STORMWATER BASIN AREA INVESTIGATION REPORT

PROPOSED CHASE BANK

1506 Pennsylvania State Highway Route 3 (West Chester Pike)
Parcel No. 67-2-42:4
Township of Westtown, Chester County, Pennsylvania

Prepared for:

PARAMOUNT REALTY SERVICES, INC
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Prepared by:

DYNAMIC EARTH

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Project #1478-99-191EC
September 26, 2024

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1.0 INTRODUCTION

Dynamic Earth, LLC (Dynamic Earth) has completed a subsurface evaluation for the stormwater management facilities associated with the proposed commercial development to be located at 1506 Pennsylvania State Highway Route 3 (West Chester Pike) in the Township of Westtown, Chester County, Pennsylvania.

The subject site is further identified as Parcel No. 67-2-42:4 and is bound to the north by West Chester Pike with commercial properties beyond; to the east by commercial properties; to the west by the existing retail development with commercial properties beyond; and to the south by the existing retail development with residential properties beyond. The project site is shown on the attached *Soil Profile Pit Location Plan* included in the Appendix of this report.

At the time of Dynamic Earth's investigation, the subject site consisted of a paved parcel located in the northeastern corner of a larger retail development with associated pavements and utilities. Surface cover observed at the time of our investigation included asphalt pavements.

Topographic information was provided on a January 10, 2023 *Partial Topographic Survey, Sheets 1 and 2,* prepared by Dynamic Survey, LLC. Existing site grades generally slope downward toward the southeast and southwest from a high elevation of approximately 424.0 feet along the northeastern property boundary, to low elevations of approximately 405.0 feet and 403.0 feet along the southwestern and southeastern property boundaries. The elevations referenced in the survey, and throughout this report, are given in 1988 North American Vertical Datum (NAVD88), unless otherwise noted.

Based on a July 12, 2024 *Grading Plan* prepared by Dynamic Engineering Consultants, P.C., the proposed site development will include the construction of a one-story Chase Bank with associated drive-up ATM. The proposed building is expected to occupy a footprint area of approximately 3,294 square feet and contain a finished floor elevation of approximately 414.65 feet. Based on the aforementioned grading plan, maximum earth cuts and fills of approximately 0.7 feet and 1.7 feet are expected to be required across the proposed building pad; respectively. Additional site improvements are expected to include pavements, utilities, and stormwater management facilities.

The stormwater management facilities proposed to infiltrate stormwater runoff are anticipated to consist of an underground basin located within the southern portion of the site. The proposed underground basin will reportedly contain an invert elevation of 406.5 feet.

2.0 SCOPE OF SERVICES

Dynamic Earth's scope of services pertaining to this report included evaluating the subsurface conditions by excavating soil profile pits to estimate the apparent seasonal high groundwater levels and performing in-situ permeability testing. A total of two soil profile pits (identified as SPP-1 and SPP-2) were excavated using a track-mounted backhoe. Additionally, two in-situ permeability tests were performed at corresponding soil profile pit locations. The test locations were located within existing asphalt-paved areas, were backfilled to the surface with excavated soil, and were patched surficially with hot mix asphalt upon completion. The soil profile pit locations are shown on the attached *Soil Profile Pit Location Plan.* The Township of Westtown's engineer was informed of the planned test pitting prior to our mobilization.

The soils encountered were classified in general conformance with U.S. Department of Agriculture (USDA) soil classification. Observations were made for groundwater and/or redoximorphic features indicative of zones of saturation or seasonal high groundwater. Soil logs are included in the Appendix of this report.

Infiltration testing was performed in general accordance with Pennsylvania's *Stormwater Best Management Practices Manual-Appendix C* using double-ring infiltrometer techniques. Detailed results of the infiltration testing are included in the appendix of this report.

Environmental conditions were not evaluated by Dynamic Earth.

3.0 SOIL SURVEY

Based on a review of the United States Department of Agriculture – Natural Resources Conservation Services (USDA-NRCS) soil survey, Urban Land is mapped beneath the site. The *USDA-NRCS Custom Soil Report* is included in the appendix of this report, for reference.

