P201900287



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TESTING PROTOCOL FOR STORM WATER INFILTRATION BEST MANAGEMENT PRACTICES PERCOLATION TESTING IN A BORING.

PROJECT NUMBER: 17-13355

DATE: JANUARY 9, 2018

JOB SITE LOCATION:

PARCELS 1-4 INCLUSIVE OF PARCEL MAP # 18954: THE VICINITY OF THE SOUTH WEST CORNER OF HAVEN AVENUE AND SNOWDROP ROAD, RANCHO CUCAMONGA, SAN BERNARDINO COUNTY, CA.

PARENT APN: 0201-043-56-0000

PREPARED FOR:

MR. KIRK WALLACE (626) 255-6275 ALLERA PROPERTIES, LLC. 2403 CLIFF ROAD UPLAND, CA. 91784 VIA E-MAIL: <u>wallacekirk@yahoo.com</u>

THIS SUBMITTAL HAS BEEN PREPARED FOR THE PROJECT NOTED ABOVE. IF YOU HAVE ANY QUESTIONS PLEASE DO NOT HESITATE TO CT THE UNDERSIGNED AT YOUR CONVENIENCE.

Percolation Investigation AM/PAC AND ASSOCIATES, INC.

2900 Adams St., Suite C-35 • Riverside, CA 92504

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PROPOSED DEVELOPMENT:

THE CLIENT PROPOSES BUILDING CUSTOM HOMES ON EACH OF THE FOUR LOTS TESTED. A GRADING PLAN PREPARED BY CUBIT ENGINEERING WAS PROVIDED TO THIS OFFICE PRIOR TO TESTING. CODE COMPLIANCE REQUIRES A WQMP STORM WATER INFILTRATION PERCOLATION REPORT TO AID IN BMP DESIGN AND VERIFICATION OF THE BMP SIZING.

PURPOSE AND SCOPE OF THIS REPORT:

TO PROVIDE THE CLIENT WITH THE REQUIRED SOIL BORING AND INFILTRATION TESTING DATA NECESSARY TO COMPLY WITH THE COUNTY OF SAN BERNARDINO STORM WATER INFILTRATION BEST MANAGEMENT PRACTICES PROGRAM. THIS DATA IS REQUIRED AND USED TO VERIFY AND PROVE THE SITE SOILS EVALUATION.

METHODOLOGY OF TESTING:

TESTING WAS PERFORMED CONFORMING TO THE PUBLISHED GUIDELINES FROM THE "TECHNICAL GUIDANCE DOCUMENT FOR WATER QUALITY MANAGEMENT PLANS" COUNTY OF SAN BERNARDINO. PREPARED BY CDM SMITH, INC. DATED JUNE 7, 2013 AND APPROVED FOR USE, EFFECTIVE SEPTEMBER 19, 2013.

CITED AS APPENDIX D OF THE AFOREMENTIONED DOCUMENT IS "APPENDIX VII, INFILTRATION RATE EVALUATION PROTOCOL AND FACTOR OF SAFETY RECOMMENDATIONS". PER TABLE VII.1: RECOMMENDED INFILTRATION METHODS, METHODS FOR ESTABLISHING DESIGN INFILTRATION RATE; THE PERCOLATION TEST PROCEDURE (RIVERSIDE COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH) WAS USED.

TWO (2) PERCOLATION TESTS WERE PERFORMED IN THE IMMEDIATE AREA OF EACH OF THE FOUR PROPOSED INFILTRATION BASINS. ONE BASIN PER EACH BUILDING PARCEL. ALL TESTS WERE PERFORMED TO A TOTAL DEPTH OF 5' BELOW THE PROPOSED FINISHED GRADE. BORING DIAMETER IS 8". THE BASIN DEPTHS WERE NOTED ON THE GRADING PLAN PREPARED BY CUBIT ENGINEERING. A COPY OF THIS PLAN IS ATTACHED TO THIS REPORT.

PER SECTION VII., 1.3 "A NOTE ON "INFILTRATION RATE" VS. "PERCOLATION RATE", THE TESTED RATE HAS BEEN CONVERTED TO AN INFILTRATION RATE USING THE PORCHET METHOD OF CONVERSION. SEE THE DATA SHEETS ATTACHED.

CONCLUSIONS AND RECOMMENDATIONS:

THE EXCAVATED AND TESTED SOILS AT THE OBSERVED DEPTHS ARE HOMOGENEOUS AND CAN BE EXPECTED TO HAVE THE SAME OR VERY SIMILAR INFILTRATION, POROUS AND ABSORPTION QUALITIES. IT SHOULD BE NOTED THAT THE PORCHET METHOD OF CONVERSION HAS A FACTOR OF SAFETY OF 3 BUILT IN TO THE CALCULATIONS.

BORING LOGS:

- **TEST** 1:
- 0-5' G/M TAN, SILTY-FINE TO COARSE GRAINED SANDS, ABUNDANT ANGULAR GRAVELS, FIRM TO DENSE AND DRY.

TEST 2:

0-5' G/M TAN, SILTY-FINE TO COARSE GRAINED SANDS, ABUNDANT ANGULAR GRAVELS, DENSE AND DRY.

TEST 3:

0-5' G/M TAN, SILTY-FINE TO COARSE GRAINED SANDS, ABUNDANT ANGULAR GRAVELS, FIRM AND DRY

TEST 4:

0-5' G/M TAN, SILTY-FINE TO COARSE GRAINED SANDS, ABUNDANT ANGULAR GRAVELS, DENSE AND DRY

TEST 5:

0-5' G/M TAN, SILTY-FINE TO COARSE GRAINED SANDS, ABUNDANT ANGULAR GRAVELS, FIRM TO DENSE AND DRY.

TEST 6:

0-5' G/M TAN, SILTY-FINE TO COARSE GRAINED SANDS, ABUNDANT ANGULAR GRAVELS, DENSE AND DRY.

TEST 7:

0-5' G/M TAN, SILTY-FINE TO COARSE GRAINED SANDS, ABUNDANT ANGULAR GRAVELS, FIRM AND DRY

TEST 8:

0-5' G/M TAN, SILTY-FINE TO COARSE GRAINED SANDS, ABUNDANT ANGULAR GRAVELS, DENSE AND DRY

NO GROUNDWATER, EVIDENCE OF HIGH GROUNDWATER, SOIL MOTTLING, SOIL CONTAMINATION OR FILL MATERIAL WAS EVIDENT IN ANY SOIL BORING AT ANY DEPTH OBSERVED.

AM/PAC & ASSOCIATES, INC. PROJECT # 17-13355 DATE: JANUARY 9, 2018

TEST DATA:

TEST 1: 30:00 MINUTES PER INCH PERCOLATION RATE.

2.0 INCHES PER HOUR

USING THE PORCHET METHOD OF CONVERSION, THIS TRANSLATES TO 0.19 INCHES PER HOUR INFILTRATION RATE.

TEST 2: 30:00 MINUTES PER INCH PERCOLATION RATE.

2.0 INCHES PER HOUR

USING THE PORCHET METHOD OF CONVERSION, THIS TRANSLATES TO 0.19 INCHES PER HOUR INFILTRATION RATE.

TEST 3: 33:33 MINUTES PER INCH PERCOLATION RATE.

3.0 INCHES PER HOUR

USING THE PORCHET METHOD OF CONVERSION, THIS TRANSLATES TO 0.28 INCHES PER HOUR INFILTRATION RATE.

TEST 4: 30:00 MINUTES PER INCH PERCOLATION RATE.

