



Keystone Plus Construction
 1925 Minnesota Ave, N.E.. Suite A
 Washington, D.C. 20020
 Ph: (202) 857-7903

PRODUCT SUBMITTAL INFORMATION

Item No.	QTY	Type	Description	ACTION REQUIRED
	1	Elect	Geomorphological Report	For your records

KPC JOB No. 20-19002

SUBMITTAL No. 014

Eastern Market Metro Park

225 7th Street SE

Washington, DC 20003

Section for Comments by KPC

ACTION REQUIRED:

* Please be advised the final report for the Geomorphological Report has been completed and uploaded on the Prolog review and reference.

Department of General Services

1250 U Street, NW., 4th Floor

Washington DC 20009

Attn: Lisa Dixon ; Cassidy Mullen

Section for comments by DGS:

Review is for general conformance with the contract documents. Sole responsibility for correctness of dimensions, details quantities and safety during fabrication and erection shall remain with the subcontractor. Subcontractor to notify Keystone Plus Construction Corp. if discrepancies arise and/or coordination is required with other trades.

Date: 4/15/2019

Prepared by: Vivian Frias

Geo-Sci Consultants LLC

4410 Van Buren Street, University Park, Maryland 20782

tel: 301 277 3731

danwagner.soil@gmail.com

**GEOARCHAEOLOGICAL INTERPRETATIONS
OF THE EASTERN MARKET METRO PARK
IN SOUTHEAST WASHINGTON, D.C.**

Submitted to
Applied Archaeology, Inc.

By
Daniel P. Wagner, Ph.D.
Pedologist

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Introduction and Methods

The following is a discussion of observations and interpretations regarding the nature of soil materials examined within several sections of the Eastern Market Metro Park at the intersections of Pennsylvania Avenue and 7th, 8th and 9th Streets in Southeast Washington, D.C. Investigations were directed toward the identification and characterization of any original land surfaces or other intact natural deposits that might once have been available for occupation. This study's principal goal was therefore to determine the integrity of the park's soils, and to assess whether this property in a highly altered, urbanized scene could potentially still contain cultural materials in comparatively intact contexts.

Geoarchaeological investigation efforts entailed examinations of soils by means of four hand auger borings made on March 29, 2019. The examined soil profiles were described in accordance with standard pedological techniques and nomenclature for the field description of soil. The compiled descriptions are attached at the end of the report, and a map of boring locations is shown in Figure 1.

