

UNDERWOOD ENGINEERING COMPANY

1 KEYSTONE AVE. SUITE 300
CHERRY HILL, NJ 08003

Patrick M Underwood, President

856-933-1818

CLIENT: KS Engineers, P.C.
530 Walnut Street, Suite 460
Philadelphia, PA 19106

PROJECT: Russo Park Infiltration Testing
7301 Torresdale Avenue
Philadelphia, NJ

REQUIREMENT: Professional Engineering Services

LOCATION: Locations Provided by Client

DATE: 9/28/2025

UE REF. NO.: 5454-12573-1, WO#25-6889

ATTENTION: Richard Burrell, P.E. email: rburrell@kseng.com

PURPOSE

The purpose of this report is to present the findings of the geotechnical field and laboratory analysis compiled from the Russo Park Infiltration Investigation project located at 7301 Torresdale Avenue, in the City of Philadelphia, Pennsylvania. All supplemental test locations were shown on the conceptual plan.

INVESTIGATION

The geotechnical investigation was requested by KS Engineers, PC to ascertain groundwater and subsurface soil data. Representatives of Underwood Engineering, Inc. were present on Monday and Tuesday, October 6th and 7th, 2025, to observe and log the test pit data.

The 12.5 acre site was located on an existing active playground with a one-story multi-purpose building. The site is bounded by Torresdale Avenue to the North, Cottman Avenue to the West, Bleigh Avenue to the East, and Edmund Street to the South. A detailed Test Pit Layout Plan is included below in Appendix A for further reference. The investigation consisted of seven (7) soil profile test pits and thirteen (13) double-ring infiltration tests conducted at the locations and depths provided by the client. A John Deere 320 P-Tier rubber wheeled backhoe loader was used in the subsurface investigation. Double-ring infiltration testing was completed utilizing a modified version of ASTM D-3385. Soil samples were collected for laboratory processing to determine permeability class rating and textural analysis per ASTM D-6913 and ASTM D-7928. The investigation was conducted in accordance with PWD Section 3.3 of the Stormwater Management Guidance Manual. Areas disturbed during excavation and infiltration testing operations were restored upon completion. All investigative methods and summaries of results are provided in the following paragraphs. Test date: 10/5-10/7/2025.

FINDINGS

The soil was consistent with alluvial geology and the Trenton Gravel and Pennsauken Bridgeton Formations. The uppermost soil stratum consisted of sandy topsoil ranging in thickness from approximately half a foot to one foot. Generally, underlying the topsoil were clayey sands with some fine content (sandy clay loams, sandy loams) which extended to the depths explored in some test pits. Fine content refers to the amount of silt and clay present in the soil. Shallow soils in TP-5 exhibited lesser fine content (loamy sands). The test pits were terminated at depths ranging from approximately 9.4 feet to 13.5 below grade surface (BGS).

Groundwater/SHWT was encountered in the test pits at depths ranging from 9.6 feet to 11.9 BGS. It should be noted that groundwater data presented on the individual test boring logs may not be representative of daily or seasonal variations in the ground water level. The seasonal high water table as indicated by mottling and other soil characteristics is only an average based on long-term fluctuations in groundwater. Actual groundwater tables may vary from average annual seasonal highs, based on precipitation frequencies and other factors.

Thirteen (13) double-ring infiltration tests were performed on site. The in-situ testing performed on the soil yielded stabilized infiltration rates ranging from 1.0 inches per hour to 13.5 inches per hour. The in-situ testing findings are detailed further in Appendix C, the Infiltration Log Soil Analysis.

The soil samples collected for laboratory analysis to determine textural analysis and permeability class rating per ASTM D-6913 and ASTM D-7928 yielded class ratings of K2, or 0.6 to 2 inches per hour, to K4, or 6 to 20 inches per hour. The laboratory testing yielded consistent infiltration rates with the in-situ infiltration rates. The laboratory findings and locations are shown in Appendices A and B to include the Test Pit Layout Plan and Laboratory Soils Analysis.

Soils encountered in the test pit are as follows: The soils are logged in Unified Soil Classification System (USCS) as required by PWD Chapter 3.3.

Test Pit # 1 (Elev. 35.30)

<u>Depth (in.)</u>	<u>Classification</u>
0 – 11	10YR 3/2 Very Dark Grayish Brown fine to coarse TOPSOIL; Silty Sand (Sandy Clay Loam), Grass
11– 31	10YR 7/6 Yellow fine to coarse CLAYEY SAND (Sandy Clay Loam)
31 – 67	10YR 5/3 Brown CLAYEY SAND
67 – 91	2.5Y 6/2 Light Brownish Gray fine to coarse SILTY SAND
91 – 113	10YR 5/6 Yellowish Brown SILTY SAND
113 – 130	2.5Y 6/3 Light Yellowish Brown SILTY SAND, sidewall-cave 110"
130 – 142	Wet, 10YR 5/4 Yellowish Brown fine to coarse SILTY SAND
	Groundwater/ESHWT Encountered at 138"
	IT-1 at 0" (Surface) Rate - 1.0 in./hr.
	IT-2 at 12" Rate – 1.5 in./hr.

Test Pit # 2 (Elev. 33.90)**Depth (in.) Classification**

0 – 8	10YR 3/2 Very Dark Grayish Brown fine to coarse TOPSOIL, Silty Sand (Sandy Loam), Grass
8 - 16	10YR 7/6 Yellow fine to coarse CLAYEY SAND (Sandy Clay Loam)
16 – 40	10YR 5/8 Yellowish Brown fine to coarse SILTY SAND
40 – 49	10YR 5/6 Yellowish Brown fine to coarse Poorly Graded SAND WITH SILT
49 – 58	5Y 6/2 Light Olive Gray SILTY SAND
58 – 85	10YR 5/3 Brown fine to coarse Poorly Graded SAND WITH SILT
85 – 102	Moist, 10YR 5/2 Grayish Brown fine to coarse SILTY SAND
102 – 122	Wet, 10YR 5/6 Yellowish Brown fine to coarse SILTY SAND Groundwater/ESHWT Encountered at 116” IT-3 at 0” (Surface) Rate – 4.5 in./hr. IT-4 at 12” Rate – 1.0 in./hr.