2.4 INCHES PER HOUR

USING THE PORCHET METHOD OF CONVERSION, THIS TRANSLATES TO 0.22 INCHES PER HOUR INFILTRATION RATE.

TEST 5: 30:00 MINUTES PER INCH PERCOLATION RATE.

2.0 INCHES PER HOUR

USING THE PORCHET METHOD OF CONVERSION, THIS TRANSLATES TO 0.19 INCHES PER HOUR INFILTRATION RATE.

TEST 6: 30:00 MINUTES PER INCH PERCOLATION RATE.

2.0 INCHES PER HOUR

USING THE PORCHET METHOD OF CONVERSION, THIS TRANSLATES TO 0.19 INCHES PER HOUR INFILTRATION RATE.

AM/PAC & ASSOCIATES, INC. PROJECT # 17-13355 DATE: JANUARY 9, 2018

TEST 7: 33:33 MINUTES PER INCH PERCOLATION RATE.

3.0 INCHES PER HOUR

USING THE PORCHET METHOD OF CONVERSION, THIS TRANSLATES TO 0.28 INCHES PER HOUR INFILTRATION RATE.

TEST 8: 30:00 MINUTES PER INCH PERCOLATION RATE.

2.4 INCHES PER HOUR

USING THE PORCHET METHOD OF CONVERSION, THIS TRANSLATES TO 0.22 INCHES PER HOUR INFILTRATION RATE.

AVERAGES

26.25 MINUTES PER INCH PERCOLATION RATE

- 2.35 INCHES PER HOUR PERCOLATION RATE
- 0.22 INCHES PER HOUR PORCHET CONVERSION INFILTRATION RATE

ATTACHED TO THIS REPORT ARE SELECTED PAGES OF THE APPENDIX D REFERENCING THIS TYPE OF TESTING AND THE PROTOCOL AND PROCEDURE REQUIRED.

COPY OF SBDO GUIDELINES APPENDIX - D, SECTION VII

APPENDIX VII. INFILTRATION RATE EVALUATION PROTOCOL AND FACTOR OF SAFETY RECOMMENDATIONS

VII.1. Introduction

Soil characterization and infiltration testing is required in order to properly size and locate stormwater management facilities. The purpose of this appendix is to provide guidance for investigating infiltration at both the project planning and design phases, as well as provide requirements for applying a factor of safety to testing results.

VII.1.1. <u>Two phases of assessment</u>

The role of soil characterization and infiltration testing differs with the phase of project development as described below.

Site Assessment / Project Planning Phase: Soil characterization or infiltration testing may be conducted to determine if infiltration is a potentially feasible BMP and/or where on the site infiltration is potentially infeasible. The intent of this investigation is to identify if the project site, or a portion of the site, has soils that are clearly unsuitable for infiltration. For those sites or portions of the site where soils are unsuitable, infiltration BMPs can be eliminated from consideration. The intent of this testing is not to prove definitively that infiltration is feasible. Simpler methods may be used to determine infiltration potential at this phase. The observed infiltration rate is adjusted to account for the type of test and the uncertainty of the testing method and reported as the *measured infiltration rate* for the purpose of evaluating feasibility. These methods are not appropriate to determine the *design infiltration rate*.

Site Planning / Design Phase: Where infiltration BMPs are selected, infiltration testing must be conducted to determine the *design infiltration rate* of proposed facilities, except in limited cases where infiltration rate is presumed to be sufficient as identified in Section VII.1.2. The required size of the proposed facilities strongly depends on the design infiltration rate; therefore, testing may be required at the preliminary site design phase to facilitate site planning. However, infiltration testing must be conducted as close to the proposed facility as possible, therefore, conducting testing after preliminary site design also has merits. Use of more sophisticated methods at this phase allows better confidence in testing and therefore a lower factor of safety on observed infiltration rates (and therefore smaller facility designs). Factors of safety are discussed in VII.4.

Soil characterization and infiltration testing can be considered to fulfill two functions:

- Determine where infiltration is potentially feasible and must be considered (if other limitations, such as depth to groundwater or contamination, do not restrict infiltration). This role is satisfied through simple infiltration tests, or use of maps and available data.
- 2. Determine the design infiltration rate for proposed facilities. This function is satisfied through more sophisticated investigation methods, conducted by a qualified professional.

 Table VII.1 provides required methods of assessing infiltration rate for each purpose.

Methods for Identifying Areas Potentially Feasible for Infiltration	 Use of Regional Maps and "Available Data"¹ OR Simple Open Pit Infiltration Test OR Any of the testing methods used to establish design infiltration rate (below)
Methods for Establishing Design Infiltration Rate	 Open Pit Falling Head Procedure Single Ring Infiltrometer Test Double Ring Infiltrometer Test Well Permeameter Method (USBR Procedure 7300- 89) Percolation Test Procedure (Riverside County Department of Environmental Health) Other analysis methods at the discretion of the project engineer and approval of the reviewing agency

Table VII.1: Recommended Infiltration Investigation Methods

Available data is defined in Section VII.2 below and does not require additional investigation.

VII.1.2. Waiver of Infiltration Testing Requirements

The infiltration testing requirements described in this appendix are not applicable for certain combinations of BMP type and general soil condition. In cases where available soils information indicates that the soils are clearly sufficient to support the level of infiltration required for proper function of the BMP and uncertainty in infiltration rate would not significantly influence the performance of the practice, it is not mandatory to conduct infiltration testing. Conditions under which infiltration testing requirements are waived include:

- Impervious area dispersion (See HSC-2: Impervious Area Dispersion): Testing requirements are waived for this BMP for all soil types. Soil amendments are required to use this practice where site soils are hydrologic soil group C or D.
- Localized on-lot infiltration (See HSC-1: Localized On-Lot Infiltration): Testing requirements are waived for this BMP for A, B, and C soil types if soil type and general drainage conditions are confirmed with site-specific information. This BMP is not suitable for D soils unless infiltration testing demonstrates that the ponded depth would drain within 24 hours.
- Porous pavement designed to be self-retaining (See INF-6: Permeable Pavement (concrete, asphalt, and pavers)): Testing requirements for this BMP are waived for A, B, and C soil types if soil type and general drainage conditions are confirmed with site-specific information. This waiver does not apply to porous pavement that accepts run-on from a tributary area larger than 50 percent of its area.
- Bioinfiltration (See INF-4: Bioinfiltration Fact Sheet). Based on the LID BMP hierarchy, this type of BMP may only be used if infiltration of the full DCV is not feasible; therefore exploratory infiltration rate assessment (Section VII.2) is required. However, testing to determine design infiltration rate (Section VII.3) is not required. See Appendix XI for instructions for sizing the infiltration component of a bioinfiltration BMP to achieve maximum feasible infiltration.

VII.1.3. <u>A Note on "Infiltration Rate" vs. "Percolation Rate"</u>

A common misunderstanding is that the "percolation rate" obtained from a percolation test is equivalent to the "infiltration rate" obtained from a single or double ring infiltrometer test. While the percolation rate is related to the infiltration rate, percolation rates tend to overestimate infiltration rates and can be off by a factor of ten or more because they incorporate both downward and horizontal fluxes of water, whereas infiltration only refers to a downward flux of water. When using borehole-type methods, the percolation rate obtained shall be converted to a reasonable estimate of the infiltration rate using the Porchet Method (aka Inverse Borehole Method) (See Example VII.1).

