the building, pavement and utility areas should be an 8 ton weight dropped about 20 to 30 feet, in a regular overlapped pattern.

After completing DDC operations, final grades can be constructed using engineered fill. Once final proposed grading plans have been developed, an appropriate DDC plan can be developed.

Once a dynamic compaction contractor is selected by the owner, the contractor's proposed compaction and filling plan should be submitted to ECS, Ltd. for review and acceptance. The dynamic compaction plan should detail, as a minimum, the equipment to be used at the site; the drop spacing, frequency and height; the filling or refilling plan and the material specifications for fill. The compaction plan should show the planned crater spacing and drop sequence. The dynamic compaction should be observed by a geotechnical engineers' representative.

Dynamic Compaction Sequence

The sequencing of the Dynamic Compaction operation is critical for the success of this project. The proposed site grading requires approximately 10 feet of cut on the east side of the site, and up to 12 feet of fill on the west side of the site. The cut/fill line runs north to south near the center of the proposed development.

Since the DDC process results in several feet of loose disturbed material at the surface, careful sequencing will reduce the handling of fill, and may reduce the amount of ironing passes required. We recommend the following sequence: ?

1. The initial DDC operation should be performed uniformly across the site, after any topsoil and grasses are stripped.
2. Once the initial DDC has been completed, the ironing pass should be done on the portion of the site that will require new, engineered fill to raise grades.
3. After the ironing pass has been completed in fill areas, the disturbed soils in the cut areas should be removed. Any suitable soils stripped from this area should be used in the fill areas. Any unsuitable materials should be removed from the site.
4. Once cut areas are cut to near final grades, removing the disturbed soils is complete, the subgrade should be proofrolled and examined to determine if ironing passes are needed in the cut areas.

Slope Stability/Retaining Walls

A slope stability analysis was performed for the proposed retaining walls and slopes on the west side of the site. The analysis was performed to estimate the factor of safety for global stability of the slope, as well as global stability of the proposed retaining walls. It is our understanding

Board of Zoning Adjustment
District of Columbia
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that the latest grading plan has lowered the floor slabs up to 2 feet from the conceptual grading plans.

In addition, the slope grade will be reduced to a maximum steepness of 4H:1V. Dynamic compaction will not be performed on the slope. The retaining wall recommendations provided below are based on these new design parameters. Steeper slopes will result in an unacceptable Factor of Safety for Global Stability of the slope. Therefore, we recommend maintaining continuous monitoring of the slope and wall construction to ensure that these parameters are not exceeded.

Retaining Wall Design

We have considered several alternatives for the types of construction for the proposed retaining walls. Based on the slope stability runs we have determined that if the wall will be of the rigid cantilever type, it would require being supported on drilled piers. This alternative would be cost prohibitive. It is our opinion that the most economical wall system is a segmental retaining wall. This section provides general recommendations for design and construction of segmental retaining walls.

Generally, segmental retaining walls will have geogrid reinforcement lengths approximately 70% of the wall height. However, for this project, the geogrids will serve a dual purpose. In addition to its function in support of the segmental wall, the geogrid will also act as slope reinforcement. This will require geogrid lengths as long as 35 feet, regardless of the wall height. For this reason it is very important that the retaining wall designer be thoroughly familiar with this geotechnical report so that the slope reinforcement parameters are included with the final wall design.

Once the final grading plans have been completed, we recommend that final slope stability analyses be performed to confirm the required length of geogrid to be used in the retaining wall design.

The sequencing of the retaining wall construction is also very important. The construction of the segmental retaining wall will likely require cuts in order to place the geogrid reinforcement. Therefore, in order to avoid undermining shallow foundations, it is very important that the construction of the retaining walls should be done prior to construction of the building foundations. Also, while the dynamic compaction procedures will not significantly impact the soils within the slope, the retaining wall construction should be performed after the dynamic compaction has been completed on the west side of the site. The location of the geogrid reinforcing will be near the limits of the dynamic compaction, and there is the potential that the dynamic compaction process could damage the geogrid reinforcement and the retaining walls.

Retaining Wall Design Parameters

In order to reduce the effect the proposed structures will have on the geogrid reinforcement, we recommend that the proposed retaining walls be located a minimum distance of 40 feet from building foundations. An advantage of relocating the walls this distance away from the buildings, is the ability to reuse some of the cut soils to raise grades on the western side of the site. Back slopes of the retaining wall must not exceed 3H:1V. This slope is acceptable provided the backfill is placed and compacted in accordance with the **"Fill Placement"** section of this report.

For the design of permanent site retaining walls with sloping backfill of 3H:1V, we recommend they be designed for equivalent fluid pressure of 65 psf per vertical foot of wall. This lateral earth pressure assumes that acceptable on site materials (ML or more granular) are used for the wall backfill and that drainage of the backfill is provided as discussed below. A lower equivalent fluid pressure may be used, 50 psf per vertical foot of wall, if select granular materials (SM or more granular) are used for backfill within the active wedge of the retaining wall assuming a 3H:1V backfill slope. If a reinforced segmental block wall system is selected, we recommend that the reinforced soils contain no more than 35% fines. This would require the use of more granular (SM or more granular) soils as discussed above. The design should also account for any surcharge loads that are within a 45° slope from the base of the wall, and the slope of the backfill. In addition, the design should account for the slope in front of the wall.

The final design of all retaining walls should be performed by a qualified geotechnical engineer based on the final grading plan. A final global stability analysis should also be performed as part of the design. We have performed a preliminary slope stability analysis, using the PCSTABL6H program, based on preliminary grading plans and wall locations. We recommend that the global factor of safety should be at least 1.5. Other factors of safety shall be as follows:

Factor of Safety against Sliding > 1.5
Factor of Safety against Overturning > 2.0
Factor of Safety against Bearing Capacity Failure > 2.0

If a utility line will be constructed in front of the wall, the footing of the retaining wall should be stepped-down to the invert elevation of the pipe, and the passive resistance of the soil above the invert level should be neglected. If new fills, placed in accordance with our recommendations in the section "**Earthwork Operations**" are placed under the wall, the passive resistance shall be decreased to 300 psf per foot of depth. A frictional resistance coefficient of 0.35 can be utilized for sliding resistance design for the retaining wall.

The recommendations contained above assume that the backfill behind the retaining wall is property drained. Drainage of the backfill may be accomplished through the use of a drainage chimney located behind the segmental wall system. The drain should consist a minimum of 6 inches of VDOT #57 stone completely wrapped in a filtration geotextile such as Mirafi 140N

with an AOS of 0.21 mm (Sieve No. 70). The drain should be connected to a 6 inch perforated pipe surrounded by VDOT #57 stone and drained to a suitable outlet. The geotextile used should be reviewed and approved by the geotechnical engineer.

Shallow Foundations - Buildings

We recommend that the proposed buildings be supported on a system of shallow foundations consisting of spread footings or continuous footings after the existing fills have been improved using Dynamic Compaction.

We recommend that all foundations be designed for a net allowable soil bearing pressure of 2,000 psf. Some areas of the existing fill included highly plastic clays (CH). Where highly plastic soils are encountered, the subgrades of such footings should be set at 4 feet below finished exterior grades of all interior and exterior column and wall footings, per the "**High Plasticity Soils**" section of this report.

In order to reduce the possibility of foundation bearing failure and excessive settlement due to local shear or "punching" action, we recommend that all continuous footings have a minimum width of 1.5 feet and that all isolated column footings have a minimum lateral dimension of 2.5 feet. In addition, footings should be placed at a depth to provide adequate frost cover protection. For this region, we recommend footings and grade beams, if any, in heated areas be placed at a minimum depth of 2.5 feet below finished grade. Footings and grade beams, if any, in unheated areas should be placed at a minimum depth of 2.5 feet below finished grade.

Floor Slabs

Once DDC has been completed and subgrades prepared, floor slabs can be constructed as slab-on-grade. Slab-on-grade subgrades should be prepared in accordance with the recommendations in the sections entitled Subgrade Preparation and Fill Placement.

We recommend that slabs be isolated from the foundation footings so differential settlement of the structures will not induce shear stresses on the floor slabs. Also, in order to minimize the crack width of any shrinkage cracks that may develop near the surface of the slabs, we recommend mesh reinforcement be included in the design. The mesh should be in the top half of the slabs to be effective.

We also recommend the slabs-on-grade be underlain by a minimum of 4 inches of granular material having a maximum aggregate size of 1.5 inches and no more than 2% of fines. This granular layer will facilitate the fine grading of the subgrade and help prevent the rise of water through the floor slab. Prior to placing the granular material, the floor subgrade soil should be properly compacted, proofrolled, and free of standing water, mud, and frozen soil. Before the placement of concrete, a vapor barrier may be placed on top of the granular material to provide additional moisture protection. However, special attention should be given to the surface curing of the slab in order to minimize uneven drying of the slab and associated cracking.

When loads on the floor slab are in excess of 500 psf, we recommend the granular material beneath the floor be increased to a minimum thickness of 6 inches, and additional reinforcing steel be placed in the floor slab.

