

Form 3C- Soil Permeability Coefficient Rating



Block: 116
 Lot: 47
 Municipality: Mendham
 County: Morris

Job Number: 2001MNT
 Client: Mortezai
 Date Collected: 2/25/2020

Sample Identification: Soil Log 1.1 Depth = 80"

Total Weight of sample = 493
 Weight Retained on 2 mm Sieve = 121
 Weight % Coarse Fragment = 25%
 (If above 75%, do not use this method)

Wet Weight = 40 g
 Oven Dry Weight = 31 g

Hydrometer Calibration
 Rc = 6
 Temperature = 65 °F

Sample A			
Hydrometer Readings @ 40 Sec.		Corrected Hydrometer readings	

R1 = 16 R1' = 9.4
 R2 = 15.5 R2' = 8.9
 2 Hour = 10 2 Hour' = 3.4

Percent Sand = 70.5 %
 Percent Clay = 11.0 %

Sample B			
Hydrometer Readings @ 40 Sec.		Corrected Hydrometer readings	

R1 = 16 R1' = 9.4
 R2 = 16 R2' = 9.4
 2 Hour = 10 2 Hour' = 3.4

Percent Sand = 69.7 %
 Percent Clay = 11.0 %

Sieve Analysis

	Sample A	Sample B
Weight of dried soil (grams)	<u>23</u>	<u>24</u>
Weight of soil retained on 0.045 mm Sieve (No. 325)	<u>7</u>	<u>8</u>
Weight of soil retained on 0.25mm Sieve (No. 60)	<u>16</u>	<u>16</u>
% Fine Plus Very Fine Sand	<u>30.43%</u>	<u>33.33%</u>

If % Greater than 50%, adjust permeability class to the next slowest class

Sample A Class = K3
 Sample B Class = K3

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Signature of Professional Engineer Michael K. Ford Date: 3-4-20
 Michael K. Ford NJPE No. 34722
 Van Cleef Engineering Associates

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Block: 116
 Lot: 47
 Municipality: Mendham
 County: Morris

Job Number: 2001MNT
 Client: Mortezaei
 Date Collected: 2/25/2020

Sample Identification: Soil Log 1.3 Depth = 80"

Total Weight of sample = 557
 Weight Retained on 2 mm Sieve = 103
 Weight % Coarse Fragment = 18%
 (If above 75%, do not use this method)

Wet Weight = 40 g
 Oven Dry Weight = 33 g

Hydrometer Calibration

Rc = 6
 Temperature = 65 °F

Sample A			
Hydrometer Readings		Corrected Hydrometer readings	
@ 40 Sec.			

R1 = 15.5 R1' = 8.9
 R2 = 15.5 R2' = 8.9
 2 Hour = 9.5 2 Hour' = 2.9

Percent Sand = 73.0 %
 Percent Clay = 8.8 %

Sample B			
Hydrometer Readings		Corrected Hydrometer readings	
@ 40 Sec.			

R1 = 16 R1' = 9.4
 R2 = 15.5 R2' = 8.9
 2 Hour = 10 2 Hour' = 3.4

Percent Sand = 72.3 %
 Percent Clay = 10.3 %

Sieve Analysis

	Sample A	Sample B
Weight of dried soil (grams)	26	25
Weight of soil retained on 0.045 mm Sieve (No. 325)	8	8
Weight of soil retained on 0.25mm Sieve (No. 60)	18	17
% Fine Plus Very Fine Sand	30.77%	32.00%

If % Greater than 50%, adjust permeability class to the next slowest class

Sample A Class = K3
 Sample B Class = K3

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Block: 116
 Lot: 47
 Municipality: Mendham
 County: Morris

Job Number: 2001MNT
 Client: Mortezai
 Date Collected: 2/25/2020

Sample Identification: Soil Log 2.1 Depth = 80"

Total Weight of sample = 493
 Weight Retained on 2 mm Sieve = 87
 Weight % Coarse Fragment = 18%
 (If above 75%, do not use this method)

Wet Weight = 40 g
 Oven Dry Weight = 32 g

Hydrometer Calibration

Rc = 6
 Temperature = 69 °F

Sample A			
Hydrometer Readings @ 40 Sec.		Corrected Hydrometer readings	
R1	=	16	R1' = 10.2
R2	=	16	R2' = 10.2
2 Hour	=	10	2 Hour' = 4.2
Percent Sand	=	68.1 %	
Percent Clay	=	13.1 %	