VII.1.4. Grading Plans

Many projects require a significant amount of grading prior to their construction. It is important to determine if the BMP will be placed in cut or fill since this may affect the performance of the BMP or even the soil. As such, preliminary site grading plans showing the proposed BMP locations are required along with section views through each BMP clearly identifying the extents of cut or fill. In addition, since it is imperative that any testing be performed at the proper elevations and locations, it is highly recommended that the preliminary site grading plans be provided to the engineer/geologist prior to any tests being performed.

VII.1.5. Cut Condition

Where the proposed infiltration BMP is to be located in a cut condition, the infiltration surface level at the bottom of the BMP might be far below the existing grade. For example, if the

VII.3.8. <u>Percolation Test Procedure</u>

The percolation test procedure below (per Riverside County Department of Environmental Health) should only be performed by those individuals trained and educated to perform, understand and evaluate the field conditions and tests. This would include those who hold one of the following State of California credentials and registrations: Professional Civil and Geotechnical Engineers, Certified Engineering Geologist and Certified Hydrogeologist.

The procedure for this test varies, depending on the depth of the hole to be used. Procedures for both scenarios (less than 10 feet or 10 - 40 feet deep) and diagrams (Figure VII.15 to Figure VII.17) are included below. When the percolation testing has been completed, a 3 foot long surveyor's stake (lath) shall be flagged with highly visible banner tape and placed in the location of the test indicating date, test hole number as shown on the field data sheet, and firm performing the test.

VII.3.8.1. Shallow Percolation Test (less than 10 feet)

Test Preparation

- 1) The test hole opening shall be between 8 and 12 inches in diameter or between 7 and 11 inches on each side if square.
- 2) The bottom elevation of the test hole shall correspond to the bottom elevation of the proposed basin (infiltration surface). Keep in mind that this procedure will require the test hole to be filled with water to a depth of at least 5 times the hole's radius.
- 3) The bottom of the test hole shall be covered with 2 inches of gravel.
- 4) The sides of the hole shall remain undisturbed (not smeared) after drilling and any cobbles encountered left in place.
- 5) **Pre-soaking** shall be used with this procedure. Invert a full 5 gallon bottle (more if necessary) of clear water supported over the hole so that the water flow into the hole holds constant at a level at least 5 times the hole's radius above the gravel at the bottom of the hole. Testing may commence after all of the water has percolated through the test hole or after 15 hours has elapsed since initiating the pre-soak. However, to assure saturated conditions, testing must commence no later than 26 hours after all pre-soak water has percolated through the test hole. The use of the "continuous pre-soak procedure" is no longer accepted. When sandy soils (as described below) are present, the test shall be run immediately.

Test Procedure

Test hole shall be carefully filled with water to a depth equal to at least 5 times the hole's radius (H/r>5) above the gravel at the bottom of the test hole prior to each test interval.

- In sandy soils, when 2 consecutive measurements show that 6 inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Measurements shall be taken with a precision of 0.25 inches or better. The drop that occurs during the final 10 minutes is used to calculate the percolation rate. Field data must show the two 25 minute readings and the six 10 minute readings.
- In **non-sandy soils**, obtain at least twelve measurements per hole over at least six hours with a precision of 0.25 inches or better. From a fixed reference point, measure the drop in water level over a 30 minute period for at least 6 hours, refilling after every 30 minute reading. The total depth of the hole must be measured at every reading to verify that collapse of the borehole has not occurred. The drop that occurs during the final reading is used to calculate the percolation rate.

Figure VII.15. Test Pit for Shallow Percolation Test



VII.3.8.2. Deep Percolation Test (10 - 40 feet)

Test Preparation

Example VII.1: Percolation Rate Conversion Example

(Porchet Method, aka Inverse Borehole Method):

The bottom of a proposed infiltration basin would be at 5.0 feet below natural grade. Percolation tests are performed within the boundaries of the proposed basin location with the depth of the test hole set at the infiltration surface level (bottom of the basin). The Percolation Test Data Sheet (Table 5) is prepared as the test is being performed. After the minimum required number of testing intervals, the test is complete. The data collected at the final interval is as follows:

Time interval, $\Delta t = 10$ minutes Final Depth to Water, D_f = 13.75 inches ¹³Test Hole Radius, r = 4 inches Initial Depth to Water, $D_0 = 12.25$ inches Total Depth of Test Hole, $D_T = 60$ inches

The conversion equation is used:

$$l_t = \frac{\Delta H(60r)}{\Delta t(r+2H_{avg})}$$

"H_•" is the initial height of water at the selected time interval.

 $H_o = D_T - D_0 = 60 - 12.25 = 47.75$ inches

" H_{f} " is the final height of water at the selected time interval.

 $H_f = D_T - D_0 = 60 - 13.75 = 46.25$ inches

" Δ H" is the change in height over the time interval.

 $\Delta H = \Delta D = H_o - H_f = 47.75 - 46.25 = 1.5$ inches

" H_{avg} " is the average head height over the time interval.

 $H_{avg} = (H_o - H_f)/2 = (47.75 - 46.25)/2 = 47.0$ inches

" I_t " is the tested infiltration rate.

$$I_t = \frac{\Delta H(60r)}{\Delta t(r+2H_{avg})} = \frac{(1.5 in)(\frac{60 \min}{hr})(4 in)}{(10 \min)((4 in) + 2(47 in))} = 0.37 in/hr$$

¹³ Where a rectangular test hole is used, an equivalent radius should be determined based on the actual area of the rectangular test hole (i.e., $r = (A/\pi)^{0.5}$).

APPENDIX – B

PERCOLATION TEST DATA SHEETS AND PORCHET **CONVERSION SPREAD SHEETS**

Percolation Test Data Sheet								
Project:	INFILTE	ALIDY	Project No:	17-133	155	Date:	1-9-18	
Test Hole N	0:	1	Tested By:	D. BAL	LINHER			
Depth of Te	st Hole, D _T :	60"	USCS Soil Cl	assification:	G/m			
	Test Hole	Dimension	s (inches)		Length	Width		
Diameter	(if round)=	8"	Sides (if re	ctangular)=	-	-		
Sandy Soil C	ndy Soil Criteria Test*							
							Greater	
			Time	Initial	Final	Change in	than or	
			Interval,	Depth to	Depth to	Water	Equal to 6"?	
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(y/n)	
1	Pres	oak bi	Dree	NIGHT				
2								
*If two cons	ecutive mea	surements	show that six	(inches of w	ater seeps a	way in less t	han 25	
minutes, th	e test shall b	e run for an	additional h	our with me	asurements	taken every	10 minutes.	
Other wise,	pre-soak (fi	ll) overnight	. Obtain at le	east twelve i	measuremer	nts per hole (over at least	
six hours (a	pproximatel	y 30 minute	intervals) wi	th a precisio	on of at least	0.25".		
			Δt	Do	Df	ΔD		
			Time	Initial	Final _	Change in	Percolation	
			Interval	Depthio	Depth to	Water	Rate	
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(min./in.)	
1	0810	0840	30	20	17.3	2.7		
2	0845	0915	30	20	17.5	2.5		
3	0920	0940	30	20	17.8	2.2		
4	0945	1015	30	20	18.0	2.0		
5	1020	1050	30	20	18.2	1.8	Í	
6	1055	1125	30	20	18.5	1.5		
7	1130	1200	30	20	18.5	1.5		
8	12.05	1235	30	20	18.7	1.3		
9	1240	1310	30	20	18.8	1.2		
10	1315	1345	30	20	18.9	1.1		
11	1350	1420	30	20	19.0	1.0		
12	1425	1455	30	20	19.0	1.0	30:00 mp;	
13		•						
14								
15								
COMMENTS	: R= 4	", 4×	5 = 20	" OF	WATER			