Test Pit # 3 (Elev. 34.00)**Depth (in.) Classification**

0 – 11	10YR 3/2 Very Dark Grayish Brown fine to coarse TOPSOIL, Silty Sand (Sandy Clay Loam), Grass
11 - 21	10YR 7/6 Yellow fine to coarse CLAYEY SAND (Sandy Clay Loam)
21 – 40	10YR 5/8 Yellowish Brown fine to coarse SILTY SAND
40 – 67	5Y 6/2 Light Olive Gray fine to medium SILTY SAND
67 – 80	10YR 5/3 Brown fine to coarse SILTY SAND
80 – 94	10YR 5/2 Grayish Brown fine to coarse SILTY SAND
94 – 113	Wet, 10YR 5/6 Yellowish Brown fine to coarse SILTY SAND Groundwater/ESHWT Encountered at 113” IT-5 at 0” (Surface) Rate – 1.0 in./hr. IT-6 at 12” Rate – 1.5 in./hr.

Test Pit # 4 (Elev. 33.00)**Depth (in.) Classification**

0 – 8	10YR 3/2 Very Dark Grayish Brown fine to coarse TOPSOIL, Silty Sand (Sandy Loam), Grass
8 - 28	10YR 7/6 Yellow fine to coarse CLAYEY SAND (Sandy Clay Loam)
28 – 49	2.5Y 6/1 Gray fine to medium SILTY SAND
49 – 79	2.5Y 6/2 Light Brownish Gray fine to medium SILTY SAND
79 – 128	10YR 5/4 Yellowish Brown fine to coarse SILTY SAND WITH GRAVEL
128 – 149	Wet, 2.5Y 6/3 Light Yellowish Brown fine to coarse SILTY SAND WITH GRAVEL, sidewall caving 128” Groundwater/ESHWT Encountered at 147” IT-7 at 0” (Surface) Rate – 6.0 in./hr. IT-8 at 12” Rate – 1.0 in./hr.

Test Pit # 5 (Elev. 36.00)

<u>Depth (in.)</u>	<u>Classification</u>
0 – 9	10YR 3/3 Dark Brown fine to coarse TOPSOIL; Silty Sand (Loamy Sand), Grass
9 – 18	10YR 5/3 Brown fine to coarse SILTY SAND (Sandy Loam)
18 – 32	10YR 6/4 Light Yellowish Brown fine to coarse SILTY SAND
32 – 76	10YR 6/6 Brownish Yellow fine to coarse SILTY SAND
76 – 109	10YR 7/3 Very Pale Brown fine to coarse SILTY SAND, sidewall caving 106"
109 – 122	10YR 4/6 Dark Yellowish Brown fine to coarse SILTY SAND
122 – 143	7.5YR 4/6 Strong Brown fine to coarse SILTY SAND
143 – 150	Wet, 10YR 6/2 Light Brownish Gray fine to coarse Poorly Graded SAND Groundwater/ESHWT Encountered at 143" IT-9 at 0.5" Rate – 13.5 in./hr. IT-10 at 12" Rate – 2.5 in./hr.

Test Pit # 6 (Elev. 39.60)

<u>Depth (in.)</u>	<u>Classification</u>
0 – 9	10YR 4/3 Brown fine to coarse TOPSOIL; Silty Sand, Grass
9 – 20	2.5Y 6/6 Olive Yellow fine to coarse SILTY SAND
20 – 50	10YR 5/8 Yellowish Brown fine to coarse SILTY SAND
50 – 113	10YR 7/4 Very Pale Brown fine to coarse CLAYEY SAND (Sandy Clay Loam)
113 – 162	10YR 4/6 Dark Yellowish Brown fine to coarse SILTY SAND Groundwater Not Encountered, ESHWT Not Observed IT-11 at 54" Rate – 1.0 in./hr. IT-12 at 66" Rate – 1.5 in./hr.

Test Pit # 7 (Elev. 40.00)

<u>Depth (in.)</u>	<u>Classification</u>
0 – 9	10YR 4/3 Brown fine to coarse TOPSOIL; Silty Sand, Grass
9 – 18	2.5Y 6/6 Olive Yellow fine to coarse SILTY SAND
18 – 64	10YR 5/8 Yellowish Brown fine to coarse SILTY SAND (Sandy Loam)
64 – 97	10YR 7/4 Very Pale Brown fine to coarse SILTY SAND
97 – 120	10YR 4/6 Dark Yellowish Brown fine to coarse SILTY SAND
120 -141	10YR 5/8 Yellowish Brown fine to coarse SILTY SAND Groundwater Not Encountered, ESHWT Not Observed IT-13 at 60" Rate – 4.5 in./hr.

Results of infiltration testing is contained in the table below:

Location	Depth (in.)*	Soil Classification	Stabilized Infiltration Rate (in./hr.) (field test)	Permeability Class Rating (lab tests)
IT-1	0	SANDY CLAY LOAM (SC)	1.0	K2 (0.6–2 in./hr.)
IT-2	12	SANDY CLAY LOAM (SC)	1.5	K2 (0.6–2 in./hr.)
IT-3	0	SANDY LOAM (SM)	4.5	K3 (2–6 in./hr.)
IT-4	12	SANDY CLAY LOAM (SC)	1.0	K2 (0.6–2 in./hr.)
IT-5	0	SANDY CLAY LOAM (SC)	1.0	K2 (0.6–2 in./hr.)
IT-6	12	SANDY CLAY LOAM (SC)	1.5	K2 (0.6–2 in./hr.)
IT-7	0	SANDY LOAM (SM)	6.0	K3 (2–6 in./hr.)
IT-8	12	SANDY CLAY LOAM (SC)	1.0	K2 (0.6–2 in./hr.)
IT-9	0.5	LOAMY SAND (SM)	13.5	K4 (6-20 in./hr.)
IT-10	12	SANDY LOAM (SM)	2.5	K3 (2–6 in./hr.)
IT-11	54	SANDY CLAY LOAM (SC)	1.0	K2 (0.6 – 2.0 in./hr.)
IT-12	66	SANDY CLAY LOAM (SC)	1.5	K2 (0.6 – 2.0 in./hr.)
IT-13	60	SANDY LOAM (SM)	4.5	K3 (2–6 in./hr.)

*Depths taken below existing ground surface elevations at test pit location.

CONCLUSIONS & RECOMMENDATIONS

Soils with permeability ratings of K2 or greater are considered non-hydraulically restrictive soils. Infiltration is feasible provided the infiltration rates are above 0.4 inches per hour on a site. The site exhibited a geometric mean infiltration rate, with a factor of safety of 2 applied, of 0.85 inches per hour. Based on the results of the testing performed as detailed above, it is our professional opinion that the soils encountered are suitable for infiltration.