Storm Sewer Structure

We understand that the most recent conceptual site plan proposes a storm sewer box structure on the northwest side of the site. The details regarding the invert elevations were not available for this report. However, based on our familiarity with the subsurface conditions in the vicinity of the proposed structure, we recommend that careful consideration be given to the foundation of the structure. Considering the size of the structure, and that will be located on a slope, we recommend that foundations be designed for the structure as described in the "Shallow Foundations" section of this report.

If dynamic compaction in the area of the storm sewer can not be performed, it will be necessary to lower the footings of the storm structure to a more suitable bearing strata. Once the final invert elevations of the structure have been determined, the foundation elevation can be determined.

Underground Drainage

We recommend that any below grade areas be provided with a perimeter drainage system. This system may consist of perforated or porous wall, closed joint drain tiles located around the perimeter of the below grade area, outside the walls, slightly below the below grade floor level. In addition "underslab" drains should designed along interior wall footings where these will be changes in the lower floor slab grades within the building. These interior drain lines should be below the lower floor slab elevation.

Drain lines should be surrounded by a minimum of 6 inches of free draining granular filter material having a gradation compatible with the size of the openings utilized in the drain lines and surrounding soils to be retained. In addition, we recommend that the below grade floor slabs be underlain by a minimum of 4 inches of free draining granular material. The underslab drainage blanket and the drain tiles should be connected to a permanent sump with automatic and stand-by pump arrangement, or to a storm sewer, to remove any water which may accumulate. Where below grade floor slabs are in excess of 60 feet in the minimum lateral dimension are anticipated, we recommend that the underslab drainage blanket be provided with drain tile laterals to facilitate the removal of seepage water.

Below Grade Walls

Below grade walls should be designed to withstand lateral earth pressures and surcharge loads. We recommend that the below grade walls be designed for a linearly increasing lateral earth pressure of 60 psf per vertical foot of wall. This lateral earth pressure assumes that granular materials are used for wall backfill. In order to maintain a 60 psf lateral earth pressure, drainage of the backfill must be provided, and this can be provided by the previously mentioned subdrainage system placed adjacent to the footings and discharged to a suitable outlet area. The wall design should also account for any surcharge loads within a 45 degree slope from the base of the wall. A Lateral Earth Pressure Diagram is included in the Appendix of this report.

The space between the outside of the walls and the excavation should be backfilled with a granular fill extending to a level of approximately 2 feet below the final outside grade. The remaining 2 feet should consist of a clayey material to minimize the amount of surface water infiltration into the granular material, and thus, reduce the excess water to be handled by the drainage system. The ground surface adjacent to the below grade walls should be kept properly graded to prevent ponding of water adjacent to the below grade walls.

Suitable prefabricated drainage materials may be used in lieu of the granular backfill, adjacent to the below grade walls. Examples of suitable materials include Enka Mat, Mira Drain, or Geotec Drains. These materials should be covered with a filter fabric having an equivalent opening size (EOS) consistent with the size of the soil to be retained. The material should be placed in accordance with the manufacturer's recommendations and connected to either the perimeter drainage system or the underslab granular mat, which in turn should be properly drained.

To achieve a desirable balance between minimizing excessive pressures against the below grade walls and reducing the settlement of the wall backfill, we recommend that the wall granular backfill be compacted to 90% of the maximum dry density obtained in accordance with ASTM Specification D-1557, Modified Proctor Method. Where the fill materials will be supporting the pavements or gutters, the upper 1 foot should be compacted to 95% of the maximum dry density referenced above.

Backfill materials should consist of inorganic materials, free of debris, be free draining, and containing no frost susceptible soil. The fill placed adjacent to the below grade walls should not be overcompacted. Heavy earthwork equipment should maintain a minimum horizontal distance away from the below grade walls of 1 foot per foot of vertical wall height. Lighter compaction equipment should be used close to the below grade walls.

Site Slopes

Permanent slopes at the site should generally be no steeper than 4H:1V. Temporary slopes created as part of the foundation or utility excavation/installation operations should be constructed no steeper than 1 horizontal to 1 vertical above the groundwater level. The temporary slopes should be maintained for no more than 60 days. Since the soils are highly

unstable after saturation, the exposed slopes should be protected from precipitation and surface run-off. Also, any cuts associated with utility excavations may require bracing, slope flattening or other physical measures to prevent a slope failure. An examination of the applicable codes should be made by the contractor to ensure that adequate protection of the trench walls is provided.

Subgrade Preparation

For pavement areas and slab-on-grade construction, preparation of subgrade soils will be required prior to placement of new fill and construction of slabs and pavements. The subgrade preparation should consist of stripping all vegetation, rootmat, topsoil, and any other soft or unsuitable material from the building areas and proposed pavement areas.

After stripping to the desired grade and performing all necessary excavation, and prior to fill placement, the stripped surface should be observed by an experienced geotechnical engineer or his authorized representative. Proofrolling using a loaded dump truck, having an axle weight of at least 10 tons, may be used at this time to aid in identifying localized soft or unsuitable material which should be removed. Care must be exercised to identify unsuitable materials, and cause their removal. Procedures such as proofrolling, observation, and test pits, can be used to assist in identifying the presence of unsuitable materials, if any. Any soft or unsuitable materials encountered during this proofrolling should be removed and replaced with an approved backfill compacted to the criteria given below in the section entitled "**Fill Placement**".

The preparation of fill subgrades, as well as proposed building or roadway subgrades should be observed on a full-time basis. These observations should be performed by an experienced geotechnical engineer, or his representative, to ensure that all unsuitable materials have been removed, and that the subgrade is suitable for support of the proposed construction and/or fills.

In some areas, excessively soft and/or wet soils may be encountered for fill subgrades, especially in the winter or early spring months. We strongly recommend against utilizing soil bridging lifts to span over soft fill subgrade soils within the expanded building limits. All soft areas shall be excavated and removed.

Fill Placement

Fill materials should consist of an approved material, free of organic matter and debris, rocks greater than 6 inches and have a Liquid Limit and Plasticity Index less than 40 and 20, respectively. Unacceptable fill materials include topsoil, organic materials (OH, OL) and plastic silts and clays (CH, MH). All unsuitable materials removed during grading operations should be placed in approved disposal areas either on site or off site. All other soil materials not excluded above are acceptable for reuse as fill.

The existing fill materials are random, containing both suitable and unsuitable soils types. During grading, existing fills need to be separated and unsuitable soil types should be removed from the site.

Fill materials should be placed in lifts not exceeding 8 inches in loose thickness and moisture conditioned to within 2% of the optimum moisture content. Where controlled fill soils will have a total thickness not exceeding 10 feet, the soils should be compacted to a minimum of 95% of the maximum dry density obtained in accordance with ASTM Specification D-698, Standard Proctor Method. The expanded footprint of the proposed buildings or roadways should be well defined including the limits of the fill zones at the time of fill placement. Grade control should be maintained throughout the fill placement operations. All fill operations should be observed on a full-time basis by a qualified soil technician to determine that minimum compaction requirements are being met. A minimum of one compaction test per 2,500 square foot area should be tested in each lift placed. The elevation and location of the tests should be clearly identified at the time of fill placement.

The upper one foot of soil supporting pavements, sidewalks, or gutters should be compacted to a minimum of 100% of the maximum dry density obtained in accordance with ASTM Specification D-698, Standard Proctor Method.

Granular soils (Unified Soil Classification System SM or better) should be compacted with a smooth drum vibratory roller or rubber tired compactors. Cohesive soils should be compacted with a sheepsfoot roller, preferably a Cat 815.

Fill materials shall not be placed on frozen soils. All frozen soils should be removed prior to continuation of fill operations. Borrow fill materials shall not contain frozen materials at the time of placement. All frost heaved soils should be removed prior to placement of fill, stone, concrete or asphalt.

Soil bridging lifts within the expanded building limits should not be used since excessive settlement of the structures will likely occur.

Pavement Design

All parking lot and access drive subgrades should be prepared in accordance with the sections entitled Subgrade Preparation and Fill Placement. Special attention should be given to identifying existing fill soils which require undercut and replacement or in-place densification.

An important consideration with the design and construction of pavements is surface and subsurface drainage. Where standing water develops, either on the pavement surface or within the base course layer, softening of the subgrade and other problems related to the deterioration of the pavement can be expected. Furthermore, good drainage should minimize the possibility of the subgrade materials becoming saturated over a long period of time. We would be pleased

to be of further assistance to you in the design of the project pavements by providing additional recommendations during construction of the project.

We suggest that, at the time of construction, additional laboratory testing, i.e., California Bearing Ratio (CBR) and Atterberg Limits tests be performed in the proposed pavement areas on representative subgrade materials to permit proper design of these pavements. The CBR samples should be obtained from within one foot of the proposed pavement subgrade elevation. The average design CBR value provided should be in the middle of the range of values which can be expected from the site soils. More fine grained and cohesive soils such as silt and clay will have lower CBR values while soils containing significant proportions of gravel will have higher CBR values.

