GEOTECHNICAL SPECIFICATIONS

for

DYNAMIC COMPACTION

Fort Stanton Property

East Parcel

Fairfax County, Virginia

ECS Job No. 5349

March 4, 1999

GENERAL

The following dynamic compaction geotechnical specifications have been developed from the results of our subsurface exploration performed for our Preliminary Report of Subsurface Exploration and Geotechnical Engineering Analysis for the proposed Fort Stanton development, ECS Report No. 5349, dated February 3, 1999. These notes address the preparation of the building pads and associated site features, ie. roadways, utilities, sidewalks, etc. with respect to dynamic compaction as recommended in the above referenced preliminary geotechnical report.

These dynamic compaction geotechnical specifications are applicable to the portion of the site identified on the Boring Location Plan as being underlain by 20 to 40 feet of existing uncontrolled fill material. The notes reflect the recommendations of the Geotechnical Report that the building groundprints be deep dynamically compacted, and that the utility lines and pavement subgrades be lightly dynamically compacted, and that the site be brought to final design grades by additional engineered fill.

Ground improvement by deep dynamic compaction (DDC) is generally assessed by indirect methods during the DDC process, or by post verification with soil borings, dynamic cone penetrometer, dilatometer, or pressuremeter testing. However, two of the most meaningful measurements of the effectiveness of the DDC are the size and depth of the craters formed by the weight drop, and the deflation or lowering of the top of the fill after the compaction. The latter will likely be one to two feet in the deepest fill areas of this site, and requires a topographic survey of the site both before and after the DDC, as well as a record of any crater backfill brought onto the site.

DYNAMIC COMPACTION

DESCRIPTION

A. The work under this section describes the method of site improvement known as Dynamic Compaction. This technique consists of utilizing a high energy compaction to improve the site soils by densifying the existing fills, collapsing voids and proofing

Board of Zoning Adjustment
District of Columbia
CASE NO.16457
EXHIBIT NO.131A6

the subject area. All work shall be in accordance with these specifications and in conformity with the alignment grades and details shown on the plans.

SUBMITTALS

A. A Work plan, including a layout of impact locations spacing and drop heights, shall be submitted by the Specialty Contractor prior to the preconstruction conference and the start of work.

B. Accurate records of the densification activities shall be maintained by the Geotechnical Engineer. These records shall include:

1. Weight and dimensions of weights
2. Drop Locations
3. Number of Drops
4. Crater Depths
5. Drop Heights

C. A final report summarizing the compaction program shall be submitted by the Geotechnical Engineer as soon as possible after the completion of dynamic compaction operations and the post DDC survey and/or testing program, as outlined herein.

QUALITY ASSURANCE

A. The Specialty Contractor shall be regularly engaged in dynamic compaction work for a minimum of five years and be prequalified to perform work on this project and who can furnish proof of having satisfactorily performed dynamic compaction on a minimum of fifteen projects during the past three years. Proof of experience shall, upon request, be submitted to the Geotechnical Engineer for review and approval. The Specialty Contractor's project manager shall review these Geotechnical Specifications and discuss them with the Geotechnical Engineer of Record to insure their understanding prior to the Pre-Construction Conference. Any modifications to the dynamic compaction program, if necessary, will need to be submitted to the geotechnical engineer for review.

B. Testing and Inspection Service: The Owner shall engage the Geotechnical Engineer of Record for the project to provide performance monitoring, soil inspection and quality control services during the dynamic compaction and filling operations.

PRE-CONSTRUCTION CONFERENCE

A. A pre-construction conference consisting of the Specialty Contractor, the Geotechnical Engineer, the earthwork contractor, and the Owner shall be held to coordinate each entities function and to discuss densification work plan and resolve any differences of opinion before beginning work.

B. The conference attendees will also meet at project site at the start of densification to review specifications, the authority of the Geotechnical Engineer, and agree upon testing procedures and frequency. They may also observe the DDC of the initial pad as a test of crater size and depth as a function of number of drops.

EXECUTION

EQUIPMENT AND MATERIALS

A. The Specialty Contractor shall provide all operations and equipment necessary for the dynamic compaction of the site. The dynamic compaction shall be accomplished using a steel weight of about 15 tons, or larger, falling from heights of approximately 60 feet, unless a modification of this criteria is proposed in the Work Plan and the modification is approved by the Geotechnical Engineer of Record. The shape of the weight should be an equal-sided polygon or approximate equivalent.