QUALIFICATIONS

The findings presented in this report are based solely on the above investigation. No conclusions are to be drawn other than those specifically stated herein. This report does not reflect any variations, which may be encountered during construction. Underwood Engineering Company will not be responsible for variations in subsurface soils encountered in other areas other than those tested.

Respectfully submitted,

UNDERWOOD ENGINEERING COMPANY

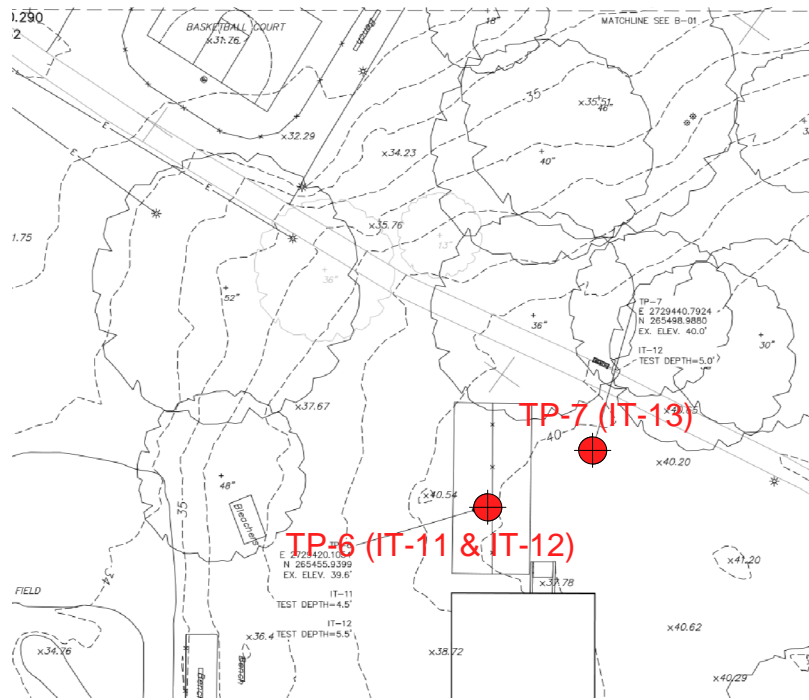
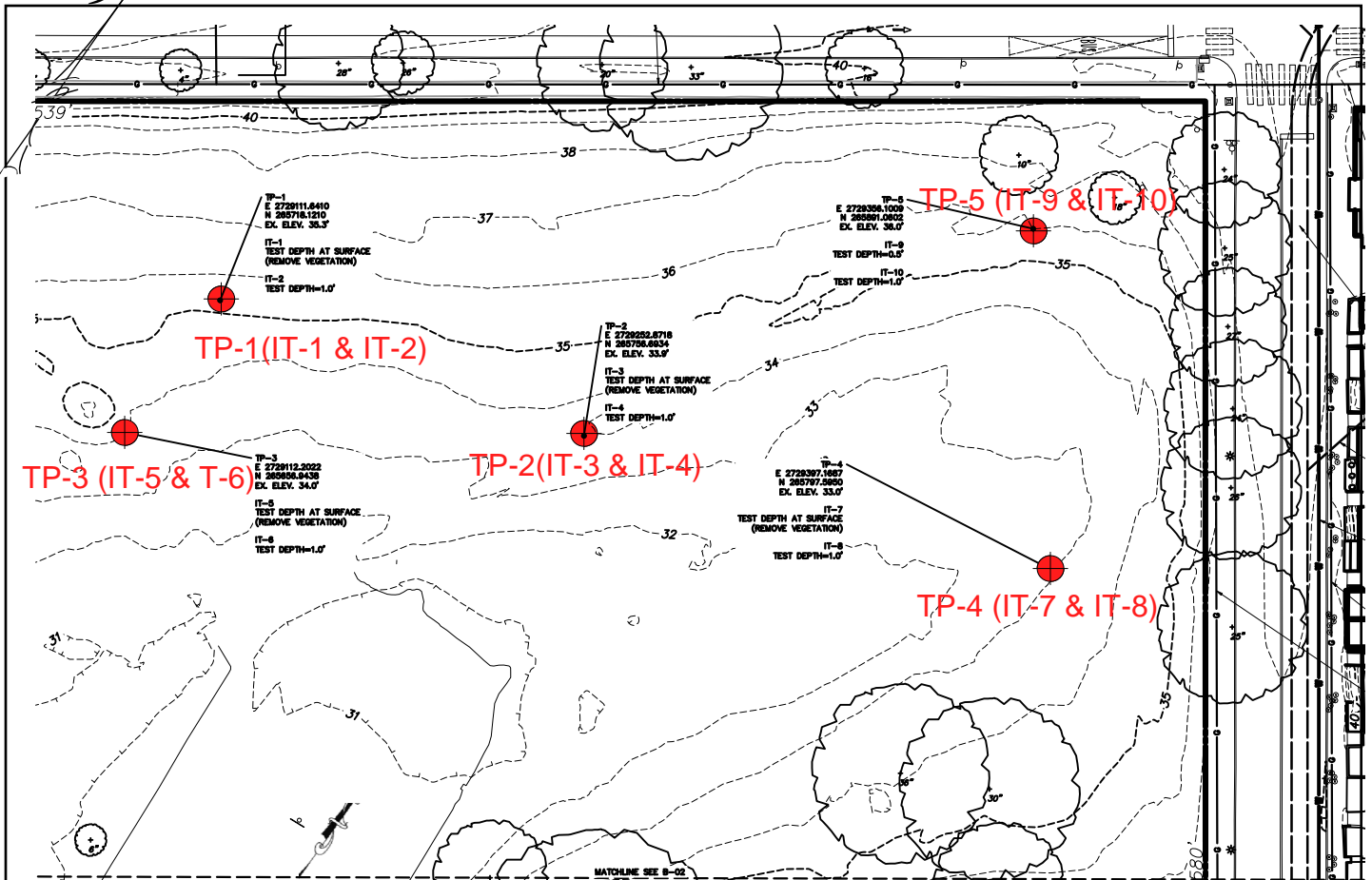
Christopher T. Koss

Christopher T. Koss, P.E.



