STORMWATER BASIN AREA INVESTIGATION REPORT

PROPOSED RESIDENTIAL DEVELOPMENT Texas Road & Greenwood Road Block 119, Lot 16 Township of Marlboro, Monmouth County, New Jersey

Prepared for:

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1.0 PROJECT DESCRIPTION

Dynamic Earth, LLC (Dynamic Earth) has completed an exploration and evaluation of the subsurface conditions for the proposed site development to be located at Texas Road and Greenwood Road in the Township of Marlboro, Monmouth County, New Jersey. The site is further identified as Block 119, Lot 16 and is shown on the *Soil Profile Pit Location Plan* in the Appendix of the report.

At the time of Dynamic Earth's investigation, the subject site was undeveloped and wooded. The proposed site development is expected to include construction of five, three-story residential buildings occupying a total footprint area of approximately 55,300 square feet. Additional improvements will include associated pavements, utilities, and clubhouse, and shed with associated amenities. Stormwater management facilities are proposed within the northwestern and southwestern portion of the site. Conceptual site development details were provided on a July 30, 2020 *Overall Site Plan* prepared by Dynamic Engineering Consultants, PC (Dynamic).

Topographic information was provided on a July 31, 2020 *Boundary and Topographic Survey* prepared by Dynamic Survey, LLC. Existing site grades range between approximately 53 feet within the northwestern portion of the site and 92 feet within the southeastern portion of the site. The elevations provided in this report are referenced to 1988 North American Vertical Datum (NAVD 88).

The subject site is bound to the north by a wooded area with Ticetown Road beyond; to the east by Greenwood Road; to the south by Texas Road; and to the west by a wooded area, with residential property beyond.

2.0 SCOPE OF SERVICES

Dynamic Earth's scope of services pertaining to this report included evaluating the subsurface conditions at soil profile pits to estimate the apparent seasonal high groundwater level. Four soil profile pits (identified as SPP-1 through SPP-4) were excavated at the site using a rubber-tire backhoe. Test locations were located within the area of anticipated stormwater management facilities and were backfilled to the surface with excavated soils at completion. The test locations are shown on the enclosed *Soil Profile Pit Location Plan*.

The soils encountered were classified using the United States Department of Agriculture (USDA) classification system. Observations were made for groundwater and/or soil mottling and mineral deposits potentially indicative of zones of saturation or seasonal high groundwater. Soil logs are included in the Appendix of this report.

Laboratory Permeability Testing: Undisturbed tube permeameter tests were conducted in accordance to New Jersey Department of Environmental Protection (N.J.D.E.P.) *Stormwater Best Practices Manual – Appendix E* test methods on representative samples obtained from anticipated stormwater management facility infiltration depths. Detailed results of the permeability testing are included herein.

3.0 SOIL SURVEY

Based on a review of the United States Department of Agriculture – Natural Resources Conservation Services (USDA-NRCS) soil survey, the following soil resources are mapped underlying the area of the site and are shown on the enclosed *"Soil Survey Location Plan"*.

Manahawkin muck, zero to two percent slopes, frequently flooded (MakAt): Manahawkin muck, zero to two percent slopes, frequently flooded is mapped within the central portion of the site. The typical soil profile (as detailed in the soil survey) consists of muck to a depth of 47 inches; underlain by sand to a depth of 80 inches below the natural ground surface (limit of report). The depth of the water table is reported to range between zero to six inches below the natural ground surface.

Atsion sand, zero to two percent slopes (AtsA): Atsion sand, zero to two percent slopes is mapped within the southwestern portion of the site. The typical soil profile (as detailed in the soil survey) consists of peat to a depth of two inches; underlain by sand to a depth of 80 inches below the natural ground surface (limit of report). The depth of the water table is reported to range between zero to 12 inches below the natural ground surface.

Elkton loam, zero to two percent slopes (EkaAr): Elkton loam, zero to two percent slopes is mapped within the eastern and northern portions of the site. The typical soil profile (as detailed in the soil survey) consists of loam to a depth of eight inches; underlain by clay loam to a depth of 60 inches below the natural ground surface (limit of report). The depth of the water table is reported to range between zero to 12 inches below the natural ground surface.

Klej loamy sand, zero to five percent slopes (KkgB): Klej loamy sand, zero to five percent slopes is mapped within the eastern and southern portions of the site. The typical soil profile (as detailed in the soil survey) consists of decomposed plant material to a depth of four inches; loamy sand to a depth of 40 inches; underlain by sand to a depth of 64 inches below the natural ground surface (limit of report). The depth of the water table is reported to range between 12 to 24 inches below the natural ground surface (limit of report).

