EARTH ENGINEERING INCORPORATED

Geotechnical Engineers & Geologists

PRELIMINARY REPORT OF DUE DILIGENCE GEOTECHNICAL INVESTIGATION

PROPOSED RETAIL CENTER & COMMUNITY DEVELOPMENT

LOGAN TRIANGLE

CITY AND COUNTY OF PHILADELPHIA, PENNSYLVANIA

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Previous Investigation Testing Location Plan
Previous Investigation Boring Logs

I. INTRODUCTION AND BACKGROUND

A. PROJECT OBJECTIVE AND SCOPE OF WORK

Earth Engineering Incorporated (EEI) has completed the due diligence geotechnical investigation for the proposed development in the Logan Triangle area of Philadelphia, Pennsylvania. The objective of this investigation was to evaluate the general subsurface soil conditions within the proposed development areas. Based on the encountered conditions and the results of geotechnical analyses performed for this project, EEI has developed preliminary geotechnical recommendations for the design and construction of a suitable foundation system. EEI also provides general construction guidelines for the development of the site.

The scope of work for this project included fifteen (15) test borings, twenty-eight (28) test pits, geologic analysis of site conditions, and a geotechnical engineering analysis of the data obtained. This investigation was performed in general accordance with EEI Proposal No. BB-13993R3. The following report sections present the results of the field and laboratory investigations and document recommendations regarding the geotechnical aspects of this project.

B. PROJECT DESCRIPTION AND EXISTING FEATURES

The proposed development area is known as the Logan Triangle in Philadelphia, Pennsylvania. More specifically, the Logan Triangle is bordered by U.S. Route 1 (Roosevelt Boulevard) to the southeast, Marshall Street to the east, Loudon Street to the north, 11th Street to the west and Wingohocking Street to the south. The site currently houses only a handful of structures. The site is generally grassed with spare scrub and small stands of trees.

Previously, the project site was home to the Wingohocking Creek and several smaller tributaries. Early in the previous century, the creek and tributaries were channelized into sewers in order to control sewage flows. The Wingohocking Creek was contained in a sewer beneath the existing Cortland Street. The tributaries were contained in sewers along 11th Street (between Loudon and Wyoming), Wyoming Street (between 11th and 9th) and 9th Street to the Cortland Street sewer.

The basin area that fed the creek beds in the project area was subsequently filled to the current topography. Previous investigations and reports by both Lippincott Engineering Associates in the late 1980s and the U.S. Army Corps of Engineers in the early 2000's have

shown that the suspected depth of historic fill is as much as 48 feet in the southeast area of the Logan Triangle.

The project area was developed in the early 1920s with the current street grid, infrastructure, and row homes. Many of the row homes that were constructed began to exhibit signs of settlement. The previously mentioned engineering studies that began in the 1980's identified deep depths of ash fill that were used to fill the former Wingohocking Creek valley. More than 900 homes have since been demolished within the project area because of settlement issues.

According to discussions EEI has had with the Client and review of the project history, development will primarily take place in the portion of the site with the shallowest depths of historic fill. A sketch of the development area is shown on Figure 1.



Figure 1: Site Location (Microsoft 2015)

A topographic map of the site, from the *Topographic Maps of Pennsylvania* series, Germantown Quadrangle, is shown in Plate 1 in the Appendix to this report.

According to the latest "DRAFT CONCEPT PLAN" provided to EEI by the client, the proposed development is to consist of a Lowe's home improvement store, a BJ's Wholesale Club, two retail structures (labeled as "P1" and "P2"), a Community Center and Fieldhouse. The following figure shows the latest site concept.

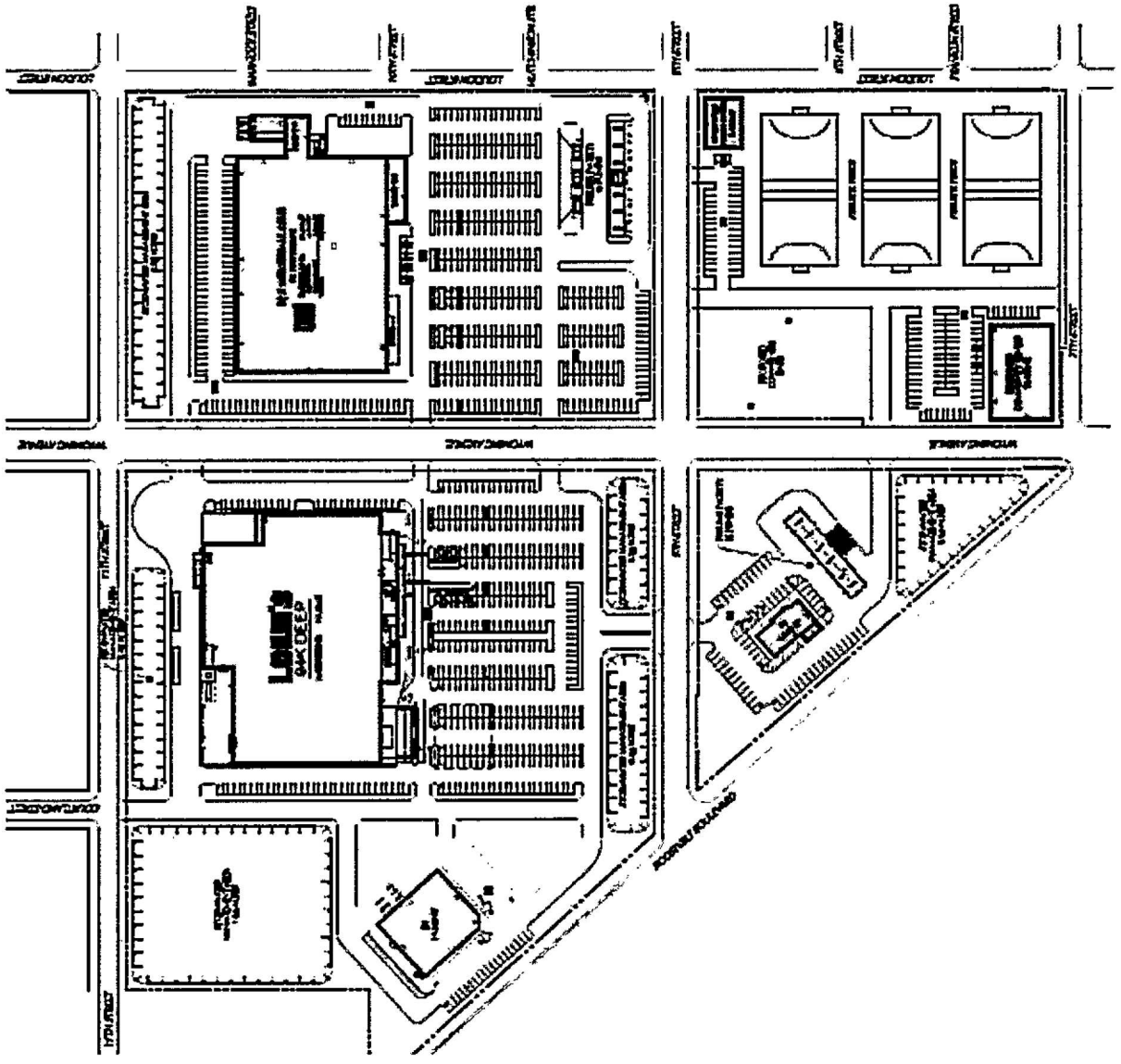


Figure 2: Site Concept (Langan 2015)

II. FIELD INVESTIGATION, OBSERVATIONS, AND DATA

A. FIELD ACTIVITIES AND PROCEDURES

1. Test Borings

A total of fifteen (15) test borings, denoted in this report as B-1 through B-15, were conducted for this investigation to obtain geotechnical data within the proposed development areas at the site. The borings were completed on March 30 through April 1, 2015 by Allied Well Drilling of Honey Brook, PA using a CME 45C truck mounted drill rig. Supervision and monitoring of the test boring program was performed by representatives of EEI. The test borings were field located by representatives of EEI using existing features. The test borings were marked in the field by EEI and surveyed by Langan (Project Surveyor). The Langan plan is included as the current investigation testing location plan. The test boring logs are included in Appendix A of this report.

The borings were advanced using 2-inch outer-diameter, split-barrel (spoon) samplers and 3-¼ inch inner-diameter hollow-stem augers. Split-barrel sampling was conducted with an automatic hammer. The borings were conducted in accordance with ASTM Standard D1586. Standard Penetration Test (SPT) values were recorded for each sample. The SPT values, which are a measure of soil density and consistency, are the number of blows required to drive the 2-inch outer diameter split-barrel sampler 1 foot using a 140-pound weight dropped 30 inches. The number of blows required to advance the sampler over the 12-inch interval from 6 to 18 inches is considered the "N" value, or the SPT value.

2. Test Pits

A total of twenty-eight (28) test pits, denoted in this report as TP-1 through TP-28, were conducted for this investigation to obtain geotechnical data within the proposed development areas at the site. The test pits were excavated by James D. Morrissey, Inc Contractors of Philadelphia, Pennsylvania using a Komatsu 210 trackhoe. Supervision and monitoring of the test pit program was performed by representatives of EEI. The test pits were marked in the field by EEI and surveyed by Langan (Project Surveyor) who also provided the existing ground surface elevations. The test pit logs are also include din Appendix A of this report.

3. Previous Subsurface Investigation

A previous subsurface investigation was completed at the site by Lippincott Engineering Associates (LEA) of Delanco, New Jersey in 1986. This Investigation included a total of thirty-eight (38) test borings and five (5) test pits. Data from the LEA investigation will be used to

supplement the information gathered during the current preliminary subsurface investigation. The testing location plan, test boring logs and test pit logs prepared by LEA as part of the 1986 investigation are included as Appendix B to this report.

4. Groundwater Observations

Groundwater measurements were taken in each boring and test pit advanced during the subsurface investigation during, immediately after completing drilling, and subsequently after completing drilling. Groundwater was encountered in eleven (11) of the test boring locations and one (1) of the test pit locations. The shallowest depths at which groundwater was encountered was 8.0 feet and 8.5 feet in TP-8 and B-5, respectively.

B. PUBLISHED GEOLOGICAL INFORMATION

According to the Commonwealth of Pennsylvania Topographic and Geologic Survey, Atlas of Preliminary Geologic Quadrangle Maps of Pennsylvania, Germantown, PA Quadrangle, Revised 1978, the site is situated within an area mostly underlain by the Wissahickon Formation (Geologic Symbol: Xw) and partially underlain by the Pensauken and Bridgeton Formation (Geologic Symbol: Tpb). Plate 2, which is included in the Appendix, shows the location of the site on a geologic map of the area.

As noted in the Pennsylvania Topographic and Geologic Survey, Engineering Characteristics of the Rocks of Pennsylvania, Fourth (4th) Series, Revised 1982, the Wissahickon Formation is typically composed of mica schist. This rock is characterized by its distinct foliation which is caused by the preferential orientation of muscovite, feldspar, and quartz. The foliation within this formation is typically well developed, fissile to thin. This rock type is moderately resistant to weathering and the overlying soil mantle is typically thin to thick. Excavation rates are moderate in weathered areas of this formation. The residual soils of the Wissahickon Formation typically exhibit good surface drainage. Joint and cleavage openings of the underlying rock type provide a low secondary porosity and low permeability.

Also noted in the above-referenced publication, the Pensauken and Bridgeton Formations are composed of yellow to reddish brown crossbedded clayey sand with interbedded quartz, chert and quartzite gravels. These formations are well-bedded and crossbedded. This formation is deeply weathered. Excavation is generally easy in comparison to other roc types.

III. INTERPRETATION OF INFORMATION AND DATA

A. STRATIFICATION AND SUBSURFACE CONDITIONS

The samples of soil obtained during the field investigation were examined and visually classified by EEI. EEI has generalized the subsurface profiles for the investigated area. EEI encountered three (3) artificial FILL strata and two (2) naturally occurring soil strata. Review of previous reports for the project area show three (3) naturally occurring soil strata, these three layers will be discussed in this report.

In general, a topsoil layer was encountered at the surface of the test locations that ranged in depth from 0.2 feet to 0.6 feet. In many of the test boring and test pit locations that appeared to coincide with locations of homes relic basement slabs were encountered and appeared to be intact. The depth to basement slab varied due to the variability in the surface elevation above the existing street grid from block to block. Similarly, areas situated near the center of the existing blocks, where excavated, were found to have intact concrete pads below a cover of fill soils and topsoil. It is believed that these concrete pads are former drive lanes that existed between the residences that once existed at the site.

Subsurface profiles, which depicts the strata, and other information obtained from the field investigation is presented on the *Boring Profiles,* which are included in the FIGURES AND DRAWINGS. The boring profiles show each soil strata and their individual subsets, if necessary. Detailed descriptions and data regarding the subsurface conditions are shown on the *Boring Logs,* included in the APPENDIX. The following subsections provide general descriptions of the materials encountered.