Sample B			
Hydrometer Readings @ 40 Sec.		Corrected Hydrometer readings	
R1	=	16	R1' = 10.2
R2	=	16	R2' = 10.2
2 Hour	=	10	2 Hour' = 4.2
Percent Sand	=	68.1 %	
Percent Clay	=	13.1 %	

Sieve Analysis

	Sample A	Sample B
Weight of dried soil (grams)	= 24	25
Weight of soil retained on 0.045 mm Sieve (No. 325)	= 7	7
Weight of soil retained on 0.25mm Sieve (No. 60)	= 17	18
% Fine Plus Very Fine Sand	= 29.17%	28.00%

If % Greater than 50%, adjust permeability class to the next slowest class

Sample A Class = K3
 Sample B Class = K3

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 Client: Mortezai
 Date Collected: 2/25/2020

Sample Identification: Soil Log 2.1 Depth = 80"

Total Weight of sample = 587
 Weight Retained on 2 mm Sieve = 102
 Weight % Coarse Fragment = 17%
 (If above 75%, do not use this method)

Wet Weight = 40 g
 Oven Dry Weight = 34 g

Hydrometer Calibration

Rc = 6
 Temperature = 69 °F

Sample A			
Hydrometer Readings		Corrected Hydrometer readings	
@ 40 Sec.			

R1 = 16 R1' = 10.2
 R2 = 16 R2' = 10.2
 2 Hour = 10 2 Hour' = 4.2

Percent Sand = 70.0 %
 Percent Clay = 12.4 %

Sample B			
Hydrometer Readings		Corrected Hydrometer readings	
@ 40 Sec.			

R1 = 16 R1' = 10.2
 R2 = 16 R2' = 10.2
 2 Hour = 10 2 Hour' = 4.2

Percent Sand = 70.0 %
 Percent Clay = 12.4 %

Sieve Analysis

	Sample A	Sample B
Weight of dried soil (grams)	25	24
Weight of soil retained on 0.045 mm Sieve (No.325)	6	6
Weight of soil retained on 0.25mm Sieve (No. 60)	19	18
% Fine Plus Very Fine Sand	24.00%	25.00%

If % Greater than 50%, adjust permeability class to the next slowest class

Sample A Class = K3
 Sample B Class = K3

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Signature of Professional Engineer

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 County: Morris

Job Number: 2001MNT
 Client: Mortezai
 Date Collected: 2/25/2020

Sample Identification: Soil Log 3.1 Depth = 80"

Total Weight of sample = 701
 Weight Retained on 2 mm Sieve = 124
 Weight % Coarse Fragment = 18%
 (If above 75%, do not use this method)

Wet Weight = 40 g
 Oven Dry Weight = 35 g

Hydrometer Calibration

Rc = 5.5
 Temperature = 69 °F

Sample A			
Hydrometer Readings @ 40 Sec.		Corrected Hydrometer readings	
R1	=	15	R1' = 9.7
R2	=	15	R2' = 9.7
2 Hour	=	8.5	2 Hour' = 3.2

Percent Sand = 72.3 %
 Percent Clay = 9.1 %

Sample B			
Hydrometer Readings @ 40 Sec.		Corrected Hydrometer readings	
R1	=	15	R1' = 9.7
R2	=	15	R2' = 9.7
2 Hour	=	9	2 Hour' = 3.7

Percent Sand = 72.3 %
 Percent Clay = 10.6 %

Sieve Analysis

	Sample A	Sample B
Weight of dried soil (grams)	= <u>26</u>	= <u>25</u>
Weight of soil retained on 0.045 mm Sieve (No.325)	= <u>6</u>	= <u>6</u>
Weight of soil retained on 0.25mm Sieve (No. 60)	= <u>20</u>	= <u>19</u>
% Fine Plus Very Fine Sand	= <u>23.08%</u>	= <u>24.00%</u>

If % Greater than 50%, adjust permeability class to the next slowest class

Sample A Class = K3
 Sample B Class = K3

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 County: Morris

Job Number: 2001MNT
 Client: Mortezai
 Date Collected: 2/25/2020

Sample Identification: Soil Log 3.1 Depth = 85"