Closing

This report has been prepared for use by KSI Services, Inc. and other design professionals for design and construction of the project described herein. The results of this engineering study may be relied upon for design of the foundation system; however, proper implementation of the recommendations given in this report will be essential. Any changes in the design which vary from the description of the project given herein should be brought to our attention so that we may offer any alternate or additional recommendations or geotechnical input which may apply.

APPENDIX

Unified Soil Classification System

Reference Notes For Boring Logs

ECS Boring Logs

ECS Test Pit Logs

WPD Test Pit Logs

Laboratory Test Results

Dynamic Compaction Specifications

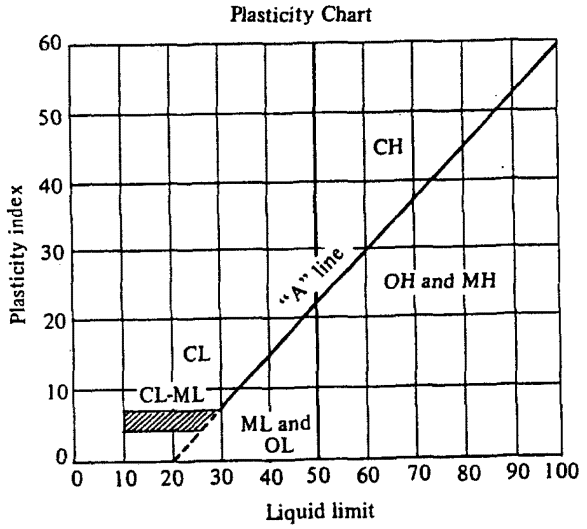
General Retaining Wall Specifications

Boring Location Diagram/Vicinity Map

Unified Soil Classification System (ASTM D-2487)

Major Divisions			Group Symbols	Typical Names	Laboratory Classification Criteria	
Coarse-grained soils (More than half of material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GM[a] d u	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits below "A" line with P.I. greater than 7	
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM[a] d u	Silty sands, sand-silt mixtures	Atterberg limits above "A" line or P.I. less than 4	Limits plotting in hatched zone with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above "A" line with P.I. greater than 7	
Fine-grained soils (More than half material is smaller than No. 200 sieve)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			OL	Organic silts and organic silty clays of low plasticity		
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			CH	Inorganic clays of high plasticity, fat clays		
			OH	Organic clays of medium to high plasticity, organic silts		
	Highly organic soils		Pt	Peat and other highly organic soils		

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:
- Less than 5 per cent: GW, GP, SW, SP
- More than 12 per cent: GM, GC, SM, SC
- 5 to 12 per cent: *Borderline* cases requiring dual symbols[b]



[a]Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 28 or less and the P.I. is 6 or less; the suffix u used when L.L. is greater than 28.

[b]Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC, well-graded gravel-sand mixture with clay binder.

From Winterkorn and Fang, 1975

REFERENCE NOTES FOR BORING LOGS

I. Drilling and Sampling Symbols:

SS - Split Spoon Sampler
ST - Shelby Tube Sampler
RC - Rock Core: NX, BX, AX
PM - Pressuremeter
DC - Dutch Cone Penetrometer

RB - Rock Bit Drilling
BS - Bulk Sample of Cuttings
PA - Power Auger (no sample)
HSA - Hollow Stem Auger
WS - Wash Sample

Standard Penetration (Blows/Ft) refers to the blows per foot of a 140 lb. hammer falling 30 inches on a 2 inch O.D. split spoon sampler, as specified in ASTM D-1586. The blow count is commonly referred to as the N-value.

II. Correlation of Penetration Resistances to Soil Properties:

Relative Density-Sands, Silts

SPT-N	Relative Density
0 - 3	Very Loose
4 - 9	Loose
10 - 29	Medium Dense
30 - 49	Dense
50 - 80	Very Dense

Consistency of Cohesive Soils

Unconfined Compressive Strength, Qp, tsf	Consistency
under 0.25	Very Soft
0.25 - 0.49	Soft
0.50 - 0.99	Firm
1.00 - 1.99	Stiff
2.00 - 3.99	Very Stiff
4.00 - 8.00	Hard
over 8.00	Very Hard

III. Unified Soil Classification Symbols:

GP - Poorly Graded Gravel
GW - Well Graded Gravel
GM - Silty Gravel
GC - Clayey Gravels
SP - Poorly Graded Sands
SW - Well Graded Sands
SM - Silty Sands
SC - Clayey Sands

ML - Low Plasticity Silts
MH - High Plasticity Silts
CL - Low Plasticity Clays
CH - High Plasticity Clays
OL - Low Plasticity Organics
OH - High Plasticity Organics
CL-ML - Dual Classification (Typical)

IV. Water Level Measurement Symbols:

WL - Water Level
WS - While Sampling
WD - While Drilling

BCR - Before Casing Removal
ACR - After Casing Removal
WCI - Wet Cave In
DCI - Dry Cave In

The water levels are those water levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in a granular soil. In clays and plastic silts, the accurate determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally applied.

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-1	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION: 190.00

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % (●) — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	18	6	Sandy CLAY and ASPHALT, Brown and Black, Moist, Medium Dense, (FILL)		22
	2	SS	18	12	Medium to Coarse Sandy CLAY, With Asphalt Fragments, Trace Asphalt and Roots, Brown and Black, Moist, Stiff to Very Hard, (CH-FILL)		12
5	3	SS	6	4		185	50/6
	4	SS	18	12	Sandy CLAY, Trace Gravel, Brown and Red, Moist, Stiff, (CH-FILL)		12
10						180	
	5	SS	18	18			10
15						175	
	6	SS	18	12	Clayey SAND, With Quartz Gravel, Tannish Brown, Moist, Medium Dense, (SC-FILL)		20
20						170	
	7	SS	12	10			50/6
25					ASPHALT, Trace Sand and Clay, Black, Dry to Moist, Dense to Extremely Dense, (FILL)	▽ 165	
	8	SS	18	8			32
30							

CONTINUED ON NEXT PAGE.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL DRY WS OR ▽	BORING STARTED 01-26-99	
WL DRY BCR 30.0' ACR	BORING COMPLETED 01-26-99	CAVE IN DEPTH @ 38.0'
WL 25.0' @ 24HRS	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-1	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION 190.00

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % (●) — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
30					Medium to Coarse Sandy CLAY, Trace Brick, Dark Brown and Black, Moist, Stiff, (CH-FILL)		
	9	SS	18	0			10
35						155	
					Clayey Fine SAND, Trace Roots, Medium Brown, Moist, Medium Dense, (SC-FILL)		
	10	SS	18	10			9
40					Silty Fine SAND, Trace Clay, Purplish Brown, Moist, Medium Dense, (SM)	150	
	11	SS	18	18			20
45					END OF BORING @ 45.0'	145	
50						140	
55						135	
60							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL DRY WS OR ▽	BORING STARTED 01-26-99	
WL DRY BCR 30.0' ACR	BORING COMPLETED 01-26-99	CAVE IN DEPTH ● 38.0'
WL 25.0' @ 24HRS	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-2	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

ECS LTD

SITE LOCATION: WASHINGTON D.C. SE

CALIBRATED PENETROMETER TONS/FT.² (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % (●) — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
					ENGLISH UNITS		
					SURFACE ELEVATION 188.00		
0	1	SS	18	12	Fine Sandy CLAY, Trace Roots, Brown, Moist, Medium Stiff to Stiff, (CL-FILL)		8
	2	SS	18	10	Fine Sandy CLAY and ASPHALT, Trace Roots, Brown and Black, Moist, Medium Dense, (CL-FILL)	185	14
5	3	SS	18	12	Clayey Fine SAND, With Asphalt, Brown, Moist, Loose, (SC-FILL)		8
	4	SS	18	14		180 ▽	7
10							
	5	SS	18	6	Sandy CLAY, With Gravel, Brown, Wet to Saturated, Stiff to Very Hard, (CH)	175	10
15							
	6	SS	0	0		170	50/0
20							
					END OF BORING @ 22.0'	165	
25							
						160	
30							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 8.5'	WS OR (WD)	BORING STARTED 01-26-99	
WL	BCR ACR	BORING COMPLETED 01-26-99	CAVE IN DEPTH ●
WL		RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-2A	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ECS LTD

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
					ENGLISH UNITS
					SURFACE ELEVATION 188.00
25	1	SS	18	18	Fine Sandy CLAY, Trace Gravel, Tannish Brown, Moist, Very Stiff to Very Hard, (CL)
30	2	SS	18	18	

WATER LEVELS (▽) ELEVATION (FT): 185, 180, 175, 170, 165, 160

CALIBRATED PENETROMETER TONS/FT.²: 1, 2, 3, 4, 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10, 20, 30, 40, 50+

⊗22 ⊗57

CONTINUED ON NEXT PAGE.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 38.5' WS OR (7D)	BORING STARTED 01-26-99	
WL BCR ACR	BORING COMPLETED 01-26-99	CAVE IN DEPTH ●
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-2A	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

CALIBRATED PENETROMETER TONS/FT.^{2}: 1 2 3 4 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10 20 30 40 50+