1. Fill I: Demolition Fill

The materials designated as Fill I consist of silty sand and sandy silt with various amounts of demolition debris. The constituents of the demolition debris included: brick, stone, concrete, wood, steel, ceramic, glass, tires, fabric, and shingles. Where encountered the Fill I extended to depths ranging from 2.0 feet to 18.0 feet below the existing ground surface. The USCS Group Symbol for a representative samples of this material are SM and ML. The corresponding ASTM Group Name are silty sand and sandy silt.

The SPT values recorded during the sampling of this soil ranged from 2 to 22 blows per foot of penetration. Based on these values, the relative density of the Stratum I soils ranges from very loose to medium dense. Very dense portions of Fill I were encountered, these are attributed to obstructions and oversized debris within this layer. Generally, the relative density

of this stratum is medium dense. These materials were encountered in a dry and moist state during the field investigation.

2. Fill II: Ash and Cinder Fill

The materials designated as Fill II consist of the historic ash and cinder fill that was used to a great extent to bring the former Wingohocking Creek Valley to its current elevation. Based on visual classification, Fill II is a poorly-graded sand and silty sand mixture that mainly includes ash, cinders and coal. Other constituents of the ash fill layer included those included in the demolition debris as well as rounded gravel, oyster shells, and metal fragments. Where encountered, the Fill II extended to depths ranging from 8.0 feet to 45.0 feet below the existing ground surface. A subcomponent of the Fill II stratum was discovered in TP-27 where a layer of clean, dry slag was encountered below a relic slab at 5.0 feet to the termination depth of the test pit at 10.0 feet. The USCS Group Symbols for representative samples of the Fill II material are SM, SP and SP-SM. The corresponding ASTM Group Name are silty sand, poorly-graded sand and poorly-graded silty sand.

The SPT values recorded during the sampling of this soil ranged from the weight of the sampling hammer over 12 inches to 10 blows per foot of penetration. Based on these values, the relative density of the Stratum I soils ranges from very loose to loose. These materials were encountered in a moist to wet state during the field investigation.

3. Fill III: Soil Fill

The materials designated as Fill III consist of silty sand and sandy silt with various amounts of and gravel. Where encountered, the Fill III extended to depths ranging from 5.0 feet to 38.0 feet below the existing ground surface. The USCS Group Symbol for representative samples of this material are SM and ML. The corresponding ASTM Group Name are silty sand and sandy silt.

Fill III soils were not identified in the soil borings, therefore SPT values were not recorded for this stratum. However, Fill III soils identified during the test pit operation offered easy excavation rates. Generally, the relative density of this stratum is medium dense. These materials were encountered in a dry moist state during the field investigation.

4. Stratum I: Residual Soils

The soils designated as Stratum I consist mainly of clayey silt and sandy silt with varying amounts of sand and gravel. The Stratum I soils are residual soils that are formed by the complete chemical weathering of the underlying bedrock. The USCS Group Symbol for a

representative sample of this material is ML. The corresponding ASTM Group Name is clayey silt. The Stratum I soils extended to depths ranging from 8.0 feet to 60.0 feet below the existing ground surface.

The SPT values recorded during the sampling of this soil ranged from 2 to 28 blows per foot of penetration. Based on these values, the relative density of Stratum I ranges from soft to very stiff. These materials were encountered in a dry, moist, and wet state during the field investigation.

5. Stratum II: Alluvial Soils

The previously identified Stratum II soils consist of alluvial materials that were deposited in their current locations by flowing water, namely the former Wingohocking Creek and tributaries. The Stratum II soils were not identified during this current subsurface investigation, but were identified at the site by previous investigations.

According to the previous subsurface investigations at the site, Stratum II soils consisted of a mixture of soft/loose sand, silt, clay and organics. The depth at which this stratum was previously encountered was 30 feet to 35 feet.

6. Stratum III: Weathered Schist

The soils designated as Stratum III consist mainly of silty sand and well graded sand with varying amounts of gravel. The USCS Group Symbol for representative samples of this material is SM and SW. The corresponding ASTM Group Name is Silty sand and Well-graded Sand. The Stratum III soils were encountered at depths ranging from 4.0 feet to 38.0 feet below the existing ground surface, to the termination depths of borings ranging in depth from 19.4 feet to 43.1 feet.

The SPT values recorded during the sampling of this soil ranged from 4 blows per foot of penetration to greater than 50 blows over 6 inches of penetration. Based on these values, the relative density of Stratum II ranges from loose to very dense. Generally, the Stratum II soils are medium dense to dense. These materials were encountered in a dry to moist state during the field investigation.

7. Bedrock

Top of bedrock, inferred herein as auger refusal, was not encountered in any of the test borings at the site. Auger refusal on an assumed obstruction was encountered in one test boring, B-15, at a depth of 10.5 feet. Multiple attempts were made to bypass this obstruction with no success. Due to the preliminary nature of the investigation, the logistics of the field

program, and the presence of the Fill I materials above auger refusal, EEI concluded that that refusal was encountered on an obstruction and not bedrock material.

IV. GEOTECHNICAL RECOMMENDATIONS

A. GEOTECHNICAL ANALYSES

EEI has completed geotechnical analyses in order to provide preliminary foundation design recommendations. The analyses are based on the conditions encountered in the field and laboratory analyses. EEI has evaluated the subsurface conditions and provides the following soil parameters utilized for foundation analyses in Table 1.

TABLE 1
GEOTECHNICAL SOIL PROPERTIES

Stratum	FILLS, Stratum I	Stratum II
Moist Unit Weight - γ_m (pcf)	28	34
Effective Stress Angle of Internal Friction - ϕ' (deg)	110	120
Cohesion – c (psf)	0	0

B. STRUCTURE SUPPORT RECOMMENDATIONS

EEI considered many foundation support options including: deep foundations, intermediate foundations, shallow foundations, and ground modification. Due to the nature of the fill soils at the site and the concern for subsidence of future structures at the Logan Triangle site, generally EEI recommends that the proposed structures be supported by deep or intermediate deep foundations. Plate load testing performed by Lippincott Engineering Associates as part of the previous engineering efforts for the Logan neighborhood showed that excessive settlements would be realized under typical shallow foundation loading scenarios. The following report subsections detail preliminary recommendations for the individual proposed structures.

The finished floor elevations (FFEs) for each proposed structure at the site are not available at this time. When the site concept has been advanced to where proposed structure types, sizes, locations, and elevations are all available, they should be communicated to EEI so that their ramifications to this report may be investigated.

Due to the pervasiveness of the Ash and Cinder FILL and the loose/soft consistency of portions of the underlying native soils, the large structures at the site will need to be supported by deep foundations. Different alternatives for pile supported structures are described below based on type of pile installation and previous site work treatment.

1. Proposed Lowe's Home Improvement

Due to the pervasiveness of the Ash and Cinder FILL and the loose/soft consistency of portions of the underlying native soils, the large structures at the site will need to be supported by deep foundations. Different alternatives for pile supported structures are described below based on type of pile installation and previous site work treatment.

Lowe's Option 1a: Driven Timber Piles without Pre-Drilling

Timber piles may be driven to a depth of approximately 40 feet, after the Demolition FILL, basement slabs and relic pavements have been removed – negating the need for pre-drilling the pile locations. Based on past experience and average typical bay spacing of a Lowe's and structural loads, it is estimated there will be approximately 85 column foundations, with 4 timber piles per column. Similarly, the floor slab should a structural slab and be pile supported with a pile every 10 feet on a 10 foot by 10 foot grid (using the Lowe's shown on the provided "Draft Concept Plan"). This estimate results in approximately 1300, 8-inch tip and 12-inch butt, 40-foot long timber piles. The timber piles should be treated for corrosion resistance.

Lowe's Option 1b: Driven Timber Piles with Pre-Drilling

Timber piles may be driven to a depth of approximately 40 feet. However, if the Demolition FILL, relic slabs and pavements have not been removed, the pile locations will also need to be pre-drilled within the top 8 feet to 10 feet so that piles are not obstructed during installation. The estimated type, number, and length of piles are the same as Option 1a with the exception of the added cost of pre-drilling.

Lowe's Option 2a: Driven Steel Piles without Pre-Drilling

Steel pipe piles may be driven to a depth of approximately 45 feet, after the Demolition FILL, basement slabs and relic pavements have been removed – negating the need for pre-drilling the pile locations. Based on past experience and average typical bay spacing of a Lowe's and structural loads, it is estimated there will be approximately 85 column foundations, with 3 steel piles per column. Similarly, the floor slab should be a structural slab and be pile supported with a pile every 10 feet on a 10 foot by 10 foot grid (using the Lowe's shown on the

provided "Draft Concept Plan"). This estimate results in approximately 1215, 12-inch or 18-inch diameter, 45-foot long steel pipe piles. The steel pipe piles should be treated for corrosion resistance.

Alternately, a driven H Pile price may also be sought for comparison. H piles should be 45 feet long.

Lowe's Option 2b: Driven Steel Piles with Pre-Drilling

Steel pipe piles may be driven to a depth of approximately 45 feet. However, if the Demolition FILL, relic slabs and pavements have not been removed, the pile locations will also need to be pre-drilled within the top 8 feet to 10 feet so that piles are not obstructed during installation. The estimated type, number, and length of piles are the same as Option 2a with the exception of the added cost of pre-drilling.

Alternately, a driven H Pile price may also be sought for comparison. H piles should be 45 feet long.

2. Proposed BJ's Wholesale Club

BJ's Option 1a: Driven Timber Piles without Pre-Drilling

Timber piles may be driven to an average depth of approximately 35 feet, after the Demolition FILL, basement slabs and relic pavements have been removed – negating the need for pre-drilling the pile locations. Assuming the same average typical bay spacing and structural loads of a Lowe's, it is estimated there will be approximately 70 column foundations, with 4 timber piles per column. Similarly, the floor slab should be a structural slab and be pile supported with a pile every 10 feet on a 10 foot by 10 foot grid (using the BJ's shown on the provided "Draft Concept Plan"). This estimate results in approximately 1100, 8-inch tip and 12-inch butt, 35-foot long timber piles. The timber piles should be treated for corrosion resistance.

BJ's Option 1b: Driven Timber Piles with Pre-Drilling

Timber piles may be driven to a depth of approximately 35 feet. However, if the Demolition FILL, relic slabs and pavements have not been removed, the pile locations will also need to be pre-drilled within the top 8 feet to 10 feet so that piles are not obstructed during installation. The estimated type, number, and length of piles are the same as Option 1a with the exception of the added cost of pre-drilling.

BJ's Option 2a: Driven Steel Piles without Pre-Drilling

Steel pipe piles may be driven to a depth of approximately 40 feet, after the Demolition FILL, basement slabs and relic pavements have been removed – negating the need for pre-

drilling the pile locations. Assuming the same average typical bay spacing and structural loads of a Lowe's, it is estimated there will be approximately 70 column foundations, with 3 steel piles per column. Similarly, the floor slab should be a structural slab and be pile supported with a pile every 10 feet on a 10 foot by 10 foot grid (using the BJ's shown on the provided "Draft Concept Plan"). This estimate results in approximately 1030, 12-inch or 18-inch diameter, 40-foot long steel pipe piles. The steel pipe piles should be treated for corrosion resistance.

Alternately, a driven H Pile price may also be sought for comparison. H piles should be 45 feet long.

BJ's Option 2b: Driven Steel Piles with Pre-Drilling

Steel pipe piles may be driven to a depth of approximately 40 feet. However, if the Demolition FILL, relic slabs and pavements have not been removed, the pile locations will also need to be pre-drilled within the top 8 feet to 10 feet so that piles are not obstructed during installation. The estimated type, number, and length of piles are the same as Option 2a with the exception of the added cost of pre-drilling.

Alternately, a driven H Pile price may also be sought for comparison. H piles should be 45 feet long.

The proposed fuel island canopy should also be pile supported. Therefore an allowance for additional piles for the fuel canopy is recommended. According to the data available at this time, the soils at the expected depth of the buried fuel tanks should be capable of supporting that load without the support of deep foundations.

3. Proposed Fieldhouse

Fieldhouse Option 1: Excavate and Replace Unsuitable Soils

Based on data from previous investigations, the vertical limit of Ash and Cinder FILL at the location of the proposed Fieldhouse is approximately 10.0 feet below grade (at the time of the 1986 investigation). The unsuitable FILL materials may be able to be excavated and replaced with acceptable material in a feasible manner in order to create a stable building platform for shallow foundations and a slab-on-grade. A final geotechnical subsurface investigation should be performed in order to verify the subsurface profile throughout the footprint of the proposed structure.

Fieldhouse Option 2a: Driven Timber Piles without Pre-Drilling

Timber piles may be driven to an average depth of approximately 35 feet, after the Demolition FILL, basement slabs and relic pavements have been removed – negating the need

for pre-drilling the pile locations. No structural information is currently available for this structure. However, 12 column foundations are estimated for support of this structure with 3 timber piles per column. For estimation purposes, a pile-supported slab does not appear necessary at this time, but the slab should be a structural slab on subgrade soils that have been previously excavated, replaced and compacted. This estimate results in approximately 36, 8-inch tip and 12-inch butt, 35-foot long timber piles. The timber piles should be treated for corrosion resistance.

