

THE SCHOOL DISTRICT OF PHILADELPHIA
SCHOOL REFORM COMMISSION
Office of Capital Programs
440 North Broad Street, 3rd Floor – Suite 371
Philadelphia, PA 19130

TELEPHONE: (215) 400-4730

Addendum No. 1

Subject: Paving & Stormwater Management Project
SDP Contract No. B-088C of 2016/17- General Construction

Location: William Rowen Elementary School

This Addendum, dated 25th of April, 2018, shall modify and become part of the Contract Documents for the work of this project. Any items not mentioned herein, or affected by, shall be performed strictly in accordance with the original documents.

1. Attached is the revised Bid Proposal Form.
2. Attached are Pavement Core Results, dated 2/03/2017, 10 pages
3. Attached is Infiltration Testing Letter Report dated April 28, 2017 (rev 6/19/17)
with geotechnical lab testing results

This information is provided for the Contractor's information only. This information was used for design purposes only and may not be representative of site soils for the entire site or current soil conditions
Any interpretation of this information by the Contractor is solely at its own risk.

-END OF ADDENDUM NO. 1-

BID PROPOSAL FORM
PAVING AND STORMWATER MANAGEMENT
WILLIAM ROWEN ELEMENTARY SCHOOL

Contract No. B-088C of 2016/17 General Construction

TO: The School District of Philadelphia
School Reform Commission

OWNER

Office of Capital Programs
The School District of Philadelphia
440 North Broad Street
Third Floor - Suite 371
Philadelphia, PA 19130-4015

ADDRESS

FROM: _____

**CONTRACTOR
ADDRESS**

**CITY/STATE
CONTACT NAME
PHONE NO.**

BASE CONTRACT PROPOSAL:

1. Having become completely familiar with the local conditions affecting the cost of Work at the place where Work is to be executed, and having carefully examined the site conditions as they currently exist, and having carefully examined the Bidding and Contract Documents prepared for this project, together with any Addenda to such Bidding and Contract Documents as listed hereinafter, the Undersigned hereby proposes and agrees to provide all labor, materials, plant, equipment, transportation and other facilities as necessary and/or required to execute all of the Work described by the Contract Documents for: **Contract No. B-088C of 2017/18-General Construction**

for the lump sum consideration of: _____
_____ Dollars (\$_____), said amount being hereinafter referred to as the Base Proposal Amount. Base proposal Amount includes Unit Price Items listed below, if applicable.

BID ALTERNATES (Not applicable to this Contract – No Alternates)

UNIT PRICES: NOT APPLICABLE TO THIS CONTRACT

ACKNOWLEDGEMENT OF RECEIPT OF ADDENDA:

2. The Undersigned acknowledges receipt of the following Addenda (list by number and date appearing on Addenda):

<u>Addendum No.</u>	<u>Date</u>	<u>Addendum No.</u>	<u>Date</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

TIME OF COMPLETION:

3. The Undersigned agrees to Substantially Complete all Work under this Contract within the time periods specified in Division 1, General Requirements, Section 00 1300 entitled "Time of Completion, Milestones and Phasing or Sequencing Requirements".

INSURANCE:

4. All Bidders are instructed to refer to Article GC-11 of the General Conditions. All Contractors or Subcontractors bidding Work on the Project shall include in their bids the costs of Workers Compensation and Employer's Liability Insurance, Commercial General Liability Insurance, Automobile Liability Insurance, Excess Umbrella Liability Insurance (Commercial Umbrella Liability Insurance) and any other types of insurance identified in Division 1- General Requirements, Section 01200 (or 01 1200) entitled "Special Insurance Requirements".

LIQUIDATED DAMAGES:

5. Upon failure by the Contractor to achieve Substantial Completion within the time specified in Article GC-8 of the General Conditions from the Date of Commencement as set forth in the Notice to Proceed, the Contractor shall pay to the School District, as liquidated damages and not as a penalty, the sum of One Thousand Dollars (\$1,000.00) per day for each consecutive calendar day of delay until such time as Substantial Completion of the Work is achieved.

6. In addition, the Contractor shall be responsible for and pay for the cost of completion of construction of the Work, as well as for any and all additional charges of the School District, Architect/Engineer, other Project Contractors, and any other Consultants to the School District relating to the Contractor's failure to achieve Substantial Completion on a timely basis, including, but not limited to, delay damages, disruption damages, acceleration costs or expenses, investigative expenses, consulting fees, experts' fees, and attorneys' fees.

7. The Contractor and the School District agree that the amounts so fixed herein as liquidated damages are reasonable forecasts of just compensation for the harm that will be caused to the School District by the Contractor's breach.

GENERAL STATEMENT:

8. The Undersigned declares that the person or persons signing this Proposal is/are fully authorized to sign on behalf of the firm listed and to fully bind the firm listed to all the Proposal's conditions and provisions thereof.

9. It is agreed that the Undersigned has complied or will comply with all requirements of local, state, and federal laws, and that no legal requirement has been or will be violated in making or accepting this Proposal, in awarding the Contract to it and/or in prosecution of the Work.

10. Bid Security in the amount of ten percent (10%) of the Base Bid, plus all additive Alternates Proposal amounts, is attached hereto and made a part hereof, without endorsement, in the sum of _____ Dollars (\$_____), which shall become the property of the School District in the event the Contract and Performance Bond and Labor and Materialmen's Bond are not executed within the time set forth, as liquidated damages.

11. The Undersigned further agrees within five (5) calendar days from date of Notice of Acceptance of this Proposal or Contract award, to sign and deliver to the School District, all required copies of the School District/Contractor Agreement, the Performance Bond, the Labor and Materialmen's Bond, and the Maintenance Bond, in the forms included in the Bidding Documents, and the policies of insurance or insurance certificates as required by the General Conditions. In case the undersigned fails or neglects to deliver within the specified time the School District/Contractor Agreement, the Performance Bond, the Labor and Materialmen's Bond, and the Maintenance Bond, and the insurance policies or certificates, all as aforesaid, the undersigned shall be considered as having abandoned the Contract, and the Bid Bond accompanying this Proposal shall be forfeited to the School District by reason of such failure on the part of the undersigned, as liquidated damages and not as a penalty.

12. The Undersigned further agrees that the Bid Security may be retained by the School District and shall remain with the School District until the School

District/Contractor Agreement has been signed and delivered to the School District and the Performance Bond, the Labor and Materialmen's Bond, and the Maintenance Bond, and insurance policies or certificates have been made and delivered to the School District.

Respectfully submitted this _____ day of _____, 201__.

Individual Proprietorship or Partnership

If Contractor is an individual proprietorship or is a partnership, sign here:

(Trade Name of Firm)

By: _____ By: _____ (SEAL)
(Witness) (Owner or Partner)

Corporation

If Contractor is a corporation, sign here:

(Name of Corporation)

ATTEST:

By: _____ By: _____ (SEAL)
(Secretary or Treasurer) (President or Vice President)

(CORPORATE SEAL)

Signature by anyone other than the President or Vice President and the Secretary or Treasurer of the Corporation must be accompanied by a power of attorney, executed by the proper corporate officers under the corporate seal indicating authority to execute this Bid.



SEAL

22 E KING ST.
P.O. BOX 887
PHILADELPHIA, PA 19106
P: 800-644-4800
F: 800-644-2486

CONSULTANTS
HUNT ENGINEERING COMPANY

SCHOOL & LOCATION
WILLIAM ROWEN ELEMENTARY SCHOOL
6801 NORTH 19TH STREET

PROJECT TITLE
STORMWATER MANAGEMENT CONCEPT

DRAWING TITLE
CONCEPT #03

APPROVED BY

SCHOOL DISTRICT OF PHILADELPHIA
THE SCHOOL REFORM COMMISSION

DEPARTMENT OF DESIGN AND CONSTRUCTION SERVICES
140 NORTH BROAD STREET
PHILADELPHIA, PA 19102
215-400-4730 FAX 215-400-4731
www.phila.k12.pa.us

CONTRACTOR TO VERIFY ALL CONDITIONS AND DIMENSIONS AT SITE

NO.	DATE	REVISION
1		
2		
3		
4		
5		
6		
7		
8		

SPEC. NO. DATE
02/08/2016

SCALE LOCATION NO.
1" = 20' 00

DRAWN BY TYPE NO.
AAA 00

CHECKED BY FILE NO.
JAE

DRAWING NO.
C-3

FEBRUARY 8, 2016
SHEET 1 OF 1

02/08/16 - FINAL CONCEPT SUBMISSION (NOT FOR CONSTRUCTION)