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT. ⊗
					ENGLISH UNITS		
					SURFACE ELEVATION 188.00		
30					Fine Sandy CLAY, Trace Gravel, Tannish Brown, Moist, Very Stiff to Very Hard, (CL)	155	
	3	SS	18	16	CLAY, With Fine Sand, Trace Gravel, Tannish Brown, Moist, Hard, (CL)		36
35					CLAY, Trace Fine Sand, Purplish Brown, Moist, Very Stiff to Hard, (CH)	150 ▽	
	4	SS	18	18			30
40					END OF BORING @ 40.0'	145	
45						140	
50						135	
55						130	
60							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 38.5'	WS OR (CD)	BORING STARTED 01-26-99	
WL	BCR ACR	BORING COMPLETED 01-26-99	CAVE IN DEPTH ●
WL		RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-3	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION: 200.00

CALIBRATED PENETROMETER TONS/FT.^{2}: 1 2 3 4 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10 20 30 40 50+

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽)	ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT. ⊗
0	1	SS	18	6	Clayey SAND, Trace Gravel and Roots, Medium Brown, Moist, Medium Dense, (SC-FILL) [Asphalt Debri]			10
	2	SS	18	12	Fine to Medium Sandy CLAY, With Silt, Trace Roots, Medium to Dark Brown, Moist to Wet, Hard, (CL-FILL) [Asphalt]			35
5	3	SS	18	13			195	13
	4	SS	15	12	Fine Sandy CLAY, Trace Gravel, Brown and Gray, Moist to Wet, Stiff to Very Hard, (CL-FILL) [Construction Debri]			58/9
10					END OF BORING @ 10.0'		190	
15							185	
20							180	
25							175	
30								

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL WS OR ▽	BORING STARTED 01-22-99	
WL BCR ACR	BORING COMPLETED 01-22-99	CAVE IN DEPTH ●
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-3A	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

CALIBRATED PENETROMETER TONS/FT.² (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽)	ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
					ENGLISH UNITS			
					SURFACE ELEVATION 200.00			
30					Fine Sandy CLAY, With Gravel, Trace Roots, Dark Brown, Moist, Stiff, (CL-FILL)			
	5	SS	18	18				11
35							165	
					SAND, With Silt, Trace Clay, Tannish Brown, Moist to Wet, (SP-SM)	▽		
	6	SS	18	18				24
40							160	
					SILT, Trace Fine Sand, Purplish Gray, Wet to Saturated, Dense, (ML)			
	7	SS	18	18				38
45					END OF BORING @ 45.0'		155	
50							150	
55							145	
60								

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 38.5' WS OR ⓦ	BORING STARTED 01-22-99	
WL BCR ACR	BORING COMPLETED 01-22-99	CAVE IN DEPTH ●
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-3A	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION 200.00

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0						200	
5						195	
10						190	
15	1	SS	18	14	Fine Sandy SILT and CLAY, Trace Gravel, Dark Brown and Black, Moist, Stiff to Very Stiff, (ML/CL-FILL) [Construction Debri]	185	12
20	2	SS	18	12		180	12
25	3	SS	18	16		175	19
30	4	SS	18	18	Fine Sandy CLAY, With Gravel, Trace Roots, Dark Brown, Moist, Stiff, (CL-FILL)		10

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THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 38.5' WS OR (D)	BORING STARTED 01-22-99	
WL BCR ACR	BORING COMPLETED 01-22-99	CAVE IN DEPTH ●
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-4	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION: 198.00

CALIBRATED PENETROMETER TONS/FT.² (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % (●) — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	18	18	Fine Sandy SILT, With Gravel and Construction Debri, Trace Clay, Roots and Quartz Fragments, Brown and Black, Moist, Medium Dense, (ML-FILL)	195	20
	2	SS	18	18			27
5	3	SS	18	6			13
					Silty CLAY, With Gravel and Fine Sand, Trace Roots and Construction Debri, Medium to Dark Brown, Moist to Wet, Stiff, (CL-FILL)	190	
	4	SS	18	12			11
10							
						185	
	5	SS	18	14			12
15							
					CLAY, With Fine Sand, Trace Silt and Roots, Light Purplish Brown, Moist, Hard, (CL-Possible FILL)	180	
	6	SS	18	18			43
20							
						175	
	7	SS	18	14			29
25							
					Fine to Medium SAND, With Silt, Tannish Brown,	170	
	8	SS	11	8			50/5
30							

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THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 13.5' WS OR WD	BORING STARTED 01-25-99	
WL BCR 15.0' ACR	BORING COMPLETED 01-25-99	CAVE IN DEPTH ● 29.0'
WL 3.5' @ 24HRS	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-4	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

CALIBRATED PENETROMETER TONS/FT.² — 1 2 3 4 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ — 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT. ⊗ — 10 20 30 40 50+

ENGLISH UNITS

SURFACE ELEVATION 198.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽)	ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
30					Fine to Medium SAND, With Silt, Tannish Brown,			
					CLAY, Trace Fine Sand, Tannish to Purplish Gray, Moist, Very Hard, (CL/CH)		165	
	9	SS	18	16				⊗65
35								
							160	
	10	SS	18	18				⊗56
40					END OF BORING @ 40.0'			
							155	
45								
							150	
50								
							145	
55								
							140	
60								

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 13.5' WS OR (D)	BORING STARTED 01-25-99	
WL BCR 15.0' ACR	BORING COMPLETED 01-25-99	CAVE IN DEPTH ● 29.0'
WL 3.5' @ 24HRS	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-5	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION: 200.00

CALIBRATED PENETROMETER TONS/FT.² (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % (●) — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▼) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	18	0	Sandy CLAY, With Gravel and Construction Debri, Trace Roots, Brown, Moist, Stiff to Very Stiff, (CL-FILL)		11
	2	SS	18	6			22
5	3	SS	18	14	Sandy SILT, Trace Clay and Construction Debri, Dark Brown, Moist, Medium Dense to Dense, (ML-FILL)	195	14
	4	SS	18	12			33
10						190	
	5	SS	18	6	GRAVEL, With Sand, Gray, Moist, Very Loose, (GP-FILL) [Asphalt &/or Construction Debri]		8
15						185	
	6	SS	18	18	CLAY, Trace Fine Sand and Quartz Fragments, Tannish Brown, Moist, Very Stiff, (CL/CH-Possible FILL)		34
20					SAND, With Clay and Quartz Fragments, Tannish Brown, Moist, Dense, (SC-Possible FILL)	180	
	7	SS	18	18			37
25						175	
					CLAY, Trace Fine Sand, Purplish Brown, Moist, Very Stiff, (CL/CH)		
	8	SS	18	18			19
30							

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THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 38.5' WS OR WD	BORING STARTED 01-25-99	
WL BCR ACR	BORING COMPLETED 01-25-99	CAVE IN DEPTH ● 28.5'
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-5	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ECS LTD

CALIBRATED PENETROMETER TONS/FT.^{2}: 1 2 3 4 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10 20 30 40 50+

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT. ⊗
					ENGLISH UNITS		
					SURFACE ELEVATION 200.00		
30					CLAY, Trace Fine Sand, Purplish Brown, Moist, Very Stiff, (CL/CH)		
	9	SS	18	18			⊗23
35						165	
					Medium SAND, With Silt, Tannish Brown, Moist, Dense, (SP-SM)	▽	
	10	SS	18	18			⊗32
40					END OF BORING @ 40.0'	160	
45						155	
50						150	
55						145	
60							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 38.5'	WS OR (TD)	BORING STARTED 01-25-99	
WL	BCR ACR	BORING COMPLETED 01-25-99	CAVE IN DEPTH ● 28.5'
WL		RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-6	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

CALIBRATED PENETROMETER TONS/FT.² (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

ENGLISH UNITS

SURFACE ELEVATION 186.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	18	8	Sandy CLAY, Trace Gravel and Construction Debri, Brown, Moist, Stiff to Very Stiff, (CL-FILL)	185	14
	2	SS	18	16			24
5	3	SS	18	14	Sandy SILT, Trace Clay and Quartz Fragments, Brown, Moist, Medium Dense, (ML-FILL)	180	15
	4	SS	18	18			21
10						175	
	5	SS	18	18	Silty Fine SAND, Trace Clay, Brown to Tan, Moist, Loose to Medium Dense, (SM)		30
15						170	
	6	SS	18	18			20
20						165	
	7	SS	18	18			9
25						160	
	8	SS	18	18			15
30							

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THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 38.5' WS OR (TD)	BORING STARTED 01-25-99	
WL BCR DRY ACR	BORING COMPLETED 01-25-99	CAVE IN DEPTH @ 31.0'
WL DRY @ 24HRS	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-6	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION: 186.00