Fieldhouse Option 2b: Driven Timber Piles with Pre-Drilling

Timber piles may be driven to a depth of approximately 35 feet. However, if the Demolition FILL, relic slabs and pavements have not been removed, the pile locations will also need to be pre-drilled within the top 8 feet to 10 feet so that piles are not obstructed during installation. The estimated type, number, and length of piles are the same as Option 2a with the exception of the added cost of pre-drilling. It is estimated that the slab subgrade soil should also be undercut a minimum of 3.0 feet and the slab itself is constructed as a structural slab.

4. Community Center

Community Center Option 1a: Driven Timber Piles without Pre-Drilling

Timber piles may be driven to an average depth of approximately 35 feet, after the Demolition FILL, basement slabs and relic pavements have been removed – negating the need for pre-drilling the pile locations. No structural information is currently available for this structure. However, 24 column foundations are estimated for support of this structure with 3 timber piles per column. For estimation purposes, a pile-supported slab does not appear necessary at this time, but the slab should be a structural slab on subgrade soils that have been previously excavated, replaced and compacted. This estimate results in approximately 72, 8-inch tip and 12-inch butt, 35-foot long timber piles. The timber piles should be treated for corrosion resistance.

Community Center Option 1b: Driven Timber Piles with Pre-Drilling

Timber piles may be driven to a depth of approximately 35 feet. However, if the Demolition FILL, relic slabs and pavements have not been removed, the pile locations will also need to be pre-drilled within the top 8 feet to 10 feet so that piles are not obstructed during installation. The estimated type, number, and length of piles are the same as Option 1a with the exception of the added cost of pre-drilling. It is estimated that the slab subgrade soil should also be undercut a minimum of 3.0 feet and the slab itself is constructed as a structural slab.

Community Center Option 2: Excavate and Replace Unsuitable Soils

Based on data from previous investigations, the vertical limit of Ash and Cinder FILL at the location of the proposed Community Center is approximately 13.0 feet below grade (at the time of the 1986 investigation). Although less likely than the Fieldhouse because of the deeper column of FILL, the unsuitable FILL materials may be able to be excavated and replaced with acceptable material in a feasible manner in order to create a stable building platform. A final geotechnical subsurface investigation should be performed in order to verify the subsurface profile throughout the entire footprint of the proposed structure.

5. Proposed Structure P1

P1 Option 1: Excavate and Replace Unsuitable Soils

Based on data from previous investigations, the vertical limit of Ash and Cinder FILL at the location of the proposed structure P1 may range from zero feet up to 19.0 feet below grade, depending on the actual location of the structure. The unsuitable FILL materials may be able to be excavated and replaced with acceptable material in a feasible manner in order to create a stable building platform for spread footing and slab-on-grade construction. A final geotechnical subsurface investigation should be performed in order to verify the subsurface profile throughout the footprint of the proposed structure.

P1 Option 2a: Driven Timber Piles without Pre-Drilling

Timber piles may be driven to an average depth of approximately 30 feet, after the Demolition FILL, basement slabs and relic pavements have been removed – negating the need for pre-drilling the pile locations. No structural information is currently available for this structure. However, 24 column foundations are estimated for support of this structure with 3 timber piles per column. For estimation purposes, a pile-supported slab does not appear necessary at this time, but the slab should be a structural slab on the subgrade soils that have been previously excavated, replaced and compacted. This estimate results in approximately 72, 8-inch tip and 12-inch butt, 30-foot long timber piles. The timber piles should be treated for corrosion resistance. After a final geotechnical subsurface investigation is performed, the subsurface profile beneath the structure can be fully analyzed. The possibility of portions of the structure being supported by spread footings while another portion of the structure isolated and supported by deep foundations may be studied.

P1 Option 2b: Driven Timber Piles with Pre-Drilling

Timber piles may be driven to a depth of approximately 30 feet. However, if the Demolition FILL, relic slabs and pavements have not been removed, the pile locations will also need to be pre-drilled within the top 8 feet to 10 feet so that piles are not obstructed during installation. The estimated type, number, and length of piles are the same as Option 2a with the exception of the added cost of pre-drilling. It is estimated that the slab subgrade soil should also be undercut a minimum of 3.0 feet and the slab itself is constructed as a structural slab.

6. Proposed Structure P2

P2 Option 1a: Driven Steel Piles without Pre-Drilling

Steel pipe piles may be driven to a depth of approximately 50 feet, after the Demolition FILL, basement slabs and relic pavements have been removed – negating the need for pre-drilling the pile locations. This depth is considered too deep to be feasible for timber piles. No structural information is currently available for this structure. However, 14 column foundations are estimated for support of this structure with 3 piles per column. Similarly, the floor slab should be pile supported with a pile every 10 feet on a 10 foot by 10 foot grid (using the structure shown on the provided "Draft Concept Plan"). This estimate results in approximately 69, 12-inch or 18-inch diameter, 50-foot long steel pipe piles. The steel pipe piles should be treated for corrosion resistance.

Alternately, a driven H Pile price may also be sought for comparison. H piles should be 55 feet long. It is stressed that the depth of Ash and Cinder FILL is the deepest at the location of this structure and the depth to suitable bearing material may vary widely. Final pile lengths should be determined by the final geotechnical investigation.

P2 Option 1b: Driven Steel Piles with Pre-Drilling

Steel pipe piles may be driven to a depth of approximately 50 feet. However, if the Demolition FILL, relic slabs and pavements have not been removed, the pile locations will also need to be pre-drilled within the top 8 feet to 10 feet so that piles are not obstructed during installation. The estimated type, number, and length of piles are the same as Option 2a with the exception of the added cost of pre-drilling.

Alternately, a driven H Pile price may also be sought for comparison. H piles should be 55 feet long. As previously mentioned, once final site design is completed, the footprint of structure P2 should be investigated during a final geotechnical investigation phase.

The proposed fuel island canopy and buried fuel tanks should also be pile supported. Therefore an allowance for additional piles for these associated features is recommended.

C. SUPPORT OF NON-STRUCTURAL AREAS

The project site is typically filled with 6.0 feet to 8.0 feet of Demolition FILL that is generally unsuitable for support of slabs and/or parking lots in its current condition. The Demolition FILL is the result of the building material and contents of the homes that formerly occupied the area being used as backfill during demolition. The Demolition FILL consists of brick, foundation stones, wood, gravel, pipe, fabric, glass and various other household materials mixed within a soil matrix. In addition to the Demolition FILL, basement slabs and pavements appear to be intact across the site.

1. Overall Sitework and Pavements

Site Work Option 1:

Remove the Demolition FILL, basement slabs and pavements across the site. Process the materials for re-use. Remove deleterious materials such as metals, wood, organics, etc. Concrete, stone and brick may be crushed to an acceptable size of 3-inches or less and mixed within a soil matrix for re-use on the site.

Pavement subgrades across the site should be reinforced with a geogrid reinforcement (such as a Tensar Triax) to minimize the short-term effects of subsidence caused by the underlying Ash and Cinder FILL layer and/or loose native soils. However, potential instabilities related to any underlying Ash and Cinder FILL will continue to be long-term concerns for pavements.

Pavement sections should also be thickened from the typical sections in order to provide added strength. Actual final determinations of pavement thicknesses would be completed during the Final Geotechnical Investigations. **For reference, typical pavements for a Lowe's are:**

Heavy Duty Concrete:	6.0 inches concrete (reinforced) 6.0 inches aggregate base course
Heavy Duty Asphalt:	1.5 inches asphalt wearing course 2.0 inches asphalt binder course 8.0 inches aggregate base course
Standard Duty Asphalt:	1.5 inches asphalt wearing course 2.0 inches asphalt binder course

6.0 inches aggregate base course

Site Work Option 2:

Remove the Demolition FILL, basement slabs and pavements only locations and depths necessary – such as beneath major anchor structures, other retail spaces, utility corridors, and stormwater management areas (if necessary). Process this material for re-use. This approach will require the need to pre-drill pile foundation locations to assure that obstructions are not encountered at shallow depths (to be discussed later).

If the Demolition FILL is not fully removed, the risk of subsidence of pavement subgrades the upward reflection of relic structures that were not removed increases. Pavement areas should at a minimum, be undercut 3 feet, reinforced with geogrid, backfilled with suitable materials and a thickened pavement section should be anticipated. Pavement subgrades across the site should be reinforced with a geogrid reinforcement (such as a Tensar Triax) to minimize the short-term effects of subsidence caused by the underlying Ash and Cinder FILL layer and/or loose native soils, as well as reduce the short-term effects of the variability within the Demolition FILL materials with hard near-surface obstructions and relic foundations that are left in-place. However, potential instabilities related to any underlying Ash and Cinder FILL will continue to be long-term concerns for pavements. **For reference, thickened pavements may be:**

Heavy Duty Concrete:	8.0 inches concrete (reinforced) 12.0 inches aggregate base course
Heavy Duty Asphalt:	2.0 inches asphalt wearing course 4.0 inches asphalt binder course 12.0 inches aggregate base course
Standard Duty Asphalt:	2.0 inches asphalt wearing course 4.0 inches asphalt binder course 8.0 inches aggregate base course

Typical and thickened pavement sections detailed are for reference only and may be subject to change once actual traffic and grading conditions for the sites are known.

2. Utilities

As previously discussed with the Client, many of the utilities that are to be constructed may be built in areas that are to be dedicated to the City of Philadelphia. Consequently, these utilities should be supported on piles based on City of Philadelphia and/or Philadelphia Water Department requirements. However, utilities not constructed in areas to be dedicated may not

need to be pile supported provided that proper geotechnical oversight of the subgrade preparation and monitoring during the construction process is performed.

3. Proposed Athletic Fields

It is recommended that the proposed athletic field are constructed of natural material to allow for easier maintenance and repair of potential movement or subsidence within the in-situ subsurface soils. Synthetic athletic surfaces are cost-prohibitive when compared to the risk of the FILL layers that underlie the area. At minimum however, 3.0 feet of the subgrade should be removed and replaced with suitable materials prior to construction of the athletic surface. Proposed grading plans are unavailable at this time, but consideration should be given to using this area as a location to place of excess Demolition FILL material once deleterious materials have been process from it.

D. SPECIAL SITE CONSIDERATIONS

Special consideration for development at the site should be given to the type, size and location of the proposed structures and features in relations to the findings of the previous studies and this preliminary geotechnical subsurface investigation. Finished floor elevations and depths of proposed development should take into account the presence of former pavements and basement slabs which were found to be intact during the current investigation.

Additionally, relic foundations or isolated thickened slab sections were encountered in test pit TP-14 and possibly in test boring B-15. Therefore, EEI recommends that the proposed development schemes be correlated to the previous site usage (if this hasn't been previously completed) in order to understand where more substantial substructures may be located within the subsurface. Based on the findings of the test borings and test pits, EEI believes that foundation elements that would require the use of a conventional high-powered trackhoe or hydraulic hammering is necessary where typical residential structures once stood. However, the periodic findings of thickened concrete sections or impassable obstructions suggests larger and/or heavier structures may have resided on some portions of the Logan Triangle development area.

EEI does not recommend stormwater infiltration into the Fill soils at the site. Previous studies have concluded that the Fill soils, particularly the ash and cinder fill soils, contributed to the settlement issues in the Logan Triangle development area. It was found that, although similar in gradation to a granular material, the particle size of the ash and cinder may change by degradation due to flowing water. Various tests were performed on the ash collected from the

site previously that proved the ash is soluble in water, is susceptible to loss of shear strength when saturated, and large decreases in volume can be expected when saturated. Therefore, situating stormwater infiltration facilities within this site is not recommended.

E. PAVEMENTS AND INFRASTUCTURE

Pavements at the site, including parking lots, streets and drive aisles, should be supported on soils that would provide adequate support without the concern of short term subsidence or total long term failure. Due to the nature and consistency of Demolition Fill and Ash and Cinder Fill strata at the site, regions of surface subsidence within grassed areas are clearly evident. Therefore it is EEI's recommendation that all non-structural paved areas at the site should be considered for geotextile reinforcement. Fabric or geogrid reinforcement should be considered in order to reduce the costs quantity and costs of overexcavation and disposal of unsuitable subbase soils, as well as reducing the thickness of the pavement section. The subbase reinforcement will work to minimize differential settlement of paved areas in relation to associated infrastructure (i.e.: inlet structures).

It is recommended that the location and depths of the existing and active sewer elements within the development area be verified. Development over the existing sewers should be avoided so that damage to aging infrastructure may be minimized. Similarly, new site sewers will require geotechnical investigations, in accordance with PWD requirements, to confirm whether deep foundations are required for support.

F. SITE PREPARATION

Concrete, asphalt, subbase, topsoil and demolition rubble deemed unsuitable by an onsite representative of the testing agency's Geotechnical Engineer should be removed from the development area to expose the soils at the construction subgrade elevations. The subgrade should be proof-rolled and compacted in order to densify and verify the integrity of the subgrade bearing materials. EEI recommends that a smooth drum vibratory roller having a minimum static weight of 10 tons be utilized for this purpose. Areas that cannot be accessed by this sized equipment should be densified and compacted by use of walk-behind or hand operated equipment. The proof-rolling and compaction activities should be observed and evaluated during construction by the on-site representative of the Geotechnical Engineer of Record. Any soft zones of soil encountered during proof-rolling should be removed and replaced with structural fill as described in the *FILL AND COMPACTION* subsection of this

report. Extra attention should be given to the proof-rolling in the area of the removed underground storage tanks prior to the placement of subgrade materials or asphalt. Additionally, the *FOUNDATION SUPPORT RECOMMENDATIONS* section details areas of localized undercuts prior to foundation construction activities.