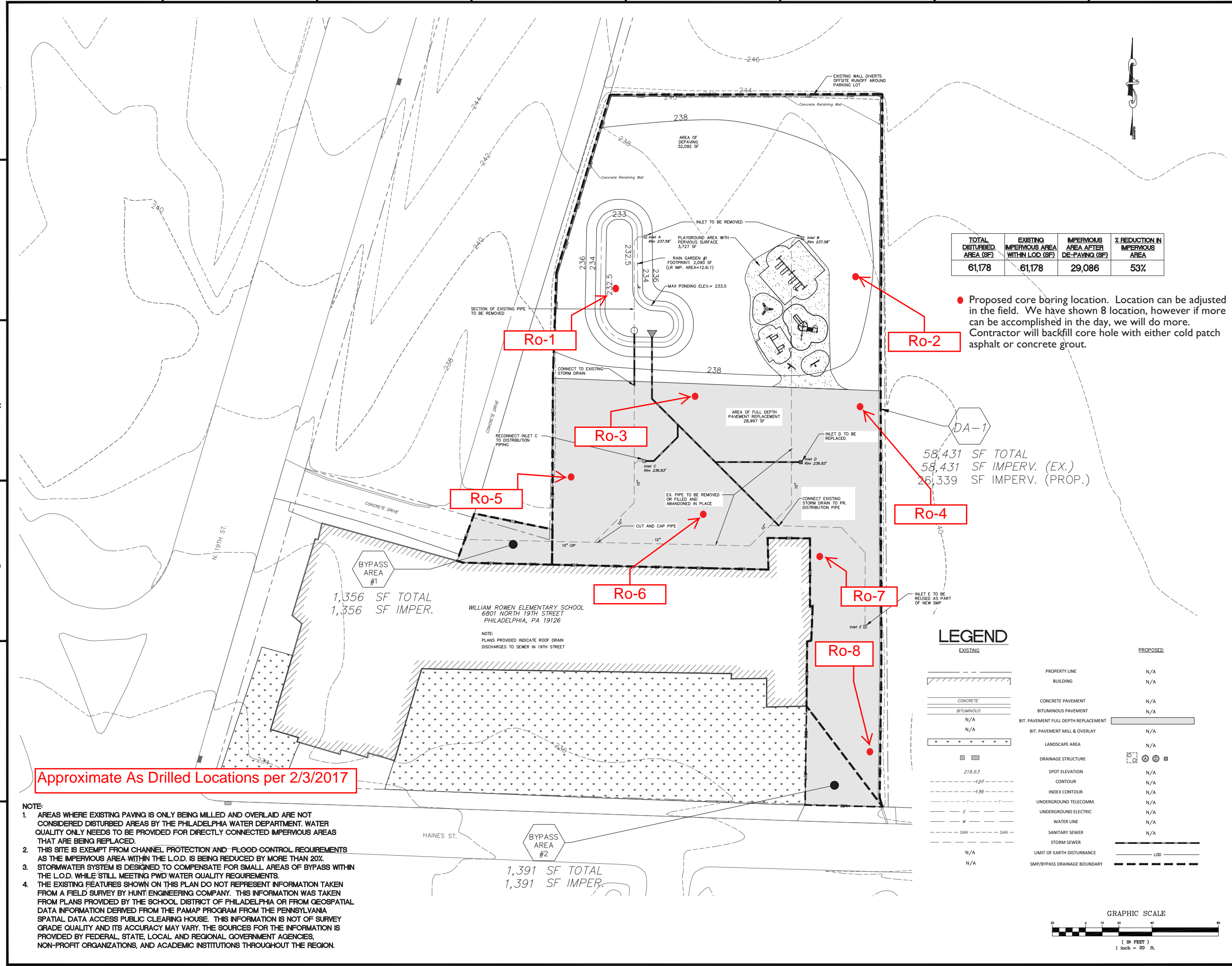
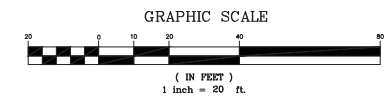
TOTAL DISTURBED AREA (SF)	EXISTING IMPERVIOUS AREA WITHIN L.O.D. (SF)	IMPERVIOUS AREA AFTER DE-PAVING (SF)	% REDUCTION IN IMPERVIOUS AREA
61,178	61,178	29,086	53%

Proposed core boring location. Location can be adjusted in the field. We have shown 8 location, however if more can be accomplished in the day, we will do more. Contractor will backfill core hole with either cold patch asphalt or concrete grout.

58,431 SF TOTAL
58,431 SF IMPERV. (EX.)
26,339 SF IMPERV. (PROP.)

LEGEND

EXISTING	PROPOSED
PROPERTY LINE	N/A
BUILDING	N/A
CONCRETE PAVEMENT	N/A
BITUMINOUS PAVEMENT	N/A
BIT. PAVEMENT FULL DEPTH REPLACEMENT	
BIT. PAVEMENT MILL & OVERLAY	N/A
LANDSCAPE AREA	N/A
DRAINAGE STRUCTURE	
SPOT ELEVATION	N/A
CONTOUR	N/A
INDEX CONTOUR	N/A
UNDERGROUND TELECOMM.	N/A
UNDERGROUND ELECTRIC	N/A
WATER LINE	N/A
SANITARY SEWER	N/A
STORM SEWER	N/A
LIMIT OF EARTH DISTURBANCE	LOD
SMP/BYPASS DRAINAGE BOUNDARY	



NOTE:

- AREAS WHERE EXISTING PAVING IS ONLY BEING MILLED AND OVERLAID ARE NOT CONSIDERED DISTURBED AREAS BY THE PHILADELPHIA WATER DEPARTMENT. WATER QUALITY ONLY NEEDS TO BE PROVIDED FOR DIRECTLY CONNECTED IMPERVIOUS AREAS THAT ARE BEING REPLACED.
- THIS SITE IS EXEMPT FROM CHANNEL PROTECTION AND FLOOD CONTROL REQUIREMENTS AS THE IMPERVIOUS AREA WITHIN THE L.O.D. IS BEING REDUCED BY MORE THAN 20%.
- STORMWATER SYSTEM IS DESIGNED TO COMPENSATE FOR SMALL AREAS OF BYPASS WITHIN THE L.O.D. WHILE STILL MEETING PWD WATER QUALITY REQUIREMENTS.
- THE EXISTING FEATURES SHOWN ON THIS PLAN DO NOT REPRESENT INFORMATION TAKEN FROM A FIELD SURVEY BY HUNT ENGINEERING COMPANY. THIS INFORMATION WAS TAKEN FROM PLANS PROVIDED BY THE SCHOOL DISTRICT OF PHILADELPHIA OR FROM GEOSPATIAL DATA INFORMATION DERIVED FROM THE PAMAP PROGRAM FROM THE PENNSYLVANIA SPATIAL DATA ACCESS PUBLIC CLEARING HOUSE. THIS INFORMATION IS NOT OF SURVEY GRADE QUALITY AND ITS ACCURACY MAY VARY. THE SOURCES FOR THE INFORMATION IS PROVIDED BY FEDERAL, STATE, LOCAL AND REGIONAL GOVERNMENT AGENCIES, NON-PROFIT ORGANIZATIONS, AND ACADEMIC INSTITUTIONS THROUGHOUT THE REGION.



Pavement Section Layer Thicknesses

Project Name:	William Rowen Elementary School	Description:	Pavement Core
Location:	6801 N. 19th Street, Philadelphia, PA	Tested By:	K. Coutsouros
Test Date:	February 3, 2017	Weather:	Overcast, 29°F to 32°F, gentle to mod. breeze

	Core Ro-1	Core Ro-2	Core Ro-3	Core Ro-4	Core Ro-5	Core Ro-6	Core Ro-7	Core Ro-8
Core Diameter (Inches)	<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>
Asphalt Top (Inches)	<u>1.00</u>	<u>1.00</u>	<u>1.00</u>	<u>0.5</u>	<u>0.75</u>	<u>1</u>	<u> </u>	<u> </u>
Asphalt Binder (Inches)	<u>1.50</u>	<u>1.00</u>	<u>1.50</u>	<u>1</u>	<u>1.5</u>	<u>2.25</u>	<u> </u>	<u> </u>
Total Asphalt (Inches)	2.50	2.00	2.50	1.50	2.25	3.25	0.00	0.00
Concrete (Inches)	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>4.50</u>	<u>6.00</u>
Gravel Base (Inches)	<u>4.00</u>	<u>6.50</u>	<u>6.00</u>	<u>7</u>	<u>6.5</u>	<u>4.75</u>	<u>5</u>	<u>10.50</u> (Possible Crushed Concrete)
Total Depth (Inches)	6.50	8.50	8.50	8.50	8.75	8.00	9.50	16.50

- Notes:
1. Measurement of layer thicknesses made to nearest 1/8 inch.
 2. Gravel Base was generally 2 inch minus, subrounded, gravel, except as noted.



















April 28, 2017 (Revised: June 19, 2017)

Ms. Julie Skierski, RLA
Office of Capital Programs
School District of Philadelphia
440 North Broad Street
Philadelphia, Pennsylvania 19130

RE: Infiltration Testing Summary
William Rowen Elementary School
6801 N. 19th Street
Philadelphia, PA 19126

Dear Ms. Skierski,

Hunt Engineering Company is pleased to present this letter summarizing test results of double-ring infiltration tests performed for the School District of Philadelphia planned William Rowen Elementary School (school) paving replacement and associated stormwater improvements. The location of the school is shown on Figure 1 in Attachment A. Two stormwater management practice (SMP) basin/features are planned, and will be located on paved school property as shown on Figure 2 in Attachment A.

Prior to commencing the excavation / infiltration testing, Master Locators, a private utility locator service, scanned the test pit locations to identify potential underground utilities that may be encountered during the test pit excavation. Two test pits were excavated and backfilled each day, on April 12, 2017 and April 13, 2017, respectively, for a total of four test pits. Accurate Drilling LLC, under the technical guidance of Hunt Engineering Company, excavated the test pits using a Komatsu WB140 rubber tire backhoe /loader excavation equipment. The soils exposed in the excavated test pits were described and documented by a representative of Hunt Engineering Company.

OVER 35 YEARS OF ENGINEERING EXCELLENCE

P.O. Box 537 | 22 East King Street | Malvern | PA | 19355 | p: 610-644-4600 | f: 610-644-2466 | www.huntengineering.com

Infiltration Test Summary
 William Rowen Elementary School
 6801 N. 19th Street
 Philadelphia, PA 19126

Two double ring infiltrometer tests were completed at the base of each of the four test pits for a total of 8 infiltration tests. The location of TP-Ro-4 was moved toward to the south from the marked location for ease of excavation and reduction of surface treatment disturbance; however the excavated location remained within the footprint of the proposed basin. The depth of the infiltration test pits was measured by tape with respect to the top of existing paved surface. The infiltration testing was performed by Hunt Engineering Company in general accordance with the double-ring infiltrometer test methodology per the Philadelphia Water Department (PWD) Stormwater Management Guidance Manual, Chapter 3.3.

A summary of the infiltration rate, (inches/hour), is provided in the following Table I. The test elevation is also provided for each test, which sometimes varied in the same test pit. The infiltration rate for each DRI test was determined by averaging the last four readings of each test. A geometric mean was determined from the average infiltration rates for each basin. Detailed results from the infiltration testing can be found in Attachment B on Double Ring Infiltration Testing Logs.