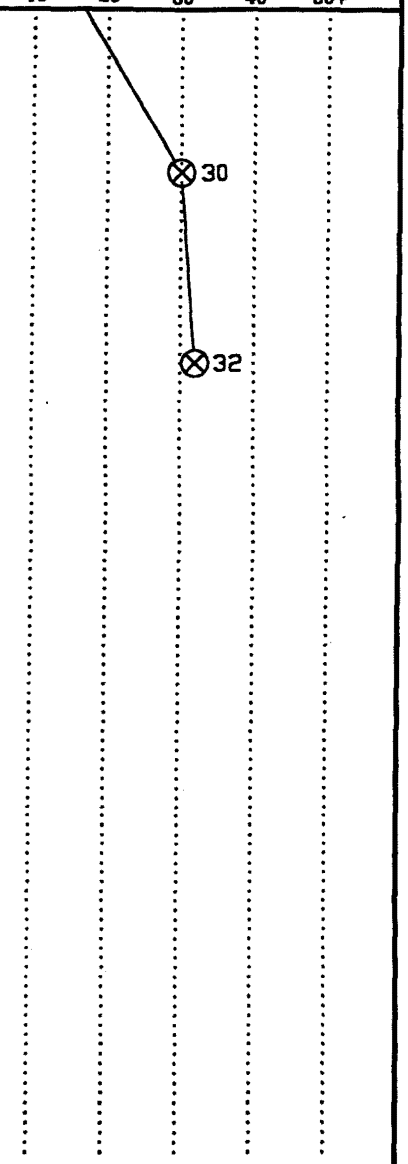
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
30					Silty Fine SAND, Trace Clay, Brown to Tan, Moist, Loose to Medium Dense, (SM)
	9	SS	18	18	
35					CLAY, Trace Fine Sand, Purplish Brown, Moist, Hard, (CL)
	10	SS	18	18	
40					END OF BORING @ 40.0'
45					
50					
55					
60					

WATER LEVELS (▽) ELEVATION (FT): 155, 150, 145, 140, 135, 130

CALIBRATED PENETROMETER TONS/FT.^{2}: 1, 2, 3, 4, 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10, 20, 30, 40, 50+



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 38.5' WS OR ⓓ	BORING STARTED 01-25-99	
WL BCR DRY ACR	BORING COMPLETED 01-25-99	CAVE IN DEPTH ● 31.0'
WL DRY @ 24HRS	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-7	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
					ENGLISH UNITS
					SURFACE ELEVATION 188.00
0	1	SS	18	8	Gravelly Silty CLAY, With Construction Debri, Brown and Black, Moist, Very Hard, (CL-FILL)
	2	SS	18	16	
5	3	SS	18	12	
	4	SS	18	10	Fine to Medium Sandy SILT, Trace Gravel and Construction Debri, Brown, Moist, Medium Dense, (ML-FILL)
10					
	5	SS	18	8	
15					
	6	SS	18	14	
20					CLAY, With Fine to Medium Sand, Trace Construction Debri, Brown and Gray, Moist, Stiff to Very Stiff, (CL-FILL)
	7	SS	18	18	
25					
	8	SS	18	7	
30					

WATER LEVELS (▽) ELEVATION (FT): 185, 180, 175, 170, 165, 160

CALIBRATED PENETROMETER TONS/FT.^{2}: 1, 2, 3, 4, 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ

10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10, 20, 30, 40, 50+

⊗15, ⊗84, ⊗22, ⊗16, ⊗13, ⊗14, ⊗16, ⊗13

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THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL WS OR ⓌⒹ	BORING STARTED 01-18-99	
WL BCR ACR	BORING COMPLETED 01-21-99	CAVE IN DEPTH ●
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-7	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (Ψ)	ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
					ENGLISH UNITS			
					SURFACE ELEVATION 188.00			
30					CLAY, With Fine to Medium Sand, Trace Construction Debri, Brown and Gray, Moist, Stiff to Very Stiff, (CL-FILL)		155	
	9	SS	18	18				12
35							150	
	10	SS	18	7				14
40					Fine Sandy SILT, Purplish Brown, Moist, Dense, (ML)		145	
	11	SS	18	16				37
45					END OF BORING @ 45.0'		140	
50							135	
55							130	
60								

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL WS OR (D)	BORING STARTED 01-18-99	
WL BCR ACR	BORING COMPLETED 01-21-99	CAVE IN DEPTH ●
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-8B	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

CALIBRATED PENETROMETER TONS/FT.^{2}: 1 2 3 4 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10 20 30 40 50+

DESCRIPTION OF MATERIAL

ENGLISH UNITS

SURFACE ELEVATION 190.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT. ⊗
0						190	
5						185	
10						180	
15						175	
20	1	SS	18	12	SILT, With Fine Sand, Medium to Dark Brown, Moist, Loose to Medium Dense, (ML-Possible FILL)	170	8
25	2	SS	18	16		165	20
30	3	SS	18	18			14

CONTINUED ON NEXT PAGE.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 38.5' WS OR ▽	BORING STARTED	01-18-99	
WL BCR DRY ACR	BORING COMPLETED	01-21-99	CAVE IN DEPTH @ 34.0'
WL	RIG FOREMAN	BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-8B	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

CALIBRATED PENETROMETER TONS/FT.^{2}: 1 2 3 4 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10 20 30 40 50+

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT. ⊗
					ENGLISH UNITS		
					SURFACE ELEVATION 190.00		
30					Fine SAND, With Silt, Yellowish Brown, Moist, Medium Dense, (SP-SM)		
	4	SS	18	18			⊗29
35						155	
					Fine SAND, Trace Silt, Orangish Yellowish Brown, Saturated, Extremely Dense, (SP)	▽	
	5	SS	3	3			⊗50/3
40					END OF BORING @ 40.0'	150	
45						145	
50						140	
55						135	
60							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 38.5' WS OR ▽D	BORING STARTED 01-18-99	
WL BCR DRY ACR	BORING COMPLETED 01-21-99	CAVE IN DEPTH @ 34.0'
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-9	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION: 202.00

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	18	6	Clayey SILT, With Fine Sand, Medium to Dark Brown and Purple, Moist, Loose to Medium Dense, (ML-Possible FILL)	200	8
	2	SS	18	14			26
5	3	SS	18	12	Silty Fine SAND, Trace Mica, Yellowish Tannish Brown, Moist, Medium Dense to Dense, (SM)	195	34
	4	SS	18	14			18
10						190	
	5	SS	18	16			24
15						185	
	6	SS	18	18			19
20						180	
	7	SS	18	16			26
25						175	
	8	SS	18	8			23
30							

CONTINUED ON NEXT PAGE.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 40.0' WS OR ▽	BORING STARTED 01-22-99	
WL BCR DRY ACR	BORING COMPLETED 01-22-99	CAVE IN DEPTH ● 26.0'
WL DRY @ 24HRS	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-9	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION: 202.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
30					CLAY, Trace Fine Sand, Purplish Brown, Moist, Hard to Very Hard, (CL)
	9	SS	18	18	
35					
	10	SS	18	18	
40					
	11	SS	18	18	
45					
	12	SS	18	0	
50					END OF BORING @ 50.0'
55					
60					

WATER LEVELS (▽) ELEVATION (FT): 170, 165, 160, 155, 150, 145

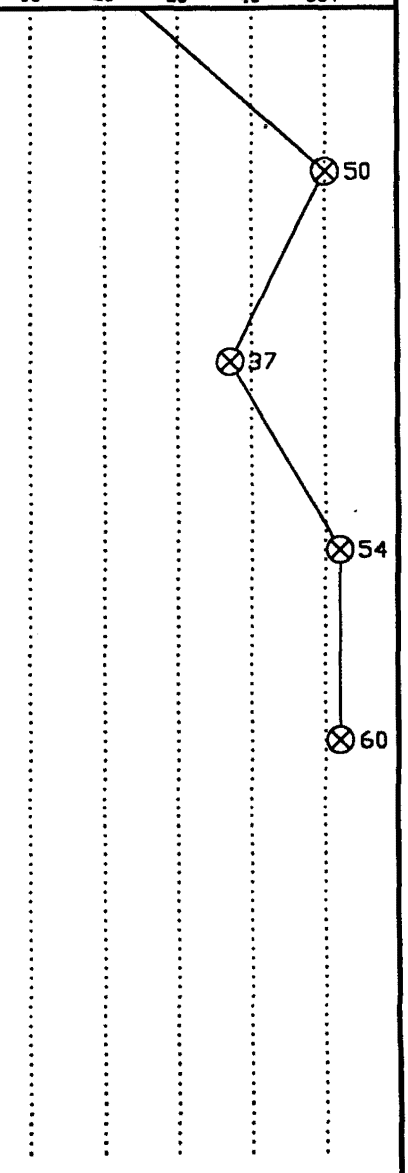
CALIBRATED PENETROMETER TONS/FT.² — 1, 2, 3, 4, 5+

PLASTIC LIMIT % (X) — WATER CONTENT % — LIQUID LIMIT % (Δ)

10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT. (⊗)

10, 20, 30, 40, 50+



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 40.0' WS OR ▽D	BORING STARTED 01-22-99	
WL BCR DRY ACR	BORING COMPLETED 01-22-99	CAVE IN DEPTH @ 26.0'
WL DRY @ 24HRS	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-10A	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION 204.00

CALIBRATED PENETROMETER TONS/FT.^{2}: 1 2 3 4 6+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10 20 30 40 50+