Small portions of the site are currently occupied by existing structures, and it appears that relic basement slabs remain in place. The base of all excavations resulting from the removal of existing features and utilities should be proof-rolled and inspected by a representative of the Geotechnical Engineer of Record to confirm stability prior to backfilling. Following confirmation of a stable subgrade, the excavations should be backfilled as specified in the *FILL AND COMPACTION* section of this report.

The site should be graded during construction to convey surface runoff away from active work areas. The work areas should be sealed by rolling on a daily basis to promote runoff. Careful grading and management of surface water runoff will help minimize disturbance of the subgrade. EEI recommends that all construction areas, including those that will be excavated to achieve the planned subgrade elevation, be proof-rolled immediately before the placement of any structural fill and/or the placement of subbase stone, and again before the installation of concrete or asphalt. Such preparations will allow soft and weak areas to be observed and remediated before construction.

G. EXCAVATIONS

Based on the expected grades and the general predominant existing grades of the street grid, EEI expects that foundation and utility excavations for the proposed structures will occur within the Fill I, Fill II, FILL III, Stratum I, Stratum II and Stratum III soils at the site. EEI expects that these materials should be capable of being excavated with conventional earth excavation equipment and techniques. However, relic foundations, walls and pavements may be present within excavation areas that may prove difficult excavation. Improved excavation rates will be realized utilizing a late model high-powered track-mounted excavator. Very dense weathered rock (Stratum III) may be encountered in portions of the site. Trench excavation within very dense Stratum III weathered rock may require rock excavation equipment such as hydraulic hammering, splitting, or other rock removal techniques.

Excavations must be sloped, benched, or shored to prevent collapse during soil excavation and during construction. Sloping, benching, or shoring of all construction excavations should be conducted in accordance with 29 CFR 1926, Subpart P. A competent

person as defined by the aforementioned regulation is required to confirm the stability of all excavations during construction. The actual excavation wall slopes, benching, or shoring should be determined in the field and should be based on the required depth of excavations and on the soil types encountered. Care should be taken during construction to protect existing foundations and utilities from undermining.

H. GROUNDWATER CONTROL

As previously mentioned, groundwater was only encountered as shallow as 8.0 feet in portions of the site. Final grades and elevations for the proposed development schemes are yet to be determined, therefore the impact of groundwater cannot be fully defined. However, excavations at the site extending to these depths and elevations may encounter groundwater, even if the slab and foundation elevations of the proposed structures are well above the groundwater elevations. Typically dewatering, if necessary for foundations and utility construction, should be based on standard practices and on the flows encountered at the time of construction. The final number and positioning of pumps required to de-water the excavation should be made by the contractor, subject to review by the Engineer.

It should be noted that the groundwater observations were made at the time of the subsurface investigation and that groundwater table elevations may fluctuate with daily, seasonal, and climatic variations. The contractor should be advised that they may conduct their own investigations to verify groundwater elevations prior to performing excavations on site.

I. FILL AND COMPACTION

1. Onsite Fill Criteria

Fill material which supports foundations, floor slabs, and pavements, as well as material used for retaining wall backfill, is considered structural fill. Following completion of site preparation measures and required excavations, structural fill required to elevate the subgrade within structural areas may be placed.

Some of the excavations necessary for site development and utility installation are expected to make portions of the Demolition FILL for reuse as structural fill. These materials are generally unsuitable in their current condition for reuse as structural fill. However, Demolition FILL may be processed for proper reuse provided the moisture content deviates nominally from optimum levels, all oversized particles are crushed to 3-inches or less and contained in a soil matrix, and any organics or deleterious materials are removed.

Consequently, all Demolition FILL material should be carefully evaluated for reuse by a representative of the Geotechnical Engineer of Record at the time of excavation. Any soils which are deemed unsuitable for reuse as structural fill should be stockpiled separately and removed from the site or placed in non-structural areas.

Due to the nature of their primary constituents the Ash and Cinder FILL layer is not acceptable for reuse as structural fill at the site. Samples of Soil FILL, Stratum I, Stratum II and Stratum III that may become available for use as structural fill should be evaluated for reuse by a representative of the Geotechnical Engineer of Record for inspections.

Aerating and drying of any excessively moist soils are best accomplished in warm, dry summer months. The on-site soils, if used, will require careful moisture control as portions are fine-grained and sensitive to moisture changes. Caution should be exercised during construction to not stockpile and/or expose these soils to weather conditions for long periods of time. Materials stockpiled for use as structural fill should be graded to shed water and rolled with a smooth drum roller to maintain the soils. During periods of wet site conditions, travel upon the construction areas should be limited to minimize disturbance of the subgrade which will lead to instabilities.

2. Imported Fill Criteria

If any structural fill is required to be **imported** to the site, it should meet the following criteria:

- it should be free of organic matter, ash, cinders, frozen materials, and demolition debris,
- the plasticity index should be less than 10,
- it should be less than 15 percent by weight rock fragments larger than 3 inches, less than 30 percent by weight larger than ¾ inches, and less than 30 percent by weight smaller than the No. 200 sieve.
- meets the definition of clean fill according to PADEP Management of Fill Policy, Document Number 258-2182-773.

The above criteria are provided as a general guideline for soil materials imported to the site. Soil materials that become available for use as a structural fill should be submitted to the Geotechnical Engineer of Record for evaluation before they are imported to the site.

3. Compaction Criteria

Structural fill should be placed in horizontal lifts not exceeding 8 inches in loose thickness and compacted with a smooth drum vibratory roller with a minimum static weight of 10 tons. Structural fill should be placed in horizontal lifts of 6 inches loose thickness where

compaction by hand-operated equipment is necessary. The optimum lift thickness and number of repetitions necessary to achieve the required percentage compaction values should be determined in the field with test passes of the chosen compaction equipment. The fill material should be placed at, or deviate nominally from, the optimum moisture content as determined in accordance with ASTM D698 and compacted to a minimum percentage of the maximum dry density as indicated in the following table.

TABLE 5
COMPACTION CRITERIA

Fill Area	Percent (%) of Maximum Dry Density Per ASTM D698
Foundation Support, and Wall Backfill	98
Utility Trenches and Walkways	95
Nonstructural	92

J. CONSTRUCTION QUALITY CONTROL

As documented within this report, the proposed construction will include earthwork procedures and foundation placement activities. The quality of these activities is an integral part of the development of this site and directly affects the validity of the recommendations presented in this report. Based on EEI's past experience, the most effective and economical earthwork inspection is obtained through the presence of a qualified representative of the Geotechnical Engineer of Record during site preparation, excavation of on-site materials, site development, proof-rolling, placement of structural fill, and installation of foundation elements. EEI recommends that these activities be examined, tested, and confirmed by the Geotechnical Engineer of Record.

K. LIMITATIONS

The preliminary conclusions and recommendations presented in this report are based on the subsurface data collected, details stated in this report, and the assumption that the subsurface conditions do not deviate from those disclosed by the data acquisition activities performed. The data from previous investigations at the site was obtained through EEI's association with the current planned development at the site. EEI did not perform, nor can EEI verify the accuracy and validity of the data acquisition procedures undertaken by others.

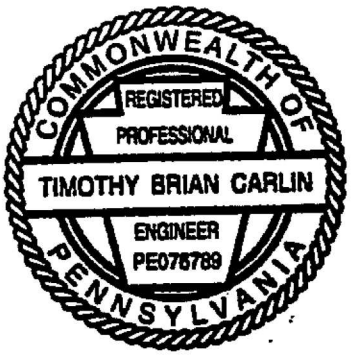
It is recommended that the site design concepts, once finalized, and final foundation plans be made available to EEI for review. Any substantial change in the proposed plans should be brought to the attention of EEI so that the impact of the change on the recommendations presented herein may be evaluated.

The procedures followed during the subsurface exploration, and the analyses and conclusions contained herein, have followed generally accepted practices of geotechnical engineering. EEI provides no other warranties, either expressed or implied, as to the professional advice provided under the terms of EEI's agreement and included in this report. The conclusions and recommendations presented in this report are based on the assumption that recognized, proper construction practices will be followed throughout construction and that a Professional Engineer qualified in Geotechnical Engineering will be retained to oversee the inspection of site preparation, proof-rolling, foundation construction, and other critical earthwork operations. If subsurface conditions substantially deviate during construction from those described in this report, EEI should be contacted promptly.

Additional investigations are recommended to collect subsurface data within the limits of the existing building. This report also is considered preliminary based on the degree to which the site grading and structural loading has yet to be presented to EEI. It is recommended that the final foundation plans be made available to EEI for review. Any substantial change in the proposed plans should be brought to the attention of EEI so that the impact of the change on the recommendations presented herein may be evaluated.

EEI emphasizes that geotechnical analyses made in this report are for the proposed development of the Logan Triangle in the City and County of Philadelphia, Pennsylvania. EEI does not assume any responsibility for the use of this report in generating a foundation design for a site other than the one specifically addressed in this report.

Respectfully submitted,
EARTH ENGINEERING INCORPORATED



Timothy B. Carlin

Timothy B. Carlin, P.E.
Geotechnical Engineer

Patrick McNamara

Patrick McNamara, P.E.
Director – Geotechnical Investigations

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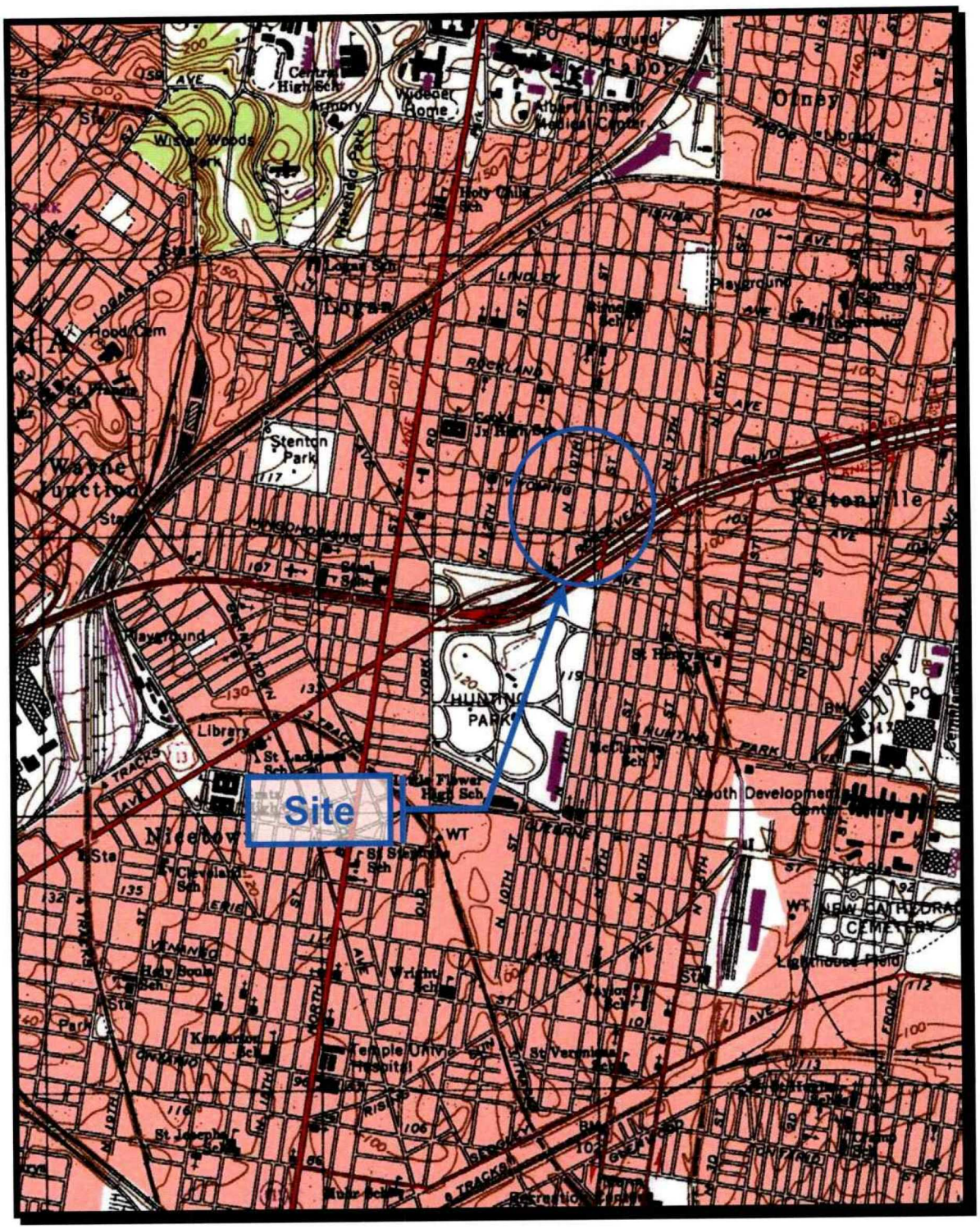


PLATE 1 – TOPOGRAPHIC MAP OF SITE

Reprinted from the United States Department of the Interior Geological Survey, Topographic Maps of Pennsylvania, Germantown, PA Quadrangle, Photorevised 1983.