Table I – DRI Test Summary

Infiltration Test Location	Approximate Exist. Ground Elevation	Infiltration Test Location	Tested Elevation (ft.)	Average Infiltration Rate (in/hr.)	Geometric Mean Infiltration Rate (in/hr.)
TP-Ro-1 Basin #1	238.2±	1A	233.0±	3.19	4.36
	238.2±	1B	233.3±	5.81	
TP-Ro-2 Basin #1	238.3±	2A	232.9±	7.41	
	238.3±	2B	232.9±	2.63	
TP-Ro-3 Basin #2	237.5±	3A	234.5±	6.75	11.33
	237.5±	3B	234.5±	10.31	
TP-Ro-4 Basin #2	237.5±	4A	234.4±	13.88	
	237.5±	4B	234.4±	17.06	

The school site is located within the Upland Section of the Piedmont Physiographic Province of Pennsylvania. The Piedmont Upland is characterized by rolling hills and valleys underlain structurally by metamorphic rock of the Precambrian and early Paleozoic age. The most prevalent bedrock within the Piedmont Upland is the Oligoclase-Mica Schist of the Wissahickon Formation, which is a metamorphosed rock with a laminated or

Infiltration Test Summary
William Rowen Elementary School
6801 N. 19th Street
Philadelphia, PA 19126

foliated structure. This type of schist consists of thin sheets, and easily splits apart because of the abundance of parallel and subparallel oriented mica crystals.

Native soils of the Piedmont Upland are developed either in-place by chemical weathering processes of the underlying shallow bedrock resulting in a soil product termed residuum, or the surficial soils are transported, by running water; termed alluvium. Soils that develop on these eroded bedrock surfaces will closely reflect the character of the parent bedrock materials. Weathering of the schist bedrock will produce sandy silts to silty sands with varying amounts of mica. Chemical weathering of the oligoclase feldspar will result in soft decomposed clayey, silty material. The original structure of the parent rock can be retained in the soil structure. The schist rock is generally steeply dipping with near vertical joints and cleavage, which provide a secondary porosity and zones of active weathering. The continuity, and degree of weathering, or disintegration, is highly variable. Each of the infiltration tests were performed in the disintegrated zones of the Oligoclase-Mica Schist of the Wissahickon Formation.

Surficial soils in an urban setting such as the school could also be disturbed soils, such as artificial fill associated with anthropomorphic activities including natural soils mixed with debris. The soils encountered in the infiltration test locations are characteristic of the Urban Land – Chester complex (UdB). According to USDA soils documentation, UdB are classified as “well” - draining soils. The soils of the UdB generally classify according to the US Department of Agriculture (USDA) classification system, as silt loam to sandy loam soils, or according to the Unified Soil Classification System (USCS) as predominantly ML, CL or SM soils.

Each of the test pits encountered soils that had been disturbed and classify as Made Land at elevations higher than the elevation of the infiltration test. Made Land soils are sometimes similar in composition to the native soils of the area, however, the soil is considered fill since it has been disturbed.

The subsurface profile for the test pits generally consisted of asphalt or concrete overlying aggregate base/crushed stone/ overlying urban fill material (disturbed native soils and sometimes containing construction debris, etc.) underlain by native soil over weathered bedrock. Shallow more intact bedrock of schist, was encountered within the depth of excavation for Test Pit TP-Ro-3 and TP-Ro-4 at 6.3 feet, and 5.3 feet, respectively. Details of the subsurface profile for each soil can be found on the individual soil infiltration records in Attachment B.

After completing the double ring infiltrometer tests, the test pit depth was increased approximately 4 feet below the infiltration test depth to check for the presence of limiting layers. Documentation of the soils encountered below the infiltrometer test elevation was reported in the soil infiltration records in Attachment B. A bulk sample from the soils at the infiltration test elevation and below was retained for laboratory testing. Results of the laboratory tests are pending.

Infiltration Test Summary
 William Rowen Elementary School
 6801 N. 19th Street
 Philadelphia, PA 19126

In accordance with test methodology per the Philadelphia Water Department (PWD) Stormwater Management Guidance Manual, Chapter 3.3 soil samples were collected that were representative of the soils within 1 foot of the infiltration interface. The samples were tested for laboratory particle size analysis (ASTM D422) and soils classification (ASTM D4318) by Craig Testing Laboratories. Results of the laboratory tests are summarized in the following table. Details of the soil laboratory tests are included in the Geotechnical Laboratory Testing Results, Attachment C.

Table 2 – Laboratory Testing Summary

Test Pit	Approximate Depth (ft.)	Atterberg Limits (%) (ASTM D4318)			Particle Size Distribution ASTM D422			USCS Group Symbol <small>(See Notes 1 & 2)</small>
		LL	PL	PI	% Gravel	% Sand	% Fines	
Ro-1	4.9 – 5.2	-	-	-	0.2	90.6	9.6	SW-SM\SC
Ro-2	5.4 – 5.7	-	-	-	0.0	91.7	8.3	SW-SM\SC
Ro-3	3.0 – 3.4	-	-	-	65.1	29.9	5.0	GW-GM\GC
Ro-4	3.1 – 3.5	-	-	-	12.5	76.6	10.9	SP-SM\SC

Notes:

1. USCS Classification – used to classify soils for engineering purposes
2. Refinement of the combined USCS classification can be made with additional testing of Atterberg limits and/or a particle size analysis using a hydrometer device to better define the fine soil fraction.

The soil samples retained from within one foot of the infiltration interface were also tested by the Penn State Agricultural Analytical Services Laboratory for soil nutrient levels of soil pH, phosphorus, and potassium. The following table summarizes the results. The detailed results with recommended amendments are included in Soil Fertility Test Results, Attachment D.

Table 3 –Soil Fertility Testing Summary

Test Pit	Sample Depth (ft.)	Soil pH	Phosphorus (ppm)	Potassium (ppm)
Ro-1 and Ro-2	4.9 – 5.7	6.7	8	50
Ro-3 and Ro-4	3.0 – 3.5	7.9	147	99

Infiltration Test Summary
William Rowen Elementary School
6801 N. 19th Street
Philadelphia, PA 19126

Hunt Engineering Company appreciates the opportunity to be of continued service to the School District of Philadelphia on this project. If additional information is required or there are questions regarding the contents of this letter, please contact the undersigned at 610.644.4600.

Sincerely,
HUNT ENGINEERING COMPANY



Peter Neumann, MSc, P.E.
Manager – Geotechnical Engineering



Infiltration Test Summary
William Rowen Elementary School
6801 N. 19th Street
Philadelphia, PA 19126

Attachment A – Test Location Plans

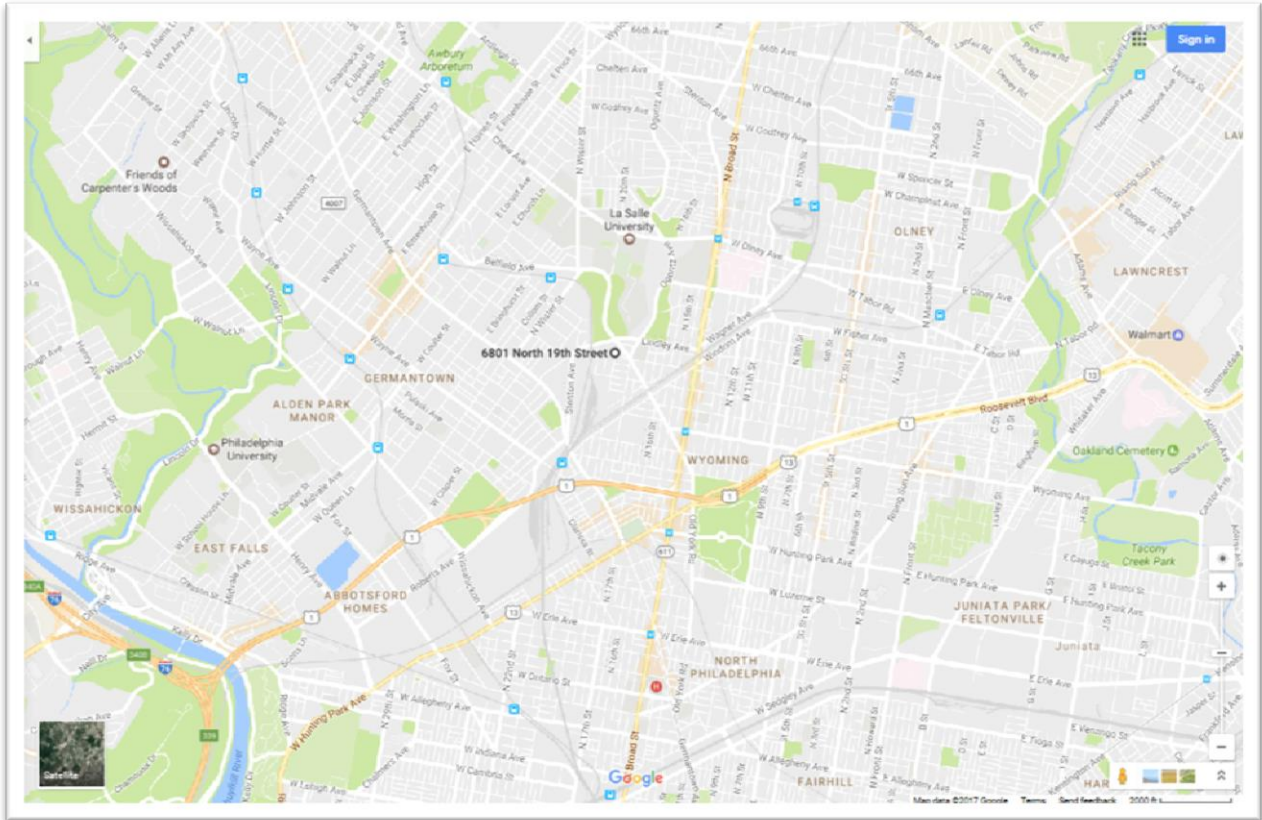
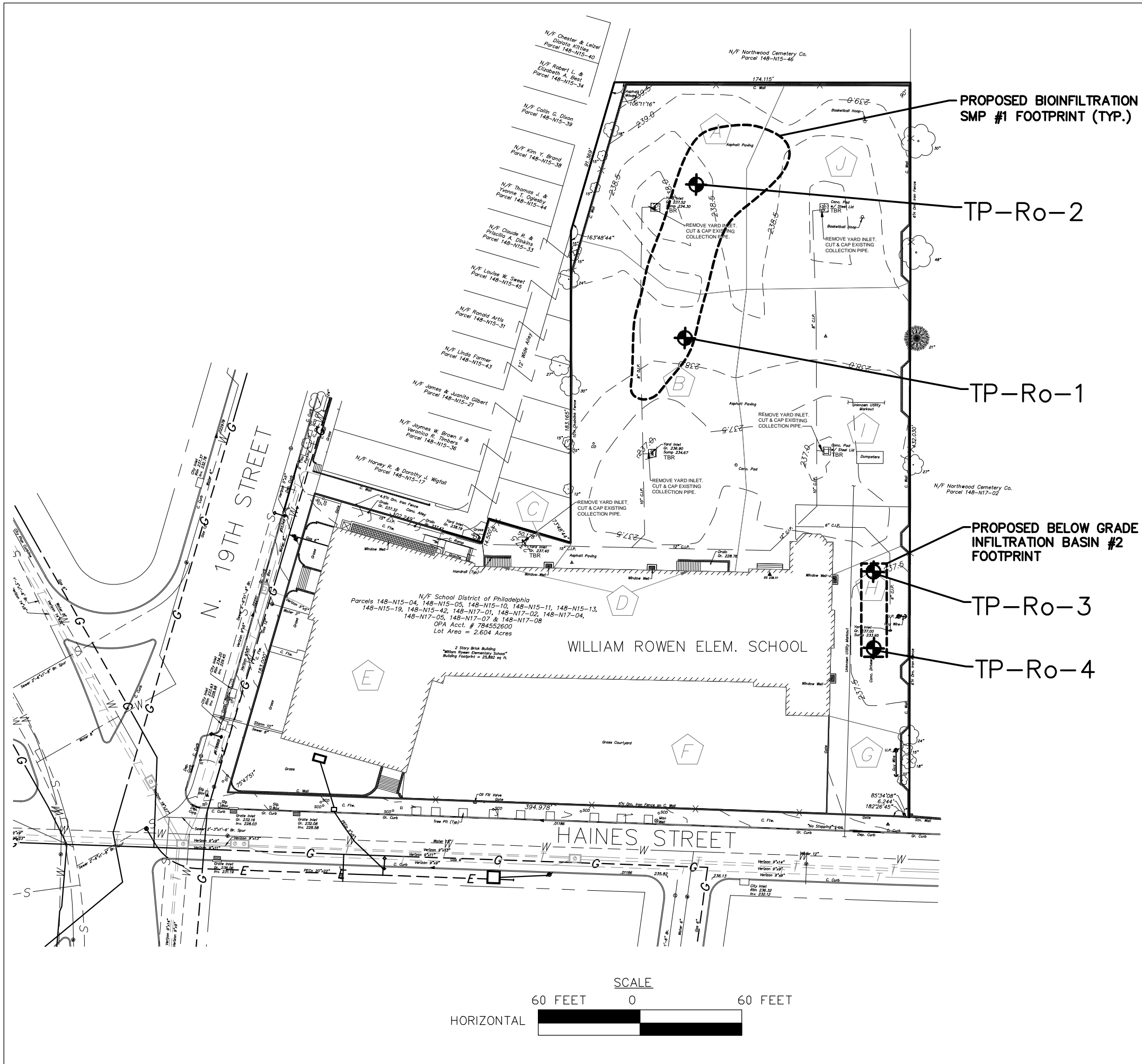