Pits, Sand, and Gravel (PHG): Pits, Sand, and Gravel is mapped within a relatively small area within the western portion of the site. The typical soil profile (as detailed in the soil survey) consists

of sandy material disturbed by human activity. The depth to groundwater is not reported in the survey.

4.0 **RESULTS**

Detailed descriptions of the subsurface conditions encountered at each location are provided on the *Records of Subsurface Exploration* included herein. A summary of the subsurface conditions encountered is presented below.

4.1 Subsurface Soil Profile

Soil profile pits were performed within existing landscaped areas and encountered approximately eleven to 14 inches of topsoil at the surface. Beneath the surface cover, natural coastal plain deposits were encountered that generally consisted of sand, loamy sand, sandy clay loam, silt loam, and clay loam with variable amounts of gravel. The natural coastal plain deposits were encountered to refusal (due to continuous wet cave-in) depths ranging between approximately ten feet and 12.0 feet below the ground surface; corresponding to elevations ranging between 72.0 feet and 61.5 feet.

4.2 Seasonal High Groundwater and Permeability

Evidence of seasonal high groundwater (based on soil mottling) was encountered within the soil profile pits at depths ranging between approximately 0.9 feet and 4.1 feet below the ground surface; corresponding to elevations ranging between 80.2 feet and 70.6 feet. Groundwater was encountered at depths ranging between approximately two feet and 4.1 feet; corresponding to elevations ranging between 80.2 feet. Groundwater levels are expected to fluctuate seasonally and following significant periods of precipitation. A summary of the seasonal high groundwater levels and permeability test results is presented in the following table:

	STOR	MWATER	INVESTIGA	ATION SU	MMARY						
		Estimated High Gro	l Seasonal oundwater]	Permeability Test	Results					
Location	ApproximateHigh GroundwaterFermeability Test ResultsSurfaceDepthSamplePermeability (Inches/EElevationCfeet)ElevationDepth(Inches)Replicate AReplicate A										
	Elevation	(Feet)	Elevation	(Inches)	Replicate A	Replicate B					
SPP-1	81.0	4.1	76.9	53							
SDD 2	84.0	20	80.2	35	1.7	1.7					
311-2	84.0	5.0	00.2	50	0.2	< 0.2					
SPP-3	71.5	0.9	70.6	50							
SPP-4	74.5	0.9	73.6	55	< 0.2	< 0.2					

Soil Profile Pit Location Plan



Soil Survey Location Plan

		PHI AISA Asa Asa	ERAT MAKAT ETAT ETAT
SCALE: N.T.S.	JOB No: 2841-99-001E DRAWN BY:	SOIL SURVEY LOCATION PLAN	LEGEND: AtsA: Atsion Sand, zero to two percent slopes KkgB: Klej loamy sand, zero to five percent slopes PHG: Pits Sand and Gravel
2	LESIGNED BY: - CHECKED BY: PHH	PROJECT: ASHBELL ASSOCIATES, LLC Proposed Residential Development Block 119 Lot 16 Texas Road and Greenwood Road, Township of Marlboro, Monmouth County, New Jersey	MakAt: Manahawkin Muck, zero to two percent slopes, frequently flooded EkaAr: Elkton Loam, zero to two percent slopes NOTES: 1. THIS PLAN HAS BEEN PREPARED BASED ON A MAP FROM THE USDA WEB SOIL SURVEY INTERACTIVE MAP.
OF 2	DATE:	Rev. # 0	