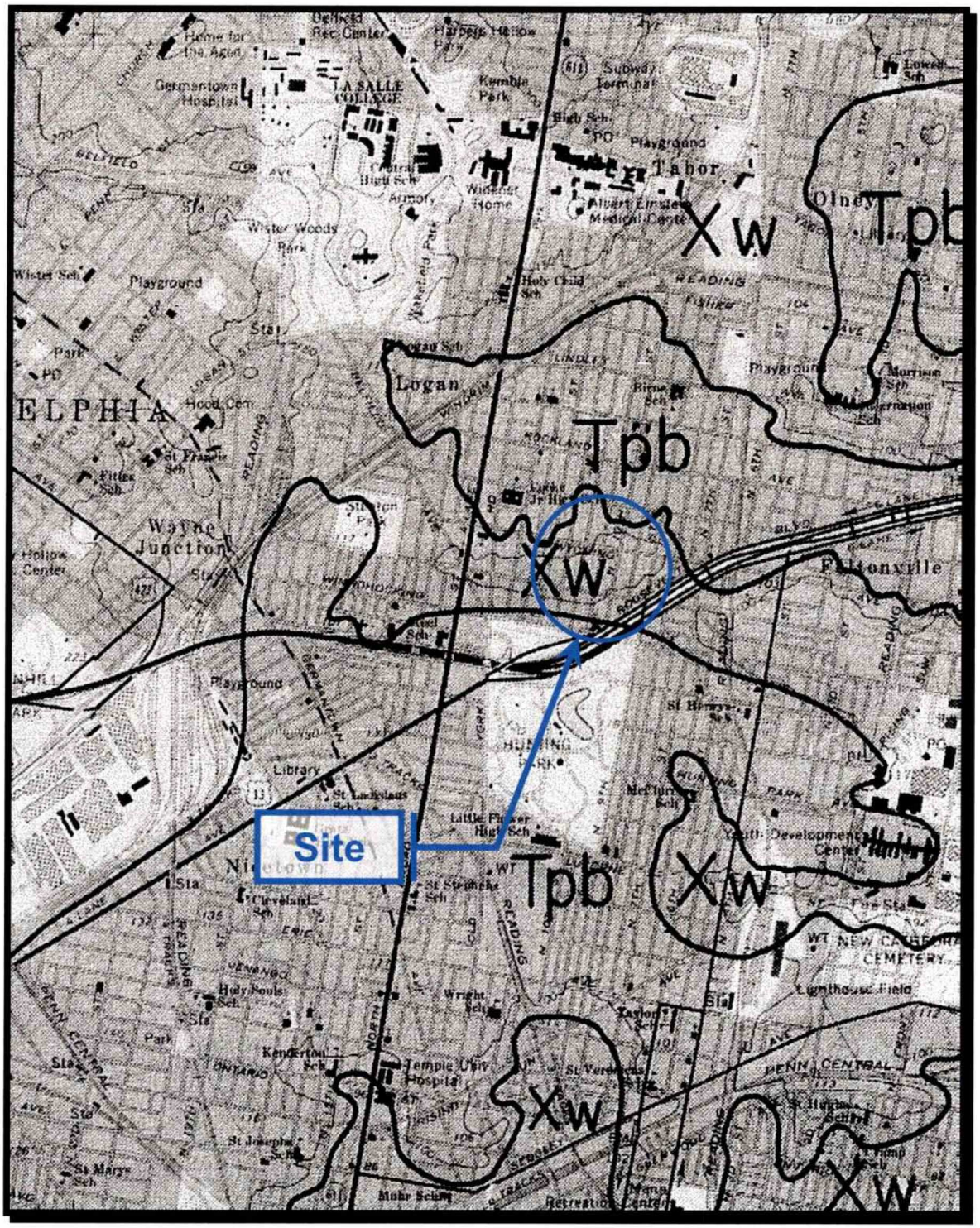


PLATE 2 - GEOLOGIC MAP OF SITE

Reprinted from the Pennsylvania Geological Survey, Atlas of Preliminary Geologic Quadrangle Maps of Pennsylvania, Germantown, PA Quadrangle, Compiled 1978.



Date	Description	No.
REVISIONS		

SHAUN F. HIGGINS DATE SIGNED
PROFESSIONAL LAND SURVEYOR
PENNSYLVANIA LIC. No. SU-051088-E

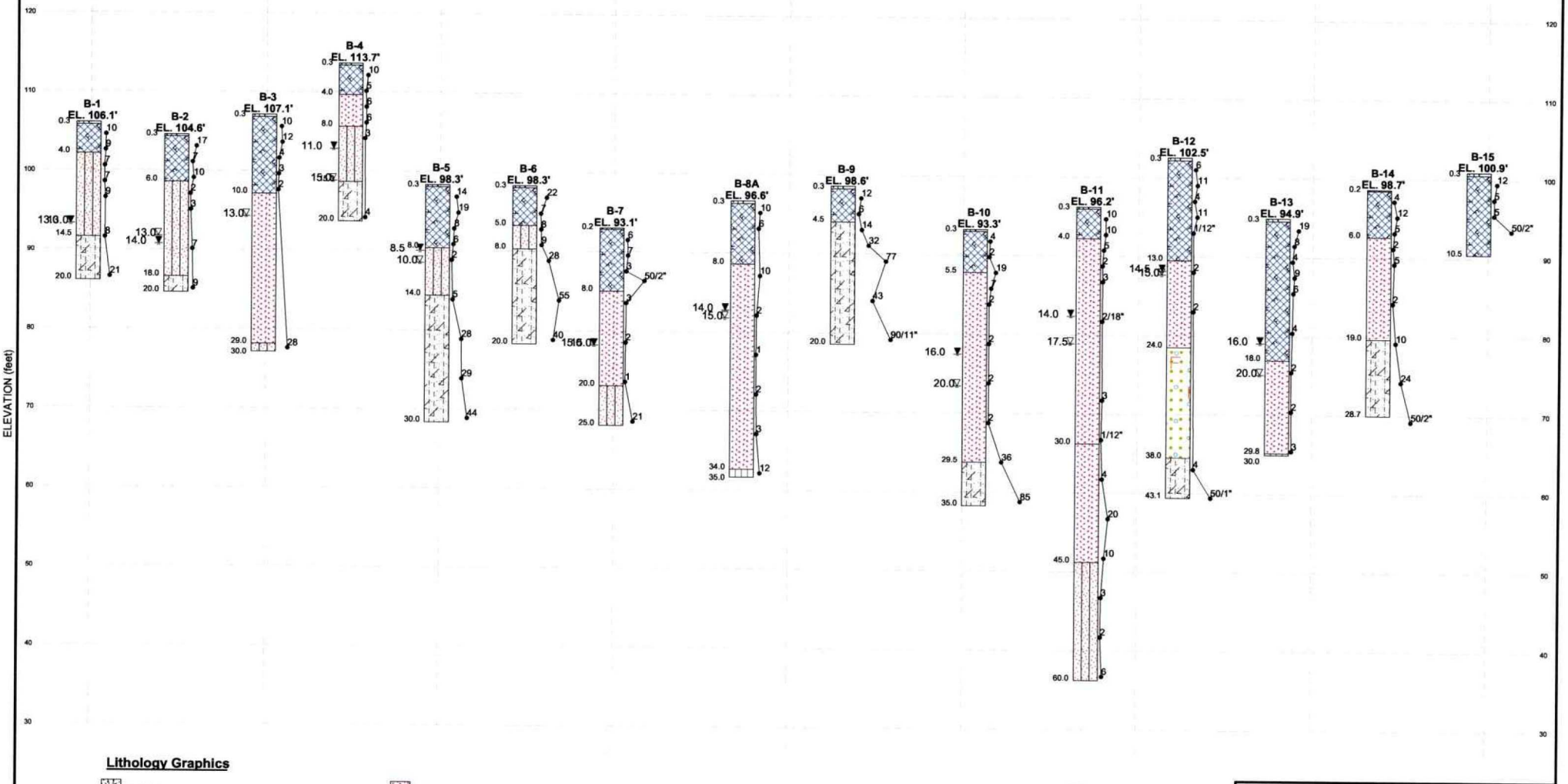
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Project
LOGAN POINTE
CITY OF PHILADELPHIA
COUNTY STATE

Drawing Title
TEST PIT AND BORING LOCTIONS

Project No. 220080901	Drawing No. VB-101
Date 8 APRIL 2015	
Scale 1"=80'	
Drawn By ASB / Checked By SFH	
Submission Date	Sheet 1 of 1

Filename: Langan.com\data\PA\data\220080901\Civil 3D\Existing\220080901-BORING LOCATIONS.dwg Date: 4/8/2015 Time: 10:11 User: asather Style Table: Langan.stb Layout: ARCH D-B



EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

BORING PROFILES
PREPARED FOR
LOGAN TRIANGLE
PHILADELPHIA PA

Project Number: 27607.00 PHASE 002

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

BORING LOG

BORING NO.: B-1
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 106.1

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 18.0'
WATER DEPTH: 13.0' TIME: 0 DATE: 3/31/2015
CHECKED BY: _____ DATE: _____
WATER DEPTH: 13.0' TIME: 24 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0								DEPTH 0.3 Topsoil ELEVATION 105.8	
	S-1	4 5 5 4	1.9'	-	ML	M		Demo Fill - Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0									
	S-2	4 4 5 5	2.0'	-	SM	D			
4.0								4.0 102.1	
	S-3	2 3 4 3	1.0'	-	SM	D		Orange Brown Clayey Silt with varying amounts of Sand and Gravel, with organics	
6.0									
	S-4	2 3 4 4	1.5'	-	GC-GM	D			
8.0									
	S-5	2 4 5 3	1.6'	-	SM	D			
10.0									
13.0									
	S-6	2 4 4 5	1.7'	-	SW	W			
15.0								14.5 91.6	
								Multicolored Sandy Silt, Schist Saprolite	
18.0									
	S-7	5 9 12 10	1.4'	-	SW	M			End of Boring at 20.0'
20.0								20.0 86.1	

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

BORING LOG

BORING NO.: B-2
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 104.6

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 18.0'
CHECKED BY: _____ DATE: _____

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: 13.0' TIME: 0 DATE: 3/31/2015
WATER DEPTH: 14.0' TIME: 24 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0								DEPTH 0.3 Topsoil ELEVATION 104.3	
	S-1	9 11 6 5	1.4'	-	SM	D		Demo Fill - Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0									
	S-2	4 4 3 3	0.7'	-	SM	D			
4.0									
	S-3	6 5 5 3	1.0'	-	SM	D			
6.0								6.0 98.6	
	S-4	1 1 1 1	0.0'	-	ML	D		Orange Brown Clayey Silt with varying amounts of Sand and Gravel	
8.0									
	S-5	1 1 2 2	1.6'	-	ML	M			
10.0									
13.0									
	S-6	1 3 4 9	1.8'	-	SC-SM	W			
15.0									
18.0								18.0 86.6	
	S-7	4 5 4 6	2.0'	-	SM	D		Multicolored Sandy Silt, Schist Saprolite	End of Boring at 20.0'
20.0								20.0 84.6	

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

BORING LOG

BORING NO.: B-3
SHEET: 1 OF 2
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 107.1

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 28.0'
WATER DEPTH: 13.0' TIME: 0 DATE: 3/31/2015
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0								DEPTH 0.3 Topsoil ELEVATION 106.8	
	S-1	2 4 6 3	1.5'	-	CL-ML	D		Demo Fill - Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0									
	S-2	3 5 7 4	1.7'	-	SM	D			
4.0									
	S-3	4 2 2 2	1.5'	-	SM	D			
6.0									
	S-4	1 2 1 2	1.0'	-	SM	D			
8.0									
	S-5	2 1 1 1	0.2'	-	SM	M			
10.0								10.0 97.1	
								Ash Fill - Gray and Black Ash, Cinders and Coal	
13.0									
	S-6	1/12 1 1	0.5'	-	SP-SM	W			
15.0									
18.0									
	S-7	1/12 1/12	0.5'	-	SP-SM	W			
20.0									

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

BORING LOG

BORING NO.: B-3
SHEET: 2 OF 2
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 107.1

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 28.0'
CHECKED BY: _____ DATE: _____

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: 13.0' TIME: 0 DATE: 3/31/2015
WATER DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH ELEVATION	
								Ash Fill - Gray and Black Ash, Cinders and Coal *(continued)*	
23.0									
	S-8	1/12 1 1	0.2'	-	SP-SM	W			
25.0									
28.0									
	S-9	7 11 17 16	1.5'	-	SW	W		29.0 78.1 Orange Brown Sandy Gravel	
30.0								30.0 77.1	End of Boring at 30.0'