FIGURE I
SITE LOCATION MAP
WILLIAM ROWEN ELEMENTARY SCHOOL
6801 N. 19TH STREET
PHILADELPHIA, PENNSYLVANIA

Map Data © 2017 Google



PROPOSED BIOINFILTRATION SMP #1 FOOTPRINT (TYP.)

TP-Ro-2

TP-Ro-1

PROPOSED BELOW GRADE INFILTRATION BASIN #2 FOOTPRINT

TP-Ro-3

TP-Ro-4

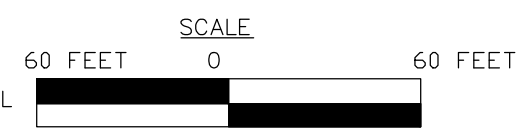
NOTES:

1. THE CONCEPTUAL SMP BASIN FOOTPRINTS AND ASSOCIATED TEST PIT LOCATIONS WERE SHOWN ON TOPOGRAPHIC BASE PLAN TITLED, "WILLIAM ROWEN ELEMENTARY SCHOOL, 6801 N. 19TH STREET, 19126, PAVING AND STORMWATER MANAGEMENT PROJECT, ERSA EXISTING CONDITIONS PLAN", PREPARED BY HUNT ENGINEERING COMPANY, ISSUED FOR INFILTRATION TESTING PURPOSES ON APRIL 3, 2017.
2. TEST PIT LOCATIONS WERE MARKED IN THE FIELD BY A HUNT ENGINEERING COMPANY REPRESENTATIVE ON APRIL 5, 2017.
3. EXCAVATION LOCATIONS WERE SCANNED BY A PRIVATE UTILITY LOCATOR SERVICE, "MASTER LOCATORS", ON APRIL 7, 2017.
4. TEST PITS TP-Ro-1 AND TP-Ro-2 WERE EXCAVATED AND THE INFILTRATION RATE TESTED ON APRIL 12, 2017. TEST PITS TP-Ro-3 AND TP-Ro-4 WERE EXCAVATED AND THE INFILTRATION RATE TESTED ON APRIL 13, 2017. TEST PITS WERE BACKFILLED THE SAME DAY THEY WERE EXCAVATED.
5. USE OF THIS PLAN IS LIMITED TO THE ILLUSTRATION OF THE APPROXIMATE TEST PIT LOCATIONS AND OTHER PERTINENT SITE FEATURES. ANY OTHER USE OF THIS PLAN WITHOUT PERMISSION FROM HUNT ENGINEERING COMPANY IS PROHIBITED.

LEGEND

- APPROXIMATE TEST PIT LOCATION
- APPROXIMATE FOOTPRINT LIMITS OF SMP BASINS #1 AND #2

INFILTRATION TEST PIT LOCATION PLAN			
WILLIAM ROWEN ELEMENTARY SCHOOL 6801 N 19TH ST, PHILADELPHIA, PA 19126			
		P.O. BOX 537 22 EAST KING STREET, MALVERN, PA 19355 PHONE: 610-644-4600 FAX: 610-644-2466 WWW.HUNTENGINEERING.COM	
SCALE: AS SHOWN	PROJECT NO: 2155006.4	FIGURE: 2	
DRAWN BY: K. COUTSOUROS	CHECK BY: P. NEUMANN	DATE: APRIL 2017	



Infiltration Test Summary
William Rowen Elementary School
6801 N. 19th Street
Philadelphia, PA 19126

Attachment B – Infiltration Test Records



Double Ring Infiltration Testing Log

TP-Ro-IA

Project Name: William Rowen Elementary School Date: 4/12/2017
 Project Basin No.: 1 Weather: Overcast to mostly cloudy, 69° to 71°F, gentle breeze, no precipitation
 Testing Company: Hunt Engineering Co. Tester's Name: P. Neumann
 Phone Number: 610-644-4600 Email Address: pneumann@huntengineering.com
 Test Number: A Test Pit/Boring Hole Number: 1 Test Method: Stormwater Management Guidance Manual, Version 3.0 July 2015
 Test Depth (feet): 5.2 Surface Elevation (feet): 238.2 Instrument Diameter (inches): Inner Ring = 6 in./Outer Ring = 12 in.

Soil Characterization

Depth (feet):	Deposit Type:	Soil Description	Limiting Layers Type and Depth (feet):
0 - 0.3 ft (2.5 - 3.5 in. thick)	Asphalt		
0.4 ft (5 in. thick)	Aggregate Base	GRAVEL, little Silty Sand, damp, homogeneous, coarse, subangular, light gray, GM	
0.4 - 1.2 ft (5 to 10 in. thick)	Possible Fill	Clayey SAND, stiff, damp, homogeneous, poorly graded, medium plastic fines, brown, SC	
1.1 - > 9.2 ft	Weathered Schist	Silty SAND, micaceous, contains weathered rock fragments, damp, homogeneous, uniform, black, white, brown-orange, SM	
Notes: 1. No subsurface water encountered within the depth excavated.			

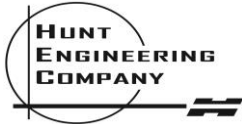
Presoak

Time:	Time Interval:	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):
10:25	0	5.125	0.427		
10:55	30	5.000	0.417		
11:25	30	3.250	0.271	1.875	0.156

Infiltration Testing

Time:	Time Interval (10 or 30 minutes):	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):	Average Infiltration Rate (inches per hour):	Remarks:
11:25	0	5.125	0.427	0.000	0.000		
11:35	10	4.375	0.365	0.750	0.063	4.50	
11:45	10	4.500	0.375	0.625	0.052	3.75	
11:55	10	4.500	0.375	0.625	0.052	3.75	
12:05	10	4.625	0.385	0.500	0.042	3.00	
12:15	10	4.625	0.385	0.500	0.042	3.00	
12:25	10	4.500	0.375	0.625	0.052	3.75	
12:35	10	4.625	0.385	0.500	0.042	3.00	
12:45	10	4.625	0.385	0.500	0.042	3.00	

Average Stabilized Infiltration Testing Rate (inches per hour): **3.19**



Double Ring Infiltration Testing Log

TP-Ro-IB

Project Name: William Rowen Elementary School Date: 4/12/2017

Project Basin No.: I Weather: Overcast to mostly cloudy, 69° to 71°F, gentle breeze, no precipitation

Testing Company: Hunt Engineering Co. Tester's Name: P. Neumann

Phone Number: 610-644-4600 Email Address: pneumann@huntengineering.com

Test Number: B Test Pit/Boring Hole Number: I Test Method: Stormwater Management Guidance Manual, Version 3.0 July 2015

Test Depth (feet): 4.9 Surface Elevation (feet): 238.2 Instrument Diameter (inches): Inner Ring = 6 in./Outer Ring = 12 in.

Soil Characterization

Depth (feet):	Deposit Type:	Soil Description	Limiting Layers Type and Depth (feet):
0 - 0.3 ft (2.5 - 3.5 in. thick)	Asphalt		
0.4 ft (5 in. thick)	Aggregate Base	GRAVEL, little Silty Sand, damp, homogeneous, coarse, subangular, light gray, GM	
0.4 - 1.2 ft (5 to 10 in. thick)	Possible Fill	Clayey SAND, stiff, damp, homogeneous, poorly graded, medium plastic fines, brown, SC	
1.1 - > 9.2 ft	Weathered Schist	Silty SAND, micaceous, contains weathered rock fragments, damp, homogeneous, uniform, black, white, brown-orange, SM	
Notes: I. No subsurface water encountered within the depth excavated.			