4.0 RESULTS

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

4.1 Subsurface Soil Profile

Soil profile pits were performed within asphalt-paved areas and encountered approximately four inches of asphalt underlain by approximately four inches of gravel subbase at the surface. Beneath the surficial cover, existing fill materials were encountered that generally consisted of apparent reworked on-site silty clay loam with variable amounts of gravel and debris. The debris encountered consisted of wood fragments. Where penetrated, this stratum extended to depths ranging between approximately 2.7 feet and 2.9 feet below the ground surface; corresponding to elevations 409.6 feet and 409.3 feet. Beneath the existing fill materials, apparent buried topsoil was encountered within SPP-1 at a depth of approximately 2.7 feet below the ground surface; corresponding to an elevation of 409.3 feet. The apparent buried topsoil extended to a depth of approximately 3.8 feet; corresponding to an elevation of approximately 408.2 feet. Beneath the existing fill material and/or apparent buried topsoil, naturally occurring residual soils were encountered that generally consisted of silt loam with variable amounts of gravel. The natural residual soils extended to termination depths ranging between approximately 12.3 feet and 12.8 feet below the ground surface; corresponding to an elevation of 399.7 feet.

4.2 Subsurface Conditions and Soil Permeability

Evidence of seasonal high groundwater (based on soil mottling) and/or groundwater were not encountered during this investigation. Groundwater is expected to fluctuate seasonally and following periods of significant precipitation.

In-situ testing was performed at each soil profile pit location and yielded permeability rates ranging between approximately 0.5 inches per hour (iph) and 0.75 iph. A summary of groundwater and in-situ permeability test results is tabulated below:

SUMMARY OF SUSBURFACE CONDITIONS & FIELD PERMEABILITY TESTING								
Location	Surface Elevation (feet)	Soil Mottling		Groundwater		Infiltration Test Results		Comments
		Depth (feet)	Elevation (feet)	Depth (feet)	Elevation (feet)	Depth (in)	Rate[1] (in/hr)	
SPP-1	412.0	Not Encountered		Not Encountered		60	0.75	Fill to 2.7'
SPP-2	412.5	Not Encountered		Not Encountered		72	0.5	Fill to 2.9'

[1]Field Infiltration Rate – does not include factor of safety

5.0 GENERAL COMMENTS AND LIMITATIONS

Supplemental recommendations will be required upon finalization of conceptual site plans or if significant changes are made in the characteristics or location of the proposed stormwater management facilities. Dynamic Earth should be included as a consultant to the design team and should be provided with final plans for review to confirm these criteria apply or to modify recommendations as necessary.