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

BORING LOG

BORING NO.: B-4
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 113.7

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 18.0'
CHECKED BY: _____ DATE: _____

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: 15.0' TIME: 0 DATE: 3/31/2015
WATER DEPTH: 11.0' TIME: 24 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0								DEPTH / ELEVATION	
								0.3 Topsoil 113.4	
	S-1	3 6 4 1	2.0'	-	ML	D		Demo Fill - Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0									
	S-2	7 3 2 2	0.3'	-	SM	D			
4.0								4.0 109.7	
	S-3	1 2 4 3	1.0'	-	SM	D		Ash Fill - Gray and Black Ash, Cinders and Coal	
6.0									
	S-4	1 2 4 3	0.2'	-	SM	D			
8.0								8.0 105.7	
	S-5	1 1 2 4	2.0'	-	SM	D		Orange Brown Sandy Silt with varying amounts of Clay and Gravel with interlayers of Coarse Sand and fine Gravel	
10.0									
13.0									
	S-6	1/12 1 1	1.6'	-	SC-SM	W			
15.0								15.0 98.7	
								Multicolored Sandy Silt, Schist Saprolite	
18.0									
	S-7	2 2 2 5	2.0'	-	SM	M			Schist fragments in tip
20.0								20.0 93.7	End of Boring at 20.0'

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-5
SHEET: 1 OF 2
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 98.3

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 28.0'
WATER DEPTH: 10.0' TIME: 0 DATE: 3/31/2015
CHECKED BY: _____ DATE: _____
WATER DEPTH: 8.5' TIME: 24 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH ELEVATION	
0.0								0.3 Topsoil 98.1	
	S-1	3 9 5 3	1.5'	-	SM	D		Demo Fill - Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0									
	S-2	26 13 6 7	1.8'	-	SM	D			
4.0									
	S-3	5 4 4 3	0.9'	-	SM	D			
6.0									
	S-4	2 3 3 1	1.3'	-	SM	M			
8.0								8.0 90.3	
	S-5	1 1 1 2	1.3'	-	ML	W		Orange Brown Clayey Silt with trace Sand	
10.0									
13.0									
	S-6	1 2 3 5	1.6'	-	ML	M		14.0 84.3	
15.0								Multicolored Sandy Silt, Schist Saprolite	
18.0									
	S-7	5 12 16 17	1.4'	-	SM	M			
20.0									

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-5
SHEET: 2 OF 2
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 98.3

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 28.0'
WATER DEPTH: 10.0' TIME: 0 DATE: 3/31/2015
CHECKED BY: DATE:
WATER DEPTH: 8.5' TIME: 24 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH ELEVATION	
								Multicolored Sandy Silt, Schist Saprolite *(continued)*	
23.0									
	S-8	13 13 16 18	1.8'	-	SM	D			
25.0									
28.0									
	S-9	6 20 24 50/4	1.5'	-	SM	D			
29.8								30.0 68.3	End of Boring at 29.8'

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-6
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT) 98.3

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 18.0'
CHECKED BY:
DATE:

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: TIME: DATE:
WATER DEPTH: TIME: DATE:
NOT ENCOUNTERED [X]

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH / ELEVATION	
0.0								0.3 Topsoil 98.0	
	S-1	7 7 15 15	1.3'	-	GP	D		Demo Fill - Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0									
	S-2	3 3 4 4	0.3'	-	GP	D			
4.0									
	S-3	4 4 4 4	1.6'	-	CL	D		5.0 93.3 Orange Brown Clayey Silt with trace Gravel	
6.0									
	S-4	3 4 5 7	1.8'	-	SM	D			
8.0								8.0 90.3 Multicolored Sandy Silt, Schist Saprolite	
	S-5	7 11 17 17	1.2'	-	SM	D			
10.0									
13.0									
	S-6	6 19 36 45	1.8'	-	SM	D			
15.0									
18.0									
	S-7	14 17 23 50/4	1.8'	-	SM	D		20.0 78.3	End of Boring at 20.0'
20.0									

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-7
SHEET: 1 OF 2
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT) 93.1

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 23.0'
CHECKED BY: _____ DATE: _____

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: 15.0' TIME: 0 DATE: 4/1/2015
WATER DEPTH: 15.0' TIME: 24 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH / ELEVATION	
0.0	S-1	10 4 2 5	0.8'	-	SM	D		0.2 / 92.9 Topsoil Demo Fill - Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0	S-2	1 2 5 3	0.7'	-	SM	D			
4.0	S-3	3 2 1 1	1.3'	-	SM	D			
6.0	S-4	2 50/2	0.5'	-	ML	D			Probable slab 6.5'-7.0'
6.7 / 8.0								8.0 / 85.1	
	S-5	3 2 1 1	0.4'	-	ML	M		Ash Fill - Gray and Black Ash, Cinders and Coal	
10.0									
13.0	S-6	1 1 1 1	0.4'	-	SP	M			
15.0									
18.0	S-7	WOH 1	1.5'	-	ML	M			
20.0								20.0 / 73.1	

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-7
SHEET: 2 OF 2
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT) 93.1

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 23.0'
CHECKED BY: _____ DATE: _____

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: 15.0' TIME: 0 DATE: 4/1/2015
WATER DEPTH: 15.0' TIME: 24 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH ELEVATION	
								Orange, Red and Brown Silty Sand with some Fine to Coarse Gravel	Moderate augering at 20.5'
23.0									
	S-8	7 9 12 13	1.1'	-	SW-SM	M			End of Boring at 25.0'
25.0								25.0 68.1	

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-8
SHEET: 1 OF 1
START DATE: 3/30/15
END DATE: 3/30/15
SURFACE ELEV. (FT): 96.6

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 7.5'
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED [X]

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH ELEVATION	
0.0								0.3 Topsoil 96.3	
	S-1	3 5 10 12	0.2'	-	SM	D		Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0									
	S-2	8 5 50/5	1.1'	-	GP	D			
3.4									
4.0									
	S-3	33 50/3	0.8'	-	GP	D			Hard augering at 4.0'
4.8									
6.0				-				6.0 90.6	
6.2	S-4	50/2	0.2'			NA			Concrete slab at 6.0'; Offset boring 5' and refused at 6.0' depth

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-8A
SHEET: 1 OF 2
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT) 96.6

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 33.0'
CHECKED BY:
DATE:

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: 15.0' TIME: 0 DATE: 4/1/2015
WATER DEPTH: 14.0' TIME: 24 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH / ELEVATION	
0.0								0.3 Topsoil 96.3	
	S-1	2 5 5 4	1.3'	-	SM	D		Brown Silty Sand with Brick, Stone, Concrete and Wood Fragments	Relocated from B-8: 35' from Wyoming, 80' from 9th; Augered through FILL to 8.0' (no sample from 4.0'-8.0')
2.0									
	S-2	3 3 3 3	0.6'	-	SM	D			
4.0									
8.0								8.0 88.6	
	S-5	5 4 6 4	0.5'	-	SP	M		Ash Fill - Gray and Black Ash, Cinders and Coal, rock fragments, trace organics	
10.0									
13.0									
	S-6	2 1 1 1	0.7'	-	SP	W			
15.0									
18.0									
	S-7	1/18 1	1.3'	-	SP	D			
20.0									

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-8A
SHEET: 2 OF 2
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 96.6

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 33.0'
CHECKED BY: _____ DATE: _____

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: 15.0' TIME: 0 DATE: 4/1/2015
WATER DEPTH: 14.0' TIME: 24 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH ELEVATION	
								Ash Fill - Gray and Black Ash, Cinders and Coal, rock fragments, trace organics *(continued)*	
23.0									
	S-8	1 1 1 2	0.5'	-	SP	D			
25.0									
28.0									
	S-9	2 1 2 3	0.3'	-	SP	D			Hydrocarbon odor at 28.0'
30.0									
33.0									
	S-10	4 5 7 11	1.7'	-	SM	D		34.0 62.6	
35.0								Gray Green Medium to Coarse Sand with fine gravel	End of Boring at 35.0'
								35.0 61.6	

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-9
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 98.6

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 18.0'
WATER DEPTH: ____ TIME: ____ DATE: ____
CHECKED BY: ____ DATE: ____
WATER DEPTH: ____ TIME: ____ DATE: ____
NOT ENCOUNTERED [X]

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0								DEPTH ELEVATION	
								0.3 Topsoil 98.2	
	S-1	3 4 8 6	1.2'	-	SM	D		Demo Fill - Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0									
	S-2	7 4 2 5	0.8'	-	SM	D			
4.0									
	S-3	6 5 9 8	1.2'	-	SM	D		4.5 94.1 Tan, brown Silty Sand, Schist Saprolite	
6.0									
	S-4	10 12 20 20	2.0'	-	SM	D			
8.0									
	S-5	13 41 36 31	1.8'	-	SM	D			
10.0									
13.0									
	S-6	7 18 25 34	2.0'	-	SM	D			Highly to moderately decomposed 14.0'-18.0'
15.0									
18.0									
	S-7	17 40 50/5	1.4'	-	SM	D			End of Boring at 19.4'
19.4								20.0 78.6	

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.:	B-10
SHEET:	1 OF 2
START DATE:	4/1/15
END DATE:	4/1/15
SURFACE ELEV. (FT)	93.3

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 33.0'
WATER DEPTH: 20.0' TIME: 0 DATE: 4/1/2015
CHECKED BY:
DATE:
WATER DEPTH: 16.0' TIME: 2 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH / ELEVATION	
0.0	S-1	2 2 2 1	1.4'	-	SM	D		0.3 / 93.0 Topsoil Demo Fill - Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0	S-2	1 1 1 3	0.2'	-	SM	D			
4.0	S-3	11 12 7 4	0.9'	-	SM	D			
6.0	S-4	6 4 3 2	1.2'	-	SP	D		5.5 / 87.8 Ash Fill - Gray and Black Ash, Cinders and Coal	
8.0	S-5	2 1 1 1	0.2'	-	SP	D			
10.0									
13.0	S-6	1 1 1 1	1.2'	-	SP	M			
15.0									
18.0	S-7	1 1 1 1	1.0'	-	SP	W			
20.0									

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-10
SHEET: 2 OF 2
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 93.3

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 33.0'
WATER DEPTH: 20.0' TIME: 0 DATE: 4/1/2015
CHECKED BY:
DATE:
WATER DEPTH: 16.0' TIME: 2 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH ELEVATION	
								Ash Fill - Gray and Black Ash, Cinders and Coal *(continued)*	
23.0									
	S-8	1 1 1 1	0.2'	-	SP	W			
25.0									
28.0									
	S-9	9 19 17 10	1.2'	-	SM	W			
30.0								29.5 63.8	
								Gray Silty Sand and Sandy Gravel, Schist Saprolite	Hard augering at 29.5'
33.0									
	S-10	12 47 38 50/4	1.3'	-	GW-GM	M			End of Boring at 35.0'
35.0								35.0 58.3	

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-11
SHEET: 1 OF 3
START DATE: 3/30/15
END DATE: 3/30/15
SURFACE ELEV. (FT): 96.2

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 58.0'
CHECKED BY: _____ DATE: _____

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: 17.5' TIME: 0 DATE: 3/30/2015
WATER DEPTH: 14.0' TIME: 24 DATE: 3/31/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH 0.3 Topsoil ELEVATION 96.0	
0.0	S-1	3 5 5 6	1.7'	-	SM	D		Demo Fill - Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0	S-2	5 6 4 3	0.1'	-	SM	D			
4.0								4.0 92.2	
	S-3	6 4 1 1	0.0'	-		NA		Ash Fill - Gray and Black Ash, Cinders and Coal	
6.0	S-4	1 1 1 1	1.0'	-	ML	D			
8.0	S-5	4 2 1 1	0.0'	-		NA			
10.0									
13.0	S-6	1 1 1/12	0.3'	-	ML	M			
15.0									
18.0	S-7	1/12 1/12	0.3'	-	ML	W			
20.0									

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-11
SHEET: 2 OF 3
START DATE: 3/30/15
END DATE: 3/30/15
SURFACE ELEV. (FT) 96.2

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 58.0'
WATER DEPTH: 17.5' TIME: 0 DATE: 3/30/2015
CHECKED BY: _____ DATE: _____
WATER DEPTH: 14.0' TIME: 24 DATE: 3/31/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH ELEVATION	
								Ash Fill - Gray and Black Ash, Cinders and Coal *(continued)*	
23.0									
	S-8	4 2 1 1	1.0'	-	ML	W			
25.0									
28.0									Hydrocarbon odor at 28.0'
	S-9	1/12 1/12	0.2'	-	ML	W			
30.0								30.0 66.2	
								Ash Fill - Dark Gray Micaceous Sand and Gravel with Ash, Stone and Wood	
33.0									
	S-10	2 2 2 3	1.5'	-	SM	M			
35.0									
38.0									
	S-11	10 11 9 7	0.9'	-	SW	M			
40.0									

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

BORING LOG

BORING NO.: B-11
SHEET: 3 OF 3
START DATE: 3/30/15
END DATE: 3/30/15
SURFACE ELEV. (FT) 96.2

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 58.0'
CHECKED BY: _____ DATE: _____