Records of Subsurface Exploration

	D			R				=				SOIL PROFIL	E PIT LOG										s	oil Profi P:	e Pit: <u>SPP- 1</u>
Project: Location:	Proposed Residen Texas Road and G	ntial Development Breenwood Road, Township of I	Marlboro, I	Monmouth Co	unty, New Jers	ey						Project No.: Client:	2841-99-001E Ashbell Associates, L	LC											
Surface Ele	evation (ft):	81.0 Date Starte	d:				B/19/20 B/19/20		Groundy	water Data			Depth			El.					Groundw	ater Com	ments		
Proposed I	Location:	SWM	Neted:	Logged by:		R. Q	uackenbush		Seepage				(it) -			(ff) -									
/ Test	n Visual Observation			Contractor:		Pen	nyweight Co		Groundwater				4.1			76.9			Light Gray (10 YR	7/1) and Yellowis	h Brown (10 YF	R 5/6) mot	ttles 49" - 14	14"	
Method:				Rig Type:		Case	IOUE DALKING		Seasonal High Gr	oundwater		1	CONSISTENCY		BOU		1			MOTTLING			SAMPI IN		
DEPTH (IN) COLOR	SOIL TEXTURE			COARSE FRA	GMENTS (%)			oncorone	-	WATER	Basisteres to					ROOT	rs			r		Douth	<u> </u>	LAB RESULTS
					1	1	1	Shape	Grade	Size		Rupture	Stickiness	Plasticity	Distinctness	Topography		1	Quantity	Size	Contrast	Туре	(in)	No.	
0-14	Topsoil	SANDY	LOAM	GRAVEL	COBBLES	STONES	BOULDERS	-			MOIST	FRIABLE	NONSTICKY	NONPLASTIC	GRADUAL <5"	SMOOTH	MNY (>20%	MEDIUM	NONE			BAG	12	S-1	
				5	0	0	0	BLOCKY	WEAK	VERY FINE							mAX)								
14-49	Grayish Brown	LOAMY	SAND	GRAVEL	COBBLES	STONES	BOULDERS				MOIST	FRIABLE	NONSTICKY	NONPLASTIC	GRADUAL <5"	SMOOTH	FEW (5% MAX)	VERY	NONE			BAG	35	S-2	
	(10 YR 5/2)			<5	0	0	0	SUBANGULAR BLOCKY	WEAK	FINE								FINE							
				GRAVEL	COBBLES	STONES	BOULDERS																	1	
49-70	Dark Gray (10YR 4/1)	SANDY	CLAY M	0	0	O	0	SUBANGULAR BLOCKY	STRONG	COARSE	WET	VERY FRIABLE	MODERATELY STICKY	MODERATELY PLASTIC	GRADUAL <5"	SMOOTH	NONE		FEW 2%	FINE ⊲5MM	DISTINCT	BAG TUBE	53	S-3 T-1	
				GRAVEL	COBBLES	STONES	BOULDERS	SINGLE GRAIN	STRUCT	URELESS														i l	
70-132	Light Gray (2.5Y 6/1)	SAN	ID	<5	0	0	0	-			WET	LOOSE	NONSTICKY	NONPLASTIC			NONE		FEW 2%	FINE ⊲5MM	FAINT	BAG	100	S-4	
			_																						
			-					_																	
			-																						
<u> </u>																						+		\square	
			F					1																	
Additiona	I Remarks: Test I	Pit Refusal due to continuo	ous wet ca	ave-in at app	proximately 1	32 inches b	elow the exis	ting ground surfa	ice.															,l	
								-																	

	D	EX	R				=				SOIL PROFIL	E PIT LOG										S	bil Profile Paç	e Pit: <u>SPP-2</u> le <u>1</u> of <u>1</u>
Project:	Proposed Residen	tial Development									Project No.:	2841-99-001E												
Location:	Texas Road and G	Ireenwood Road, Township of Marlbo	ro, Monmouth C	ounty, New Jers	sey	8/10/20				1	Client:	Ashbell Associates, L	LC				1							
Surface El Terminatio	evation (ft): n Depth (ft):	84.0 Date Started: 12.0 Date Completed:				8/19/20 8/19/20		Groundy	water Data			Depth (ft)			El. (ft)					Groundy	ater Comn	ients		
Proposed Excavatio	Location: n	SWM	Logged by	r:	R.Q Pen	uackenbush nyweight Co		Seepage				3.8			80.2			Links Come (40 VD	7(4) and Vallavia	- Dawa (40.)/	F(C)	451 44		
/ Test Method:	Visual Observation		Rig Type	•	Case 5	580L Backhoe		Seasonal High Gr	oundwater			3.8			80.2			Light Gray (10 TR	//I) and relidwis	n biown (10 fr	(5/6) mou	les 45 - 14	4	
method.								STRUCTURE		WATER		CONSISTENCY		BOUN	IDARY				MOTTLING			SAMPLING		
DEPTH (IN	I) COLOR	SOIL TEXTURE		COARSE FR.	AGMENTS (%)		Shane	Grade	Size	CONTENT	Resistance to	Stickinger	Placticity	Distinctness	Topography	ROOT	rs	Quantity	Size	Contrast	Type	Depth	No	LAB RESULTS
							onape	ordae	0.20		Rupture	Suckiness	Flashcity	Districticos	ropography			quantity	Gill	oonnuus	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(in)		
0-11	Topsoil	SANDY LOAM	GRAVEL 5	0	0 O	0	SUBANGULAR BLOCKY	WEAK	VERY FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	GRADUAL <5"	SMOOTH	FEW (5% MAX)	VERY FINE	NONE			BAG	11	S-1	
			GRAVEL	COBBLES	STONES	BOULDERS																		
11-45	Grayish Brown (10 YR 5/2)	LOAMY SAND	45	0	0	0	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	GRADUAL <5"	SMOOTH	NONE		NONE			BAG TUBE	35	S-2 T-1	A = 1.7 IPH B = 1.7 IPH
			GRAVEL	COBBLES	STONES	BOULDERS																		
45-75	Dark Gray (10YR 4/1)	SANDY CLAY LOAM	0	0	0	0	SUBANGULAR BLOCKY	STRONG	COARSE	WET	VERY FRIABLE	MODERATELY STICKY	MODERATELY PLASTIC	GRADUAL <5"	SMOOTH	NONE		FEW 2%	FINE ⊲5MM	DISTINCT	BAG TUBE	50	8-3 T-2	A = 0.2 IPH B < 0.2 IPH
			GRAVEL	COBBLES	STONES	BOULDERS																		
75-144	Light Gray (2.5Y 6/1)	LOAMY SAND	<5	0	0	0	SUBANGULAR BLOCKY	WEAK	FINE	WET	LOOSE	NONSTICKY	NONPLASTIC			NONE		FEW 2%	FINE ⊲5MM	FAINT	BAG	110	S-4	
							-																	
							_																	
							_																	
Additiona	ıl Remarks: Test i	Pit Refusal due to continuous w	et cave-in at ap	oproximately '	144 inches b	elow the exist	ting ground surfa	ace.																