Project:	INFILTE	ATTON	Project No:	17-133	55	Date:	1-9-1B
Test Hole N	0:	2	Tested By:	D. RAI	LINGER		
Depth of Te	st Hole. D-:	100	USCS Soil Cl	assification:	Glm		
	Test Hole	- Dimension	s (inches)		Length	Width	
Diameter	(if round)=	8"	Sides (if re	ctangular)=	-	-	
Sandy Soil C	criteria Test ^a						1
							Greater
			Time	Initial	Final	Change in	than or
			Interval,	Depth to	Depth to	Water	Equal to 6"
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(y/n)
1	Pres	DAKED	DIERN	14#1			
2							
*If two cons	ecutive mea	asurements	show that six	inches of w	ater seeps a	way in less t	han 25
minutes, th	e test shall b	be run for an	additional h	our with me	asurements	taken every	10 minutes
Other wise,	pre-soak (fi	II) overnight	. Obtain at le	east twelve r	measuremer	nts per hole	over at leas
six hours (a	pproximatel	y 30 minute	intervals) wi	th a precisio	n of at least	0.25".	
			∆t	Do	D _f	ΔD	
			Time	Initial	Final	Change in	Percolation
			Interval	Depth to	Depth to	Water	Rate
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(min./in.)
1	0813	0843	30	20	11.3	2.7	1
2	0848	0918	30	20	17.6	2.4	
3	0923	0943	30	20	17.9	Z.1	
4	0948	1018	30	Zo	18.2	1.8	
5	1023	1053	30	20	18.4	1.6	
6	1058	1128	30	20	18.6	1.4	
7	133	1203	30	20	18.7	1.3	
8	1208	1235	30	20	18.7	1.3	
9	1243	1313	30	20	18.8	1.2	
10	1318	1348	30	20	19.0	1.0	
	1353	1423	30	20	19.0	1.0	
11	1428	1458	30	20	19.0	1.0	30:00 mpi
11 12							
11 12 13							
11 12 13 14							
11 12 13 14 15							

Percolation Test Data Sheet								
Project:	INFILTE	ANDIN	Project No:	17-133	155	Date:	1-9-18	
Test Hole N	0:	3	Tested By:	D. BAL	LINGER			
Depth of Te	st Hole, D _T :	60"	USCS Soil Cl	assification:	G/M			
	Test Hole	Dimension	s (inches)		Length	Width		
Diameter	(if round)=	8"	Sides (if re	ctangular)=	-	-		
Sandy Soil C	Sandy Soil Criteria Test*							
							Greater	
			Time	Initial	Final	Change in	than or	
			Interval,	Depth to	Depth to	Water	Equal to 6"?	
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(y/n)	
1	Pres	oaked	Dierk	1045				
2								
*If two cons minutes, th Other wise	ecutive mea e test shall b pre-soak (fi	asurements : be run for an II) overnight	show that six additional h	c inches of w our with me	ater seeps a asurements	way in less t taken every	han 25 10 minutes. over at least	
six hours (a	nrovimatel	v 20 minuta	intervals) wi	ith a provisio	n of at least	ר איז		
Six nours (a	phoximatei	y so minute		D.		Δ.2.3		
			Time	Initial	Final	Change in	Percelation	
			Intenral	Denth to	Denth to	Water	Rato	
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in)	(min /in)	
1	10811	1846	30	20	17.3	7.7		
2	1)851	(9971	30	Zo	17.10	2.4		
3	0924	0956	30	Zo	17.8	Z.2		
4	1000	1030	30	70	18.1	1.9		
5	1/34	1104	30	20	18.4	1.4		
6	1108	1118	30	20	18.4	1.4	1	
7	1121	1151	30	ZD	18.8	1.2	1	
8	1154	1226	30	20	18.8	1.2		
9	1230	1300	30	20	18.9	1.1		
10	1305	1335	30	20	19.0	1.0		
11	/339	1419	30	20	19.0	1.0		
12	1424	1454	30	20	19.1	, 9	33.33 moi	
13							J	
14								
15								
COMMENTS	* R=4	445	= 20"	of war	TOL			