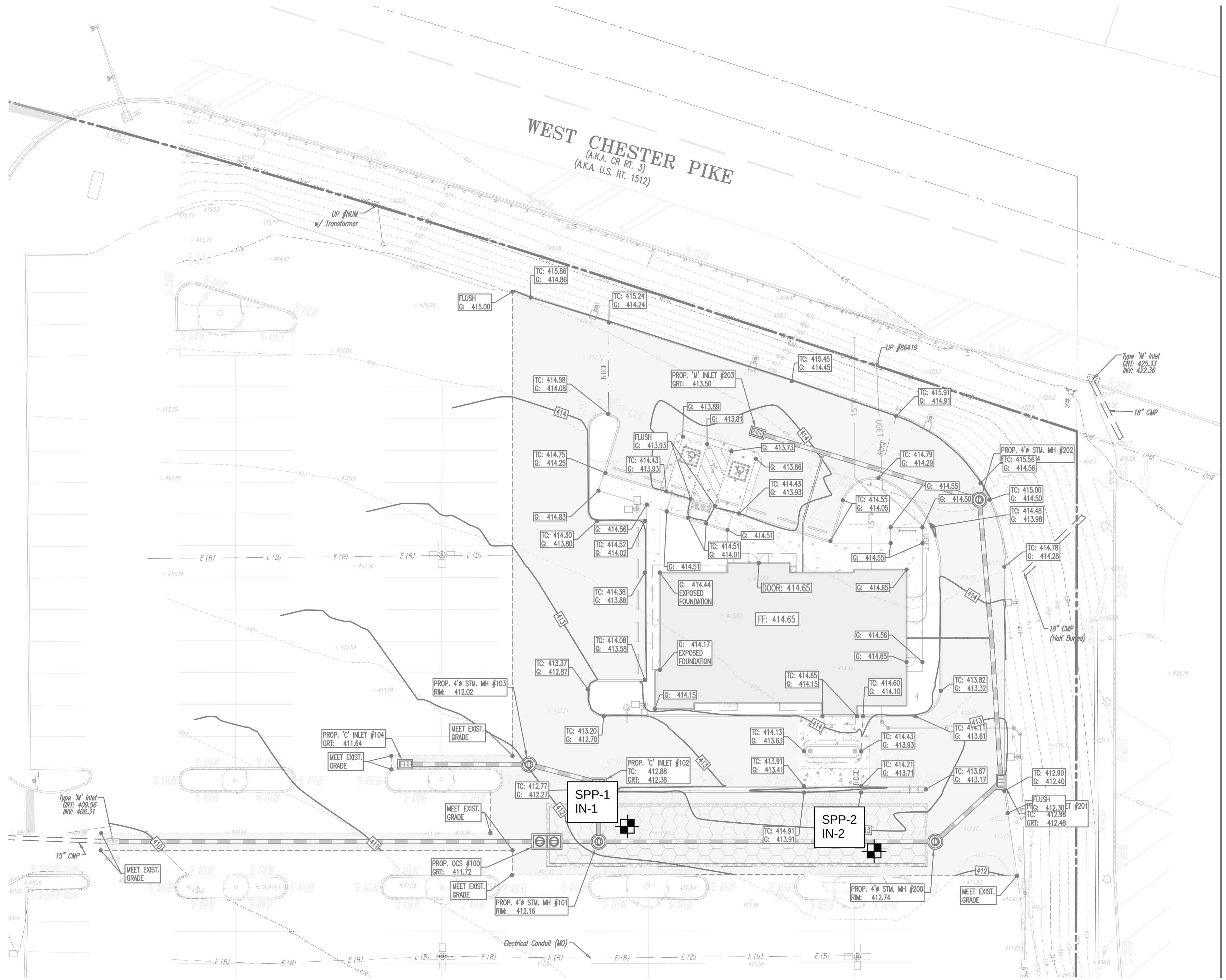
The results presented herein should be utilized by a qualified engineer in preparing preliminary design concepts and site grading. The engineer should consider these results as minimum physical standards that may be superseded by local and regional building codes and structural considerations. These results are prepared for the use of the client for the specific project detailed and should not be used by any third party. These recommendations are relevant to the preliminary design phase and should not be substituted for construction specifications.

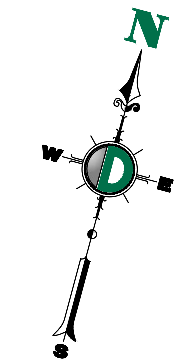
The possibility exists that conditions between test locations may differ from those at specific soil profile pit locations, and conditions may not be as anticipated by the designers or contractors. In addition, the construction process may itself alter soil conditions. Therefore, Dynamic Earth Geotechnical Engineers or their representatives should observe and document the final construction procedures used, and the conditions encountered, as well as conduct testing and inspection to ensure the design criteria are met or recommendations to address deviations are implemented.

Dynamic Earth assumes that a qualified contractor will be employed to perform the construction work, and that the contractor will be required to exercise care to ensure all excavations are performed in accordance with applicable regulations and good practice. Particular attention should be paid to avoiding damaging or undermining adjacent properties and maintaining slope stability. Deviations from the noted subsurface conditions encountered during construction should be brought to the attention of the geotechnical engineer.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been promulgated after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics, and engineering geology. No other warranties are implied or expressed.

Soil Profile Pit Location Plan





SCALE: N.T.S.