	D	EX	R				Ξ				SOIL PROFIL	E PIT LOG										S	o il Profil Pa	e Pit: <u>SPP-3</u> ge <u>1</u> of <u>1</u>
Project:	Proposed Resident	tial Development									Project No.:	2841-99-001F												
Location:	Texas Road and G	reenwood Road, Township of Mariboro	, Monmouth Co	ounty, New Jers	iey	8/19/20					Client:	Ashbell Associates, L	LC		FI									
Termination	Depth (ft):	10.0 Date Completed:				8/19/20		Ground	water Data			(ft)			(ft)					Groundy	ater Com	nents		
Proposed Lo Excavation	Visual Observation	SWM	Logged by Contractor:		Pen	nyweight Co		Seepage Groundwater				2.5			69.0			Light Gray (10 YR	7/1) and Yellowis	h Brown (10 YF	R 5/6) mot	ttles 11" - 12	20"	
Method:	visual Observation		Rig Type	:	Case 5	580L Backhoe		Seasonal High Gr	oundwater			0.9			70.6	1					—			-
DEPTH (IN)	COLOR	SOIL TEXTURE		COARSE FR.	AGMENTS (%)			STRUCTURE	-	WATER		CONSISTENCY	1	BOUI	NDARY	ROO	TS		MOTTLING			SAMPLING	·	LAB RESULTS
				1	1		Shape	Grade	Size	CONTENT	Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography			Quantity	Size	Contrast	Туре	Depth (in)	No.	
			GRAVEL	COBBLES	STONES	BOULDERS																I	.	
0-11	Topsoil	SANDY LOAM	5	0	0	0	SUBANGULAR BLOCKY	WEAK	VERY FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	GRADUAL <5"	SMOOTH	FEW (5% MAX)	VERY FINE	NONE			BAG	8	S-1	
			GRAVEL	COBBLES	STONES	BOULDERS																		-
11-30	Yellowish Brown (10YR 5/6)	CLAY LOAM	0	0	0	0	SUBANGULAR BLOCKY	STRONG	COARSE	MOIST	VERY FRIABLE	SLIGHTLY STICKY	SLIGHTLY PLASTIC	GRADUAL <5"	SMOOTH	NONE		FEW 2%	FINE ⊲5MM	FAINT	BAG	20	S-2	
			GRAVEL	COBBLES	STONES	BOULDERS															+		t	
30-90	Dark Gray (10YR 4/1)	SILT LOAM	0	0	0	0	PLATY	STRONG	COARSE	WET	VERY FRIABLE	MODERATELY STICKY	MODERATELY PLASTIC	GRADUAL <5"	SMOOTH	NONE		FEW 2%	FINE ⊲5MM	DISTINCT	BAG TUBE	50	S-3 T-1	
			0011/51	00001 50	0701/50																		<u> </u>	
90-120	Light Gray (2.5Y 6/1)	LOAMY SAND	<5	0	0	0	SUBANGULAR BLOCKY	WEAK	FINE	WET	LOOSE	NONSTICKY	NONPLASTIC			NONE		FEW 2%	FINE <5MM	FAINT	BAG	110	S-4	
							-																	
							_																	
							_																	
							-																	
Additional	Remarks: Test F	Pit Refusal due to continuous wet	cave-in at ap	proximately	120 inches b	elow the exist	ting ground surfa	ice.													_	_		