Project:	INFILTE	ATTOIN	Project No:	17-133	55	Date:	1-9-18
Test Hole N	0:	4	Tested By:	D. BAL	LINGER		
Depth of Te	st Hole, D _T :	60"	USCS Soil Cl	assification:	on: G/m		
	Test Hole	e Dimension	s (inches)		Length Width		
Diameter	(if round)=	8"	Sides (if re	ctangular)=			
Sandy Soil C	Criteria Test ^a						
							Greater
			Time	Initial	Final	Change in	than or
			Interval,	Depth to	Depth to	Water	Equal to 6"
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(y/n)
1	Pre.	roaked	Dre	ENIGHT	-		
2							
*If two cons	ecutive mea	surements	show that six	inches of w	ater seeps a	way in less t	han 25
minutes, the	e test shall b	e run for an	additional h	our with me	asurements	ta <mark>ken ever</mark> y	10 minutes
Other wise,	pre-soak (fi	ll) overnight	. Obtain at le	east twelve r	neasuremer	nts per hole	over at leas
		aa i i	intorvale) wi	th a preside		0.051	
six hours (aj	pproximatel	y 30 minute	incervais; wi	in a precisio	n of at least	0.25	
six hours (aj	pproximatel	y 30 minute	Δt	D _o	D _f	ΔD	
six hours (aj	pproximatel	y 30 minute	Δt Time	D _o Initial	D _f Final	ΔD Change in	Percolatio
six hours (aj	pproximatel	y 30 minute	Δt Time Interval	D _o Initial Depth to	D _f Final Depth to	ΔD Change in Water	Percolatio Rate
six hours (aj Trial No.	pproximatel Start Time	y 30 minute Stop Time	Δt Time Interval (min.)	D₀ Initial Depth to Water (in.)	D _f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolatio Rate (min./in.)
six hours (a Trial No.	Start Time	Stop Time	Δt Time Interval (min.) 30	D₀ Initial Depth to Water (in.) 20	Depth to Uater (in.)	D.25". ΔD Change in Water Level (in.) Ζ. L	Percolatio Rate (min./in.)
six hours (a Trial No. 1	Start Time	Stop Time	Δt Time Interval (min.) 30 30	D₀ Initial Depth to Water (in.) 20	Depth to Water (in.) 신 7. 나	D.25". ΔD Change in Water Level (in.) Z · L Z · 3	Percolation Rate (min./in.)
six hours (a Trial No. 1 2 3	Start Time	Stop Time 0850 0925 0959	Δt Time Interval (min.) 30 30	D₀ Initial Depth to Water (in.) 20 20	Depth to Water (in.)	Level (in.) Z · 4 Z · 3 Z · 0	Percolatio Rate (min./in.)
Six hours (a) Trial No. 1 2 3 4	Start Time 0820 0855 0929 1004	Stop Time 0850 0925 0959 1034	Δt Time Interval (min.) 30 30 30	D₀ Initial Depth to Water (in.) 20 20 20 20	Depth to Water (in.) (7.4 (7.7 (8.0) (8.0	ΔD Change in Water Level (in.) Z · 4 Z · 3 Z · 0	Percolatio Rate (min./in.)
Six hours (a) Trial No. 1 2 3 4 5	Start Time 0820 0855 0929 1004 1038	Stop Time 0850 0925 0959 1034 1108	ΔtTimeInterval(min.)3030303030	D _o Initial Depth to Water (in.) 20 20 20 20	Depth to Water (in.) (7.4) (7.7) (8.0) (8.4)	ΔD Change in Water Level (in.) Z·4 Z·3 Z·0 J·6	Percolatio Rate (min./in.)
six hours (a) Trial No. (1) 2 3 4 5 6	Start Time 0820 0855 0929 1004 1038 1113	Stop Time 0850 0925 0959 1034 1108 1143	ΔtTimeInterval(min.)30303030303030	$ \begin{array}{r} D_{o} \\ Initial \\ Depth to \\ Water (in.) \\ Zo $	Depth to Water (in.) (7.4 (7.7 (8.0 (8.4 (8.4) (8.5	ΔD Change in Water Level (in.) Z · L Z · O Z · O J · O I · G	Percolatio Rate (min./in.)
six hours (a) Trial No. (1) 2 3 4 5 6 7	Start Time 0820 0855 0929 1004 1038 1113 1149	Stop Time 0850 0925 0959 1034 1143 1143 1217	Δt Time Interval (min.) 30	$ \begin{array}{c} D_{o} \\ Initial \\ Depth to \\ Water (in.) \\ 2 o \\$	Depth to Water (in.) [7.4] [7.4] [7.7] [8.0 [8.0 [8.4] [8.5] [8.5] [8.5]	ΔD Change in Water Level (in.) Z · L Z · 3 Z · 0 J · 0 / · 6 / · 5	Percolatio Rate (min./in.)
six hours (a) Trial No. (1) 2 3 4 5 6 7 8	Start Time 0820 0855 0929 1004 1038 1113 1149 1223	Stop Time 0850 0925 0959 1034 1143 1143 1217 1253	Δt Time Interval (min.) 30	D _o Initial Depth to Water (in.) 20 20 20 20 20 20 20 20	Dr of at least Dr Final Depth to Water (in.) (7.4 (7.7 (8.0) (8.0 (8.4) (8.5) (8.5 (8.5) (8.5) (8.5)	ΔD Change in Water Level (in.) Z · L Z · 3 Z · 0 J · 6 / · 5 / · 4	Percolatio Rate (min./in.)
six hours (a) Trial No. 1 2 3 4 5 6 7 8 9	Start Time 0820 0820 0929 /004 /038 ///3 ///3 ///3 ///49 /223 /258	Stop Time 0850 0925 0959 1034 1143 1217 1253 1308	Δt Time Interval (min.) 30	D_0 Initial Depth to Water (in.) 20 20 20 20 20 20 20 20	Dr of at least Dr Final Depth to Water (in.) [7.4] [7.7] [8.0 [8.0 [8.4] [8.5] [8.5] [8.5] [8.5] [8.5] [8.5] [8.6] [8.6]	ΔD Change in Water Level (in.) Z · L Z · O Z · O J · O /· G /· 5 /· 4 /· 2	Percolatio Rate (min./in.)
six hours (a) Trial No. (1) 2 3 4 5 6 7 8 9 9 10	Start Time 0820 0855 0929 1004 1038 1113 1149 1223 1258 1314	Stop Time 0850 0925 0959 1034 1143 1217 1253 1308 1.344	Δt Time Interval (min.) 30 30 30 30 30 30 30 30 30 30	D_0 Initial Depth to Water (in.) 20 20 20 20 20 20 20 20	$\begin{array}{c} D_{f} \\ Final \\ Depth to \\ Water (in.) \\ 17.4 \\ 17.7 \\ 18.0 \\ 18.0 \\ 18.4 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.6 \\ 18.6 \\ 18.6 \\ 18.6 \\ 18.6 \\ 18.6 \\ 18.6 \\ 18.6 \\ 18.6 \\ 18.8 \\ 18.6 \\ 18.8 \\ 18.$	ΔD Change in Water Level (in.) Z · L Z · C Z · O J · O /· 5 /· 4 /· 2	Percolatio Rate (min./in.)
six hours (a) Trial No. (1) (2) (3) (4) (5) (6) (7) (6) (7) (6) (7) (8) (9) (10) (11)	Start Time 0820 0855 0929 1004 1038 1113 1149 1223 1258 1314 1350	Stop Time 0850 0925 0959 1034 1143 1143 1217 1253 1308 1308 1344 1420	Δt Time Interval (min.) 30 30 30 30 30 30 30 30 30 30	D _o Initial Depth to Water (in.) 20 20 20 20 20 20 20 20 20 20 20 20 20	$\begin{array}{c} D_{f} \\ Final \\ Depth to \\ Water (in.) \\ 17.4 \\ 17.7 \\ 18.0 \\ 18.4 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.6 \\ 18.6 \\ 18.6 \\ 18.6 \\ 19.0 \\ 19.0 \end{array}$	ΔD Change in Water Level (in.) Z · L Z · 3 Z · 0 J · 6 / · 4 / · 4 / · 2 / · 2 / · 2	Percolatio Rate (min./in.)
Trial No. Trial No. 1 2 3 4 5 6 7 8 9 10 11 12	Start Time 0820 0820 0929 1004 1038 1113 1149 1223 1258 1314 1350 1425	Stop Time 0850 0925 0959 1034 1143 1217 1253 1308 1.344 1420 1455	Δt Time Interval (min.) 30 30 30 30 30 30 30 30 30 30	D_0 Initial Depth to Water (in.) 20 20 20 20 20 20 20 20	$\begin{array}{c} D_{f} \\ Final \\ Depth to \\ Water (in.) \\ 17.4 \\ 17.7 \\ 18.0 \\ 18.0 \\ 18.4 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.6 \\ 18.6 \\ 18.6 \\ 19.0 \\ 19.0 \\ 19.0 \\ 19.0 \\ 19.0 \end{array}$	ΔD Change in Water Level (in.) Z · L Z · 3 Z · 0 Z · 0 J · 0 / · 4 / · 2 / · 2 / · 2 / · 2 / · 2 / · 2 / · 2 / · 2 / · 0	Percolatio Rate (min./in.)
six hours (a) Trial No. (1) (2) (3) (4) (5) (6) (7) (6) (7) (7) (8) (9) (10) (11) (11) (12) (13)	Start Time 0820 0855 0929 1004 1038 1113 1149 1223 1258 1314 1350 1425	Stop Time 0850 0925 0959 1034 1143 1217 1253 1308 1308 1344 1420 1455	Δt Time Interval (min.) 30 30 30 30 30 30 30 30 30 30	D_0 Initial Depth to Water (in.) 20 20 20 20 20 20 20 20	$\begin{array}{c} D_{f} \\ Final \\ Depth to \\ Water (in.) \\ 17.4 \\ 17.7 \\ 8.0 \\ 18.0 \\ 18.4 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.6 \\ 18.6 \\ 19.0 \\ 19.0 \\ 19.0 \\ 19.0 \\ 19.0 \\ 19.0 \end{array}$	ΔD Change in Water Level (in.) Z · L Z · 3 Z · 0 J · 0 / · 4 / · 2 / · 2	Percolatio Rate (min./in.)
six hours (a) Trial No. (1) (2) (3) (4) (5) (6) (7) (6) (7) (7) (8) (7) (7) (8) (7) (7) (8) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7	Start Time 0820 0855 0929 1004 1038 1113 1149 1223 1258 1314 1350 1425	Stop Time 0850 0925 0959 1034 1143 1143 1217 1253 1308 1308 1344 1420 1455	Δt Time Interval (min.) 30 </td <td>D_o Initial Depth to Water (in.) 2o 2o 2o 2o 2o 2o 2o 2o</td> <td>$\begin{array}{c} D_{f} \\ Final \\ Depth to \\ Water (in.) \\ 17.4 \\ 17.7 \\ 18.0 \\ 18.0 \\ 18.4 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.6 \\ 18.6 \\ 19.0 \\ 19.0 \\ 19.0 \\ 19.0 \\ 19.0 \end{array}$</td> <td>ΔD Change in Water Level (in.) Z · L Z · 3 Z · 0 Z · 0 J · 5 / · 4 / · 4 / · 2 J · 0 J · 0 J · 0</td> <td>Percolatio Rate (min./in.)</td>	D_o Initial Depth to Water (in.) 2o 2o 2o 2o 2o 2o 2o 2o	$\begin{array}{c} D_{f} \\ Final \\ Depth to \\ Water (in.) \\ 17.4 \\ 17.7 \\ 18.0 \\ 18.0 \\ 18.4 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.5 \\ 18.6 \\ 18.6 \\ 19.0 \\ 19.0 \\ 19.0 \\ 19.0 \\ 19.0 \end{array}$	ΔD Change in Water Level (in.) Z · L Z · 3 Z · 0 Z · 0 J · 5 / · 4 / · 4 / · 2 J · 0 J · 0 J · 0	Percolatio Rate (min./in.)