JOB No: 99-191EC

SHEET No: **1** OF 1

DRAWN BY: ES

DESIGNED BY: --

CHECKED BY: GJF

DATE: 09/26/2024

TITLE:

SOIL PROFILE PIT LOCATION PLAN

PROJECT: **PARAMOUNT REALTY SERVICES, LLC**

PROPOSED CHASE BANK

1506 PENNSYLVANIA STATE HIGHWAY ROUTE 3 (WEST CHESTER PIKE)
PARCEL NO. 67-2-42:4
TOWNSHIP OF WESTTOWN, CHESTER COUNTY, PA

Rev. # 0

DEC Client Code: 1478

LEGEND:

SPP-X
IN-X — APPROXIMATE LOCATION OF SOIL PROFILE PIT WITH INFILTRATION TEST

NOTES:

1. THIS PLAN IS NOT FOR CONSTRUCTION AND WAS PREPARED TO ILLUSTRATE TEST LOCATIONS ONLY AND MAY NOT REFLECT THE MOST CURRENT REVISION OF THE BASE PLAN.
2. BASE PLAN OBTAINED FROM A JULY 12, 2024 *GRADING PLAN* PREPARED BY DYNAMIC ENGINEERING CONSULTANTS, PC.

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Records of Subsurface Exploration

SOIL PROFILE PIT LOG

Soil Profile Pit: SPP-1

Project:	Proposed Chase Bank	Project No.:	1478-99-191EC
Location:	1506 Pennsylvania State Highway Route 3 (West Chester Pike), Township of Westtown, Chester County, Pennsylvania	Client:	Paramount Realty Services, Inc.

				Groundwater Data	Depth (ft)	El. (ft)	Groundwater Comments
Surface Elevation (ft):	412.0	Date Started:	9/5/24				
Termination Depth (ft):	12.3	Date Completed:	9/5/24				
Proposed Location:	SWM	Logged by:	A. Park	Seepage	NE	-	
Excavation / Test Method:	Visual Observation	Contractor:	Neighbors Property Management	Groundwater	NE	-	
		Rig Type:	Bobcat E60	Seasonal High Groundwater	NE	-	

DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS		MOTTLING			SAMPLING			INFILTRATION RESULTS
			GRAVEL	COBBLES	STONES	BOULDERS	Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography			Quantity	Size	Contrast	Type	Depth (in)	No.	
0-4	ASPHALT Black (10YR 2/1)													ABRUPT <1"				NONE						
4-8	SUBBASE Gray 10YR 4/2		100	0	0	0	STRUCTURELESS SINGLE GRAIN			MOIST	LOOSE	NONSTICKY	NONPLASTIC	ABRUPT <1"	WAVY	NONE		NONE						
8-32	FILL Yellowish Brown (10YR 5/4)	SILTY CLAY LOAM	10	0	0	0	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FIRM	SLIGHTLY STICKY	SLIGHTLY PLASTIC	CLEAR <2.5"	SMOOTH	NONE		NONE			BAG	20	S-1	
32-45	TOPSOIL Brown (7.5YR 4/2)	LOAM	10	0	0	0	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	FEW (5% MAX)	FINE	NONE			BAG	40	S-2	
45-147	Strong Brown (7.5YR 5/6)	LOAM	10	0	0	0	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FRIABLE	NONSTICKY	NONPLASTIC			NONE		NONE			BAG	60	S-3	IN-1 = 0.75 iph

Additional Remarks: Existing fill material encountered to approximately 32 inches below the ground surface. Apparent topsoil encountered between approximately 32 inches to 45 inches below the ground surface. Soil profile pit SPP-1 was terminated at approximately 12.3 feet below the ground surface.

SOIL PROFILE PIT LOG

DYNAMIC EARTH

Soil Profile Pit: SPP-2

Project:	Proposed Chase Bank	Project No.:	1478-99-191EC
Location:	1506 Pennsylvania State Highway Route 3 (West Chester Pike), Township of Westtown, Chester County, Pennsylvania	Client:	Paramount Realty Services, Inc.