		EA																					Pag	je <u>1</u> of <u>1</u>
Project: Pr	oposed Residenti	al Development	Manager at the Ca								Project No.:	2841-99-001E												
Surface Elevation	on (ft):	74.5 Date Started:	Monmouth Co	unty, New Jers	ey	8/19/20		Ground	water Data		Client:	Depth			EL.					Ground	water Com	ments		-
Proposed Loca	tion:	SWM	Logged by:		R.Q	uackenbush		Seepage				(ff) - 2.0												
/Test V Method:	isual Observation		Rig Type:		Case 5	580L Backhoe		Groundwater Seasonal High Gr	oundwater			0.9			73.6			Light Gray (10 YR	7/1) and Yellowis	h Brown (10 Y	R 5/6) mot	tles 11" - 1	35"	
	COLOR	SOIL TEXTURE			OMENTS (%)			STRUCTURE		WATER		CONSISTENCY		BOUN	DARY	ROOT	19		MOTTLING			SAMPLIN	3	
				000002110			Shape	Grade	Size	CONTENT	Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography		-	Quantity	Size	Contrast	Туре	Depth (in)	No.	EAD ALCOULTO
			GRAVEL	COBBLES	STONES	BOULDERS																		
0-11	Topsoil	SANDY LOAM	5	0	0	0	SUBANGULAR BLOCKY	WEAK	VERY FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	GRADUAL <5"	SMOOTH	FEW (5% MAX)	VERY FINE	NONE			BAG	11	S-1	
			GRAVEL	COBBLES	STONES	BOULDERS																		-
11-24	Dark Gray (10YR 4/1)	CLAY LOAM		0	0	0	SUBANGULAR BLOCKY	STRONG	COARSE	MOIST	VERY FRIABLE	SLIGHTLY STICKY	SLIGHTLY PLASTIC	GRADUAL <5"	SMOOTH	NONE		FEW 2%	FINE <5MM	FAINT	BAG	16	S-2	
			GRAVEL	COBBLES	STONES	BOULDERS																		-
24-102	Dark Gray (10YR 4/1)	SILT LOAM	0	0	0	0	PLATY	STRONG	COARSE	WET	VERY FRIABLE	MODERATELY STICKY	MODERATELY PLASTIC	GRADUAL <5"	SMOOTH	NONE		FEW 2%	FINE ⊲5MM	DISTINCT	BAG TUBE	55	S-3 T-1	A < 0.2 IPH B < 0.2 IPH
			GRAVEL	COBBLES	STONES	BOULDERS																		
102-135	Light Gray (2.5Y 6/1)	LOAMY SAND	ф	0	0	0	SUBANGULAR BLOCKY	WEAK	FINE	WET	LOOSE	NONSTICKY	NONPLASTIC			NONE		FEW 2%	FINE <5MM	FAINT	BAG	120	S-4	
							-																	
							-																	
							-																	
Additional Re	emarks: Test Pi	t Refusal due to continuous wet e	cave-in at ap	proximately 1	35 inches b	pelow the exist	Ling ground surfa	ace.		1			<u> </u>	1 1		1	<u> </u>		<u> </u>	<u> </u>		<u></u>	<u> </u>	