UNDERWOOD ENGINEERING COMPANY

APPENDIX A
Test Pit Layout Plan



Test Pit Location T.P.-

KS Engineers, P.C.	Russo Park Stormwater Investigation 7301 Torresdale Avenue Philadelphia, PA			
TEST PIT LOCATION PLAN				
Underwood Engineering Company	Scale: N.T.S.	Date: Oct. 18, 2025	UE Ref. No.: 5454-12573-1	A - 1

APPENDIX B
Laboratory Soil Analysis
(Permeability Class Rating & Textural Analysis)

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/8/2025

Location: TP-1 IT-1 at Surface (0")

Test Number: IT-1

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 0.5 % Coarse fragments = 0.2

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 99.8

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 100.2

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	37	36.9	11.4	0.03106
5	35	34.9	11.4	0.01964
15	31	30.9	11.4	0.01134
30	28	27.9	11.7	0.00812
60	25	25.0	12.2	0.00587
250	20	20.0	13.0	0.00297
1440	18	18.0	13.3	0.00125

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 15.1 Wt retained #300 sieve (0.045mm) = 55.2

% Fine plus very fine sand = 27.4

D. SOIL MORPHOLOGY

Structure : Subangular Blocky

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 55.2

%Silt = 23

%Clay = 21.8

Soil Texture: Sandy Clay Loam

Soil Permeability Class Rating: K2

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/8/2025

Location: TP-1 IT-2 at 1ft

Test Number: IT-2

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 1.0 % Coarse fragments = 0.4

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 99.6

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 100.4

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	42	41.8	11.4	0.03106
5	40	39.8	11.4	0.01964
15	35	34.9	11.4	0.01134
30	30	29.9	11.4	0.00802
60	27	26.9	11.9	0.00579
250	22	21.9	12.7	0.00293
1440	20	19.9	13.0	0.00124

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 20.4 Wt retained #300 sieve (0.045mm) = 52.9

% Fine plus very fine sand = 38.6

D. SOIL MORPHOLOGY

Structure : Subangular Blocky

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 52.9

%Silt = 24.7

%Clay = 22.4

Soil Texture: Sandy Clay Loam

Soil Permeability Class Rating: K2

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/8/2025

Location: TP-2 IT-3 at Surface

Test Number: IT-3

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 1.5 % Coarse fragments = 0.6

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 99.4

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 100.6

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	27	26.8	11.9	0.03173
5	25	24.9	12.2	0.02032
15	23	22.9	12.5	0.01188
30	20	19.9	13.0	0.00856
60	18	17.9	13.3	0.00613
250	15	14.9	13.8	0.00306
1440	13	12.9	14.2	0.00129

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 25.3 Wt retained #300 sieve (0.045mm) = 75.1

% Fine plus very fine sand = 33.7

D. SOIL MORPHOLOGY

Structure : Subangular Blocky

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 75.1

%Silt = 12.9

%Clay = 12.0

Soil Texture: Sandy Loam

Soil Permeability Class Rating: K3

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/8/2025

Location: TP-2 IT-4 at 1.0ft

Test Number: IT-4

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 1.5 % Coarse fragments = 0.6

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 99.4

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 100.6

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	48	47.7	11.4	0.03106
5	45	44.7	11.4	0.01964
15	43	42.7	11.4	0.01134
30	37	36.8	11.4	0.00802
60	35	34.8	11.4	0.00567
250	31	30.8	11.4	0.00278
1440	28	27.8	11.7	0.00117

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 11.7 Wt retained #300 sieve (0.045mm) = 54.2

% Fine plus very fine sand = 21.6

D. SOIL MORPHOLOGY

Structure : Subangular Blocky

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 54.2

%Silt = 19.1

%Clay = 26.7

Soil Texture: Sandy Clay Loam

Soil Permeability Class Rating: K2

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/8/2025

Location: TP-3 IT-5 at Surface

Test Number: IT-5

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 2.5 % Coarse fragments = 1.0

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 99

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 101

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	49	48.5	11.4	0.03106
5	47	46.5	11.4	0.01964
15	44	43.6	11.4	0.01134
30	39	38.6	11.4	0.00802
60	37	36.6	11.4	0.00567
250	33	32.7	11.4	0.00278
1440	31	30.7	11.4	0.00116

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 10.1 Wt retained #300 sieve (0.045mm) = 51.2

% Fine plus very fine sand = 19.7

D. SOIL MORPHOLOGY

Structure : Subangular Blocky

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 51.2

%Silt = 17.9

%Clay = 30.9

Soil Texture: Sandy Clay Loam

Soil Permeability Class Rating: K2

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/9/2025

Location: TP-3 IT-6 at 1.0ft

Test Number: IT-6

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 2.5 % Coarse fragments = 1.0

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 99

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 101

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	50	49.5	11.4	0.03106
5	48	47.5	11.4	0.01964
15	45	44.6	11.4	0.01134
30	42	41.6	11.4	0.00802
60	40	39.6	11.4	0.00567
250	35	34.7	11.4	0.00278
1440	33	32.7	11.4	0.00116

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 5.6 Wt retained #300 sieve (0.045mm) = 54.1

% Fine plus very fine sand = 10.4

D. SOIL MORPHOLOGY

Structure : Subangular Blocky

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 54.1

%Silt = 15.6

%Clay = 30.3

Soil Texture: Sandy Clay Loam

Soil Permeability Class Rating: K2

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/9/2025

Location: TP-4 IT-7 at Surface

Test Number: IT-7

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 0.0 % Coarse fragments = 0.0

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 100

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 100

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	28	28.0	11.7	0.03147
5	25	25.0	12.2	0.02032
15	22	22.0	12.7	0.01197
30	20	20.0	13.0	0.00856
60	18	18.0	13.3	0.00613
250	15	15.0	13.8	0.00306
1440	12	12.0	14.3	0.00130

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 13.6 Wt retained #300 sieve (0.045mm) = 72.5

% Fine plus very fine sand = 18.8

D. SOIL MORPHOLOGY

Structure : Subangular Blocky

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 72.5

%Silt = 15.7

%Clay = 11.8

Soil Texture: Sandy Loam

Soil Permeability Class Rating: K3

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/9/2025

Location: TP-4 IT-8 at 1.0ft

Test Number: IT-8

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 0.0 % Coarse fragments = 0.0

