.0 ft12"-24"14.0 ft24"-36"14.0 ft24"-36"N24"-36"14.0 ftD = Difficult	15								
181920Notes:1. Excavation terminated at 10 ft due to excavation effort.Notes:1. Excavation terminated at 10 ft due to excavation effort.Test Pit Dimensions & Orientation $BOULDER COUNT$ BoulderPROPORTIONS USED <10%	16								
1920Water SymbolsNotes:1. Excavation terminated at 10 ft due to excavation effort. $Water Symbols$ $\checkmark = GroundwaterTest Pit Dimensions & OrientationBOULDER COUNTBoulderPROPORTIONS USED<10%$	17								
20       Water Symbols         Notes:       1. Excavation terminated at 10 ft due to excavation effort.       Water Symbols         Test Pit Dimensions & Orientation       BOULDER COUNT       PROPORTIONS USED       EXCAVATION EFFORT         Boulder       Class       <10%	18								
Notes:       1. Excavation terminated at 10 ft due to excavation effort.       Water Symbols         Test Pit Dimensions & Orientation       BOULDER COUNT       PROPORTIONS USED       EXCAVATION EFFORT         14.0 ft       12"-24"       A       10-20%       Little       M = Moderate         2.5 ft       N       24"-36"       B       20-35%       Some       D = Difficult	19								
Test Pit Dimensions & Orientation $BOULDER COUNT$ PROPORTIONS USEDEXCAVATION EFFORTTest Pit Dimensions & OrientationBOULDER COUNTPROPORTIONS USEDEXCAVATION EFFORTBoulderClass<10%									
Test Pit Dimensions & OrientationBoulderClass< 10%TraceE = Easy14.0 ft12"-24"A10-20%LittleM = Moderate2.5 ftN24"-36"B20-35%SomeD = Difficult	Notes: 1. Excav	vation terminated at 10 ft	due to excavation effort.				-	er	
14.0 ft     12"-24"     A     10-20%     Little     M = Moderate       2.5 ft     N     24"-36"     B     20-35%     Some     D = Difficult	Test Pit Dime	nsions & Orientation				<u>EXCA</u>		<u>DRT</u>	
2.5 ft N $24"-36"$ B $20-35\%$ Some D = Difficult	14 N ft					N			
2.5 ft N	14.011								
>36" C 35-50% And	2.5 ft	N T	>36" C						

Appendix 3

Limitations

# **GEOTECHNICAL LIMITATIONS**

## **Explorations**

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

## Review

4. In the event that any changes in the nature, design or locations of the proposed structures are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by Siefert Associates, LLC. It is recommended that this firm be provided the opportunity for a general review of final design and specifications in order that earthwork and geotechnical recommendations may be properly interpreted and implemented in the design and specifications.

# Use of Report

5. This report has been prepared for the exclusive use of Solli Engineering, LLC and their design team for specific application to the Proposed Solar Photovoltaic Array that will be located at 958 CT Route 163 in Montville, Connecticut, in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made.