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: 17.5' TIME: 0 DATE: 3/30/2015
WATER DEPTH: 14.0' TIME: 24 DATE: 3/31/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH ELEVATION	
								Ash Fill - Dark Gray Micaceous Sand and Gravel with Ash, Stone and Wood *(continued)*	
43.0									
	S-12	1 6 4 9	1.5'	-	SW	M			
45.0								45.0 51.2	
								Red, Orange Gravelly Silt and Clayey Silt with Coarse Sand and Gravel	
48.0									
	S-13	3 1 2 2	2.0'	-	SW	W			
50.0									
53.0									
	S-14	2 1 1 2	1.7'	-	SW	W			
55.0									
58.0									
	S-15	4 5 1 3	1.0'	-	SW	W			
60.0								60.0 36.2	End of Boring at 60.0'

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-12
SHEET: 1 OF 3
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT) 102.5

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 43.0'
WATER DEPTH: 15.0' TIME: 0 DATE: 3/31/2015
CHECKED BY:
DATE:
WATER DEPTH: 14.5' TIME: 24 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH ELEVATION	
0.0								0.3 Topsoil 102.2	
	S-1	4 3 3 3	1.3'	-	SM	D		Demo Fill - Brown Clayey Silt with Brick, Stone, Concrete and Wood Fragments	
2.0									
	S-2	4 7 4 4	1.0'	-	ML	D			
4.0									
	S-3	7 3 1 1	0.8'	-	ML	D			
6.0									
	S-4	5 6 5 1	0.6'	-	ML	D			
8.0									cloth/fabric 8.0'-10.0'
	S-5	1 1/12 1	0.3'	-	ML	D			
10.0									
13.0								13.0 89.5	
	S-6	1 1 1 1	1.2'	-	ML	W		Ash Fill - Gray and Black Ash, Cinders and Coal	
15.0									
18.0									
	S-7	3 1 1 1	1.3'	-	ML	W			
20.0									

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

BORING LOG

BORING NO.: B-12
SHEET: 2 OF 3
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT) 102.5

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 43.0'
CHECKED BY:
DATE:

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: 15.0' TIME: 0 DATE: 3/31/2015
WATER DEPTH: 14.5' TIME: 24 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH ELEVATION	
								Ash Fill - Gray and Black Ash, Cinders and Coal *(continued)*	
23.0									
	S-8	WOH WOH 1 2	1.3'	-	ML	W		24.0 78.5	
25.0								Soil Fill - Brown and Green Sandy Silt with Trace Brick and Mica	
28.0									
	S-9	WOH WOH 2 1	1.6'	-	ML	W			
30.0									
33.0									
	S-10	WOH WOH 1/12	1.7'	-	ML	W			
35.0									
38.0								38.0 64.5	
	S-11	2 2 2 3	1.6'	-	ML	M		Gray, Green, Brown; Silty Sand and Clayey Silt; Schist Saprolite	
40.0									

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-12
SHEET: 3 OF 3
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 102.5

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 43.0'
WATER DEPTH: 15.0' TIME: 0 DATE: 3/31/2015
CHECKED BY:
DATE:
WATER DEPTH: 14.5' TIME: 24 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH ELEVATION	
								Gray, Green, Brown; Silty Sand and Clayey Silt; Schist Saprolite *(continued)*	
43.0				-					Hard augering at 42.5'
43.1	S-12	50/1	0.1'		SM	D		43.1 59.4	End of Boring at 43.1'

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-13
SHEET: 1 OF 2
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT) 94.9

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 28.0'
CHECKED BY: _____ DATE: _____

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: 20.0' TIME: 0 DATE: 4/1/2015
WATER DEPTH: 16.0' TIME: 2 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0								DEPTH 0.3 Topsoil ELEVATION 94.6	
	S-1	3 11 8 6	1.7'	-	SM	D		Demo Fill - Brown Silty Sand with Brick, Stone, Concrete and Wood Fragments	
2.0									
	S-2	5 4 4 2	0.8'	-	SM	D			
4.0									
	S-3	3 2 2 3		-	SM	D			
6.0									
	S-4	4 4 5 5		-	SM	D			
8.0									
	S-5	2 3 3 2	1.6'	-	SM	D			
10.0									
13.0									
	S-6	4 1 3 3	0.7'	-	SM	M			
15.0									
18.0								18.0 76.9	
	S-7	1 1 1 2	0.5'	-	SP	W		Ash Fill - Gray and Black Ash, Cinders and Coal	
20.0									

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-13
SHEET: 2 OF 2
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 94.9

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 28.0'
CHECKED BY:
DATE:

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: 20.0' TIME: 0 DATE: 4/1/2015
WATER DEPTH: 16.0' TIME: 2 DATE: 4/1/2015
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
								Ash Fill - Gray and Black Ash, Cinders and Coal *(continued)*	
23.0									
	S-8	2 1 1 1	1.3'	-	SP	W			
25.0									
28.0									
	S-9	2 1 2 3	0.7'	-	ML	M			
30.0								29.8 / 65.2 30.0 Gray Green clayey silt / 64.9	Undisturbed soils at 29.5' End of Boring at 30.0'

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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BORING LOG

BORING NO.: B-14
SHEET: 1 OF 2
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT) 98.7

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 28.0'
CHECKED BY: _____ DATE: _____

PROJECT LOCATION: Philadelphia PA
INSPECTOR NAME: J. Kufta
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
WATER DEPTH: _____ TIME: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED [X]

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0								DEPTH / ELEVATION	
								0.2 Topsoil 98.5	
	S-1	6 2 2 2	0.7'	-	SM	M		Demo Fill - Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0									
	S-2	3 7 5 3	1.3'	-	SM	M			Abundant brick 2.0'-6.0'
4.0									
	S-3	11 4 1 1	0.6'	-	SM	M			
6.0								6.0 92.7	
	S-4	1 1 1 1	0.7'	-	SP	M		Ash Fill - Gray and Black Ash, Cinders and Coal	
8.0									
	S-5	4 2 3 2	0.8'	-	SP	M			
10.0									Ash moist throughout
13.0									
	S-6	WOH 1 1 1	0.9'	-	SP	M			
15.0									
18.0									
	S-7	1 2 8 7	0.8'	-	SM	M			
20.0								19.0 79.7	
								Multicolored Sandy Silt, Schist Saprolite	

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

BORING LOG

BORING NO.: B-14
SHEET: 2 OF 2
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT) 98.7

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 28.0'
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED [X]

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
23.0								Multicolored Sandy Silt, Schist Saprolite *(continued)*	
25.0	S-8	6 17 7 11	1.2'	-	SM	M			
28.0									Hard augering at 26.5'
30.0	S-9	35 50/2	0.7'	-	SM	M		28.7 / 70.0	End of Boring at 28.7'

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

BORING LOG

BORING NO.: B-15
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT) 100.9

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: J. Kufta
EQUIPMENT: CME 45C Truck Mounted Drill Rig
DRILLER NAME/COMPANY: C. Lindhorst/Allied Well Drilling
DRILLING METHODS: Cont SS sampling to 10', 5' intervals beyond
AUGER SIZE: 3.25" ID HSA
TOTAL DEPTH: 10.5'
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED [X]

DEPTH (FT)	SAMPLE NO.	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0								DEPTH ELEVATION	
								0.3 Topsoil 100.6	
	S-1	5 5 7 13	1.2'	-	SM	M		Brown Sandy Silt with Brick, Stone, Concrete and Wood Fragments	
2.0									
	S-2	7 2 3 2	0.5'	-	SM	M			
4.0									
	S-3	2 2 3 4	1.2'	-	SM	M			
6.0									
	S-4	39 50/2	0.7'	-	SM	M			
8.0									
								10.5 90.4	Boring offset once with both locations encountering auger refusal at 10.0' depth. Weathered rock in sampler at 8.0'. Likely large obstructions in Fill as noted in test pits at same depths.

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-1
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 98.0

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil 0.6 / 97.4	
0.6	sm	m		Demo Fill - Silty sand with concrete, stone, asphalt, brick and trace wood; brown	Stone approx. 8"-18" in size
5.0				5.0 / 93.0	No ash apparent

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-2
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 102.5

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: ____ TIME: ____ DATE: ____
CHECKED BY: ____ DATE: ____
WATER DEPTH: ____ TIME: ____ DATE: ____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil — 0.6 / 101.9	
0.6	sm	m		Demo Fill - Silty sand with concrete, stone, asphalt, brick and trace wood; brown — 4.0 / 98.5	Stone approx. 8"-18" in size
4.0		NA		Concrete slab — 4.5 / 98.0	Intact brick wall above concrete slab
4.5	ml	m		Soil Fill - Silt with sand; brown — 8.5 / 94.0	
8.5	sm	m		Demo Fill - Silty sand with stone, brick; brown — 10.0 / 92.5	Stone approx. 12"-24" in size
10.0					No ash apparent

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-3
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 104.4

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil 0.6 / 103.8	
0.6					
0.8	sm			Demo Fill - Silty sand with concrete, stone, asphalt, brick and trace wood; brown 4.0 / 100.4	Stone approx. 8"-18" in size
4.0					
4.5		NA		Concrete slab 4.5 / 99.9	
	ml	m		Soil Fill - Sandy silt; brown 8.0 / 96.4	
8.0					slab at 8'
	sm	m		Demo Fill - Silty sand with stone; brown 11.0 / 93.4	Stone approx. 8"-18" in size
11.0					No ash apparent

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-4
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 96.7

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION	REMARKS
				DEPTH / ELEVATION	
0.0	ml	m		8" Topsoil	
0.6				0.6 / 96.1	
0.6	gp	m		1.0 Remnant, degraded asphalt, subbase layer / 95.7	
1.0				Demo Fill - Silt with sand and trace stone; brown	Stone approx. 6" in size
	ml	m			
12.0				12.0 / 84.7	No ash apparent

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-5
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 97.4

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil 0.8 / 96.7	
0.8	sm	m		Demo Fill - Silty sand with stone, brick, terra cotta, concrete and trace wood, trash; brown	Stone approx. 6"-18" in size
6.5		NA		6.5 / 90.9 Concrete slab 7.0 / 90.4	
7.0	sm	m		Silty sand, highly micaceous; brown 11.5 / 85.9	No ash apparent
11.5					

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

TEST PIT LOG

PIT NO.: TP-6
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 99.3

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: ____ TIME: ____ DATE: ____
CHECKED BY: ____ DATE: ____
WATER DEPTH: ____ TIME: ____ DATE: ____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0					
0.7	ml	m		8" Topsoil — 0.7 / 98.6	
	sm	m		Demo Fill - Silty sand with stone, brick, asphalt, concrete and trace wood; brown	concrete, stone and asphalt approx. 6"-36" in size
4.5				4.5 / 94.8	
5.0		NA		Concrete slab — 5.0 / 94.3	
	sm	m		Well-graded silty sand, micaceous; light brown	
10.0				10.0 / 89.3	No ash apparent

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-7
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 97.8

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil — 0.6 / 97.2	
0.6	sm	m		Demo Fill - Silty sand with stone, asphalt, concrete and trace wood; brown — 4.0 / 93.8	concrete, stone approx. 6"-24" in size
4.0		NA		Concrete slab — 4.5 / 93.3	
4.5	sm	d		Silty sand, micaceous, brown — 6.0 / 91.8	
6.0	ml	m		Sandy silt, micaceous; brown — 10.5 / 87.3	No ash apparent
10.5					

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-8
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 97.3

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: 8.0' TIME: 0 Hr DATE: 3/31/2015
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		0.6 / 96.7 — 8" Topsoil	
0.6	sm	m		4.0 / 93.3 — Demo Fill - Silty sand with brick, concrete, stone, slate and trace wood; brown	
4.0		NA		4.5 / 92.8 — Concrete slab	
4.5	ml	m		10.5 / 86.8 — Sandy silt, micaceous; brown	No ash apparent
10.5					

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-9
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 93.8

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION	REMARKS
				DEPTH / ELEVATION	
0.0	ml	m		0.5 / 93.3 — 8" Topsoil	
0.5	sm	m		Demo Fill - Silty sand with stone, brick, concrete, plastic, wood; brown	
2.0				2.0 / 91.8	
2.5		NA		2.5 / 91.3 — Concrete slab	
	cl-ml	m		Silty clay; brown and dark brown	
11.0				11.0 / 82.8	No ash apparent

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-10
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 100.0

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: ____ TIME: ____ DATE: ____
CHECKED BY: ____ DATE: ____
WATER DEPTH: ____ TIME: ____ DATE: ____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		0.6 / 99.4 — 8" Topsoil	
0.6	sm	m		Demo Fill - Silty sand with stone, brick, concrete, trace wood; brown	4" thick concrete pavement running N-S (30'), and E-W (25') near middle of block at 18" depth before breaking through basement slab
4.0				4.0 / 96.0	
4.5		NA		4.5 / 95.5 — Concrete slab	
				Silt with sand; brown	
				11.0 / 89.0	No ash apparent

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-11
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 91.0