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 100

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 100

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	48	48.0	11.4	0.03106
5	46	46.0	11.4	0.01964
15	42	42.0	11.4	0.01134
30	39	39.0	11.4	0.00802
60	35	35.0	11.4	0.00567
250	32	32.0	11.4	0.00278
1440	25	25.0	12.2	0.00120

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 14.9 Wt retained #300 sieve (0.045mm) = 58.2

% Fine plus very fine sand = 25.6

D. SOIL MORPHOLOGY

Structure : Subangular Blocky

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 58.2

%Silt = 20

%Clay = 21.8

Soil Texture: Sandy Clay Loam

Soil Permeability Class Rating: K2

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/9/2025

Location: TP-5 IT-9 at 0.5ft

Test Number: IT-9

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 0.0 % Coarse fragments = 0.0

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 100

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 100

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	15	15.0	13.8	0.03417
5	13	13.0	14.2	0.02192
15	11	11.0	14.5	0.01279
30	9	9.0	14.8	0.00914
60	7	7.0	15.2	0.00655
250	6	6.0	15.3	0.00322
1440	6	6.0	15.3	0.00134

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 6.1 Wt retained #300 sieve (0.045mm) = 84.5

% Fine plus very fine sand = 7.2

D. SOIL MORPHOLOGY

Structure : Granular

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 84.5

%Silt = 9.3

%Clay = 6.2

Soil Texture: Loamy Sand

Soil Permeability Class Rating: K4

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/11/2025

Location: TP-5 IT-10 at 1ft

Test Number: IT-10

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 8.4 % Coarse fragments = 3.4

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 96.6

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 103.5

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	25	24.2	12.2	0.03213
5	24	23.2	12.4	0.02049
15	22	21.3	12.7	0.01197
30	20	19.3	13.0	0.00856
60	18	17.4	13.3	0.00613
250	15	14.5	13.8	0.00306
1440	13	12.6	14.2	0.00129

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 21.7 Wt retained #300 sieve (0.045mm) = 75.8

% Fine plus very fine sand = 28.6

D. SOIL MORPHOLOGY

Structure : Granular

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 75.8

%Silt = 11.6

%Clay = 12.6

Soil Texture: Sandy Loam

Soil Permeability Class Rating: K3

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/11/2025

Location: TP-6 IT-11 at 54" (4.5ft)

Test Number: IT-11

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 1.0 % Coarse fragments = 0.4

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 99.6

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 100.4

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	34	33.9	11.4	0.03106
5	32	31.9	11.4	0.01964
15	28	27.9	11.7	0.01149
30	25	24.9	12.2	0.00830
60	23	22.9	12.5	0.00594
250	20	19.9	13.0	0.00297
1440	18	17.9	13.3	0.00125

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 11.6 Wt retained #300 sieve (0.045mm) = 58.7

% Fine plus very fine sand = 19.8

D. SOIL MORPHOLOGY

Structure : Subangular Blocky

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 58.7

%Silt = 19.4

%Clay = 21.9

Soil Texture: Sandy Clay Loam

Soil Permeability Class Rating: K2

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/11/2025

Location: TP-6 IT-12 at 66" (5.5ft)

Test Number: IT-12

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 6.0 % Coarse fragments = 2.4

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 97.6

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 102.5

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	30	29.3	11.4	0.03106
5	29	28.3	11.5	0.01973
15	27	26.3	11.9	0.01159
30	25	24.4	12.2	0.00830
60	22	21.5	12.7	0.00599
250	19	18.5	13.2	0.00299
1440	17	16.6	13.5	0.00126

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 13.4 Wt retained #300 sieve (0.045mm) = 59.1

% Fine plus very fine sand = 22.7

D. SOIL MORPHOLOGY

Structure : Subangular Blocky

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 59.1

%Silt = 17.7

%Clay = 23.2

Soil Texture: Sandy Clay Loam

Soil Permeability Class Rating: K2

Underwood Engineering Company

1 Keystone Avenue, Cherry Hill, NJ 08003

Patrick M. Underwood, President

(856) 933-1818

Client: KS Engineers

Project: Russo Park Infiltration Testing

Requirement: Hydrometer & Sieve Analysis

Date Performed: 10/11/2025

Location: TP-7 IT-13 at 60" (5ft)

Test Number: IT-13

Project No:5454-12573-1, WO#25-6889

ASTM D7928 HYDROMETER AND SIEVE ANALYSIS

A. COARSE FRAGMENT CONTENT

Total dry sample wt. = 250.0 Wt. retained #10 sieve (2mm) = 10.1 % Coarse fragments = 4.0

B. HYDROMETER ANALYSIS

Weight used for hydrometer analysis = 100.0g

Percent Passing #10 sieve = 96

Temperature = 24 °C

a = 1.0 based on specific gravity of soil particles = 2.65 from Table 1 of ASTM D-422

w, weight used for hydrometer analysis/percent passing #10 x 100 = 104.2

L, value of effective depth, Table 2 of ASTM D-422 = see table below

k, based on specific gravity of soil particle and temperature = 0.01301

Time, t (minutes)	Hydrometer reading, r	Percent in suspension, $P=100ra/w$	L (cm)	Soil particle diam.(mm), $D = k \sqrt{L/t}$
2	27	25.9	11.9	0.03173
5	25	24.0	12.2	0.02032
15	23	22.1	12.5	0.01188
30	20	19.2	13.0	0.00856
60	18	17.3	13.3	0.00613
250	16	15.4	13.7	0.00305
1440	13	12.5	14.2	0.00129

C. SIEVE ANALYSIS (of hydrometer sample)

Wt. passing #60 sieve (0.25mm) = 3.3 Wt retained #300 sieve (0.045mm) = 71.4

% Fine plus very fine sand = 4.6

D. SOIL MORPHOLOGY

Structure : Granular

Consistence : Friable

E. Soil Permeability CLASS RATING and TEXTURAL ANALYSIS

%Sand = 71.4

%Silt = 14.8

%Clay = 13.8

Soil Texture: Sandy Loam

Soil Permeability Class Rating: K3

APPENDIX C
Infiltration Log Soil Analysis



PWD Stormwater Infiltration Testing Log

Report No.:	1
Issue No.:	1

Client: KS Engineers PC	cc:	
Project: Russo Park Infiltration Testing		
Work Date: 10/6-10/7/2025		
		Submitted By: M. Wanberg
		Date of Issue: 10/18/2025