				Groundwater Data	Depth (ft)	El. (ft)	Groundwater Comments
Surface Elevation (ft):	412.5	Date Started:	9/5/24				
Termination Depth (ft):	12.8	Date Completed:	9/5/24				
Proposed Location:	SWM	Logged by:	A. Park	Seepage	NE	-	
Excavation / Test Method:	Visual Observation	Contractor:	Neighbors Property Management	Groundwater	NE	-	
		Rig Type:	Bobcat E60	Seasonal High Groundwater	NE	-	

DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%) GRAVEL	COBBLES	STONES	BOULDERS	STRUCTURE Shape	Grade	Size	WATER CONTENT	CONSISTENCY Resistance to Rupture	Stickiness	Plasticity	BOUNDARY Distinctness	Topography	ROOTS	MOTTLING Quantity	Size	Contrast	SAMPLING Type	Depth (in)	No.	INFILTRATION RESULTS
0-4	ASPHALT Black (10YR 2/1)		0	0	0	0								ABRUPT <1"			NONE						
4-8	SUBBASE Gray 10YR 4/2		100	0	0	0	STRUCTURELESS SINGLE GRAIN			MOIST	LOOSE	NONSTICKY	NONPLASTIC	ABRUPT <1"	WAVY	NONE	NONE						
8-35	FILL Yellowish Brown (10YR 5/4)	SILTY CLAY LOAM	10	0	0	0	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FIRM	SLIGHTLY STICKY	SLIGHTLY PLASTIC	CLEAR <2.5"	SMOOTH	NONE	NONE			BAG	20	S-1	
35-55	Yellowish Brown (10YR 5/6)	SILT LOAM	10	0	0	0	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	NONE	NONE			BAG	40	S-2	
55-153	Strong Brown (7.5YR 5/6)	SILT LOAM	10	0	0	0	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FRIABLE	NONSTICKY	NONPLASTIC			NONE	NONE			BAG	80	S-3	IN-2= 0.5 iph

Additional Remarks: Existing fill material encountered to approximately 35 inches below the ground surface. Debris encountered included wood. Soil profile pit SPP-2 was terminated at approximately 12.8 feet below the ground surface.

Infiltration Test Results

INFILTRATION TEST REPORT

Client: Paramount Realty Services, Inc.
Test Hole No.: IN-1 @ SPP-1
Project: Proposed Chase Bank
Date: 9/5/2024
Location: 1506 Pennsylvania State Highway Route 3 (West Chester Pike), Township of Westtown, Chester County, Pennsylvania
Weather: Sunny and clear
Project No.: 1478-99-191EC
Project Manager: E. Sherriff

Surface Elevation: 412.0 feet
Test Depth/Elevation: 5.0 feet / 407.0

Reading No.	Water Level (Inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/ Hour)
	Start	Finish			
PS-1	8.0	7.625	0.375	0.5	--
PS-2	8.0	7.625	0.375	0.5	--
1	8.0	7.625	0.375	0.5	0.75
2	8.0	7.625	0.375	0.5	0.75
3	8.0	7.625	0.375	0.5	0.75
4	8.0	7.625	0.375	0.5	0.75

Recommended Field Infiltration Rate = 0.75 iph

INFILTRATION TEST REPORT

Client: Paramount Realty Services, Inc.
Test Hole No.: IN-2 @ SPP-2
Project: Proposed Chase Bank
Date: 9/5/2024
Location: 1506 Pennsylvania State Highway Route 3 (West Chester Pike), Township of Westtown, Chester County, Pennsylvania
Weather: Sunny and clear
Project No.: 1478-99-191EC
Project Manager: E. Sherriff

Surface Elevation: 412.5
Test Depth/Elevation: 6.0 feet / 406.5

Reading No.	Water Level (Inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/ Hour)
	Start	Finish			
PS-1	8.0	7.75	0.25	0.5	--
PS-2	8.0	7.75	0.25	0.5	--
1	8.0	7.75	0.25	0.5	0.5
2	8.0	7.75	0.25	0.5	0.5
3	8.0	7.75	0.25	0.5	0.5
4	8.0	7.75	0.25	0.5	0.5