Total Weight of sample = 497
 Weight Retained on 2 mm Sieve = 98
 Weight % Coarse Fragment = 20%
 (If above 75%, do not use this method)

Wet Weight = 40 g
 Oven Dry Weight = 36 g
Hydrometer Calibration
 Rc = 5.5
 Temperature = 69 °F

Sample A			
Hydrometer Readings @ 40 Sec.		Corrected Hydrometer readings	
R1	=	19.5	R1' = 14.2
R2	=	19	R2' = 13.7
2 Hour	=	10	2 Hour' = 4.7

Percent Sand = 61.3 %
 Percent Clay = 13.1 %

Sample B			
Hydrometer Readings @ 40 Sec.		Corrected Hydrometer readings	
R1	=	19	R1' = 13.7
R2	=	19	R2' = 13.7
2 Hour	=	10	2 Hour' = 4.7

Percent Sand = 61.9 %
 Percent Clay = 13.1 %

Sieve Analysis

	Sample A	Sample B
Weight of dried soil (grams)	= <u>24</u>	<u>25</u>
Weight of soil retained on 0.045 mm Sieve (No. 325)	= <u>8</u>	<u>8</u>
Weight of soil retained on 0.25mm Sieve (No. 60)	= <u>16</u>	<u>17</u>
% Fine Plus Very Fine Sand	= <u>33.33%</u>	<u>32.00%</u>

If % Greater than 50%, adjust permeability class to the next slowest class

Sample A Class = K3
 Sample B Class = K3

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Job Number: 2001MNT
 Client: Mortezai
 Date Collected: 2/25/2020

Sample Identification: Soil Log 4.1 Depth = 88"

Total Weight of sample = 387
 Weight Retained on 2 mm Sieve = 45
 Weight % Coarse Fragment = 12%
 (If above 75%, do not use this method)

Wet Weight = 40 g
 Oven Dry Weight = 32 g

Hydrometer Calibration

Rc = 5.5
 Temperature = 70 °F

Sample A	
Hydrometer Readings @ 40 Sec.	Corrected Hydrometer readings

R1 = 20 R1' = 14.9
 R2 = 20 R2' = 14.9
 2 Hour = 10 2 Hour' = 4.9

Percent Sand = 53.4 %
 Percent Clay = 15.3 %

Sample B	
Hydrometer Readings @ 40 Sec.	Corrected Hydrometer readings

R1 = 20 R1' = 14.9
 R2 = 20 R2' = 14.9
 2 Hour = 10 2 Hour' = 4.9

Percent Sand = 53.4 %
 Percent Clay = 15.3 %

Sieve Analysis

	Sample A	Sample B
Weight of dried soil (grams)	<u>26</u>	<u>26</u>
Weight of soil retained on 0.045 mm Sieve (No. 325)	<u>14</u>	<u>14</u>
Weight of soil retained on 0.25mm Sieve (No. 60)	<u>12</u>	<u>12</u>
% Fine Plus Very Fine Sand	<u>53.85%</u>	<u>53.85%</u>

If % Greater than 50%, adjust permeability class to the next slowest class

Sample A Class = K2

Sample B Class = K2

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Signature of Professional Engineer

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 County: Morris

Job Number: 2001MNT
 Client: Mortezai
 Date Collected: 2/25/2020

Sample Identification: Soil Log 4.3A Depth = 80"

Total Weight of sample = 501
 Weight Retained on 2 mm Sieve = 78
 Weight % Coarse Fragement = 16%
 (If above 75%, do not use this method)

Wet Weight = 40 g
 Oven Dry Weight = 35 g

Hydrometer Calibration

Rc = 5.5
 Temperature = 70 °F

Sample A			
Hydrometer Readings		Corrected Hydrometer readings	
@ 40 Sec.			
R1	=	15.5	R1' = 10.4
R2	=	15.5	R2' = 10.4
2 Hour	=	9.5	2 Hour' = 4.4
Percent Sand	=	70.3 %	
Percent Clay	=	12.6 %	

Sample B			
Hydrometer Readings		Corrected Hydrometer readings	
@ 40 Sec.			
R1	=	16	R1' = 10.9
R2	=	16	R2' = 10.9
2 Hour	=	10	2 Hour' = 4.9
Percent Sand	=	68.9 %	
Percent Clay	=	14.0 %	