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)
0						200
5						195
10						190
15						
20	1	SS	18	14	SILT, With Fine Sand and Construction Debri, Medium to Dark Brown, Moist, Medium Dense, (ML-FILL)	185
25	2	SS	18	18		180
30	3	SS	18	14		175

⊗ 10 — ⊗ 19 — ⊗ 20

CONTINUED ON NEXT PAGE.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 33.5' WS OR ▽D	BORING STARTED 01-21-99	
WL BCR DRY ACR	BORING COMPLETED 01-21-99	CAVE IN DEPTH @ 37.5'
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-10A	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

CALIBRATED PENETROMETER TONS/FT.² — 1 2 3 4 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ — 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT. ⊗ — 10 20 30 40 50+

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽)	ELEVATION (FT)
					ENGLISH UNITS		
					SURFACE ELEVATION 204.00		
30					Fine Sandy CLAY, With Gravel, Tannish Brown, Wet to Saturated, Hard to Very Hard, (CL-Possible FILL)	▽	170
35							165
40					Fine SAND, Trace Silt, Tan, Saturated, Extremely Dense, (SP-SM)		160
45							155
50					END OF BORING @ 50.0'		150
55							145
60							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 33.5' WS OR (7D)	BORING STARTED 01-21-99	
WL BCR DRY ACR	BORING COMPLETED 01-21-99	CAVE IN DEPTH ● 37.5'
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-8	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION: 190.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (∇)	ELEVATION (FT)
0	1	SS	18	12	Sandy SILT and CLAY, With Cobbles, Wood and Asphalt, Brown and Gray, Moist, Medium Dense to Dense, (ML/CL-FILL)		190
	2	SS	18	14			
5	3	SS	14	12			185
10					END OF BORING @ 8.5'		180
15							175
20							170
25							165
30							

CALIBRATED PENETROMETER TONS/FT.^{2}: 1 2 3 4 6+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ

10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10 20 30 40 50+

⊗ 10, ⊗ 9, ⊗ 94/8

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL WS OR FD	BORING STARTED 01-15-99	
WL BCR ACR	BORING COMPLETED 01-15-99	CAVE IN DEPTH ●
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-11	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

CALIBRATED PENETROMETER TONS/FT.² (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

ENGLISH UNITS

SURFACE ELEVATION 208.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽)	ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0					Sandy SILT and CLAY, With Asphalt and Cobbles, Brown and Gray, Moist, Medium Dense, (ML/CL-FILL)		205	
	1	SS	18	12				12
5	2	SS	18	12			200	9
	3	SS	18	16				12
10							195	
	4	SS	18	16				20
15							190	
	5	SS	18	14				27
20							185	
	6	SS	18	14				19
25					Sandy CLAY, With Cobbles, Brown, Moist to Wet, Dense, (CL)		180	
	7	SS	18	16				35
30								

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THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 33.5' WS OR ▽	BORING STARTED 01-14-99	
WL BCR DRY ACR	BORING COMPLETED 01-14-99	CAVE IN DEPTH ● 32.0'
WL DRY @ 24HRS	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-11	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ECS LTD

CALIBRATED PENETROMETER TONS/FT.^{2}: 1 2 3 4 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10 20 30 40 50+

DESCRIPTION OF MATERIAL

ENGLISH UNITS

SURFACE ELEVATION 208.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽)	ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT. ⊗
30					Sandy CLAY, With Cobbles, Brown, Moist to Wet, Dense, (CL)			
					Fine to Coarse SAND, Brown, Moist to Wet, Medium Dense to Dense, (SM)	▽	175	
	8	SS	18	14				⊗33
35								
							170	
	9	SS	18	16				⊗19
40					END OF BORING @ 40.0'			
							165	
45								
							160	
50								
							155	
55								
							150	
60								

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL 33.5' WS OR (ID)	BORING STARTED 01-14-99	
WL BCR DRY ACR	BORING COMPLETED 01-14-99	CAVE IN DEPTH ● 32.0'
WL DRY @ 24HRS	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-12	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % (●) — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

ENGLISH UNITS

SURFACE ELEVATION 210.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	18	8	Sandy SILT and CLAY, Brown and Gray, Moist, Medium Dense to Dense, (ML/CL-FILL)		6
	2	SS	18	14			12
5	3	SS	18	8		205	14
	4	SS	18	14			10
10	5	SS	6	0		200	70/6
15	6	SS	18	14		195	19
20					Silty Fine to Medium SAND, Light Gray and Brown, Moist to Wet, Dense, (SM)	190	
	7	SS	18	16			45
25						185	
	8	SS	18	18			38
30							

CONTINUED ON NEXT PAGE.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL DRY WS OR (D)	BORING STARTED 01-15-99	
WL BCR DRY ACR	BORING COMPLETED 01-15-99	CAVE IN DEPTH ●
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-12	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION: 210.00

CALIBRATED PENETROMETER TONS/FT.^{2}: 1 2 3 4 6+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10 20 30 40 50+

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
30					Silty Fine to Medium SAND, Light Gray and Brown, Moist to Wet, Dense, (SM)		
	9	SS	12	12			50/6
35						175	
	10	SS	18	18			43
40					END OF BORING @ 40.0'	170	
45						165	
50						160	
55						155	
60							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL DRY WS OR ▽	BORING STARTED 01-15-99	
WL BCR DRY ACR	BORING COMPLETED 01-15-99	CAVE IN DEPTH ●
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-8A	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION 190.00

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % (X) — WATER CONTENT % — LIQUID LIMIT % (Δ) (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (⊗) (10, 20, 30, 40, 50+)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (∇) ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0					FILL	190	
5						185	
10	1	SS	18	14	Clayey SILT, With Gravel, Sand and Cobbles, Light Brown and Gray, Moist, Medium Dense, (ML-FILL)	180	⊗23
15	2	SS	18	12		175	⊗23
					END OF BORING @ 17.0'		
20						170	
25						165	
30							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL	WS OR (TD)	BORING STARTED 01-15-99	
WL	BCR ACR	BORING COMPLETED 01-15-99	CAVE IN DEPTH ●
WL		RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
KSI SERVICES, INC.	5349	B-10	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
FORT STANTON	GREENHORNE & O'MARA

ECS LTD

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION 204.00

CALIBRATED PENETROMETER TONS/FT.^{2} (1 2 3 4 5+)

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ (10 20 30 40 50+)

STANDARD PENETRATION BLOWS/FT. ⊗ (10 20 30 40 50+)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽)	ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	18	8	Sandy SILT and CLAY, With Gravel, Brick and Asphalt, Brown, Gray and Red, Moist, Medium Stiff to Very Stiff, (ML/CL-FILL)		200	9
	2	SS	18	6				22
5	3	SS	18	10				20
	4	SS	18	0			195	19
10								
	5	SS	18	14			190	43
15								
					END OF BORING @ 18.5'		185	
20								
							180	
25								
							175	
30								

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL WS OR WD	BORING STARTED 01-21-99	
WL BCR ACR	BORING COMPLETED 01-21-99	CAVE IN DEPTH ●
WL	RIG FOREMAN BADGER	DRILLING METHOD HOLLOW STEM AUGER

TEST PIT LOG

BORING LOCATION: NE corner

BORING METHOD: JD310D Backhoe

LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-1

DATE STARTED: 11/17/98

DATE COMPLETED: 11/17/98

SHEET 1 OF 1

SURFACE ELEVATION: 204 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
200				FILL - Brown and yellow brown, medium dense, Silty to Clayey fine-medium SAND (SM/SC) and fine Sandy SILT with Clay (ML/CL), gravels and cobbles - Moist to very moist								Wild grasses at surface. Variable amounts of debris - wood, brick, concrete, wire, asphalt, plastic and rubber.
				4.5								
	5			FILL - Brown to gray brown, reddish brown and black, soft to medium stiff, silty CLAY (CL/CH) with sand, gravels - Very moist								Concrete, brick, wood pieces.
				Slight to moderate organic odor								Large concrete chunk/boulders at 8-9 feet.
195				9.0								
	10			FILL - Brown/gray brown, medium stiff, micaceous fine-medium Sandy SILT (ML) to Silty fine-medium SAND (SM), some gravels - Moist to very moist								
				11.0								
190				Test pit terminated at 11 feet. No water. Backfilled.								