Laboratory Test Results

		Τι	ube Permea	meter 1	Fest Data	1			Job Number:	2841-99-001E
Sample ID:	Boring/T	est Pit No.:	SPP-2	Sample	e No.:	T-1	Depth:	35"	Project: Client: Lab Tech:	Proposed Residential Development Pallu Associates, LLC Chrvs Luna
MUNICIPALI	ΤY	Township o	of Marlboro		BLOCK	119	LOT	16		
1. Test Numb	ber	T1	Replicate (lett	ter)	А	Date Coll	ected _	8/19/2020		
2. Material T	ested:		_Fill	Х	Test in Na	ative Soil-Ir	ndicate Depth			
3. Type of Sa	ample:	X	Undisturbed			Disturbed				
4. Sample D	imensions:		Inside Radius Length of San	of Samp nple, L, ir	le Tube, R n inches	, in cm	1.91 4.00			
5. Bulk Dens	sity Determi	nation (Distu	rbed Samples	Only): N	N/A					
6. Sample W	/eight (Wt.	Tube Contai	ning Sample-W	/t. of Emp	pty Tube), g	grams				Wt. of Tube Containing Sample
7. Sample V	olume (L x	2.54 cm./incl	h x 3.14R2), cc				116.3831			
8. Bulk Dens	sity (Sample	e Wt./Sample	e Volume), grar	ms/cc.			0	> 1.2		
9. Standpipe	Used:	X	No		Yes, India	cate Interna	al Radius, cm.	N/A		
10. Height of	f Water Lev	el Above Rir	m of Test Basir	n, in inche	es:					
	At the Beg At the End	inning of Ead of Each Tes	ch Test Interval st Interval, H2	l, H1	5.00 4.00	<u> </u>				
11. Rate of V	Water Leve	Drop (Add a	additional lines	if needeo	d):					
	Time, Si Inte	tart of Test erval, T1	Time End c Interval	of Test T2	Length Interval,	n of Test T, Minutes				
	0:0	00:00	2:00:0	0		30				
	0:0	00:00	2:00:0	0		32	_			
	0:0	00:00	2:00:0	0	:	32	-			
12. Calculati	on of Perm K =	eability:	K, (in/hr) = 60 CI	min/hr x	r2/R2 x L(i ti on:	n)/T(min) x K2	In (H1/H2)	T= <u>32</u>	.0	
13. Defects i	in the Samp	ole (Check ap	opropriate item	s):						
	x	NONE								
		Soil/Tube C	ontact	_Large (Gravel		Large Root	S		
		Dry Soil	Sm	earing _		Compa	ction			
		Other - Spee	cify							

		Τι	ube Permeau	meter T	est Data	a			Job Number:	2841-99-001E
Sample ID:	Boring/T	est Pit No.:	SPP-2	Sample	e No.:	T-1	Depth:	35"	Project: Client: Lab Tech:	Proposed Residential Development Pallu Associates, LLC Chrvs Luna
MUNICIPALI	TY	Township o	f Marlboro		BLOCK	119	LOT	16		
1. Test Numb	ber	T1	Replicate (lett	er)	В	Date Colle	ected	8/19/2020		
2. Material T	ested:		Fill	Х	Test in Na	ative Soil-Ir	dicate Depth			
3. Type of Sa	ample:	X	Undisturbed	-		Disturbed				
4. Sample D	imensions:		Inside Radius Length of Sam	of Sampl nple, L, in	le Tube, R n inches	, in cm	1.91 3.50			
5. Bulk Dens	sity Determi	nation (Distu	rbed Samples	Only): N	I/A					
6. Sample W	/eight (Wt.	Tube Contai	ning Sample-W	t. of Emp	oty Tube), g	grams				Wt. of Tube Containing Sample
7. Sample V	olume (L x	2.54 cm./incl	n x 3.14R2), cc.				101.8353			
8. Bulk Dens	sity (Sample	e Wt./Sample	e Volume), gran	ns/cc.			0	> 1.2		
9. Standpipe	e Used:	x	No		Yes, India	cate Interna	al Radius, cm.	N/A		
10. Height of	f Water Lev	el Above Rir	n of Test Basin	, in inche	es:					
	At the Beg At the End	inning of Ea I of Each Tes	ch Test Interval st Interval, H2	, H1 _	5.00 4.00	<u>)</u>				
11. Rate of V	Nater Leve	l Drop (Add a	additional lines	if needed	d):					
	Time, Si Inte	tart of Test erval, T1	Time End o Interval	f Test T2	Length Interval,	n of Test T, Minutes				
	0:0	00:00	0:31:0	5	:	31				
	0:0	00:00	0:29:3	1	2	29	_			
	0:0	00:00	0:27:33	3	2	28	_			
12. Calculati	ion of Perm K =	eability:	K, (in/hr) = 60 Cla	min/hr x assificat	r2/R2 x L(i ion:	in)/T(min) x K2	In (H1/H2)	T= <u>28</u> .	0	
13. Defects i	in the Samp	ole (Check ap	opropriate items	s):						
	x	NONE								
		Soil/Tube C	ontact	_Large G	Gravel		_ Large Root	s		
		Dry Soil	Sme	earing		Compa	ction			
		Other - Spee	cify							