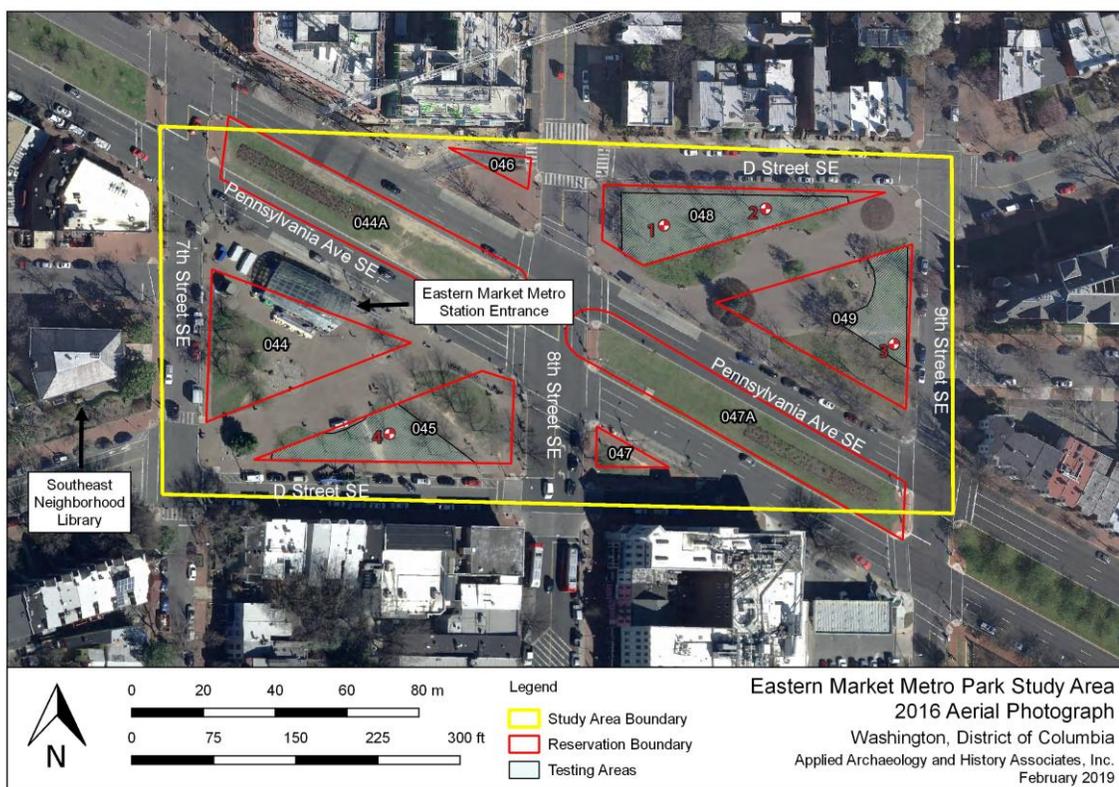


Figure 1. Approximate locations of soil borings.

Geology and Geomorphology

As with all of southeastern Washington, D.C., the study location is situated within the Coastal Plain Physiographic Province. Geologically, this province is characterized by unconsolidated sediments that can range widely both in composition as well as age. Although sediments as old as Lower Cretaceous constitute much of the Washington, D.C. Coastal Plain, the predominant deposits within the project area are of Quaternary age. Most Quaternary sediments were derived by ancient fluvial processes and tend to have mixed compositions characterized by sandy and gravelly strata interbedded with layers of loamy, silty or even clayey sediments. Additionally, across nearly level to gently sloping landscapes relatively thin (<1 m) surficial deposits of eolian silt or sand are also often present.

Independent of the deposit types, all of the regional upland landscapes are very old, and most of the original site soils would have had very prolonged histories of weathering usually greatly predating even the earliest human presence in the region. This has important implications for both prehistoric and early historic cultural resources since, as would be the case for all landscapes of such antiquity, the majority of cultural materials should occur at or near the level of original surfaces. Hence, in most instances integrity of the original surfaces is of paramount importance, and disturbances or destruction of surfaces also translate to comparable impacts on archaeological deposits. A notable exception to this general rule is where land surfaces formerly available to Paleoindians have been protectively buried at levels below those of modern disturbance by eolian deposits of later Pleistocene or Holocene origins. Such deposits, usually consisting of loess (wind-blown silt) are sporadically but widely distributed throughout the Coastal Plain portion of Washington, D.C., and have been correlated with the Younger Dryas cold reversal interval that occurred between Paleoindian and Early Archaic occupations.

Results

The study location has undergone considerable amounts of disturbances involving both filling and grading of the original soils. Within the context of surrounding properties and streets, the overall topography of the terrain seems little altered, and it is only soil examinations that define the degrees of modification. These revealed that a variably thick mantle of mixed earthen fill covers the entire project area. At the location of Boring 4 it is relatively shallow, extending only to the depth of 26 cm. Elsewhere, the fill is as much as a meter or more in thickness, and the base of the fill was not actually reached at the location of Boring 3 where a layer of crushed stone caused auger refusal at the depth of 125 cm. This stone layer was also encountered in Borings 1 and 2, but was sufficiently thin to be penetrated (Figure 2). It's possible that the crushed stone identifies a former staging surface for the Metro construction, and its greater thickness at the Boring 3 location is possibly

consistent with the original landscape here purported to have been a lower lying wetland or pond (Figure 3).



Figure 2. At the location of Boring 1 a strongly developed subsoil horizon occurs at the depth of 110 cm beneath a layer of crushed stone.



Figure 3. A thicker layer of crushed stone at the Boring 3 location may be signaling an originally lower lying landscape position.

Disturbances with more significant archaeological implications entail the grading and destruction of original surface horizons within which most cultural deposits would have been contained. At three of the examined locations the original surfaces as well as upper subsoil horizons had been destroyed, with soil truncations reaching well into lower subsoil levels. There is perhaps a limited potential that the original surface horizon is still

present at the location of Boring 3; however, the depth of examination corresponded to depths of subsoil horizons at the other locations. Only if the deeper fill here is a reflection of an originally lower landscape position might there still be a buried intact surface. Unfortunately, under this scenario the position would likely have been too poorly drained for occupation.