· ·	Percolation Test Data Sheet								
Project:	INFILTE	ATTON	Project No:	17-133	55	Date:	1-9-18		
Test Hole N	0;	5	Tested By:	D. BAL	LINHER				
Depth of Te	st Hole, D _T :	60"	USCS Soil Cl	assification:	G/M				
	Test Hole	Dimension	s (inches)		Length	Width			
Diameter	(if round)=	8"	Sides (if re	ctangular)=	-	-			
Sandy Soil C	riteria Test ^a								
							Greater		
			Time	Initial	Final	Change in	than or		
			Interval,	Depth to	Depth to	Water	Equal to 6"?		
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(y/n)		
1	Pres	OAKED	Over	NIGHT					
2									
minutes, th Other wise, six hours (a)	e test shall k pre-soak (fi pproximatel	e run for an II) overnight y 30 minute	additional h . Obtain at le intervals) wi	our with me east twelve i ith a precisic	asurements measurements on of at least	taken every hts per hole 0.25".	10 minutes. over at least		
			Δt	Do	Df	ΔD			
			Time	Initial	Final	Change in	Percolation		
			Interval	Depth to	Depth to	Water	Rate		
Trial Ne.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(min./in.)		
1	0824	0856	30	20	17.3	Z.1			
2	0900	0930	30	20	17.7	Z.3			
3	0934	1004	30	20	18.D	20			
4	1008	1038	30	20	18.3	1.7			
5	1043	1113	30	20	18.3	1.7			
6	1117	1147	30	20	18.5	1.5			
7	1154	1224	30	20	8.5	1.5			
8	1230	1300	30	20	18.7	1.3			
9	1304	1334	30	20	8.8	1.2			
10	1340	1410	30	20	18.9	1.1			
11	1415	1445	30	20	[9.0	1.0			
12	1448	1518	30	20	19.0	1.0	30:00 mpi		
13							1		
14									
15									
COMMENTS	* R=	4",	4×5=	20" OF	- WATCH	_			

		Perc	colation To	est Data S	heet		
Project:	INFILTE	ALIDIA	Project No:	17-133	55	Date:	1-9-18
Test Hole N	0:	4	Tested By:	D. BAL	LINGER		
Depth of Te	st Hole, D _T :	60"	USCS Soil Cl	assification:	G/m		
	Test Hole	Dimension	s (inches)		Length	Width	
Diameter	(if round)=	8"	Sides (if re	ctangular)=	tangular)= <u> </u>		
Sandy Soil C	Criteria ⊤est*					1	
							Greater
			Time	Initial	Final	Change in	than or
			Interval,	Depth to	Depth to	Water	Equal to 6"
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(y/n)
1	Pre s	DAKED	Over	NIGHT			
2							
*If two cons	ecutive mea	surements	show that six	inches of w	ater seeps a	way in less t	han 25
minutes, th	e test shall b	e run for an	additional h	our with me	asurements	taken every	10 minutes
Other wise,	pre-soak (fi	ll) overnight	. Obtain at le	east tw <mark>elve</mark> i	measuremer	nts per hole	over at leas
six hours (aj	pproximatel	y 30 minute	intervals) wi	th a precisio	n of at least	0.25".	
			∆t	Do	Df	ΔD	
			Time	Initial	Final	Change in	Percolatio
			Intervai	Depth to	Depth to	Water	Rate
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(min./in.)
1	0880	0900	30	20	17.0	3.0	/
2	0905	0935	30	20	17.3	2.7	7
3	0940	1010	30	20	17.6	2.4	
4	1015	1045	30	20	17.9	2.1	
5	1050	1120	30	20	18.3	1.1	
6	1125	1155	30	20	18.5	1.5	
7	1159	1229	30	20	18.5	1.5	
8	1234	1304	30	20	18.7	1.3	
9	1308	1338	30	20	18.8	1.2	
10	1342	1412	30	20	19.0	1.0	
11	1414	1446	30	20	18.9	1.1	/
12	1452	1522	30	20	19.0	1.0	30:00 ME
13							
14							
15							
COMMENTS	R=4	", 4×	5 = 20	o" 0F	DATER		