B. Fill Material: Crater backfill materials shall be a grannular fill, SM or coarser, and shall be submitted to the Geotechnical Engineer of Record for approval prior to it's use.

FIELD TEST AREA

A. An initial test pad, covering one of the unit building pads, shall be established on the site to determine crater size, depth, and heave characteristics as a function of the cumulative number of drops. The DDC pattern for the initial test pad shall be a two pass, skipped pattern of 15 feet on center, with a split spacing on the second pass. this results in a final crater spacing of 7.5 feet center to spacing, with an estimated crater diameter of 5 feet. For the initial test pad a minimum of 5 drops per grid point shall be used, with additional drops at the discretion of the Geotechnical Engineer of Record. Contingent upon the test pad results, the Geotechnical Engineer may adjust the drop grid spacing, or the number of drops at each grid point, such that the dynamically compacted site shall be capable of supporting the proposed construction.

B. The test pad shall be topographically mapped prior to the DDC and evaluated after the completion of the DDC by a post survey. Testing with 2 soil borings with Standard Penetration Tests (SPTN), at least one of which should be at the location of a pre-DDC boring may also be required by the Geotechnical Engineer. These results will be utilized to evaluate the DDC's effectiveness.

C. The Specialty Contractor shall not proceed with production densification until satisfactory completion of test area and approval of the Geotechnical Engineer.

DENSIFICATION

A. The Specialty Contractor shall perform densification using methods and procedures established on the approved test area.

B. The Specialty Contractor shall inform the Geotechnical Engineer of densification operations before starting.

C. At a minimum, two passes shall be made over the building area, plus a buffer zone of 10 feet beyond the building perimeter. The grid pattern of each pass shall be 15 foot by 15 foot, with the second pass a split grid of the first pattern. A minimum of 5 drops shall be made at each drop point. Additional passes may also be required for areas designated by the Geotechnical Engineer after review of data collected between passes. All dynamic compaction work must be performed to the satisfaction of the Geotechnical Engineer.

D. The Specialty Contractor shall be responsible for the monitoring the scatter of displaced debris caused by the impact of the falling weight and monitoring ground vibrations in the area of adjacent structures, using the vibration monitors provided by the owner, and shall cease work and notify the Geotechnical Engineer of Record when the response thresholds and reached.

E. After filling as specified, the sites expanded building, utility line and pavement areas shall be ironed by dropping an 8 ton weight from a reduced height, 2 drops per location. An overlapping pattern covering the entire work area shall be used.

VIBRATION MONITORING

A. Vibration monitoring of the ground movements will be performed during the DDC by recording devices set up as follows:

1.) Two monitors within the 100 to 500 foot zone, moved to provide the most critical coverage as the point of DDC shifts. Threshold of measurement recording = 0.25 inches/sec.

2.) All vibration monitoring equipment will be operated on a continuous basis while the DDC is occurring.

3.) The Geotechnical Engineer shall be notified if any vibration monitor records a value in excess of 0.4 in/sec peak amplitude.

CRATER FILLING

A. The earthwork contractor shall fill the craters daily or before rainfall with approved fill to the approximate grade outside the craters.

B. The earthwork contractor shall also grade and compact the area of work each day, using approved equipment, adequate to allow construction equipment to traverse the site.

C. Upon completion of the dynamic compaction process, the site shall be graded to a smooth surface, using appropriate equipment to compact the near surface soils so that the soils meet the requirements specified in Earthwork.

FIELD QUALITY CONTROL

A. The Owner shall engage a Geotechnical Engineer for soil inspection and service quality control during work operations.

B. The Geotechnical Engineer will monitor the degree of improvement and may, upon inspection, modify procedures followed for densification, such as number of drops, height, repetition of passes, and grid spacing in order to meet performance criteria.

C. The Specialty Contractor shall, in concurrence with Geotechnical Engineer, identify any anomalies of unsatisfactory materials disclosed during dynamic compaction operations, such as localized pockets of very soft, wet soils that do not respond to the densification. If such materials are encountered, they shall be removed and replaced with approved fill, or other approaches agreed to for improving the densification.

D. After the completion of DDC, the Geotechnical Engineer shall review the records of the pre and post survey, for evidence of site deflation. In the event that these results are inconclusive, he may require additional post testing by soil borings, with SPT, pressuremeter (PMT), or cone penetrometer tests (CPT). These results will be utilized to further evaluate the DDC's effectiveness.