Project Name: Russo Park Infiltration Testing
Project Address: 7301 Torresdale Avenue, Philadelphia, PA
Date: 10/6/2025 **Email Address:** mwanberg@underwood-engineering.com
Weather: High 70's, Sunny **Tester's Name:** K. Kumar
Testing Company: Underwood Engineering Inc. **Instrument Diameter (inches):** 6"
Phone Number: 856-933-1818 **Test Method:** Double-Ring Infiltrometer
Test Number: IT-1 **Test Pit/Boring Hole Number:** TP-1 **Test Depth (inches):** 0" -Surface
Surface Elevation (feet): 35.3

Soil Characterization

Depth (Inches):	Soil Texture:	Limiting Layers Type and Depth (Inches):
0" Surface	SANDY CLAY LOAM / CLAYEY SAND	Grass/Roots Removed

Presoak

Time:	Time Interval:	Measurement (Inches):	Drop in Water Level (Inches):
12:25	0	0	0
12:55	30	5.25	0.75
1:25	30	5.5	0.5

Infiltration Testing

Time:	Time Interval (10 or 30 minutes):	Measurement (Inches):	Drop in Water Level (Inches):	Infiltration Rate (inches per hour):	Remarks:
1:25	0	0	0	1.0	
1:55	30	5.5	0.5	1.0	
2:25	30	5.5	0.5	1.0	
2:55	30	5.5	0.5	1.0	
3:25	30	5.5	0.5	1.0	
Stabilized Infiltration Testing Rate (inches per hour):				1.0	



PWD Stormwater Infiltration Testing Log

Report No.:	1
Issue No.:	1

Client: KS Engineers PC	cc:	
Project: Russo Park Infiltration Testing		
Work Date: 10/6-10/7/2025		
		Submitted By: M. Wanberg
		Date of Issue: 10/18/2025

Project Name: Russo Park Infiltration Testing
Project Address: 7301 Torresdale Avenue, Philadelphia, PA
Date: 10/6/2025 **Email Address:** mwanberg@underwood-engineering.com
Weather: High 70's, Sunny **Tester's Name:** K. Kumar
Testing Company: Underwood Engineering Inc. **Instrument Diameter (inches):** 6"
Phone Number: 856-933-1818 **Test Method:** Double-Ring Infiltrometer
Test Number: IT-2 **Test Pit/Boring Hole Number:** TP-1 **Test Depth (inches):** 12"
Surface Elevation (feet): 35.3

Soil Characterization

Depth (Inches):	Soil Texture:	Limiting Layers Type and Depth (Inches):
12	SANDY CLAY LOAM / CLAYEY SAND	

Presoak

Time:	Time Interval:	Measurement (Inches):	Drop in Water Level (Inches):
12:27	0	0	0
12:57	30	5.25	0.75
1:27	30	5.25	0.75

Infiltration Testing

Time:	Time Interval (10 or 30 mintues):	Measurement (Inches):	Drop in Water Level (Inches):	Infiltration Rate (inches per hour):	Remarks:
1:27	0	0	0	1.5	
1:57	30	5.25	0.75	1.5	
2:27	30	5.25	0.75	1.5	
2:57	30	5.25	0.75	1.5	
3:27	30	5.25	0.75	1.5	
				Stabilized Infiltration Testing Rate (inches per hour):	1.5



PWD Stormwater Infiltration Testing Log

Report No.:	1
Issue No.:	1

Client: KS Engineers PC	cc:	
Project: Russo Park Infiltration Testing		
Work Date: 10/6-10/7/2025		
		Submitted By: M. Wanberg
		Date of Issue: 10/18/2025

Project Name: Russo Park Infiltration Testing

Project Address: 7301 Torresdale Avenue, Philadelphia, PA

Date: 10/6/2025 **Email Address:** mwanberg@underwood-engineering.com

Weather: Low 60's, Sunny **Tester's Name:** K. Kumar

Testing Company: Underwood Engineering Inc. **Instrument Diameter (inches):** 6"

Phone Number: 856-933-1818 **Test Method:** Double-Ring Infiltrometer

Test Number: IT-3 **Test Pit/Boring Hole Number:** TP-2 **Test Depth (inches):** 0" Surface

Surface Elevation (feet): 33.9

Soil Characterization

Depth (Inches):	Soil Texture:	Limiting Layers Type and Depth (Inches):
0	SANDY LOAM / SILTY SAND	Grass/Roots Removed

Presoak

Time:	Time Interval:	Measurement (Inches):	Drop in Water Level (Inches):
8:18	0	0	0
8:48	30	2.75	2.75
9:18	30	2.75	2.75

Infiltration Testing

Time:	Time Interval (10 or 30 minutes):	Measurement (Inches):	Drop in Water Level (Inches):	Infiltration Rate (inches per hour):	Remarks:
9:18	0	0	0	4.5	
9:28	10	0.75	0.75	4.5	
9:38	10	0.75	0.75	4.5	
9:48	10	0.75	0.75	4.5	
9:58	10	0.75	0.75	4.5	
Stabilized Infiltration Testing Rate (inches per hour):				4.5	



PWD Stormwater Infiltration Testing Log

Report No.:	1
Issue No.:	1

Client: KS Engineers PC	cc:	
Project: Russo Park Infiltration Testing		
Work Date: 10/6-10/7/2025		
		Submitted By: M. Wanberg
		Date of Issue: 10/18/2025

Project Name: Russo Park Infiltration Testing
Project Address: 7301 Torresdale Avenue, Philadelphia, PA
Date: 10/7/2025 **Email Address:** mwanberg@underwood-engineering.com
Weather: High 70's, Sunny **Tester's Name:** K. Kumar
Testing Company: Underwood Engineering Inc. **Instrument Diameter (inches):** 6"
Phone Number: 856-933-1818 **Test Method:** Double-Ring Infiltrometer
Test Number: IT-5 **Test Pit/Boring Hole Number:** TP-3 **Test Depth (inches):** 0" Surface
Surface Elevation (feet): 34

Soil Characterization

Depth (Inches):	Soil Texture:	Limiting Layers Type and Depth (Inches):
0	SANDY CLAY LOAM / CLAYEY SAND	

Presoak

Time:	Time Interval:	Measurement (Inches):	Drop in Water Level (Inches):
11:38	0	0	0
12:08	30	0.5	0.5
12:38	30	0.5	0.5