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

▽	DURING DRILLING	None	FEET
▼	AT COMPLETION	None	FEET
▽	AFTER ____ HOURS	____	FEET
▽	AFTER ____ HOURS	____	FEET

WHITLOCK DALRYMPLE POSTON & Assoc.
8832 Rixlew Lane
Manassas, Virginia 20109
(703) 257-9280

Geotechnical Feasibility Study
Ft. Stanton Property
Goodhope and 24th Sts., S.E.
WDP Project No.: 06-98106

TEST PIT LOG

BORING LOCATION: East property boundary - north central

BORING METHOD: JD310D Backhoe

LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-2

DATE STARTED: 11/17/98

DATE COMPLETED: 11/17/98

SHEET 1 OF 1

SURFACE ELEVATION: 208 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
205	0			FILL - Brown to orange/yellow brown, medium dense, Silty to Clayey fine-medium SAND (SM/SC), gravels, some cobbles - Moist to very moist								Wild grasses at surface. Brick/concrete pieces, wood, asphalt, asphalt millings, CMU fragments.
				Hard asphalt pavement (3.5)								
				Backhoe refusal at 3-1/2 feet on buried asphalt pavement. No water. Backfilled.								Backhoe excavation difficult.
200	5											
	10											
195												

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

DURING DRILLING	None		FEET
AT COMPLETION	None		FEET
AFTER ____	HOURS ____		FEET
AFTER ____	HOURS ____		FEET

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Geotechnical Feasibility Study
Ft. Stanton Property
Goodhope and 24th Sts., S.E.
WDP Project No.: 06-98106

TEST PIT LOG

BORING LOCATION: East property boundary - central

BORING METHOD: JD310D Backhoe

LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-3

DATE STARTED: 11/17/98

DATE COMPLETED: 11/17/98

SHEET 1 OF 1

SURFACE ELEVATION: 210 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
				FILL - Brown/yellow brown, medium dense, Silty to Clayey fine-medium SAND (SM/SC) with gravels, cobbles - Moist									Wild grasses at surface.
				FILL - Gray white/orange brown, fat CLAY (CH) and fine Sandy Silt/Clay (ML/CL) - Very moist (1.5)									Brick wall piece, concrete, asphalt.
				Backhoe refusal at 2-1/2 feet on buried asphalt pavement. (2.5) No water. Backfilled.									Asphalt pavement.
205	5												
200	10												

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

DURING DRILLING	None		FEET
AT COMPLETION	None		FEET
AFTER ____	HOURS ____		FEET
AFTER ____	HOURS ____		FEET

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Ft. Stanton Property
Goodhope and 24th Sts., S.E.
WDP Project No.: 06-98106

TEST PIT LOG

BORING LOCATION: East property boundary - south central

BORING METHOD: JD310D Backhoe

LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-4

DATE STARTED: 11/17/98

DATE COMPLETED: 11/17/98

SHEET 1 OF 1

SURFACE ELEVATION: 211 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
210	0			FILL - Brown, dense, Clayey fine-medium SAND (SC) - Moist								Wild grasses at surface.
				0.5								
				Backhoe refusal at 6 inches on buried asphalt pavement. No water. Backfilled.								
	5											
205												
	10											
200												

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

DURING DRILLING	None	FEET	
AT COMPLETION	None	FEET	
AFTER ____	HOURS ____	FEET	
AFTER ____	HOURS ____	FEET	

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TEST PIT LOG

BORING LOCATION: SE corner - Near top of slope

BORING METHOD: JD310D Backhoe

LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-5

DATE STARTED: 11/17/98

DATE COMPLETED: 11/17/98

SHEET 1 OF 1

SURFACE ELEVATION: 208 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
208	0			FILL - Brown/yellow brown, medium dense, Silty to Clayey fine-medium SAND (SM/SC), gravels, cobbles - Moist								Wild grasses at surface. Concrete/brick pieces. Wire cable pieces. Asphalt.
205	3.5			FILL - Gray brown, soft to medium stiff, Clayey SAND/Sandy CLAY (SC/CL), gravels, cobbles - Very moist								Brick, concrete, glass debris.
	5			Concrete/sheet metal pieces								Large asphalt chunk at 6 feet.
	7.0			Backhoe refusal at 7 feet on oversized (+2 feet) concrete/asphalt debris. No water. Backfilled.								
200	10											
195												

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

DURING DRILLING	None	FEET		
AT COMPLETION	None	FEET		
AFTER		HOURS		FEET
AFTER		HOURS		FEET

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Ft. Stanton Property
Goodhope and 24th Sts., S.E.
WDP Project No.: 06-98106

WDP-TP BRING TP-5 11/24/98

TEST PIT LOG

BORING LOCATION: South central property - Near top of slope

BORING METHOD: JD310D Backhoe

LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-6

DATE STARTED: 11/17/98

DATE COMPLETED: 11/17/98

SHEET 1 OF 1

SURFACE ELEVATION: 200 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
				FILL - Brown and yellow brown, dense Silty/Clayey fine-coarse SAND (SM/SC), gravels, cobbles - Moist								Wild grasses at surface.
				Large 2-3 foot concrete pieces. 1.5								Brick, asphalt, concrete pieces.
				FILL - Gray to gray brown, loose to medium dense, Silty/Clayey SAND (SM/SC) to Sandy CLAY (CL) - Moist to very moist								Wire strapping.
195	5											Miscellaneous concrete, wood, asphalt, brick debris.
				8.0								
				Backhoe refusal at 8 feet on miscellaneous buried debris. No water. Backfilled.								
190	10											

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

▽	DURING DRILLING	None	FEET
▼	AT COMPLETION	None	FEET
▽	AFTER ____ HOURS	____	FEET
▽	AFTER ____ HOURS	____	FEET

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WDP-TP 98106 TP-6 11/20/98

TEST PIT LOG

BORING LOCATION: South central property

BORING METHOD: JD310D Backhoe

LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-7

DATE STARTED: 11/17/98

DATE COMPLETED: 11/17/98

SHEET 1 OF 1

SURFACE ELEVATION: 203 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
				FILL - Brown/yellow brown, medium dense, Silty to Clayey SAND (SM/SC), gravels, cobbles - Moist								Wild grasses at surface.
				FILL - Grayish black, loose to medium dense, Silty SAND (SM), gravels, some clay - Moist (1.0)								Asphalt cinders, slag pieces, wood, brick/CMU, wire.
200												
	5			Native - Yellow brown, soft to medium stiff, fine Sandy SILT (ML) to fine Sandy CLAY (CL) - Moist (6.0)								Possible original ground - Trace rootlets
195												
				Test pit terminated at 9 feet. (9.0) No water. Backfilled.								
	10											
190												

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

DURING DRILLING	None	FEET	
AT COMPLETION	None	FEET	
AFTER ____	HOURS ____	FEET	
AFTER ____	HOURS ____	FEET	

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Geotechnical Feasibility Study
Ft. Stanton Property
Goodhope and 24th Sts., S.E.
WDP Project No.: 06-98106

TEST PIT LOG

BORING LOCATION: South central property
BORING METHOD: JD310D Backhoe
LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-8
DATE STARTED: 11/17/98
DATE COMPLETED: 11/17/98
SHEET 1 OF 1

SURFACE ELEVATION: 204 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
				FILL - Yellow brown, medium dense, Silty to Clayey SAND (SM/SC) to Sandy CLAY (CL), gravels, cobbles - Moist								Wild grasses at surface.
				FILL - Grayish black, medium dense, Silty SAND (SM), gravels - Moist — 1.5								Asphalt cinders, brick.
				Native - Orange brown, medium dense/stiff, Clayey SAND (SC) to Sandy CLAY (CL), some gravels, cobbles - Moist — 3.0								Possible original ground.
200	5			Orange brown/gray, mottled, medium dense, Silty/Clayey SAND (SM/SC), trace gravels, cobbles - Moist								
				Native - Light gray brown, medium dense, Silty fine SAND/fine Sandy SILT (SM/ML) - Moist — 8.5								
195	10			Test pit terminated at 10 feet. — 10.0 No water. Backfilled.								
190												

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

DURING DRILLING	None	FEET	
AT COMPLETION	None	FEET	
AFTER ____	HOURS ____	FEET	
AFTER ____	HOURS ____	FEET	

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Geotechnical Feasibility Study
Ft. Stanton Property
Goodhope and 24th Sts., S.E.
WDP Project No.: 06-98106

TEST PIT LOG

BORING LOCATION: North central property

BORING METHOD: JD310D Backhoe

LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-9

DATE STARTED: 11/17/98

DATE COMPLETED: 11/17/98

SHEET 1 OF 1

SURFACE ELEVATION: 204 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
				FILL - Brown/yellow brown, medium dense, Silty to Clayey SAND (SM/SC), gravels, cobbles - Moist								Wild grasses at surface. Some brick, wood, concrete, asphalt, wire cable pieces.
				3.0								
				FILL - Greyish brown to gray black, medium stiff, fine Sandy CLAY to Silty CLAY (CL/CH) - Moist to very moist								Some brick, asphalt, concrete, wood debris.
200												
	5											
				Blue gray color - 5 gallon oil/grease can								Paper/plastic.
				Gray brown/gray black, soft to medium stiff, Clayey SAND/Sandy CLAY (SC/CL) to Silty CLAY (CL/CH) - Moist to very moist								
195												
	10			10.0								
				Test pit terminated at 10 feet. No water. Backfilled.								
190												

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

▽	DURING DRILLING	None		FEET
▼	AT COMPLETION	None		FEET
▼	AFTER	HOURS		FEET
▽	AFTER	HOURS		FEET

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Goodhope and 24th Sts., S.E.
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TEST PIT LOG