SAFETY

A detailed safety program shall be prepared by the Specialty Contractor to verify that job-site personnel, off site personnel and adjacent properties are protected. The safety program shall include a discussion of any special programs to assure crane safety. This will include, but not be limited to, the initial modification to all parts of the crane affected by the dynamic compaction, including cables, brakes, drums, etc., and shall include the daily, weekly, and monthly maintenance programs.

GENERAL NOTES

1. These notes are based on the project information available in the site plan drawings. If the elevation, location, or configuration of the proposed building or pavement area changes from that presently being evaluated, ECS, Ltd. shall be notified so that modifications to the geotechnical recommendations and specifications can be made, if necessary.

2. Review and approval of plans, specifications and reports by the District of Columbia, shall in no way relieve the developer of the responsibility for the design, construction and performance of the structures, pavement and slopes on the project and damage to surrounding properties.

3. Upon completion of the dynamic compaction addressed by these notes, the geotechnical engineer of record for this project, Engineering Consulting Services, Ltd. shall furnish a written opinion to the developer, as to whether or not the Deep Dynamic Compaction has been performed in accordance with the approved plans prior to the commencement of building construction, and the issuance of a non-residential use permit.

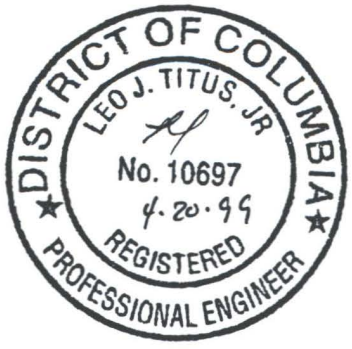
Leo J. Titus, Jr., P.E.
Project Engineer

4/20/99
Date

James W. Eckert., P.E.
Principal Engineer

4/20/99
Date

geotechnical/geospecs/5349geos



RETAINING WALL CONSTRUCTION SPECIFICATIONS
FOR
KEYSTONE SEGMENTAL BLOCK RETAINING WALLS REINFORCED WITH MIRAGRID GEOGRIDS

GENERAL NOTES

1. If the elevation, location, surcharge loading, or grading surrounding the retaining walls changes from that depicted on these plans, ECS, Ltd. shall be notified so that modifications to the geotechnical design can be made, as necessary.

2. The construction of the retaining walls shown on these plans shall be monitored and tested on a full time basis by ECS, Ltd. to ensure that the retaining walls are constructed in accordance with the intent of the design.

3. The general contractor shall oversee and coordinate between the various parties involved in the construction of the retaining walls and other systems within its confines and next to it. After completion of Keystone wall construction, the general contractor should continue to oversee the construction of other systems next to or within the confines of the Keystone walls to ensure, among other items, that geogrids are not cut, adequate surface drainage is maintained, and heavy loads (equipment or materials) are not placed next to the walls.

CLEARING AND SUBGRADE PREPARATION

1. Clearing and stripping limits shall be extended a minimum of 2 feet in front of the retaining walls and 2 feet behind the reinforced zone.

2. All existing topsoil, rootmat, and any other soft or unsuitable materials shall be removed from the clearing and stripping limits.

3. Prior to initiation of fill placement, the stripped area shall be observed by an experienced geotechnical engineer or his authorized representative to aid in locating unsuitable materials which require removal.

4. If feasible, proofrolling, using a loaded dump truck having an axle weight of at least 10 tons, or similar equipment, shall be used to identify localized soft or unsuitable material which require removal.

5. Any soft or unsuitable materials encountered during this proofrolling shall be removed and replaced with an approved backfill compacted to the criteria outlined in the section entitled FILL PLACEMENT.

EXCAVATION SUPPORT AND SLOPES

1. Temporary slopes shall be no steeper than 1H:1V.

2. Excavations shall be constructed and braced in accordance with current OSHA requirements.

3. The Contractor shall not stockpile excavated materials or equipment immediately adjacent to the excavation walls or slopes. All such materials shall be kept back from the top of the excavation a minimum distance equal to the excavation depth. Where equipment or materials must be placed immediately adjacent to the excavation walls, the excavation walls shall be designed for the anticipated surcharge loading, or additional bracing must be provided to support the anticipated surcharge loading.

MATERIALS

1. Retaining Wall Units shall consist of KEYSTONE striated face masonry units. All masonry retaining wall units shall be in strict accordance with the latest specifications furnished by KEYSTONE Retaining Wall Systems, Inc., Minneapolis, MN.