Presoak

Time:	Time Interval:	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):
10:30	0	5.000	0.417		
11:00	30	4.750	0.396	0.250	
11:30	30	2.875	0.240	2.125	0.177

Infiltration Testing

Time:	Time Interval (10 or 30 minutes):	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):	Average Infiltration Rate (inches per hour):	Remarks:
11:30	0	5.000	0.417		0.000		
11:40	10	3.750	0.313	1.250	0.104	7.50	
11:50	10	4.000	0.333	1.000	0.083	6.00	
12:00	10	4.000	0.333	1.000	0.083	6.00	
12:10	10	4.000	0.333	1.000	0.083	6.00	
12:20	10	4.000	0.333	1.000	0.083	6.00	
12:30	10	4.000	0.333	1.000	0.083	6.00	
12:40	10	4.000	0.333	1.000	0.083	6.00	
12:50	10	4.125	0.344	0.875	0.073	5.25	
13:00	10	4.000	0.333	1.000	0.083	6.00	

Average Stabilized Infiltration Testing Rate (inches per hour): **5.81**



Double Ring Infiltration Testing Log

TP-Ro-2A

Project Name: William Rowen Elementary School Date: 4/12/2017
 Project Basin No.: 1 Weather: Overcast to mostly cloudy, 69° to 71°F, gentle breeze, no precipitation
 Testing Company: Hunt Engineering Co. Tester's Name: K. Coutsouros
 Phone Number: 610-644-4600 Email Address: kcoutsouros@huntengineering.com
 Test Number: A Test Pit/Boring Hole Number: 2 Test Method: Stormwater Management Guidance Manual, Version 3.0 July 2015
 Test Depth (feet): 5.4 Surface Elevation (feet): 238.3 Instrument Diameter (inches): Inner Ring = 6 in./Outer Ring = 12 in.

Soil Characterization

Depth (feet):	Deposit Type:	Soil Description	Limiting Layers Type and Depth (feet):
0 - 0.3 ft (4 in. thick)	Asphalt		
0.3 - 0.6 ft (3 in. thick)	Aggregate Base	GRAVEL, little Silty Sand, damp, homogeneous, coarse, subangular, light gray, GM	
0.6 - 1.5 ft (12 in. thick)	Possible Fill	Clayey SAND, stiff, damp, homogeneous, uniformly graded, medium plastic fines, brown, SC	
1.5 - 9.2 ft	Weathered Schist	Silty SAND, micaceous, contains weathered rock fragments, damp, homogeneous, uniform, black, white, brown-orange, SM	
@ 9.2 ft	Less Weathered Schist		
Notes: I. No subsurface water encountered within the depth excavated.			

Presoak

Time:	Time Interval:	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):
10:45	0	4.563	0.380		
11:15	30	1.000	0.083	3.563	
11:45	30	1.500	0.125	3.063	0.255

Infiltration Testing

Time:	Time Interval (10 or 30 minutes):	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):	Average Infiltration Rate (inches per hour):	Remarks:
11:45	0	4.563	0.380		0.000		
11:55	10	3.438	0.286	1.125	0.094	6.75	
12:05	10	3.375	0.281	1.188	0.099	7.13	
12:15	10	3.125	0.260	1.438	0.120	8.63	
12:25	10	2.938	0.245	1.625	0.135	9.75	
12:35	10	3.063	0.255	1.500	0.125	9.00	
12:45	10	3.375	0.281	1.188	0.099	7.13	
12:55	10	3.375	0.281	1.188	0.099	7.13	
13:05	10	3.500	0.292	1.063	0.089	6.38	
						Average Stabilized Infiltration Testing Rate (inches per hour):	7.41



Double Ring Infiltration Testing Log

TP-Ro-2B

Project Name: William Rowen Elementary School
 Project Basin No.: 1
 Testing Company: Hunt Engineering Co.
 Phone Number: 610-644-4600
 Test Number: B Test Pit/Boring Hole Number: 2
 Test Depth (feet): 5.4 Surface Elevation (feet): 238.3

Date: 4/12/2017
 Weather: Overcast to mostly cloudy, 69° to 71°F, gentle breeze, no precipitation
 Tester's Name: K. Coutsouros
 Email Address: kcoutsouros@huntengineering.com
 Test Method: Stormwater Management Guidance Manual, Version 3.0 July 2015
 Instrument Diameter (inches): Inner Ring = 6 in./Outer Ring = 12 in.

Soil Characterization

Depth (feet):	Deposit Type:	Soil Description	Limiting Layers Type and Depth (feet):
0 - 0.3 ft (4 in. thick)	Asphalt		
0.3 - 0.6 ft (3 in. thick)	Aggregate Base	GRAVEL, little Silty Sand, damp, homogeneous, coarse, subangular, light gray, GM	
0.6 - 1.5 ft (12 in. thick)	Possible Fill	Clayey SAND, stiff, damp, homogeneous, uniformly graded, medium plastic fines, brown, SC	
1.5 - 9.2 ft	Weathered Schist	Silty SAND, micaceous, contains weathered rock fragments, damp, homogeneous, uniform, black, white, brown-orange, SM	
@ 9.2 ft	Less Weathered Schist		
Notes: 1. No subsurface water encountered within the depth excavated.			

Presoak

Time:	Time Interval:	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):
10:50	0	5.500	0.458		
11:20	30	3.063	0.255	2.438	
11:50	30	3.750	0.313	1.750	0.146

Infiltration Testing

Time:	Time Interval (10 or 30 minutes):	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):	Average Infiltration Rate (inches per hour):	Remarks:
11:50	0	5.500	0.458		0.000		
12:00	10	5.063	0.422	0.438	0.036	2.63	
12:10	10	5.125	0.427	0.375	0.031	2.25	
12:20	10	5.000	0.417	0.500	0.042	3.00	
12:30	10	5.000	0.417	0.500	0.042	3.00	
12:40	10	5.125	0.427	0.375	0.031	2.25	
12:50	10	5.000	0.417	0.500	0.042	3.00	
13:00	10	5.125	0.427	0.375	0.031	2.25	
Average Stabilized Infiltration Testing Rate (inches per hour):						2.63	



Double Ring Infiltration Testing Log

TP-Ro-3A

Project Name:	William Rowen Elementary School	Date:	4/13/2017
Project Basin No.:	2	Weather:	Mostly cloudy to scattered clouds, 54° to 61°F, gentle breeze, no precipitation
Testing Company:	Hunt Engineering Co.	Tester's Name:	P. Neumann
Phone Number:	610-644-4600	Email Address:	pneumann@huntengineering.com
Test Number:	A	Test Pit/Boring Hole Number:	3
Test Depth (feet):	3.0	Surface Elevation (feet):	237.5
		Test Method:	Stormwater Management Guidance Manual, Version 3.0 July 2015
		Instrument Diameter (inches):	Inner Ring = 6 in./Outer Ring = 12 in.

Soil Characterization

Depth (feet):	Deposit Type:	Soil Description	Limiting Layers Type and Depth (feet):
0 - 0.3 ft (3.5 to 4 in. thick)	Concrete		
0.3 - 0.4 ft (1.5 in. thick)	Sand Fill	Silty Sand, damp, homogeneous, black, SM	
0.4 - 0.8 ft (4 to 5 in. thick)	Cinder Fill	Fine SAND, contains cinder and cinder fragments, damp, homogeneous, black, SP	
0.8 - 1.4 ft (7 to 8 in. thick)	Possible Fill	Silty SAND, micaceous, homogeneous, uniformly graded, brown, SM	
1.5 - 6.3 ft	Weathered Schist	Silty SAND, micaceous, contains weathered rock fragments, damp, homogeneous, uniform, black, white, brown-orange, SM	
@ 6.3 ft	Less Weathered Schist		@ 6.3 ft Excavation refusal on bedrock
Notes: 1. No subsurface water encountered within the depth excavated.			

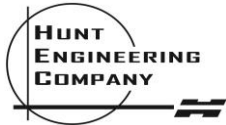
Presoak

Time:	Time Interval:	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):
09:45	0	5.125	0.427		
10:15	30	3.500	0.292	1.625	
10:45	30	2.500	0.208	2.625	0.219

Infiltration Testing

Time:	Time Interval (10 or 30 minutes):	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):	Average Infiltration Rate (inches per hour):	Remarks:
10:50	0	5.125	0.427		0.000		
11:00	10	2.500	0.208	2.625	0.219	15.75	
11:10	10	3.625	0.302	1.500	0.125	9.00	
11:20	10	3.625	0.302	1.500	0.125	9.00	
11:30	10	4.250	0.354	0.875	0.073	5.25	
11:40	10	3.750	0.313	1.375	0.115	8.25	
11:50	10	4.000	0.333	1.125	0.094	6.75	
12:00	10	4.000	0.333	1.125	0.094	6.75	
12:10	10	4.125	0.344	1.000	0.083	6.00	
12:20	10	4.000	0.333	1.125	0.094	6.75	
12:30	10	3.875	0.323	1.250	0.104	7.50	

Average Stabilized Infiltration Testing Rate (inches per hour): 6.75



Double Ring Infiltration Testing Log

TP-Ro-3B

Project Name: William Rowen Elementary School Date: 4/13/2017
 Project Basin No.: 2 Weather: Mostly cloudy to scattered clouds, 54° to 61°F, gentle breeze, no precipitation
 Testing Company: Hunt Engineering Co. Tester's Name: P. Neumann
 Phone Number: 610-644-4600 Email Address: pneumann@huntengineering.com
 Test Number: B Test Pit/Boring Hole Number: 3 Test Method: Stormwater Management Guidance Manual, Version 3.0 July 2015
 Test Depth (feet): 3.0 Surface Elevation (feet): 237.5 Instrument Diameter (inches): Inner Ring = 6 in./Outer Ring = 12 in.