Infiltration Testing

Time:	Time Interval (10 or 30 mintues):	Measurement (Inches):	Drop in Water Level (Inches):	Infiltration Rate (inches per hour):	Remarks:
12:38	0	0	0	1.0	
1:08	30	0.5	0.5	1.0	
1:38	30	0.5	0.5	1.0	
2:08	30	0.5	0.5	1.0	
2:38	30	0.5	0.5	1.0	
Stabilized Infiltration Testing Rate (inches per hour):				1.0	



PWD Stormwater Infiltration Testing Log

Report No.:	1
Issue No.:	1

Client: KS Engineers PC	cc:	
Project: Russo Park Infiltration Testing		
Work Date: 10/6-10/7/2025		
		Submitted By: M. Wanberg
		Date of Issue: 10/18/2025

Project Name: Russo Park Infiltration Testing
Project Address: 7301 Torresdale Avenue, Philadelphia, PA
Date: 10/7/2025 **Email Address:** mwanberg@underwood-engineering.com
Weather: High 70's, Sunny **Tester's Name:** K. Kumar
Testing Company: Underwood Engineering Inc. **Instrument Diameter (inches):** 6"
Phone Number: 856-933-1818 **Test Method:** Double-Ring Infiltrometer
Test Number: IT-6 **Test Pit/Boring Hole Number:** TP-3 **Test Depth (inches):** 12
Surface Elevation (feet): 34

Soil Characterization

Depth (Inches):	Soil Texture:	Limiting Layers Type and Depth (Inches):
12	SANDY CLAY LOAM / CLAYEY SAND	

Presoak

Time:	Time Interval:	Measurement (Inches):	Drop in Water Level (Inches):
11:42	0	0	0
12:12	30	5.0	1.0
12:42	30	5.25	0.75

Infiltration Testing

Time:	Time Interval (10 or 30 mintues):	Measurement (Inches):	Drop in Water Level (Inches):	Infiltration Rate (inches per hour):	Remarks:
12:42	0	0	0	1.5	
1:12	30	5.25	0.75	1.5	
1:42	30	5.25	0.75	1.5	
2:12	30	5.25	0.75	1.5	
2:42	30	5.25	0.75	1.5	
				Stabilized Infiltration Testing Rate (inches per hour):	1.5



PWD Stormwater Infiltration Testing Log

Report No.:	1
Issue No.:	1

Client: KS Engineers PC	cc:	
Project: Russo Park Infiltration Testing		
Work Date: 10/6-10/7/2025		
		Submitted By: M. Wanberg
		Date of Issue: 10/18/2025

Project Name: Russo Park Infiltration Testing
Project Address: 7301 Torresdale Avenue, Philadelphia, PA
Date: 10/6/2025 **Email Address:** mwanberg@underwood-engineering.com
Weather: High 60's, Sunny **Tester's Name:** K. Kumar
Testing Company: Underwood Engineering Inc. **Instrument Diameter (inches):** 6"
Phone Number: 856-933-1818 **Test Method:** Double-Ring Infiltrometer
Test Number: IT-7 **Test Pit/Boring Hole Number:** TP-4 **Test Depth (inches):** 0" Surface
Surface Elevation (feet): 33.00

Soil Characterization

Depth (Inches):	Soil Texture:	Limiting Layers Type and Depth (Inches):
0	SANDY LOAM / SILTY SAND	Grass/Roots Removed

Presoak

Time:	Time Interval:	Measurement (Inches):	Drop in Water Level (Inches):
11:21	0	0	0
11:51	30	0.0	6.0
12:21	30	3.0	3.0

Infiltration Testing

Time:	Time Interval (10 or 30 mintues):	Measurement (Inches):	Drop in Water Level (Inches):	Infiltration Rate (inches per hour):	Remarks:
12:21	0	0	0	6.0	
12:31	10	5.0	1.0	6.0	
12:41	10	5.0	1.0	6.0	
12:51	10	5.0	1.0	6.0	
1:01	10	5.0	1.0	6.0	
				Stabilized Infiltration Testing Rate (inches per hour):	6.0



PWD Stormwater Infiltration Testing Log

Report No.:	1
Issue No.:	1

Client: KS Engineers PC	cc:	
Project: Russo Park Infiltration Testing		
Work Date: 10/6-10/7/2025		
		Submitted By: M. Wanberg
		Date of Issue: 10/18/2025

Project Name: Russo Park Infiltration Testing

Project Address: 7301 Torresdale Avenue, Philadelphia, PA

Date: 10/6/2025 **Email Address:** mwanberg@underwood-engineering.com

Weather: High 50's, Sunny **Tester's Name:** K. Kumar

Testing Company: Underwood Engineering Inc. **Instrument Diameter (inches):** 6"

Phone Number: 856-933-1818 **Test Method:** Double-Ring Infiltrometer

Test Number: IT-9 **Test Pit/Boring Hole Number:** TP-5 **Test Depth (inches):** 0.5"

Surface Elevation (feet): 36.00

Soil Characterization

Depth (Inches):	Soil Texture:	Limiting Layers Type and Depth (Inches):
0.5	LOAMY SAND / SILTY SAND	

Presoak

Time:	Time Interval:	Measurement (Inches):	Drop in Water Level (Inches):
8:10	0	0	0
8:40	30	0.0	6.0
9:10	30	0.0	6.0

Infiltration Testing

Time:	Time Interval (10 or 30 mintues):	Measurement (Inches):	Drop in Water Level (Inches):	Infiltration Rate (inches per hour):	Remarks:
9:10	0	0	0	>12	
9:20	10	3.75	2.25	13.5	
9:30	10	3.75	2.25	13.5	
9:40	10	3.75	2.25	13.5	
9:50	10	3.75	2.25	13.5	
Stabilized Infiltration Testing Rate (inches per hour):				13.5	



PWD Stormwater Infiltration Testing Log

Report No.:	1
Issue No.:	1

Client: KS Engineers PC	cc:	
Project: Russo Park Infiltration Testing		
Work Date: 10/6-10/7/2025		
		Submitted By: M. Wanberg
		Date of Issue: 10/18/2025

Project Name: Russo Park Infiltration Testing

Project Address: 7301 Torresdale Avenue, Philadelphia, PA

Date: 10/6/2025 Email Address: mwanberg@underwood-engineering.com

Weather: Low 60's, Sunny Tester's Name: K. Kumar

Testing Company: Underwood Engineering Inc. Instrument Diameter (inches): 6"