		Τι	ube Permea	meter T	est Data	1			Job Number:	2841-99-001E
Sample ID:	Boring/T	est Pit No.:	SPP-2	Sample	e No.:	T-2	Depth:	50"	Project: Client:	Proposed Residential Development Pallu Associates, LLC Chrys Luna
MUNICIPALI	TY	Township o	f Marlboro		BLOCK	119	LOT	16		
1. Test Numb	ber	T2	Replicate (lett	ter)	А	Date Coll	ected _	8/19/2020		
2. Material T	ested:		Fill	Х	Test in Na	ative Soil-Ir	ndicate Depth			
3. Type of Sa	ample:	x	Undisturbed	-		Disturbed				
4. Sample D	imensions:		Inside Radius Length of San	of Sampl nple, L, in	le Tube, R i inches	, in cm	1.91 4.00			
5. Bulk Dens	sity Determi	nation (Distu	rbed Samples	Only): N	I/A					
6. Sample W	/eight (Wt.	Tube Contai	ning Sample-W	/t. of Emp	oty Tube), g	grams				Wt. of Tube Containing Sample
7. Sample V	olume (L x	2.54 cm./incl	n x 3.14R2), cc				116.3831			
8. Bulk Dens	sity (Sample	e Wt./Sample	e Volume), grar	ms/cc.			0	> 1.2		
9. Standpipe	e Used:	x	No		Yes, Indie	cate Interna	al Radius, cm	N/A		
10. Height of	f Water Lev	vel Above Rir	n of Test Basir	n, in inche	s:					
	At the Beg At the End	inning of Ead I of Each Tes	ch Test Interval st Interval, H2	I, H1 _	5.00 4.50	<u> </u>				
11. Rate of V	Nater Leve	I Drop (Add a	additional lines	if needed	i):					
	Time, Si Inte	tart of Test erval, T1	Time End c Interval	of Test T2	Length Interval,	n of Test T, Minutes				
	0:0	00:00	2:00:0	0	1	20				
	0:0	00:00	2:00:0	0	1	20				
	0:0	00:00	2:00:0	0	1	20	-			
12. Calculati	ion of Perm	eability:	K, (in/hr) = 60	min/hr x	r2/R2 x L(i	n)/T(min) × K1	 : In (H1/H2)	T= <u>120</u>	.0	
13 Defects i	in the Samr	le (Check ar	propriate item	s).						
	x	NONE		-,-						
		Soil/Tube C	ontact	Large G	Gravel		Large Roo	S		
		Dry Soil	Sme	earing		Compa	ction			
		Other - Spec	cify	0						
		1.								

		Τι	ibe Permea	meter 1	Fest Data	a			Job Number:	2841-99-001E
Sample ID:	Boring/T	est Pit No.:	SPP-2	Sample	e No.:	T-2	_Depth:	50"	Project: Client: Lab Tech:	Proposed Residential Development Pallu Associates, LLC Chrys Luna
MUNICIPALI	ITY	Township o	f Marlboro		BLOCK	119	LOT	16		
1. Test Numb	ber	T2	Replicate (let	tter)	В	Date Colle	ected	3/19/2020		
2. Material T	Fested:		_Fill	Х	Test in Na	ative Soil-In	dicate Depth			
3. Type of S	ample:	x	Undisturbed			Disturbed				
4. Sample D	imensions:		Inside Radius Length of Sar	s of Samp mple, L, ir	ole Tube, R n inches	, in cm	1.91 4.00			
5. Bulk Dens	sity Determi	nation (Distu	rbed Samples	Only): N	N/A					
6. Sample V	Veight (Wt.	Tube Contair	ning Sample-W	Vt. of Emp	pty Tube), g	grams				Wt. of Tube Containing Sample Wt. of Empty Tube
7. Sample V	'olume (L x	2.54 cm./incl	n x 3.14R2), co	.			116.3831			
8. Bulk Dens	sity (Sample	e Wt./Sample	e Volume), grai	ms/cc.			0	> 1.2		
9. Standpipe	e Used:	x	No		Yes, Indi	cate Interna	al Radius, cm.	N/A		
10. Height o	f Water Lev	vel Above Rir	n of Test Basir	n, in inche	es:					
	At the Beg At the End	inning of Eac I of Each Tes	ch Test Interva at Interval, H2	al, H1	5.00 4.88)				
11. Rate of V	Water Leve	l Drop (Add a	additional lines	if needeo	d):					
	Time, S Inte	tart of Test erval, T1	Time End o Interval	of Test T2	Length Interval,	n of Test T, Minutes				
	0:0	00:00	2:00:0	00	>	120				
	0:0	00:00	2:00:0	00	>	120	_			
	0:0	00:00	2:00:0	00	>	120	_			
12. Calculati	ion of Perm	eability:	K, (in/hr) = 60) min/hr x	r2/R2 x L(i	in)/T(min) x	In (H1/H2)	T= > 12	20	
	K =	< 0.2	C	lassificat	tion:	K0				
13. Defects	in the Samp	ole (Check ap	- propriate item	ıs):						
	x	NONE		,						
		 Soil/Tube Co	ontact	Large (Gravel		Large Root	S		
		Dry Soil	Sm	earing _		Compa	ction			
		Other - Spec								