Soil Characterization

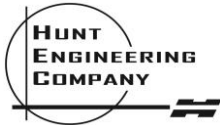
Depth (feet):	Deposit Type:	Soil Description	Limiting Layers Type and Depth (feet):
0 - 0.3 ft (3.5 to 4 in. thick)	Concrete		
0.3 - 0.4 ft (1.5 in. thick)	Sand Fill	Silty Sand, damp, homogeneous, black, SM	
0.4 - 0.8 ft (4 to 5 in. thick)	Cinder Fill	Fine SAND, contains cinder and cinder fragments, damp, homogeneous, black, SP	
0.8 - 1.4 ft (7 to 8 in. thick)	Possible Fill	Silty SAND, micaceous, homogeneous, uniformly graded, , brown, SM	
1.5 - 6.3 ft	Weathered Schist	Silty SAND, micaceous, contains weathered rock fragments, damp, homogeneous, uniform, black, white, brown-orange, SM	
@ 6.3 ft	Less Weathered Schist		@ 6.3 ft Excavation refusal on bedrock
Notes: 1. No subsurface water encountered within the depth excavated.			

Presoak

Time:	Time Interval:	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):
10:00	0	5.000	0.417		
10:30	30	3.500	0.292	1.500	
11:00	30	2.750	0.229	2.250	0.188

Infiltration Testing

Time:	Time Interval (10 or 30 minutes):	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):	Average Infiltration Rate (inches per hour):	Remarks:
11:10	0	5.000	0.417		0.000		
11:20	10	3.375	0.281	1.625	0.135	9.75	
11:30	10	3.000	0.250	2.000	0.167	12.00	
11:40	10	2.625	0.219	2.375	0.198	14.25	
11:50	10	3.125	0.260	1.875	0.156	11.25	
12:00	10	3.000	0.250	2.000	0.167	12.00	
12:10	10	3.000	0.250	2.000	0.167	12.00	
12:20	10	2.750	0.229	2.250	0.188	13.50	
12:30	10	3.125	0.260	1.875	0.156	11.25	
12:40	10	3.500	0.292	1.500	0.125	9.00	
12:50	10	3.125	0.260	1.875	0.156	11.25	
13:00	10	3.375	0.281	1.625	0.135	9.75	
Average Stabilized Infiltration Testing Rate (inches per hour):						10.31	



Double Ring Infiltration Testing Log

TP-Ro-4A

Project Name: William Rowen Elementary School
 Project Basin No.: 2
 Testing Company: Hunt Engineering Co.
 Phone Number: 610-644-4600
 Test Number: A Test Pit/Boring Hole Number: 4
 Test Depth (feet): 3.1 Surface Elevation (feet): 237.5

Date: 4/13/2017
 Weather: Mostly cloudy to overcast, 51° to 57°F, gentle breeze, no precipitation
 Tester's Name: K. Coutsouros
 Email Address: kcoutsouros@huntengineering.com
 Test Method: Stormwater Management Guidance Manual, Version 3.0 July 2015
 Instrument Diameter (inches): Inner Ring = 6 in./Outer Ring = 12 in.

Soil Characterization

Depth (feet):	Deposit Type:	Soil Description	Limiting Layers Type and Depth (feet):
0 - 0.3 ft (4 in. thick)	Concrete		
0.3 - 0.4 ft (1.5 in. thick)	Sand Fill	Silty Sand, damp, homogeneous, well graded, dark brown, SM	
0.4 - 0.9 ft (6 in. thick)	Cinder Fill	Fine SAND, contains cinder and cinder fragments, damp, homogeneous, black, SP	
0.9 - 1.8 ft (7 to 8 in. thick)	Possible Fill	Silty SAND, micaceous, homogeneous, uniformly graded, brown, SM	
1.8 - 5.3 ft	Weathered Schist	Silty SAND, micaceous, contains weathered rock fragments, damp, homogeneous, uniform, black, white, brown-orange, SM	
@ 5.3 ft	Less Weathered Schist		@ 5.3 ft Excavation refusal on bedrock
Notes: I. No subsurface water encountered within the depth excavated.			

Presoak

Time:	Time Interval:	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):
08:50	0	4.625	0.385		
09:20	30	1.750	0.146	2.875	
09:50	30	2.000	0.167	2.625	0.219

Infiltration Testing

Time:	Time Interval (10 or 30 minutes):	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):	Average Infiltration Rate (inches per hour):	Remarks:
10:05	0	4.688	0.391		0.000		
10:15	10	1.875	0.156	2.813	0.234	16.88	
10:25	10	2.125	0.177	2.563	0.214	15.38	
10:35	10	2.000	0.167	2.688	0.224	16.13	
10:45	10	2.625	0.219	2.063	0.172	12.38	
10:55	10	1.750	0.146	2.938	0.245	17.63	
11:05	10	2.500	0.208	2.188	0.182	13.13	
11:15	10	2.375	0.198	2.313	0.193	13.88	
11:25	10	2.250	0.188	2.438	0.203	14.63	
11:35	10	2.375	0.198	2.313	0.193	13.88	
11:45	10	2.250	0.188	2.438	0.203	14.63	
11:55	10	2.625	0.219	2.063	0.172	12.38	
12:05	10	2.25	0.188	2.438	0.203	14.63	
Average Stabilized Infiltration Testing Rate (inches per hour):						13.88	



Double Ring Infiltration Testing Log

TP-Ro-4B

Project Name: William Rowen Elementary School **Date:** 4/13/2017
Project Basin No.: 2 **Weather:** Mostly cloudy to overcast, 51° to 57°F, gentle breeze, no precipitation
Testing Company: Hunt Engineering Co. **Tester's Name:** K. Coutsouros
Phone Number: 610-644-4600 **Email Address:** kcoutsouros@huntengineering.com
Test Number: B **Test Pit/Boring Hole Number:** 4 **Test Method:** Stormwater Management Guidance Manual, Version 3.0 July 2015
Test Depth (feet): 3.1 **Surface Elevation (feet):** 237.5 **Instrument Diameter (inches):** Inner Ring = 6 in./Outer Ring = 12 in.

Soil Characterization

Depth (feet):	Deposit Type:	Soil Description	Limiting Layers Type and Depth (feet):
0 - 0.3 ft (4 in. thick)	Concrete		
0.3 - 0.4 ft (1.5 in. thick)	Sand Fill	Silty Sand, damp, homogeneous, well graded, dark brown, SM	
0.4 - 0.9 ft (6 in. thick)	Cinder Fill	Fine SAND, contains cinder and cinder fragments, damp, homogeneous, black, SP	
0.9 - 1.8 ft (7 to 8 in. thick)	Possible Fill	Silty SAND, micaceous, homogeneous, uniformly graded, brown, SM	
1.8 - 5.3 ft	Weathered Schist	Silty SAND, micaceous, contains weathered rock fragments, damp, homogeneous, uniform, black, white, brown-orange, SM	
@ 5.3 ft	Less Weathered Schist		@ 5.3 ft Excavation refusal on bedrock
Notes: I. No subsurface water encountered within the depth excavated.			

Presoak

Time:	Time Interval:	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):
08:55	0	5.000	0.417		
09:25	30	2.000	0.167	3.000	
09:55	30	1.000	0.083	4.000	0.333

Infiltration Testing

Time:	Time Interval (10 or 30 minutes):	Measurement, (inches)	Measurement, (feet):	Drop in water level, (inches):	Drop in water level, (feet):	Average Infiltration Rate (inches per hour):	Remarks:
10:10	0	5.125	0.427		0.000		
10:20	10	1.125	0.094	4.000	0.333	24.00	
10:30	10	1.250	0.104	3.875	0.323	23.25	
10:40	10	1.000	0.083	4.125	0.344	24.75	
10:50	10	1.250	0.104	3.875	0.323	23.25	
11:00	10	2.500	0.208	2.625	0.219	15.75	
11:10	10	2.250	0.188	2.875	0.240	17.25	
11:20	10	1.500	0.125	3.625	0.302	21.75	
11:30	10	2.625	0.219	2.500	0.208	15.00	
11:40	10	2.625	0.219	2.500	0.208	15.00	
11:50	10	2.375	0.198	2.750	0.229	16.50	
12:00	10	2.125	0.177	3.000	0.250	18.00	
12:10	10	2.000	0.167	3.125	0.260	18.75	
Average Stabilized Infiltration Testing Rate (inches per hour):						17.06	

Infiltration Test Summary
William Rowen Elementary School
6801 N. 19th Street
Philadelphia, PA 19126

Attachment C – Geotechnical Laboratory Testing Results

Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	8.4	43.7	38.1	9.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#8	93.3		
#16	82.8		
#30	61.4		
#50	34.7		
#100	17.6		
#200	9.6		

Material Description

Brown well graded SAND with silt\clay

Atterberg Limits

LL= PL= PI=

Coefficients

D₈₅= 1.3109 D₆₀= 0.5788 D₅₀= 0.4504
D₃₀= 0.2589 D₁₅= 0.1260 D₁₀= 0.0782
C_u= 7.40 C_c= 1.48

Classification

USCS= SW-SM\SC

Remarks

* (no specification provided)

Source of Sample: On-Site
Sample Number: RO-1

Depth: Bulk

Date:

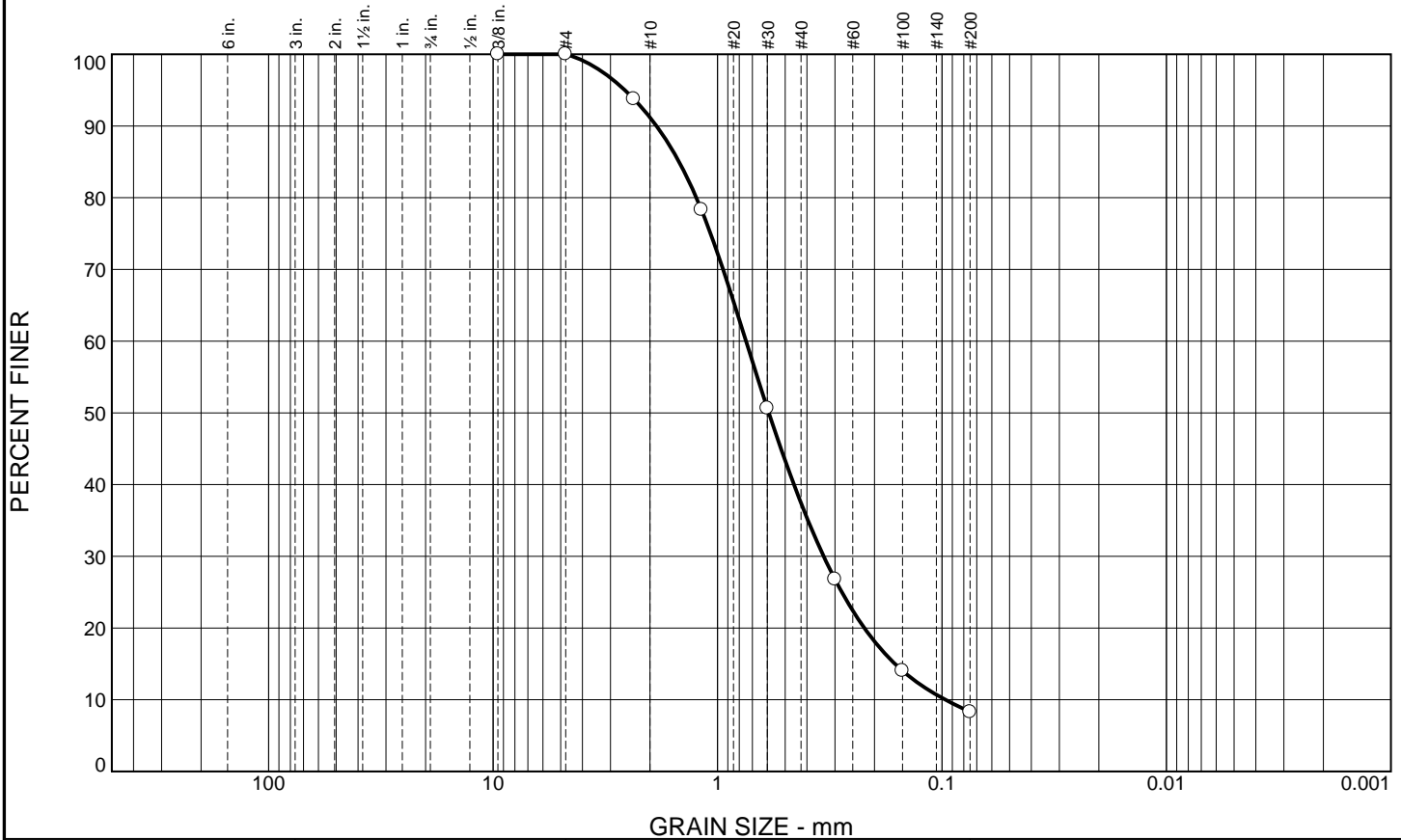


Client: Hunt Engineering
Project: 3 School Infiltration

Project No: 739502

Plate PSA-11

Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	8.8	53.8	29.1	8.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#8	93.8		
#16	78.3		
#30	50.6		
#50	26.8		
#100	14.0		
#200	8.3		

Material Description
Brown well graded SAND with silt\clay

Atterberg Limits
LL= PL= PI=

Coefficients
D₈₅= 1.4844 D₆₀= 0.7467 D₅₀= 0.5910
D₃₀= 0.3368 D₁₅= 0.1620 D₁₀= 0.0965
C_u= 7.73 C_c= 1.57

Classification
USCS= SW-SM\SC

Remarks

* (no specification provided)

Source of Sample: On-Site
Sample Number: RO-2

Depth: Bulk

Date: 5/10/17

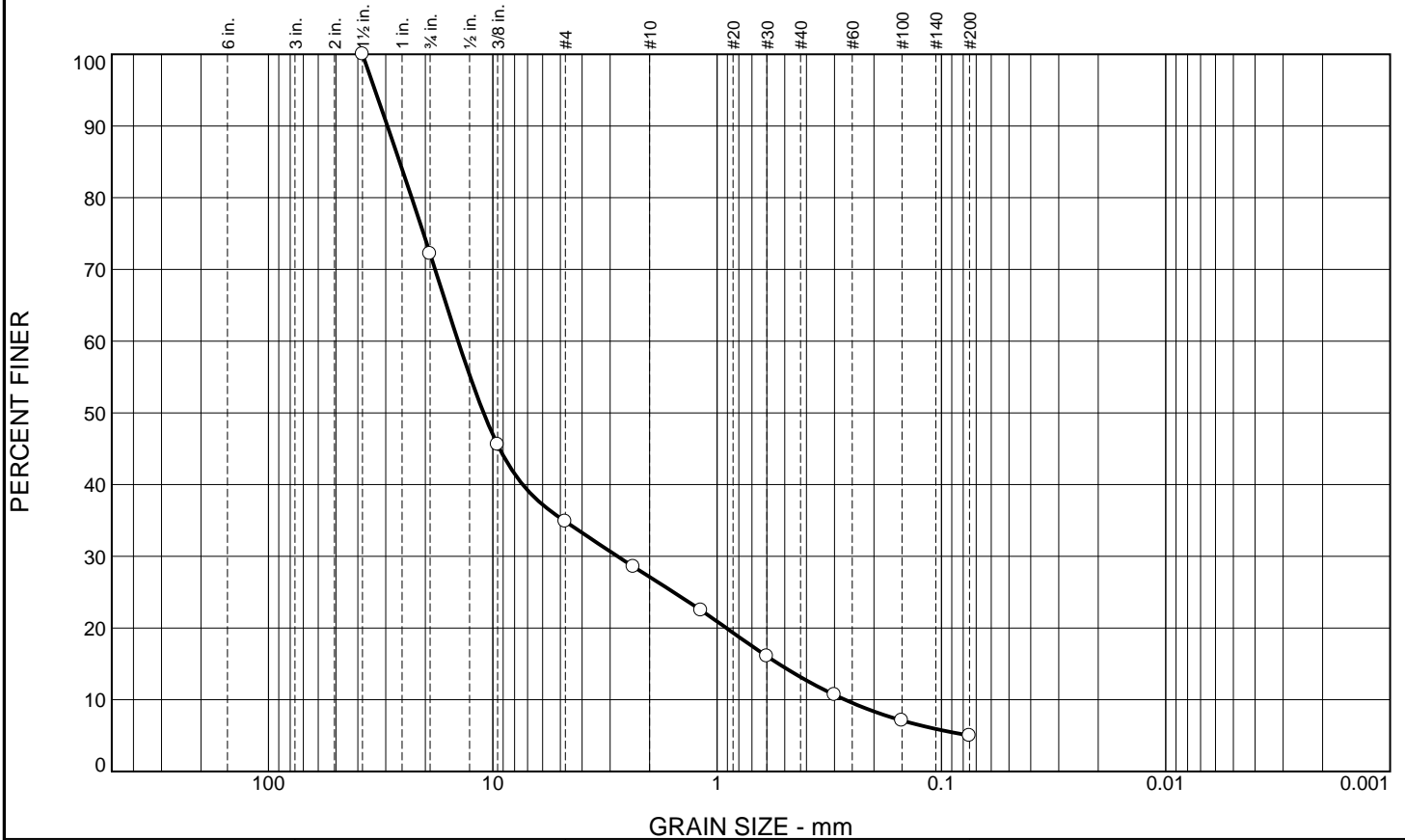


Client: Hunt Engineering
Project: 3 School Infiltration

Project No: 739502

Plate PSA-12

Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	27.8	37.3	7.8	13.9	8.2	5.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
.75	72.2		
.375	45.6		
#4	34.9		
#8	28.6		
#16	22.5		
#30	16.1		
#50	10.7		
#100	7.1		
#200	5.0		

Material Description

Light brown well graded GRAVEL with silt/clay and sand

Atterberg Limits

LL= PL= PI=

Coefficients

D₈₅= 26.0228 D₆₀= 14.2857 D₅₀= 10.9940
D₃₀= 2.7793 D₁₅= 0.5311 D₁₀= 0.2692
C_u= 53.07 C_c= 2.01

Classification

USCS= GW-GM(GC)

Remarks

* (no specification provided)