Phone Number: 856-933-1818 Test Method: Double-Ring Infiltrometer

Test Number: IT-10 Test Pit/Boring Hole Number: TP-5 Test Depth (inches): 12

Surface Elevation (feet): 36.00

Soil Characterization

Depth (Inches):	Soil Texture:	Limiting Layers Type and Depth (Inches):
12	SANDY LOAM / SILTY SAND	

Presoak

Time:	Time Interval:	Measurement (Inches):	Drop in Water Level (Inches):
9:15	0	0	0
9:45	30	3.75	2.25
10:15	30	4.25	1.75

Infiltration Testing

Time:	Time Interval (10 or 30 mintues):	Measurement (Inches):	Drop in Water Level (Inches):	Infiltration Rate (inches per hour):	Remarks:
10:15	0	0	0	3.5	
10:45	30	4.75	1.25	2.5	
11:15	30	4.75	1.25	2.5	
11:45	30	4.75	1.25	2.5	
12:15	30	4.75	1.25	2.5	
Stabilized Infiltration Testing Rate (inches per hour):				2.5	



PWD Stormwater Infiltration Testing Log

Report No.:	1
Issue No.:	1

Client: KS Engineers PC	cc:	
Project: Russo Park Infiltration Testing		
Work Date: 10/6-10/7/2025		
		Submitted By: M. Wanberg
		Date of Issue: 10/18/2025

Project Name: Russo Park Infiltration Testing

Project Address: 7301 Torresdale Avenue, Philadelphia, PA

Date: 10/7/2025 Email Address: mwanberg@underwood-engineering.com

Weather: Low 70's, Sunny Tester's Name: K. Kumar

Testing Company: Underwood Engineering Inc. Instrument Diameter (inches): 6"

Phone Number: 856-933-1818 Test Method: Double-Ring Infiltrometer

Test Number: IT-11 Test Pit/Boring Hole Number: TP-6 Test Depth (inches): 54" (4.5ft)

Surface Elevation (feet): 39.60

Soil Characterization

Depth (Inches):	Soil Texture:	Limiting Layers Type and Depth (Inches):
54" (4.5ft)	SANDY CLAY LOAM / CLAYEY SAND	

Presoak

Time:	Time Interval:	Measurement (Inches):	Drop in Water Level (Inches):
9:24	0	0	0
9:54	30	5.5	0.5
10:24	30	5.5	0.5

Infiltration Testing

Time:	Time Interval (10 or 30 mintues):	Measurement (Inches):	Drop in Water Level (Inches):	Infiltration Rate (inches per hour):	Remarks:
10:24	0	0	0	1.0	
10:54	30	5.5	0.5	1.0	
11:24	30	5.5	0.5	1.0	
11:54	30	5.5	0.5	1.0	
12:24	30	5.5	0.5	1.0	
Stabilized Infiltration Testing Rate (inches per hour):				1.0	



PWD Stormwater Infiltration Testing Log

Report No.:	1
Issue No.:	1

Client: KS Engineers PC	cc:	
Project: Russo Park Infiltration Testing		
Work Date: 10/6-10/7/2025		
		Submitted By: M. Wanberg
		Date of Issue: 10/18/2025

Project Name: Russo Park Infiltration Testing

Project Address: 7301 Torresdale Avenue, Philadelphia, PA

Date: 10/7/2025 Email Address: mwanberg@underwood-engineering.com

Weather: Low 70's, Sunny Tester's Name: K. Kumar

Testing Company: Underwood Engineering Inc. Instrument Diameter (inches): 6"

Phone Number: 856-933-1818 Test Method: Double-Ring Infiltrometer

Test Number: IT-12 Test Pit/Boring Hole Number: TP-6 Test Depth (inches): 66" (5.5ft)

Surface Elevation (feet): 39.60

Soil Characterization

Depth (Inches):	Soil Texture:	Limiting Layers Type and Depth (Inches):
66" (5.5ft)	SANDY CLAY LOAM / CLAYEY SAND	

Presoak

Time:	Time Interval:	Measurement (Inches):	Drop in Water Level (Inches):
9:28	0	0	0
9:58	30	5.25	0.75
10:28	30	5.25	0.75

Infiltration Testing

Time:	Time Interval (10 or 30 minutes):	Measurement (Inches):	Drop in Water Level (Inches):	Infiltration Rate (inches per hour):	Remarks:
10:28	0	0	0	1.5	
10:58	30	5.25	0.75	1.5	
11:28	30	5.25	0.75	1.5	
11:58	30	5.25	0.75	1.5	
12:28	30	5.25	0.75	1.5	
Stabilized Infiltration Testing Rate (inches per hour):				1.5	



PWD Stormwater Infiltration Testing Log

Report No.:	1
Issue No.:	1

Client: KS Engineers PC	cc:	
Project: Russo Park Infiltration Testing		
Work Date: 10/6-10/7/2025		
		Submitted By: M. Wanberg
		Date of Issue: 10/18/2025

Project Name: Russo Park Infiltration Testing
Project Address: 7301 Torresdale Avenue, Philadelphia, PA
Date: 10/7/2025 **Email Address:** mwanberg@underwood-engineering.com
Weather: Mid 70's, Sunny **Tester's Name:** K. Kumar
Testing Company: Underwood Engineering Inc. **Instrument Diameter (inches):** 6"
Phone Number: 856-933-1818 **Test Method:** Double-Ring Infiltrometer
Test Number: IT-13 **Test Pit/Boring Hole Number:** TP-7 **Test Depth (inches):** 60" (5ft)
Surface Elevation (feet): 40.00

Soil Characterization

Depth (Inches):	Soil Texture:	Limiting Layers Type and Depth (Inches):
60" (5ft)	SANDY LOAM / SILTY SAND	

Presoak

Time:	Time Interval:	Measurement (Inches):	Drop in Water Level (Inches):
10:56	0	0	0
11:26	30	5.25	2.25
11:56	30	5.25	2.25

Infiltration Testing

Time:	Time Interval (10 or 30 mintues):	Measurement (Inches):	Drop in Water Level (Inches):	Infiltration Rate (inches per hour):	Remarks:
11:56	0	0	0	4.5	
12:06	10	5.25	0.75	4.5	
12:16	10	5.25	0.75	4.5	
12:26	10	5.25	0.75	4.5	
12:36	10	5.25	0.75	4.5	
				Stabilized Infiltration Testing Rate (inches per hour):	4.5