Losses of the original surface and upper subsoil horizons would have entailed comparable losses of cultural materials. Soil truncations across the area extend into subsoil argillic horizons (Bt) so strongly developed that an age ranging far into the Pleistocene and well before the arrival of even the earliest of humans is indicated (Figure 4). Absent some type of excavated cultural feature, such ancient soil horizons are always culturally sterile and have no archaeological potential. The only possibility for artifacts at subsoil depths would be related to the presence of loess. Given the nearly level grade of the project area, the landscape could have provided desirable conditions for the deposition and preservation of wind-blown loessial deposits correlative with the Younger Dryas cold reversal climate. However, no silty soil textures consistent with loess were identified, and the subsoil horizons that were encountered would actually correspond to paleosol subsoils typically found beneath silt mantles. If loess ever was present it would mean that soil truncations are even more catastrophically deep, again leaving no prospects for cultural material.



Figure 4. As typified by this profile of Boring 4, strongly developed clay loam subsoil horizons across the project area indicate a soil age ranging well into the Pleistocene.

Conclusions

The project area has been severely disturbed by grading and filling. The entirety is covered by a variably thick mantle of artificial fill; and except for one location where stony fill prevented auger advancement, all of the natural soil horizons encountered were lower subsoil horizons that would originally have been at least 30 cm to more than 50 cm below former surfaces. Subsoil horizons are so strongly developed that an age extending well into the Pleistocene is indicated. Truncations reaching into such horizons would have accomplished complete destruction of any overlying cultural materials that may once have been present.

Soil Profile Descriptions

Boring 1

Horizon	Depth (cm)	Properties
A	0-28	Earthen fill; dark brown (10YR 3/3) loam; friable consistence boundary
C	28-97	Earthen fill; dark yellowish brown (10YR 4/4) sand; loose consistence boundary
2C	97-110	Crushed stone fill; very dark grayish brown (10YR 3/2) very gravelly sandy loam; very friable consistence
3Btb	110-140+	Yellowish red (5YR 4/6) clay loam; common, medium distinct mottles of brown (7.5YR 5/3); firm consistence

Other comments: Graded and filled Coastal Plain upland position; probably originally moderately well drained; original soil truncated >50 cm; description 3/29/19, D.P. Wagner

Boring 2

Horizon	Depth (cm)	Properties
A	0-22	Earthen fill; dark brown (10YR 3/3) loam; friable consistence boundary
C	22-63	Earthen fill; dark yellowish brown (10YR 4/4) sand; loose consistence boundary
2C	63-92	Crushed stone fill; dark olive brown (2.5Y 3/3) very gravelly sandy loam; very friable consistence
3Btb	92-105+	Olive brown (2.5Y 4/a) clay loam; many, coarse distinct mottles of light brownish gray (2.5Y 6/2); firm consistence

Other comments: Graded and filled Coastal Plain upland position; probably originally somewhat poorly drained; water table at 93 cm probably due to perching above dense subsoil; original soil truncated >50 cm; description 3/29/19, D.P. Wagner

Boring 3

Horizon	Depth (cm)	Properties
A	0-20	Earthen fill; dark brown (10YR 3/3) loam; friable consistence boundary
C	20-51	Earthen fill; dark yellowish brown (10YR 4/4) sand; loose consistence boundary
2C	51-75	Earthen fill; very dark grayish brown (10YR 3/2), dark brown (10YR 3/3), and yellowish red (5YR 4/6) clay loam; firm consistence
3C	75-125+	Crushed stone fill; dark olive brown (2.5Y 3/3) very gravelly sandy loam; very friable consistence

Other comments: Graded and filled Coastal Plain upland position; probably originally somewhat poorly drained; original soil truncated >50 cm; description 3/29/19, D.P. Wagner

Boring 4

Horizon	Depth (cm)	Properties
A	0-26	Earthen fill; dark brown (10YR 3/3) loam; friable consistence boundary
2Bt1	26-62	Dark reddish brown (2.5YR 3/4) clay loam; firm consistence boundary
2Bt2	62-93+	Yellowish brown (10YR 5/6) and strong brown (7.5YR 4/6) clay loam; firm consistence

Other comments: Graded Coastal Plain upland position; well drained; original soil truncated >30 cm; description 3/29/19, D.P. Wagner