2. The color of block units to be selected by the Owner.

3. Fiberglass Pins shall be nylon resin rods with fiberglass reinforcement as supplied by KEYSTONE Retaining Wall Systems, Inc. and shall be in accordance with the latest KEYSTONE specifications.

4. Geogrids shall consist of Miragrid geogrids. All geogrids shall be in strict accordance with the latest specifications furnished by the manufacturer.

5. Geotextiles shall consist of Mirafi 140N, Amoco 4551, or other equivalent as approved by ECS, Ltd.

6. Material handling and storage shall be in accordance with the manufacturer's specifications.

7. Drainage Aggregate shall consist of VDOT #57 stone.

8. Leveling Pad shall consist of VDOT 21-A, 21-B, #57, or other aggregate materials approved by ECS, Ltd.

9. Fill materials for the Reinforced Fill and Retained Fill zones as well as to replace any bench cut to install the piers in front of the wall shall consist of soils having a Unified Soil Classification System designation of ML, SM, SC, SP, SW, GM, GC, GP, or GW, be free of organic matter, cobbles greater than 6 inches in maximum dimension, or debris, and have maximum Liquid Limit and Plasticity Index of 40 and 15, respectively. Furthermore, the reinforced and retained fill zones shall consist of materials that meet or exceed the requirements of the design parameters.

10. Unacceptable fill materials include topsoil, organic materials (OH, OL), plastic silts and clays (CH, MH), and soils not meeting the criteria of the previous paragraph.

FOUNDATIONS

1. The foundation subgrades shall be prepared in accordance with the section CLEARING AND SUBGRADE PREPARATION. Footing subgrades shall not bear on any existing fills, unless specifically approved in the field by the geotechnical engineer. The leveling pad subgrade in such areas shall be stepped to suitable natural soils.

2. The bearing capacity of the subgrade supporting all retaining wall elements, including masonry blocks and reinforced fill zone, shall be verified by a qualified soil technician or geotechnical engineer at a minimum frequency of 25 feet on center. The required bearing capacity for each wall, or section of wall, is specified on the details and wall profiles.

3. The minimum required foundation embedment depth for each wall, or section of wall, is specified on the details and wall profiles. The embedment depths have been increased where a nearby underground utility line or structure exists or is proposed to ensure that the utility line is not surcharged. Concrete sub wall are utilized under some walls.

FILL PLACEMENT

1. Leveling Pad

   a. Where approved graded aggregate is used, compact to a minimum of 95% of the maximum dry density in accordance with ASTM D-698, Standard Proctor method.

   b. If No. 57 stone is used, tamp in place w/a flat plate tamper.

2. Drainage Aggregate - Tamp and compact with a smooth plate walk-behind tamper.

3. Reinforced Fill Zone - This zone shall be compacted to a minimum of 95% of the maximum dry density obtained in accordance with ASTM D-698, Standard Proctor method, to the end of the geogrids.

4. Retained Fill Zone - Shall be compacted to the minimum percentage of the maximum dry density specified above.

6. Fill materials shall not be placed on frozen or frost heaved soils. All such soils shall be removed prior to continuation of fill operations.

7. Fill materials shall not contain frozen materials at the time of fill placement. All such materials shall be removed prior to continuation of fill operations.

8. Fill soils should be placed in lifts not exceeding 8 inches in loose thickness.

9. At the time of compaction, fill soils shall be within ±2% of the optimum moisture content, as determined in accordance with the appropriate Proctor Method.

10. All fill and backfill operations shall be observed on a full-time basis by a qualified soil technician to determine if minimum compaction requirements are being met and that materials meeting or exceeding the specification requirements are used.

11. In-place density tests shall be performed with a minimum of 1 test per 1,000 square feet of fill area for each lift of fill placed. The elevation and location of the tests should be clearly identified at the time of fill placement.

12. Granular soils (Unified Soil Classification SM or better) shall be compacted with smooth drum vibratory compaction equipment or rubber tire compactors.

13. Low plasticity soils (Unified Soil Classifications ML, SC) shall be compacted with a sheepsfoot roller.

14. Care shall be exercised regarding the use of relatively heavy machinery close to the wall. Lighter compaction equipment should be used close to the wall.

15. The fill area shall be graded at the end of each day to facilitate the positive drainage of surface water associated with precipitation away from it.

DEWATERING AND SITE DRAINAGE

1. The contractor shall provide sump pit and pumping operations as required for dewatering the retaining wall excavations.

2. The Contractor shall provide and maintain adequate site drainage during earthwork operations, including providing for drainage of surface water away from the construction areas.