Sieve Analysis	Sample A	Sample B
Weight of dried soil (grams)	= 31	30
Weight of soil retained on 0.045 mm Sieve (No.325)	= 13	13
Weight of soil retained on 0.25mm Sieve (No. 60)	= 18	17
% Fine Plus Very Fine Sand	= 41.94%	43.33%

If % Greater than 50%, adjust permeability class to the next slowest class

Sample A Class = K3
 Sample B Class = K3

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Signature of Professional Engineer: Michael K. Ford Date: 3-21-20
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Block: 116
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 County: Morris

Job Number: 2001MNT
 Client: Mortezai
 Date Collected: 2/25/2020

Sample Identification: Soil Log 5.1A Depth = 80"

Total Weight of sample = 437
 Weight Retained on 2 mm Sieve = 102
 Weight % Coarse Fragment = 23%
 (If above 75%, do not use this method)

Wet Weight = 40 g
 Oven Dry Weight = 35 g

Hydrometer Calibration

Rc = 5.5
 Temperature = 70 °F

Sample A			
Hydrometer Readings @ 40 Sec.		Corrected Hydrometer readings	
R1	=	16	R1' = 10.9
R2	=	16	R2' = 10.9
2 Hour	=	10	2 Hour' = 4.9

Percent Sand = 68.9 %
 Percent Clay = 14.0 %

Sample B			
Hydrometer Readings @ 40 Sec.		Corrected Hydrometer readings	
R1	=	16	R1' = 10.9
R2	=	16	R2' = 10.9
2 Hour	=	10	2 Hour' = 4.9

Percent Sand = 68.9 %
 Percent Clay = 14.0 %

Sieve Analysis

	Sample A	Sample B
Weight of dried soil (grams)	= <u>28</u>	= <u>29</u>
Weight of soil retained on 0.045 mm Sieve (No. 325)	= <u>11</u>	= <u>12</u>
Weight of soil retained on 0.25mm Sieve (No. 60)	= <u>17</u>	= <u>17</u>
% Fine Plus Very Fine Sand	= <u>39.29%</u>	= <u>41.38%</u>

If % Greater than 50%, adjust permeability class to the next slowest class

Sample A Class = K3
 Sample B Class = K3

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Job Number: 2001MNT
 Client: Mortezai
 Date Collected: 2/25/2020

Sample Identification: Soil Log 5.2 Depth = 80"

Total Weight of sample = 450
 Weight Retained on 2 mm Sieve = 112
 Weight % Coarse Fragement = 25%
 (If above 75%, do not use this method)

Wet Weight = 40 g
 Oven Dry Weight = 36 g
Hydrometer Calibration
 Rc = 5.5
 Temperature = 70 °F

Sample A			
Hydrometer Readings		Corrected Hydrometer readings	
@ 40 Sec.			

R1 = 16 R1' = 10.9
 R2 = 16.5 R2' = 11.4
 2 Hour = 10 2 Hour' = 4.9

Percent Sand = 69.0 %
 Percent Clay = 13.6 %

Sample B			
Hydrometer Readings		Corrected Hydrometer readings	
@ 40 Sec.			

R1 = 16 R1' = 10.9
 R2 = 16 R2' = 10.9
 2 Hour = 10 2 Hour' = 4.9

Percent Sand = 69.7 %
 Percent Clay = 13.6 %

Sieve Analysis

	Sample A	Sample B
Weight of dried soil (grams)	28	28
Weight of soil retained on 0.045 mm Sieve (No.325)	10	10
Weight of soil retained on 0.25mm Sieve (No. 60)	18	18
% Fine Plus Very Fine Sand	35.71%	35.71%

If % Greater than 50%, adjust permeability class to the next slowest class

Sample A Class = K3
 Sample B Class = K3

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 County: Morris

Job Number: 2001MNT
 Client: Mortezai
 Date Collected: 2/25/2020

Sample Identification: Soil Log 6.1 Depth = 80"

Total Weight of sample = 427
 Weight Retained on 2 mm Sieve = 99
 Weight % Coarse Fragment = 23%
 (If above 75%, do not use this method)

Wet Weight = 40 g
 Oven Dry Weight = 34 g
Hydrometer Calibration
 Rc = 5.5
 Temperature = 70 °F