	Τι	ube Permeamete	r Test Data	а			Job Number:	2841-99-001E
Sample ID: Boring/T	Fest Pit No.:		ple No.:	T-1	Depth:	55"	Project: Client: Lab Tech:	Proposed Residential Development Pallu Associates, LLC Chrvs Luna
MUNICIPALITY	Township o	of Marlboro	BLOCK	119	LOT	16		
1. Test Number	T1	Replicate (letter)	Α	Date Coll	ected _	8/19/2020		
2. Material Tested:		Fill X	Test in N	ative Soil-Ir	ndicate Depth			
3. Type of Sample:	X	Undisturbed		Disturbed	I			
4. Sample Dimensions:		Inside Radius of Sa Length of Sample, I	mple Tube, R ., in inches	t, in cm	<u> 1.91</u> 3.50			
5. Bulk Density Determ	ination (Distu	urbed Samples Only)	N/A					
6. Sample Weight (Wt.	Tube Contai	ning Sample-Wt. of E	mpty Tube),	grams				Wt. of Tube Containing Sample
7. Sample Volume (L x	2.54 cm./incl	h x 3.14R2), cc.			101.8353			
8. Bulk Density (Sample	e Wt./Sample	e Volume), grams/cc.			0	> 1.2		
9. Standpipe Used:	X	No	Yes, Indi	icate Interna	al Radius, cm.	N/A		
10. Height of Water Lev	vel Above Rir	m of Test Basin, in in	ches:					
At the Beg At the End	ginning of Ead d of Each Tes	ch Test Interval, H1 st Interval, H2	5.00 5.00	<u>)</u>				
11. Rate of Water Leve	el Drop (Add a	additional lines if nee	ded):					
Time, S Inte	Start of Test erval, T1	Time End of Test Interval T2	Lengtl Interval,	h of Test T, Minutes				
0:	00:00	2:00:00	>	120				
0:	00:00	2:00:00	>	120	_			
0:	00:00	2:00:00	>	120	_			
12. Calculation of Perm	neability:	K, (in/hr) = 60 min/h	r x r2/R2 x L(in)/T(min) x	(In (H1/H2)	T= <u>> 12</u>	20	
K =	< 0.2	Classifi	cation:	K0				
13. Defects in the Samp	ple (Check ap	opropriate items):						
X	NONE							
	Soil/Tube C	ontactLarg	e Gravel		Large Root	s		
	Dry Soil	Smearing		Compa	ction			
	Other - Spee	cify						

Tube Permeameter Test Data Job									Job Number:	2841-99-001E
Sample ID:	Boring/T	est Pit No.:	SPP-4	Sample	No.:	T-1	Depth:	55"	Project: Client: Lab Tech:	Proposed Residential Development Pallu Associates, LLC Chrvs Luna
MUNICIPALI	ΤY	Township o	f Marlboro	B	BLOCK	119	LOT	16		
1. Test Number		T1	Replicate (letter)		В	Date Collected		8/19/2020		
2. Material Tested:			Fill	<u>x</u>	Test in Na	ative Soil-Ir	ndicate Depth			
3. Type of Sample:		X	Undisturbed	-		Disturbed				
4. Sample Dimensions: Inside Radius of San Length of Sample, L,				of Sample ple, L, in i	e Tube, R, inches	, in cm	<u> 1.91</u> 3.50			
5. Bulk Density Determination (Disturbed Samples Only): N/A										
6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams										Wt. of Tube Containing Sample
7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc.							101.8353			
8. Bulk Density (Sample Wt./Sample Volume), grams/cc. 0 > 1.2										
9. Standpipe Used: <u>x</u> No Yes, Indicate Internal Radius, cm. N/A										
10. Height of Water Level Above Rim of Test Basin, in inches:										
At the Beginning of Each Test Interval, H15.00At the End of Each Test Interval, H25.00						<u> </u>				
11. Rate of Water Level Drop (Add additional lines if needed):										
	Time, Si Inte	tart of Test erval, T1	Time End of Test Interval T2 Interval, T, Minutes							
	0:0	00:00	2:00:00)	>	120				
	0:0	00:00	2:00:00)	>	120	_			
	0:0	00:00	2:00:00)	>	120	_			
12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T = > 120 K = < 0.2										
13. Defects in the Sample (Check appropriate items):										
	x	NONE								
Soil/Tube ContactLarge GravelLarge Roots										
	Dry SoilSmearing Compaction									
	Other - Specify									