3. All erosion and sedimentation control shall be controlled in accordance with sound engineering practice and current County requirements.

4. Drainage towards the retaining walls shall not be permitted.

5. Ponding of water behind the retaining walls shall not be permitted.

6. Temporary soil berms or other measures shall be constructed and maintained on a daily basis to prevent drainage towards the retaining walls and ponding of water behind the retaining walls at all times during construction of the walls and adjacent buildings.

< <End of Section> >

GENERAL CONSTRUCTION SEQUENCE
FOR
KEYSTONE SEGMENTAL BLOCK RETAINING WALLS REINFORCED WITH MIRAGRID GEOGRIDS

STEP 1 - EXCAVATION AND LEVELING PAD

A. WALL LAYOUT AND GENERAL EXCAVATION

1. Survey stake wall location and general excavation limits for wall construction.
2. Ensure the wall is along proper alignment, and within appropriate property boundaries, and construction easements.
3. Perform general excavation for wall.

B. LEVELING PAD CONSTRUCTION

1. Stake wall location for leveling pad excavation.
2. Excavate trench to create the minimum leveling pad thickness and to the minimum width shown.
3. Install drain pipe with positive gravity flow to outlet, if required, and as shown on the plans.
4. Place, level and compact leveling pad material for retaining wall units.
5. Place and compact aggregate blanket drain. Install geotextile as shown.

STEP 2 - INSTALLING FIRST COURSE OF BLOCK UNITS

A. SETTING FIRST COURSE OF BLOCK UNITS

1. Check leveling pad elevation and smooth leveling pad surface.
2. Stake and string line the wall location paying close attention to exact location of curves, corners, and vertical and horizontal steps. String line must be along the molded face (back) of the block unit, and not along the broken block finish surface.

3. Install first course of blocks, checking level as placed.

B. BACKFILLING FIRST COURSE OF BLOCK UNITS

1. Recheck wall location.
2. Use drainage aggregate to fill any openings in and between block units, as required.
3. Carefully place drainage aggregate behind and up to the height of the block unit to create wall face drain.
4. Place geotextile as shown.
5. Place and compact reinforced soil behind wall drain.
6. Place and compact fill soils in front of block unit.
7. Place and compact retained fill soils.
8. Compact drainage aggregate.

STEP 3 - PLACEMENT AND BACKFILLING OF BLOCK UNITS

A. INSTALLING SUCCESSIVE COURSES OF BLOCK UNITS

1. Ensure that drainage aggregate is level with, or slightly below top of block unit below.
2. Thoroughly clean debris and aggregate off of top of block units.
3. Install connecting shear pins.
4. Place next course of block and push units forward to engage shear pins and establish proper setback, consistent with setback shown on the details and in accordance with manufacturer's specifications.

B. FILL PLACEMENT AND COMPACTION

1. Use drainage aggregate to fill openings in and between block units as required.
2. Carefully place drainage aggregate behind and up to the height of the block unit to create wall face drain.
3. Place geotextile as shown.

4. Place and compact reinforced soil behind wall drain.

5. Place and compact retained fill soils.

6. Compact drainage aggregate.

STEP 4 - GEOGRID REINFORCEMENT INSTALLATION

A. PLACEMENT OF GEOGRID REINFORCEMENT

1. Ensure that drainage aggregate is level with, or slightly below top of block unit below.

2. Thoroughly clean debris and aggregate off of top of block units.

3. Install connecting shear pins.

4. Cut geogrid to design length shown on plans (GGL) and install with strength direction perpendicular to the wall face. Hook geogrid over protruding pins as shown on details provided.

5. Place next course of block on geogrid and push units forward to engage shear pins and establish proper setback, consistent with setback shown on the details and in accordance with manufacturer's specifications.

B. BACKFILLING OVER GEOGRID

1. Pull geogrid tight using uniform tension so that there are no wrinkles in the geogrid. Hold or stake in place to maintain tension throughout fill placement process.

2. Place drainage aggregate for wall face drain in and between block units as required.

3. Place geotextile as shown.

4. Place and compact reinforced fill soil behind wall drain, working from the wall back towards the free end of the geogrid.