Sample A			
Hydrometer Readings @ 40 Sec.		Corrected Hydrometer readings	
R1	=	18	R1' = 12.9
R2	=	18	R2' = 12.9
2 Hour	=	11	2 Hour' = 5.9

Percent Sand = 62.1 %
 Percent Clay = 17.4 %

Sample B			
Hydrometer Readings @ 40 Sec.		Corrected Hydrometer readings	
R1	=	18	R1' = 12.9
R2	=	18.5	R2' = 13.4
2 Hour	=	11	2 Hour' = 5.9

Percent Sand = 61.3 %
 Percent Clay = 17.4 %

Sieve Analysis

	Sample A	Sample B
Weight of dried soil (grams)	= <u>25</u>	<u>26</u>
Weight of soil retained on 0.045 mm Sieve (No. 325)	= <u>9</u>	<u>10</u>
Weight of soil retained on 0.25mm Sieve (No. 60)	= <u>16</u>	<u>16</u>
% Fine Plus Very Fine Sand	= <u>36.00%</u>	<u>38.46%</u>

If % Greater than 50%, adjust permeability class to the next slowest class

Sample A Class = K3
 Sample B Class = K3

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 County: Morris

Job Number: 2001MNT
 Client: Mortezai
 Date Collected: 2/25/2020

Sample Identification: Soil Log 6.2A Depth = 80"

Total Weight of sample = 502
 Weight Retained on 2 mm Sieve = 139
 Weight % Coarse Fragment = 28%
 (If above 75%, do not use this method)

Wet Weight = 40 g
 Oven Dry Weight = 36 g

Hydrometer Calibration

Rc = 5.5
 Temperature = 70 °F

Sample A			
Hydrometer Readings		Corrected Hydrometer readings	
@ 40 Sec.			

R1 = 16.5 R1' = 11.4
 R2 = 17 R2' = 11.9
 2 Hour = 10 2 Hour' = 4.9

Percent Sand = 67.6 %
 Percent Clay = 13.6 %

Sample B			
Hydrometer Readings		Corrected Hydrometer readings	
@ 40 Sec.			

R1 = 17 R1' = 11.9
 R2 = 17 R2' = 11.9
 2 Hour = 10 2 Hour' = 4.9

Percent Sand = 66.9 %
 Percent Clay = 13.6 %

Sieve Analysis

	Sample A	Sample B
Weight of dried soil (grams)	28	28
Weight of soil retained on 0.045 mm Sieve (No. 325)	11	10
Weight of soil retained on 0.25mm Sieve (No. 60)	17	18
% Fine Plus Very Fine Sand	39.29%	35.71%

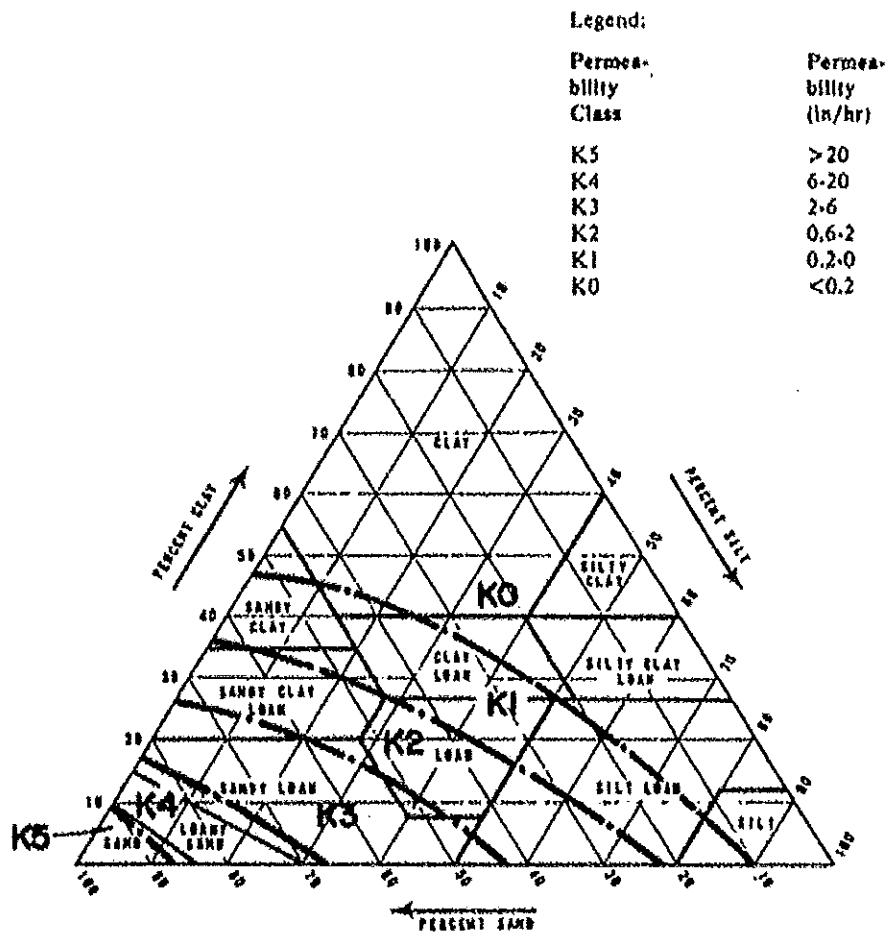
If % Greater than 50%, adjust permeability class to the next slowest class