BORING LOCATION: North central property

BORING METHOD: JD310D Backhoe

LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-10

DATE STARTED: 11/17/98

DATE COMPLETED: 11/17/98

SHEET 1 OF 1

SURFACE ELEVATION: 198 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
				FILL - Brown, medium dense, Clayey to Silty SAND (SC/SM), gravels, cobbles - Moist to very moist								Wild grasses at surface.
												Some brick, asphalt, concrete, wood debris.
195				Large asphalt sheets, concrete boulders, slab pieces at 3-5 feet								Difficult backhoe excavating.
	5			Backhoe refusal at 5 feet on buried oversized debris. 5.0								
				No water. Backfilled.								
190												
	10											
185												

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

DURING DRILLING	None		FEET
AT COMPLETION	None		FEET
AFTER ____	HOURS ____		FEET
AFTER ____	HOURS ____		FEET

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Ft. Stanton Property
Goodhope and 24th Sts., S.E.
WDP Project No.: 06-98106

TEST PIT LOG

BORING LOCATION: West central property

BORING METHOD: JD310D Backhoe

LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-11

DATE STARTED: 11/17/98

DATE COMPLETED: 11/17/98

SHEET 1 OF 1

SURFACE ELEVATION: 197 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
195				FILL - Brown, medium dense/medium stiff, Clayey SAND/Sandy CLAY (SC/CL), gravels, cobbles, boulders - Moist to very moist								Wild grasses at surface.
												Concrete slabs, brick, wood debris.
				More clayey and more moist								
				Brown, soft, silty CLAY/Sandy CLAY (CL/CH), gravels, cobbles - Very moist								Railroad tie at 4 feet.
	5											Bricks, asphalt.
				Concrete debris								
190												
				Very moist and clayey								
	10											
				Test pit terminated at 11 feet. 11.0								
				No water. Backfilled.								
185												

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

▽	DURING DRILLING	None	FEET
▼	AT COMPLETION	None	FEET
▽	AFTER ____	HOURS ____	FEET
▽	AFTER ____	HOURS ____	FEET

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Geotechnical Feasibility Study
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Goodhope and 24th Sts., S.E.
WDP Project No.: 06-98106

TEST PIT LOG

BORING LOCATION: Southwest central property

BORING METHOD: JD310D Backhoe

LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-12

DATE STARTED: 11/17/98

DATE COMPLETED: 11/17/98

SHEET 1 OF 1

SURFACE ELEVATION: 198 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
				FILL - Brown/yellow brown, medium dense, Clayey SAND (SC), gravels, cobbles - Moist								Wild grasses at surface.
												Brick, concrete, wire pieces.
				Brown/reddish brown, soft, Sandy CLAY (CL) - Very moist								
195												Brick, concrete pieces.
				Gray brown color								
	5											
				FILL - Gray brown, medium dense, Silty to Clayey SAND (SM/SC), gravels - Very moist								
190				7.5								
	10			Test pit terminated at 10 feet. 10.0 No water. Backfilled.								
185												

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

DURING DRILLING	None	FEET
AT COMPLETION	None	FEET
AFTER ____ HOURS	____	FEET
AFTER ____ HOURS	____	FEET

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TEST PIT LOG

BORING LOCATION: Southwest property - Near top of slope
BORING METHOD: JD310D Backhoe
LOGGED BY: Robert Niber, P.E. DRILLER: Washington Air

BORING NO.: TP-13
DATE STARTED: 11/17/98
DATE COMPLETED: 11/17/98
SHEET 1 OF 1

SURFACE ELEVATION: 195 ±

Elevation (ft)	Depth (ft)	Groundwater	Stratum	MATERIAL DESCRIPTION	Sample	Dry Density (pcf)	Pocket Pentrometer (tsf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing No. 200 Sieve	REMARKS
				FILL - Brown/orange brown, medium dense, Silty/Clayey SAND (SM/SC), gravels, cobbles - Moist								Wild grasses at surface.
												Rebar pieces, wood, brick, concrete, asphalt pieces.
				FILL - Gray black, medium dense, Silty SAND (SM), gravels, cobbles - Moist — 2.0								
				Concrete slab pieces (3 feet diameter)								Steel angle. Asphalt cinders.
												Bricks, concrete debris.
190	5			Gray black/grayish brown, medium dense to medium stiff, Silty/Clayey SAND (SM/SC) to Sandy CLAY (CL/CH) - Very moist								
				Backhoe refusal at 8 feet on buried oversized materials/debris. — 8.0								
				No water. Backfilled.								
185	10											

The lines between various strata on the test boring logs represent the approximate strata boundary; however, the transition between strata may be more gradual than shown, especially where indicated by a broken line.

GROUNDWATER DATA

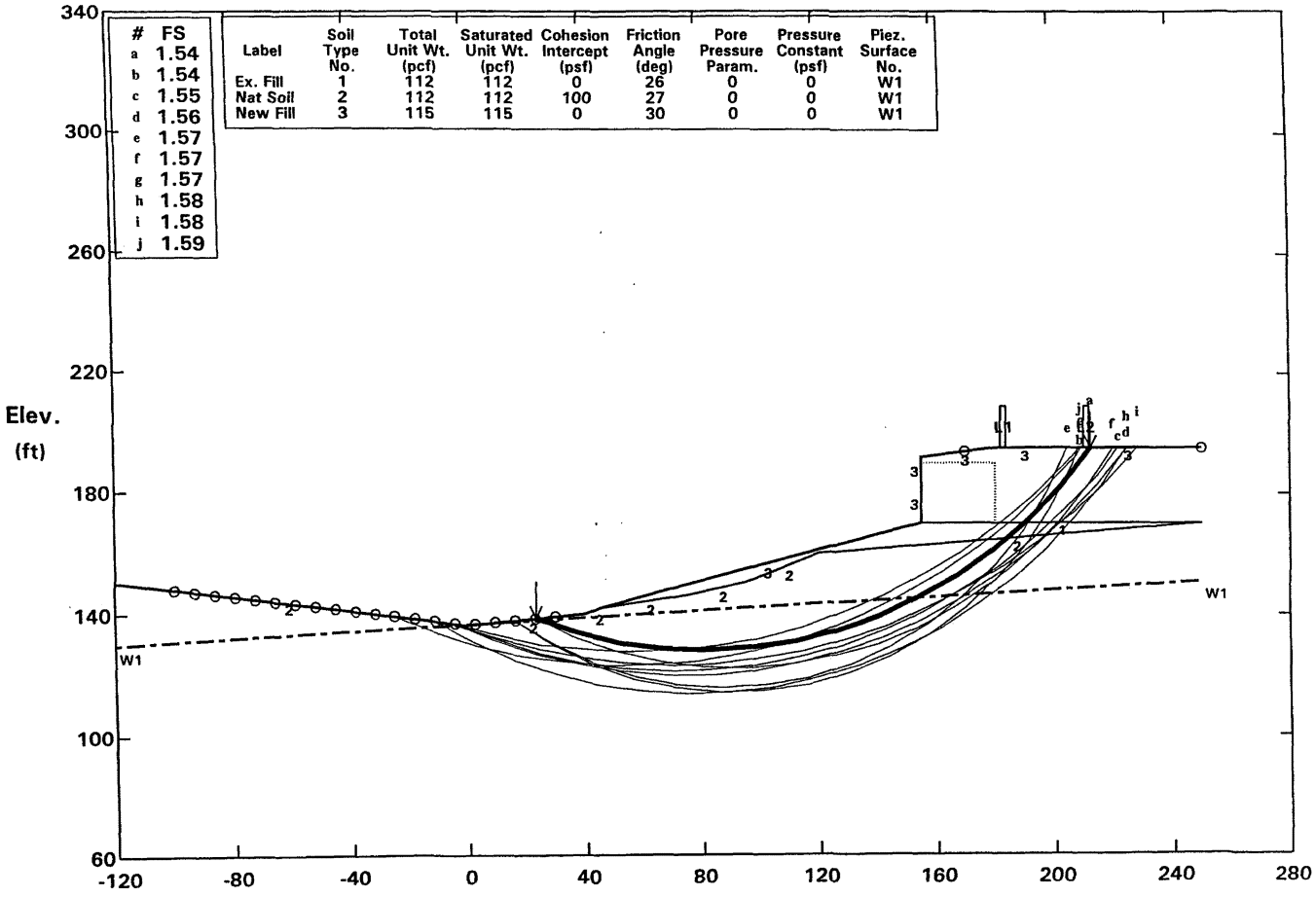
DURING DRILLING	None	FEET		
AT COMPLETION	None	FEET		
AFTER		HOURS		FEET
AFTER		HOURS		FEET

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Ft. Stanton Property
Goodhope and 24th Sts., S.E.
WDP Project No.: 06-98106

The Homes at Woodmont ECS Project No 5349 Building 3

Ten Most Critical. I:5349B3.PLT By: Leo Titus 04-16-99 4:21pm



#	FS
a	1.54
b	1.54
c	1.55
d	1.56
e	1.57
f	1.57
g	1.57
h	1.58
i	1.58
j	1.59

Label	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Ex. Fill	1	112	112	0	26	0	0	W1
Nat Soil	2	112	112	100	27	0	0	W1
New Fill	3	115	115	0	30	0	0	W1

STABL6H FSmin = 1.54 X-Axis (ft)

Factors Of Safety Calculated By The Modified Bishop Method