Project:	INFIITD.	ANDIN	Project No.	17-133	55	Date:	1-9.10	
Test Hole N	0:	7	Tested By:	D. Ra	1 ulber	Dates	1 1 10	
Depth of Te	st Hole D.	100"		assification	Falas			
Deptitorite	Tost Holy		c (inchos)		Longth			
Diameter	(if round)-		Sides (if re	ctangular)-			1	
Sandy Soil (riteria Test ^a		Jues (IITe	ccangular/-				
banay ben e							Greater	
			Time	Initial	Final	Change in	than or	
			Interval.	Depth to	Depth to	Water	Equal to 6"	
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(v/n)	
1	Pres	Endle and	Den	LHT	(,		(1)-1	
2			CNESS					
*If two cons	secutive mea	surements	show that six	inches of w	ater seeps a	way in less t	than 25	
minutes, th	e test shall b	oe run for an	additional h	our with me	asurements	taken every	10 minutes	
Other wise,	pre-soak (fi	ll) overnight	. Obtain at le	east twelve r	neasuremer	nts per hole	over at leas	
six hours (a	pproximatel	y 30 minute	intervals) wi	th a precisio	n of at least	0.25".		
			Δt	Do	D _f	ΔD		
			Time	Initial	Final	Change in	Percolatio	
			Interval	Depth to	Depth to	Water	Rate	
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(min./in.)	
1	0835	0905	30	20	17.4	Z.4		
	-	1939	30	20	17.7	2.3	/	
2	0909	0_01					1 /	
2	0909	1015	30	20	18.0	2.0		
2 3 4	0909 0945 1020	1015 1050	30 30	20 20	18.0	2.0		
2 3 4 5	0909 0945 1020 1055	1015 1050 1125	30 30 30	20 20 20	18.0 8.2 8.3	2.0 1.8 1.7		
2 3 4 5 6	0909 0945 1020 1055 1130	1015 1050 1125 1200	30 30 30 30	20 20 20 20	18.0 8.2 18.3 18.3	2.0 1.8 1.7 1.7		
2 3 4 5 6 7	0909 0945 1020 1055 1130 1205	1015 1050 1125 1200 1235	30 30 30 30 30 30	20 20 20 20 20	18.0 8.2 8.3 18.3 18.6	2.0 1.8 1.7 1.7 1.4		
2 3 4 5 6 7 8	0909 0945 1020 1055 1130 1205 1239	1015 1050 1125 1200 1235 1309	30 30 30 30 30 30 30	20 20 20 20 20 20 20	18.0 8.2 8.3 18.3 18.6 8.7	2.0 1.8 1.7 1.7 1.4 1.3		
2 3 4 5 6 7 8 9	0909 0945 1020 1055 1130 1205 1239 1314	1015 1050 1125 1200 1235 1309 1344	30 30 30 30 30 30 30 30	20 20 20 20 20 20 20	18.0 8.2 8.3 18.3 18.6 8.7 18.9	2.0 1.8 1.7 1.7 1.4 1.3 1.1		
2 3 4 5 6 7 8 9 9	0909 0945 1020 1055 1130 1205 1239 1314 1350	1015 1050 1125 1200 1235 1309 1344 1344 1420	30 30 30 30 30 30 30 30 30	20 20 20 20 20 20 20 20	18.0 8.2 8.3 18.3 18.6 18.6 18.7 18.9 19.0	2.0 1.8 1.7 1.7 1.4 1.3 1.1 1.0		
2 3 4 5 6 7 8 9 10 11	0909 0945 1020 1055 1130 1205 1239 1314 1350 1425	1015 1050 1125 1200 1235 1309 1344 1420 1455	30 30 30 30 30 30 30 30 30 30	20 20 20 20 20 20 20 20 20 20	18.0 8.2 8.3 18.3 18.6 18.6 18.7 18.9 19.0 19.0	$ \begin{array}{c} 2.0 \\ 1.8 \\ 1.7 \\ 1.7 \\ 1.4 \\ 1.3 \\ 1.1 \\ 1.0 \\ 1.0 \\ 1.0 \\ \end{array} $		
2 3 4 5 6 7 8 9 10 11 11	0909 0945 1020 1055 1130 1205 1239 1314 1350 1425 1500	1015 1050 1125 1200 1235 1309 1344 1420 1455 1530	30 30 30 30 30 30 30 30 30 30 30 30	20 20 20 20 20 20 20 20 20 20 20 20 20 2	18.0 8.2 8.3 18.3 18.6 18.6 18.7 18.9 19.0 19.0 19.1	2.0 1.8 1.7 1.7 1.4 1.3 1.1 1.0 1.0 1.0 1.0	33:33 mpi	
2 3 4 5 6 7 8 9 10 11 11 12 13	0909 0945 1020 1055 1130 1205 1239 1314 1350 1425 1500	1015 1050 1125 1200 1235 1309 1344 1420 1455 1530	30 30 30 30 30 30 30 30 30 30 30	20 20 20 20 20 20 20 20 20 20 20 20 20	18.0 8.2 8.3 18.3 18.6 18.7 18.9 19.0 19.0 19.1	2.0 1.8 1.7 1.7 1.4 1.3 1.1 1.0 1.0 .9	33:33 mpi	
2 3 4 5 6 7 8 9 10 11 12 13 13 14	0909 0945 1020 1055 1130 1205 1239 1314 1350 1425 1500	1015 1050 1125 1200 1235 1309 1344 1420 1455 1530	30 30 30 30 30 30 30 30 30 30 30	20 20 20 20 20 20 20 20 20 20 20 20	18.0 8.2 8.3 18.3 18.6 18.6 18.7 18.9 19.0 19.0 19.1	$ \begin{array}{r} 2.0 \\ 1.8 \\ 1.7 \\ 1.7 \\ 1.4 \\ 1.3 \\ 1.1 \\ 1.0 \\ 1.0 \\ 1.9 \\ 1.9 \\ 1.9 \\ 1.9 \\ 1.9 \\ 1.9 \\ 1.0 \\ 1$	33:33 mp;	

Percolation Test Data Sheet								
Project:	INFILTE	ATIDIN	Project No:	17-133	155	Date:	1-9-18	
Test Hole N	0:	B	Tested By:	D. BAL	LINGER			
Depth of Te	st Hole, D _T :	60"	USCS Soil Cl	assification: G/m				
	Test Hole	e Dimension	s (inches)		Length	Width		
Diameter	(if round)=	8"	Sides (if re	ctangular)=	-	-		
Sandy Soil C	Criteria Test*							
							Greater	
			Time	Initial	Final	Change in	than or	
			Interval,	Depth to	Depth to	Water	Equal to 6"1	
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(y/n)	
1	Pres	20160	DIADI	67HT				
2								
*If two cons minutes, th	ecutive mea e test shall b	asurements : pe run for an	show that six additional h	c inches of w our with me	ater seeps a asurements	way in less t taken every	than 25 10 minutes	
Other wise,	pre-soak (fi	II) overnight	. Obtain at le	east twelve i	measuremer	nts per hole	over at least	
six hours (a	pproximatel	y 30 minute	intervals) wi	th a precisio	n of at least	0.25".		
			۵t	Do	Df	ΔD		
			Time	Initial	Final	Change in	Percolation	
			Interval	Depth to	Depth to	Water	Rate	
Trial No.	Start Time	Stop Time	(min.)	Water (in.)	Water (in.)	Level (in.)	(min./in.)	
1	0840	0910	30	20	17.3	2.7		
2	0914	0944	30	20	17.6	Z.4		
3	0950	1020	30	20	17.8	2.2		
4	1024	1054	30	Zo	17.0	2.0		
5	1100	1130	30	20	18.2	1.8		
6	1135	1205	30	20	18.4	1.6		
7	1210	1240	30	20	18.6	1.4		
8	1245	1315	30	ZO	18.7	1.3		
9	1320	13.50	30	20	18.7	1.3	<u> </u>	
10	1355	1425	30	20	18.9	1.1		
11	1430	1500	30	20	19.0	1.0		
12	1504	1534	30	20	19.0	1.0	30.00 mpi	
13								
14								
15								
COMMENTS	"R=4	• ب ۲	¥5 = 2	20" OF	WATER			

Porchet	t Method - Conversion of	Perc Test		Logond	Required Entry
Percolati	on Rate to Infiltration Rate	TEST 1	Average	Legena	Calculated Entry
Company Name:	AM/PAC AND ASSOCIATES, INC.		_	Date:	12/9/2017
Designed By:	BALLINGER/HAWES		_ County	/City Case No:	17-13355
	Percolation Test Co	nversion to	Infiltration	Rate	
The conversion equ	ation used is:				
	$I_{T}(in/hr) = \frac{dH(in)}{dt(min)}$	x 60 (min/l) x [r(in) + 2	hr) x r(in) 2H _{AVG} (in)]	•.	
Hole Radius				r =	4.00 inches
Time Interval				dt =	30.00 minutes
Initial height of wat	er during selected time interval			H ₀ =	20.00 inches
Final Height of wate	er during selected time interval			H _f =	19.00 inches
Change in height of	f water during selected time interval			dH =	1.00 inches
Average head heigh	nt over the selected time interval			H _{AVG} =	19.50 inches
Converted infiltrati	on rate per test data			I _T =	0.19 ¹ inches/hour
	C	omments			
1					