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil 0.6 / 90.4	
0.6	sm	m		Demo Fill - Silty sand soil matrix with stone, brick, concrete, steel, tires, wood, glass; brown 6.0 / 85.0	
6.0		NA		Concrete slab 6.5 / 84.5	
6.5	sp	m		Ash Fill - Cinders and ash, gray and brown 14.0 / 77.0	Ash fill below slab at 6.5'
14.0					

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-12
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 93.0

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	** H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0	ml	m		8" Topsoil	
0.6				DEPTH 0.6 / ELEVATION 92.4	
	sm	m		Soil Fill - Silty sand, micaceous; brown	
3.0				DEPTH 3.0 / ELEVATION 90.0	
3.5	ml	m		Concrete slab — DEPTH 3.5 / ELEVATION 89.5	3.0'-3.5': some ash
	ml	m		Soil Fill - Sandy silt; brown	
8.0				DEPTH 8.0 / ELEVATION 85.0	
	sp	m		Ash Fill - Cinders and ash, gray and brown	Ash fill at 8.0'
12.0				DEPTH 12.0 / ELEVATION 81.0	

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-13
SHEET: 1 OF 1
START DATE: 3/31/15
END DATE: 3/31/15
SURFACE ELEV. (FT): 95.4

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil 0.6 / 94.8	
0.6	sm	m		Demo Fill - Silty sand soil matrix with stone, concrete, steel, fabric, wood, glass; brown 4.5 / 90.9	
4.5		NA		Concrete slab 5.0 / 90.4	
5.0	sp	m		Ash Fill - Cinders and ash, gray and brown 11.0 / 84.4	Ash fill below slab at 5.0'
11.0					

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-14
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 96.7

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	** H_2O CONTENT	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil — 0.6 / 96.1	
0.6	sm	m		Demo Fill - Silty sand with stone, brick, steel pipe, wood; brown — 4.0 / 92.7	30' long x 4' wide trench
4.0		NA		Concrete slab — 4.5 / 92.2	
4.5	sp	m		Ash Fill - Cinders and ash; black, gray and white — 6.0 / 90.7	Ash fill below slab at 4.5'
6.0		NA		Concrete - footings or isolated thickened slabs perpendicular to 9th Street (2ft thick, 2ft wide) — 8.0 / 88.7	
8.0					

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-15
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 92.2

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil 0.6 / 91.6	
0.6	sm	m		Demo Fill - Silty sand with wood, brick, stone, tile and fabric; brown 6.0 / 86.2	20' long x 4' wide trench
6.0		NA		Concrete slab 6.5 / 85.7	
6.5	sp-sm	m		Ash Fill - Cinders and ash; gray, black and brown 10.0 / 82.2	Ash fill below slab at 6.5'
10.0					

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-16
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 95.5

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: ____ TIME: ____ DATE: ____
CHECKED BY: ____ DATE: ____
WATER DEPTH: ____ TIME: ____ DATE: ____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil 0.6 / 94.9	
0.6	sp-sm	m		Ash Fill - Ash and cinders with stone, wood, brick, fabric, tile and shingles; black, brown and gray 3.0 / 92.5	25' long x 4' wide trench
3.0	ml	m		Demo Fill - Sandy silt with stone, wood, brick, fabric, tile and shingles; brown 6.0 / 89.5	Stacked stone wall apparent above slab
6.0		NA		Concrete slab 6.5 / 89.0	
6.5	sp-sm	m		Ash Fill - Cinders and ash; gray, black and brown 10.0 / 85.5	Ash fill below slab at 6.5'
10.0					

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-17
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 96.2

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil 0.6 / 95.6	
0.6	sm	m		Demo Fill - Sandy silt/silty sand with brick, stone, wood, steel pipe, tile, fabric; reddish brown 4.0 / 92.2	18' long along Hutchinson x 4' wide trench
4.0	ml	m		Silt, micaceous; reddish brown 10.0 / 86.2	Poured concrete observed wall parallel to Hutchinson possibly front wall of structure, no slab evident
10.0					

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-18
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 107.0

PROJECT NAME: Logan Triangle
PROJECT NUMBER: 27607.00 Phase 002
EQUIPMENT: Komatsu 210 Trackhoe
CHECKED BY: _____ DATE: _____

PROJECT LOCATION: Philadelphia, PA
INSPECTOR NAME: T. Carlin
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil — 0.6 / 106.4	
0.6	sm	m		Demo Fill - Silty sand with brick, stone, wood, steel pipe, fabric; reddish brown — 4.0 / 103.0	15' long along 9th x 4' wide trench
4.0		NA		Concrete slab — 4.5 / 102.5	
4.5	ml	m		Sandy silt; reddish brown — 6.0 / 101.0	
6.0					Test pit terminated in soils excavator felt were pipe screenings

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-19
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 101.6

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0				DEPTH ELEVATION	
0.6	ml	m		8" Topsoil 0.6 101.0	
6.0	sm	m		Demo Fill - Silty sand with brick, stone, tile, ceramic, wood, and trace fabric; reddish brown 6.0 95.6	17' long along 8th x 4' wide trench
6.5		NA		Concrete slab 6.5 95.1	
8.0	sm	m		Soil Fill - Silty sand/sandy silt; reddish brown 8.0 93.6	
10.0	sp-sm	m		Ash Fill - Cinders and ash with rounded rock, glass and wood; gray, black and brown 10.0 91.6	Ash fill at 8.0'

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-20
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 98.7

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: ____ TIME: ____ DATE: ____
CHECKED BY: ____ DATE: ____
WATER DEPTH: ____ TIME: ____ DATE: ____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil — 0.6 / 98.1	
0.6	sm	m		Demo Fill - Silty sand with brick, stone; reddish brown — 3.0 / 95.7	16' long along Wyoming x 4' wide along 8th
3.0		NA		Concrete slab — 3.5 / 95.2	
3.5	sm	m		Soil Fill - Silty sand; reddish brown — 5.0 / 93.7	
5.0	sp-sm	m		Ash Fill - Cinders and ash with coal; black — 6.0 / 92.7	Ash fill at 5.0'-6.0'
6.0	ml	m		Soil Fill - Silt; reddish brown — 9.0 / 89.7	
9.0	sp-sm	m		Ash Fill - Cinders and ash; black, gray and brown — 10.0 / 88.7	Ash fill at 9.0'
10.0					

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-21
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 99.3

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		0.5 / 98.8 — 8" Topsoil	
0.5	sm	m		Demo Fill - Silty sand with brick, stone, wood, tile; reddish brown	
4.0				4.0 / 95.3	
4.5		NA		4.5 / 94.8 — Concrete slab	
	ml	m		Soil Fill - Sandy silt; reddish brown	
6.0				6.0 / 93.3	Ash fill at 6.0'
	sp-sm	m		Ash Fill - Cinders and ash; black, gray and brown	
10.0				10.0 / 89.3	

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-22
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 99.7

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil — 0.6 / 99.1	
0.6	sm	m		Demo Fill - Silty sand with wood, brick, stone, steel; brown — 4.0 / 95.7	25' long along 8th x 4' wide concrete pavement at 3' stacked stone above concrete slab at 4'
4.0		NA		Concrete slab — 4.5 / 95.2	
4.5	sp-sm	m		Ash Fill - Cinders and ash with glass; white, brown and gray — 10.0 / 89.7	Ash fill below slab at 4.5'
10.0					

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-23
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 105.0

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil 0.6 / 104.4	
0.6	sm	m		Demo Fill - Silty sand/sandy silt with wood, brick, stone, steel; brown 6.0 / 99.0	
6.0		NA		Concrete slab 6.5 / 98.5	
6.5	sp-sm	m		Ash Fill - Cinders and ash with glass, tile and ceramics; white, brown, black and gray 10.0 / 95.0	Ash fill below slab at 6.5'
10.0					

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-24
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 105.3

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil 0.6 / 104.7	
0.6	sm	m		Demo Fill - Silty sand/sandy silt with wood, brick, stone, steel; brown 2.5 / 102.8	30' along 8th x 4' wide, perpendicular trench 20' long x 4' wide - all concrete pavement Move to location TP-25

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-25
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT) 103.1

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		0.6 / 102.5 — 8" Topsoil	
0.6	sm	m		Demo Fill - Silty sand with stone, brick, tile and wood; reddish brown	
4.5				4.5 / 98.6	
5.0		NA		5.0 / 98.1 — Concrete slab	
	sp-sm	m		Ash Fill - Cinders and ash with wood and small (1") rounded stones; white, gray and black	Ash fill below slab at 5.0'
10.0				10.0 / 93.1	

** D = DRY, M = MOIST, W = WET

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TEST PIT LOG

PIT NO.: TP-26
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 109.4

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: ____ TIME: ____ DATE: ____
CHECKED BY: ____ DATE: ____
WATER DEPTH: ____ TIME: ____ DATE: ____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil 0.6 / 108.8	
0.6	sm	m		Demo Fill - Silty sand with brick, stone, wood; reddish brown 2.0 / 107.4	18' long along 8th x 4' wide
2.0		NA		Concrete slab 2.5 / 106.9	
2.5	sm	m		Soil Fill - Silty sand/sandy silt; reddish brown 6.0 / 103.4	
6.0	sp-sm	m		Ash Fill - Cinders and ash with glass, oyster shells and trace metal fragments; black, gray and brown 10.0 / 99.4	Ash fill at 6.0'
10.0					

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

TEST PIT LOG

PIT NO.: TP-27
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 114.9

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		0.6 / 114.3 — 8" Topsoil	
0.6	sm	m		3.0 / 111.9 — Demo Fill - Silty sand with stone, brick and steel pipe; reddish brown	
3.0	sm	m		5.0 / 109.9 — Soil Fill - Silty sand/sandy silt; reddish brown	
5.0	gp	d		10.0 / 104.9 — Slag Fill - Slag and gravel; red and reddish brown	Slag fill at 5.0'
10.0					

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-28
SHEET: 1 OF 1
START DATE: 4/1/15
END DATE: 4/1/15
SURFACE ELEV. (FT): 104.2

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: T. Carlin
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: ____ TIME: ____ DATE: ____
CHECKED BY: ____ DATE: ____
WATER DEPTH: ____ TIME: ____ DATE: ____

DEPTH (FT)	USCS	** H_2O CONTENT	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil 0.6 / 103.6	
0.6	sm	m		Demo Fill - Silty sand/sandy silt with wood, brick, stone, steel; brown 6.0 / 98.2	15' long along 8th x 4' wide
6.0	sp-sm	m		Ash Fill - Cinders and ash; brown, gray and white 10.0 / 94.2	Ash fill at 6.0'
10.0					

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-L-2
SHEET: 1 OF 1
START DATE: 4/2/15
END DATE: 4/2/15
SURFACE ELEV. (FT): 107.6

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: C. Savidge (Langan)
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	ml	m		8" Topsoil — 0.6 / 107.0	
0.6	sm	m		Demo Fill - Silty sand with brick, stone, wood, steel pipe, fabric; reddish brown — 4.0 / 103.6	
4.0		NA		Concrete slab — 4.5 / 103.1	
4.5	ml	m		Clayey silt; reddish brown; with some gravel — 7.0 / 100.6	
7.0	SC	m		Clayey sand with gravel; orangeish-brown — 12.0 / 95.6	No ash apparent
12.0					

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
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TEST PIT LOG

PIT NO.: TP-L-8
SHEET: 1 OF 1
START DATE: 4/2/15
END DATE: 4/2/15
SURFACE ELEV. (FT) 103.1

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: C. Savidge (Langan)
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	SM	m		Demo Fill - Sand and silt with brick and wood; brown	
2.0				2.0 / 101.1	
	ML	m		Silty clay; gray	
3.0				3.0 / 100.1	
	ML	m		Silty clay; gray, stained greenish brown	
9.0				9.0 / 94.1	
	CL	m		Clay; marbled tan and orange	
10.0				10.0 / 93.1	No ash apparent

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

TEST PIT LOG

PIT NO.: TP-L-9
SHEET: 1 OF 1
START DATE: 4/2/15
END DATE: 4/2/15
SURFACE ELEV. (FT): 102.0

PROJECT NAME: Logan Triangle
PROJECT LOCATION: Philadelphia, PA
PROJECT NUMBER: 27607.00 Phase 002
INSPECTOR NAME: C. Savidge (Langan)
EQUIPMENT: Komatsu 210 Trackhoe
EXCAVATOR NAME/COMPANY: J.D. Morrissey
WATER DEPTH: _____ TIME: _____ DATE: _____
CHECKED BY: _____ DATE: _____
WATER DEPTH: _____ TIME: _____ DATE: _____

DEPTH (FT)	USCS	H_2O CONTENT **	GRAPHIC LOG	DESCRIPTION (DEPTH / ELEVATION)	REMARKS
0.0	SM	m		Demo Fill - Sand with gravel, brick, stone, trace wood and plastic; brown	
6.0	SC	m		6.0 / 96.0 Clayey sand and silt with trace gravel; brown	
7.0	CL	m		7.0 / 95.0 Clay; marbled light gray and orange	
10.0				10.0 / 92.0	No ash apparent

** D = DRY, M = MOIST, W = WET