Source of Sample: On-Site
Sample Number: RO-3

Depth: Bulk

Date: 5/10/17

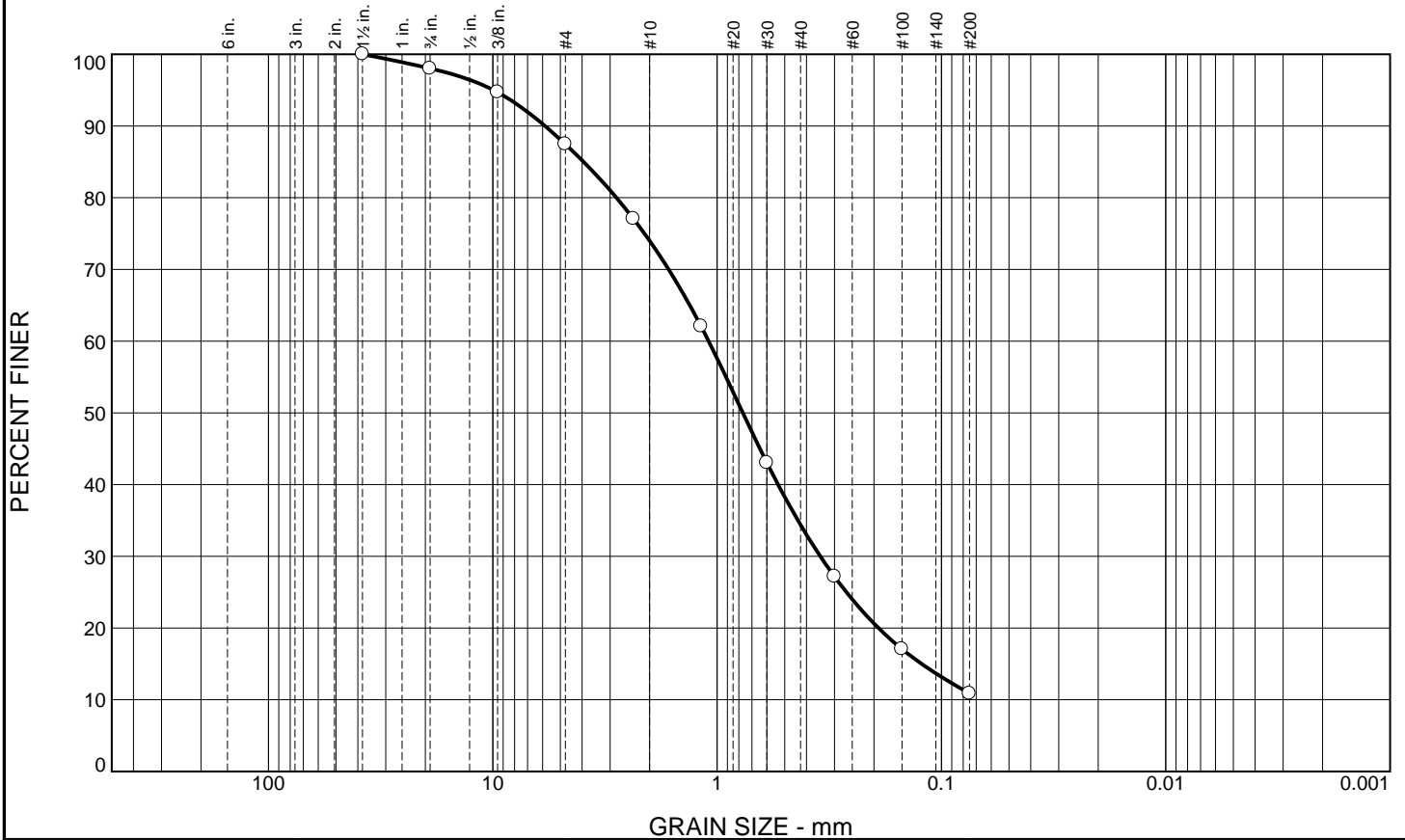


Client: Hunt Engineering
Project: 3 School Infiltration

Project No: 739502

Plate PSA-13

Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.0	10.5	13.5	39.6	23.5	10.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
.75	98.0		
.375	94.7		
#4	87.5		
#8	77.1		
#16	62.1		
#30	43.0		
#50	27.2		
#100	17.1		
#200	10.9		

Material Description
Brown poorly graded SAND with silt\clay

Atterberg Limits
LL= PL= PI=

Coefficients
D₈₅= 3.9398 D₆₀= 1.0917 D₅₀= 0.7682
D₃₀= 0.3468 D₁₅= 0.1226 D₁₀=
C_u= C_c=

Classification
USCS= SP-SM\SC

Remarks

* (no specification provided)

Source of Sample: On-Site
Sample Number: RO-4

Depth: Bulk

Date: 5/10/17



Client: Hunt Engineering
Project: 3 School Infiltration

Project No: 739502

Plate PSA-14

Infiltration Test Summary
William Rowen Elementary School
6801 N. 19th Street
Philadelphia, PA 19126

Attachment D – Soil Fertility Test Results



SOIL TEST REPORT FOR:				ADDITIONAL COPY TO:		
PETER NEUMANN HUNT ENGINEERING COMPANY 22 E. KING ST; PO BOX 537 MALVERN PA 19355				DEBBIE NEMIROFF HUNT ENGINEERING COMPANY 22 E. KING ST; PO BOX 537 MALVERN PA 19355		
DATE	LAB #	SERIAL #	COUNTY	ACRES	FIELD ID	SOIL
05/17/2017	S17-22809	50064	Chester		Ro-1 Ro-2	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
Soil pH	6.7			
Phosphorus	8 ppm			
Potassium	50 ppm			

RECOMMENDATIONS FOR: *Park Area-To Plant* *Tall Fescue*

Prior to planting, incorporate the following into the top 4 to 6 inches of soil.

- Limestone:** NONE
- Phosphate (P₂O₅):** 11 lb/1000 square feet
- Potash (K₂O):** 5 lb/1000 square feet

Apply a starter fertilizer just prior to seeding and work lightly into the soil

Apply a starter fertilizer at approximate rate of 1 lb of nitrogen per 1000 square feet, 0.5 to 1.0 lb of P₂O₅ per 1000 square feet, and 0.5 to 1.0 lb of K₂O per 1000 square feet using a fertilizer with approximate 1:1:1 or 2:1:1 ratio of N:P₂O₅:K₂O.

MESSAGES

The above recommendations are for a new establishment that will be tilled 4 to 6 inches in depth prior to planting. In some cases, turfgrass seed is planted into soils that have not been tilled. In such cases, incorporating large amounts of lime, fertilizer, and organic matter into soil 4 to 6 inches in depth is not possible. When planting into soils that have not been tilled, do not exceed 100 lb lime/1000 square feet; 5 lb P₂O₅/1000 square feet; or 2.0 lb K₂O/1000 square feet. Do not apply organic matter unless a core aerator is used to incorporate into the soil surface. If attempting to incorporate organic matter with a core aerator, apply 1/4 to 1/2 inch of organic matter to the turf/soil surface and make 8 to 10 passes with the aerator.

LABORATORY RESULTS:										Optional Tests:		
¹ pH	² P lb/A	Exchangeable Cations (meq/100g)					% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
		³ Acidity	² K	² Mg	² Ca	⁴ CEC	K	Mg	Ca			
6.7	16	2.00	0.13	0.51	0.91	3.6	3.6	14.3	25.8			

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

COMMENTS

1. Apply full lime recommendation and thoroughly mix into the soil four to six inches deep. Use a high quality agricultural ground limestone product to meet the lime recommendation on this report. Manufacturers of agricultural ground limestone products provide a number called the calcium carbonate equivalent, or CCE, on the label. CCEs with high numerical values (close to 100 or above) indicate a pure lime source (greater ability to neutralize soil acidity). The amount of lime recommended on this report is based on an agricultural ground limestone with a CCE of 100. If your lime source is close to or equal to 100, you don't need to adjust the recommended amount. In the event that you use a lime source with a CCE well below or above 100, use the following formula to adjust the required amount.

$$\text{Actual liming material required} = \frac{(\text{Soil test recommendation in lbs of lime/1000 square feet}) \times 100}{\text{CCE of liming material}}$$

Example Only:

Soil Test Recommendation: Apply 75 lbs lime/1000 square feet

CCE on label: 80 percent

$$\begin{aligned} \text{Actual liming material required} &= \frac{(75 \text{ lbs of lime}) \times 100}{80} \\ &= 94 \text{ lb liming material/1000 square feet} \end{aligned}$$

2. If organic matter test was requested and organic matter is recommended, thoroughly mix organic matter into a four to six inch soil depth. Sphagnum peat and peat humus typically contain high amounts of organic matter (> 80 %) and will usually meet organic matter requirements when incorporated at the rate recommended on the soil test report. With the exception of putting greens and tees, a good quality compost can also be used as an organic amendment; however, most composts contain lower amounts of organic matter than peats. Therefore, you may need to add greater amounts of compost to meet soil test organic matter recommendations. For more information on using composts as organic amendments in new turf plantings, refer to the publication, "Using Composts to Improve Turf Performance". This publication is available from Penn State Cooperative Extension offices or the Publication Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Bldg., University Park, PA 16802.
3. Thoroughly mix phosphate and/or potash into a four to six inch soil depth.
4. Grade and finish rake for seeding. Apply starter fertilizer just prior to seeding.
5. Fertilizers that can be used to meet recommendations for phosphate (P_2O_5) include ordinary superphosphate (0-20-0) or triple (treble) super phosphate (0-46-0). Fertilizers that can be used to meet recommendations for potash (K_2O) include muriate of potash (0-0-60) or sulfate of potash (0-0-50).



SOIL TEST REPORT FOR:				ADDITIONAL COPY TO:		
PETER NEUMANN HUNT ENGINEERING COMPANY 22 E. KING ST; PO BOX 537 MALVERN PA 19355				DEBBIE NEMIROFF HUNT ENGINEERING COMPANY 22 E. KING ST; PO BOX 537 MALVERN PA 19355		
DATE	LAB #	SERIAL #	COUNTY	ACRES	FIELD ID	SOIL
05/17/2017	S17-22810	50065	Chester		Ro-3 Ro-4	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
Soil pH	7.9			
Phosphorus	147 ppm			
Potassium	99 ppm			

RECOMMENDATIONS FOR: *Park Area-To Plant* *Tall Fescue*

Prior to planting, incorporate the following into the top 4 to 6 inches of soil.

- Limestone:** NONE
- Phosphate (P₂O₅):** NONE
- Potash (K₂O):** 3 lb/1000 square feet

Apply a starter fertilizer just prior to seeding and work lightly into the soil

Apply a starter fertilizer at approximate rate of 1 lb of nitrogen per 1000 square feet, 0.5 to 1.0 lb of P₂O₅ per 1000 square feet, and 0.5 to 1.0 lb of K₂O per 1000 square feet using a fertilizer with approximate 1:1:1 or 2:1:1 ratio of N:P₂O₅:K₂O.

MESSAGES

The above recommendations are for a new establishment that will be tilled 4 to 6 inches in depth prior to planting. In some cases, turfgrass seed is planted into soils that have not been tilled. In such cases, incorporating large amounts of lime, fertilizer, and organic matter into soil 4 to 6 inches in depth is not possible. When planting into soils that have not been tilled, do not exceed 100 lb lime/1000 square feet; 5 lb P₂O₅/1000 square feet; or 2.0 lb K₂O/1000 square feet. Do not apply organic matter unless a core aerator is used to incorporate into the soil surface. If attempting to incorporate organic matter with a core aerator, apply 1/4 to 1/2 inch of organic matter to the turf/soil surface and make 8 to 10 passes with the aerator.

LABORATORY RESULTS:										Optional Tests:		
¹ pH	² P lb/A	Exchangeable Cations (meq/100g)					% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
		³ Acidity	² K	² Mg	² Ca	⁴ CEC	K	Mg	Ca			
7.9	294	0.00	0.25	0.30	2.89	3.4	7.4	8.7	83.9			

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

COMMENTS

1. Apply full lime recommendation and thoroughly mix into the soil four to six inches deep. Use a high quality agricultural ground limestone product to meet the lime recommendation on this report. Manufacturers of agricultural ground limestone products provide a number called the calcium carbonate equivalent, or CCE, on the label. CCEs with high numerical values (close to 100 or above) indicate a pure lime source (greater ability to neutralize soil acidity). The amount of lime recommended on this report is based on an agricultural ground limestone with a CCE of 100. If your lime source is close to or equal to 100, you don't need to adjust the recommended amount. In the event that you use a lime source with a CCE well below or above 100, use the following formula to adjust the required amount.

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Example Only:

Soil Test Recommendation: Apply 75 lbs lime/1000 square feet

CCE on label: 80 percent

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