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Porchet	t Method - Conversion of	Perc Test		Logond	Required Entry	
Percolatio	on Rate to Infiltration Rate	TEST 2	Average	Legend	Calculated Entry	
Company Name:	AM/PAC AND ASSOCIATES, INC.			Date:	12/9/2017	
Designed By:	BALLINGER/HAWES		County	/City Case No:	17-13355	
	Percolation Test Co	nversion to	Infiltration	Rate		
The conversion equ	ation used is:					
	$I_{T}(in/hr) = \frac{dH(in)}{dt(min)}$	x 60 (min/ł) x [r(in) + 2	nr) x r(in) ?H _{AVG} (in)]			
Hole Radius				r =	4.00 inches	
Time Interval				dt =	30.00 minutes	
Initial height of wat	er during selected time interval			H _o =	20.00 inches	
Final Height of wate	er during selected time interval			H _f = 19.00 inches		
Change in height of	water during selected time interval			dH = 1.00 inches		
Average head heigh	nt over the selected time interval			H _{AVG} = 19.50 inches		
Converted infiltration	on rate per test data			Ι _Τ =	0.19 inches/hour	
	C	omments				

Porchet	Method - Conversion of	Perc Test		Logond	Required Entry						
Percolation	n Rate to Infiltration Rate	TEST 3	Average	Legenu	Calculated Entry						
Company Name: Designed By:	AM/PAC AND ASSOCIATES, INC. BALLINGER/HAWES		County	Date: /City Case No:	12/9/2017 17-13355						
	Percolation Test Conversion to Infiltration Rate										
The conversion equa	The conversion equation used is:										
$I_{\tau}(in/hr) = \frac{dH(in) \times 60 (min/hr) \times r(in)}{dt(min) \times [r(in) + 2H_{AVG}(in)]}$											
Hole Radius				r =	4.00 inches						
Time Interval				dt =	30.00 minutes						
Initial height of wate	r during selected time interval			H ₀ =	20.00 inches						
Final Height of water	during selected time interval			H _f = 19.10 inches							
Change in height of v	water during selected time interval			dH = 0.90 inches							
Average head height	over the selected time interval			H _{AVG} =	19.55 inches						
Converted infiltration	n rate per test data			I _T =	0.17 inches/hour						
	C	omments									

Porchet Method - Conversion of Percolation Rate to Infiltration Rate		Perc Test		Logond	Required Entry		
		TEST 4	Average	Legend	Calculated Entry		
Company Name: Designed By:	AM/PAC AND ASSOCIATES, INC. BALLINGER/HAWES		County	Date: /City Case No:	12/9/2017 17-13355		
	Percolation Test Cor	version to	Infiltration	Rate			
The conversion equa	ation used is:						
	I _T (in/hr) = dH(in) dt(min)	ĸ 60 (min/l x [r(in) + 2	hr) x r(in) 2H _{AVG} (in)]				
Hole Radius				r =	4.00 inches		
Time Interval				dt =	30.00 minutes		
Initial height of wate	er during selected time interval			H ₀ =	20.00 inches		
Final Height of wate	r during selected time interval			H _f =	19.00 inches		
Change in height of	water during selected time interval			dH =	1.00 inches		
Average head height over the selected time interval				H _{AVG} =	19.50 inches		
Converted infiltration rate per test data				I _T =	0.19 inches/hour		
	Comments						

Porchet Method - Conversion of Percolation Rate to Infiltration Rate		Perc Test		Legend	Required Entry		
		TEST 5	Average	Legend	Calculated Entry		
Company Name:	AM/PAC AND ASSOCIATES, INC.	-	-	Date:	12/9/2017		
Designed By:	BALLINGER/HAWES		County	/City Case No:	17-13355		
	Percolation Test Cor	nversion to	Infiltration	Rate			
The conversion equa	ation used is:						
	l _T (in/hr) = dH(in): dt(min)	x 60 (min/l) x [r(in) + 2	hr) x r(in) 2H _{AVG} (in)]				
Hole Radius				r =	4.00 inches		
Time Interval				dt =	30.00 minutes		
Initial height of wate	er during selected time interval			H _o =	20.00 inches		
Final Height of wate	r during selected time interval			H _f = 19.00 inches			
Change in height of	water during selected time interval			dH =	1.00 ¹ inches		
Average head height over the selected time interval				H _{AVG} =	19.50 inches		
Converted infiltration rate per test data				Ι _Τ =	0.19 inches/hour		
	Comments						

Porchet Method - Conversion of		Perc Test		legend	Required Entry			
Percolation	n Rate to Infiltration Rate	TEST 6	Average	Legenu	Calculated Entry			
Company Name: Designed By:	AM/PAC AND ASSOCIATES, INC. BALLINGER/HAWES		County	Date: /City Case No:	12/9/2017 17-13355			
	Percolation Test Cor	version to	Infiltration	Rate				
The conversion equa	tion used is:							
	$I_{T}(in/hr) = \frac{dH(in) \times 60 (min/hr) \times r(in)}{dt(min) \times [r(in) + 2H_{AVG}(in)]}$							
Hole Radius				r =	4.00 inches			
Time Interval				dt =	30.00 minutes			
Initial height of wate	r during selected time interval			H _o =	20.00 inches			
Final Height of water	during selected time interval			H _f =	19.00 inches			
Change in height of water during selected time interval			dH =	1.00 inches				
Average head height over the selected time interval				H _{AVG} =	19.50 inches			
Converted infiltration	n rate per test data			ι _τ =	0.19 inches/hour			
Comments								

Porchet Method - Conversion of Percolation Rate to Infiltration Rate		Perc Test		legend	Required Entry		
		TEST 7	Average	regena	Calculated Entry		
Company Name:	AM/PAC AND ASSOCIATES, INC.		_	Date:	12/9/2017		
Designed By:	BALLINGER/HAWES		County	/City Case No:	17-13355		
	Percolation Test Cor	nversion to	Infiltration	Rate			
The conversion equa	tion used is:						
	l _T (in/hr) = dH(in) dt(min)	x 60 (min/l) x [r(in) + 2	nr) x r(in) 2H _{AVG} (in)]	-			
Hole Radius				r =	4.00 inches		
Time Interval				dt =	30.00 minutes		
Initial height of wate	r during selected time interval			H ₀ =	20.00 inches		
Final Height of water	r during selected time interval			H _f = 19.10 inches			
Change in height of v	water during selected time interval			dH = 0.90 inches			
Average head height over the selected time interval				H _{AVG} =	19.55 inches		
Converted infiltration rate per test data				Ι _Τ =	0.17' inches/hour		
	Comments						

Porchet Method - Conversion of Percolation Rate to Infiltration Rate		Perc Test		Legend	Required Entry				
		TEST 8	Average	Legena	Calculated Entry				
Company Name:	AM/PAC AND ASSOCIATES, INC.		_	Date:	12/9/2017				
Designed By:	BALLINGER/HAWES		_ County	/City Case No:	17-13355				
	Percolation Test Cor	nversion to	Infiltration	Rate					
The conversion equa	The conversion equation used is:								
	$I_{T}(in/hr) = \frac{dH(in) \times 60 (min/hr) \times r(in)}{dt(min) \times [r(in) + 2H_{AVG}(in)]}$								
Hole Radius	ω.			r =	4.00 inches				
Time Interval				dt =	30.00 minutes				
Initial height of wate	r during selected time interval			H _o = 20.00 inches					
Final Height of water	during selected time interval			H _f = 19.00 inches					
Change in height of v	vater during selected time interval			dH = 1.00 inches					
Average head height over the selected time interval				H _{AVG} = 19.50 ⁱ inches					
Converted infiltration	n rate per test data			I _T =	0.19 inches/hour				
Comments									

APPENDIX - C ASSESSORS MAP COPY SITE PLAN BY CUBIT ENG.



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