Sample A Class = K3
 Sample B Class = K3

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Signature of Professional Engineer

Michael K. Ford Date: 3-4-20
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Adapted from N.N. Hantzsche et al. (1982) Soil Textural Analysis for Onsite Sewage Disposal Evaluation, Proc. 3rd Nat. Symposium on Individual and Small Community Sewage Treatment, Am. Soc. Agric. Eng., St. Joseph, Michigan

Figure 6. Soil Permeability/Textural Triangle



Form 3b. Tube Permeameter Test Data

Block: 116 Job Number: 2001MNT
 Lot: 47 Client: Mortezai
 Municipality: Mendham Date Collected: 2/25/2020
 County: Morris

Sample Identification: Rain Garden

Material Tested: Native Soil Depth = 24"

Type of Sample: Undisturbed X Disturbed

		<u>Replicate</u>	
		<u>A</u>	<u>B</u>
Sample Dimensions:	Inside radius of Sample Tube, R, in cm. =	<u>2.38</u>	<u>2.38</u>
	Length of Sample in inches =	<u>4.50</u>	<u>4.50</u>

Bulk density determination (Disturbed Samples Only) :

	<u>A</u>	<u>B</u>
Sample Weight, grams =	<u>252</u>	<u>250</u>
Sample Volume, Cubic centimeters (cc) =	<u>203</u>	<u>203</u>
Bulk Density, grams/cc =	<u>1.24</u>	<u>1.23</u>

Standpipe Used: No XX Yes, Internal Radius, r, in cm. =

<u>A</u>	<u>B</u>
<u>0.476</u>	<u>0.476</u>
(3/8" ID)	(3/8" ID)

Height of water level, in inches:

	<u>A</u>	<u>B</u>
At the beginning of each test interval, H1 =	<u>17.00</u>	<u>17.00</u>
At the end of each test interval, H2 =	<u>12.00</u>	<u>12.00</u>

Rate of Water Level Drop:

<u>Replicate A</u>		<u>Replicate B</u>	
Time for Water Drop	Length of test (minutes) t	Time for Water Drop	Length of test (minutes) t
<u>5</u>	<u>2.850</u>	<u>5</u>	<u>3.214</u>
<u>5</u>	<u>2.933</u>	<u>5</u>	<u>3.347</u>
<u>5</u>	<u>3.012</u>	<u>5</u>	<u>3.521</u>

Calculation of Permeability:

	<u>A</u>	<u>B</u>
$K = 60 \times (L/t) \times (r^2/R^2) \times \ln(H1/H2) =$	<u>1.3</u> in/hr	<u>1.1</u> in/hr

Defects in Sample:

<u>XX</u> None	<u> </u> Cracks	<u> </u> Worm Channels
<u> </u> Large Gravel	<u> </u> Large Roots	<u> </u> Root Channels
<u> </u> Dry soil	<u> </u> Smearing	<u> </u> Compaction
<u> </u> Soil/Tube contact	<u> </u> Other	

I hereby certify that the information furnished on form 3b of this application is true and accurate. I am aware that falsification of this data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to the penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Professional Engineer Michael K. Ford Date: 3.4.20
 Michael K. Ford NJPE No. 34722