Recommended Field Infiltration Rate = 0.5 iph

NRCS-USDA Custom Soil Survey of Chester County, Pennsylvania

United States Department of Agriculture

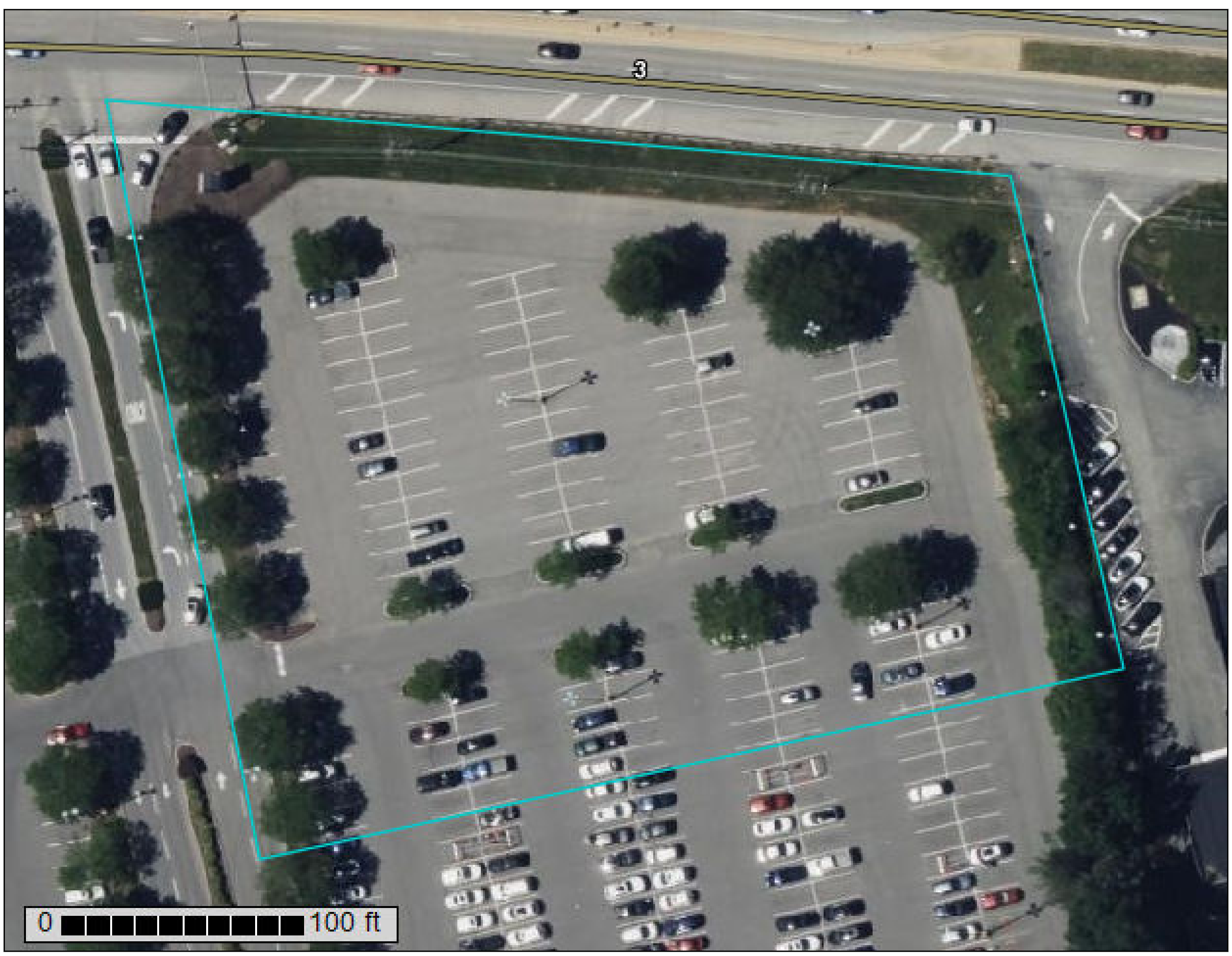
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Chester County, Pennsylvania



July 31, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:808 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 10, 20, 40, 60

Feet: 0, 35, 70, 140, 210

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Chester County, Pennsylvania
Survey Area Data: Version 16, Sep 4, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 5, 2022—Jul 4, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
UrB	Urban land, 0 to 8 percent slopes	2.2	100.0%
Totals for Area of Interest		**2.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Chester County, Pennsylvania

UrB—Urban land, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 1r3nt
Elevation: 800 to 1,500 feet
Mean annual precipitation: 36 to 46 inches
Mean annual air temperature: 41 to 62 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Parent material: Pavement, buildings and other artifically covered areas human transported material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Udorthents, unstable fill

Percent of map unit: 10 percent
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

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