5. Place and compact retained fill soils.

6. Compact drainage aggregate.

NOTE: CONTINUE CONSTRUCTION OF THE WALL TO FULL HEIGHT USING STEPS 3 AND 4

STEP 5 - CAPPING AND GRADING

1. Install cap/coping unit (optional) and secure in place per manufacturer's recommendations.

2. Place and compact final backfill

3. Finish grade for positive drainage away from the wall face.

4. Place topsoil and vegetate slopes above, below, and around wall terminations.

GENERAL NOTES:

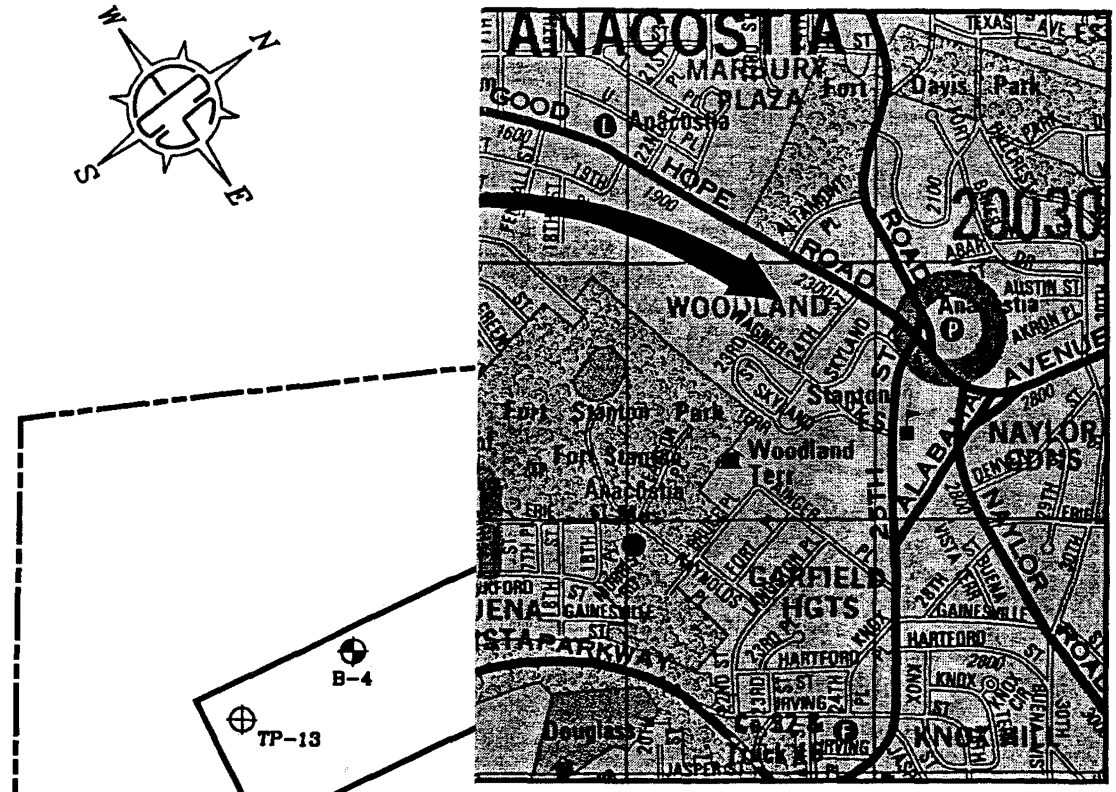
1. Alignment should be checked every other course, especially for straight walls.

2. Blocks, drainage aggregate, reinforced fill, and retained fill shall be brought up simultaneously. None of these items should lead another by more than one course height.

<<End of Section>>

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ECS LTD



VICINITY MAP

NTS

LEGEND:

- APPROX. BORING LOCATION (ECS)
- APPROX. TEST PIT LOCATION (WDP)

	BORING LOCATION DIAGRAM FORT STANTON					
	KSI SERVICES INC.					
ERING TING S,LTD	RAC	LJT	02-09-99	1"=80'	5349	1 OF 1

ENGINEERING CONSULTING SERVICES, LTD.
Geotechnical • Construction Materials • Environmental

February 3, 1999

Mr. Miles Haber
KSI Services, Inc.
8081 Wolftrap Road
Suite 300
Vienna, Virginia 22181

ECS Job No. 5349

Reference: Preliminary Report of Subsurface Exploration and Geotechnical Engineering Analysis, Fort Stanton Property, East Parcel, Southeast, Washington, D.C.

Dear Mr. Haber:

As requested, Engineering Consulting Services, Ltd. has completed the subsurface exploration and preliminary geotechnical engineering analysis for the above referenced project. This letter contains the results of our exploration, including boring logs and preliminary geotechnical engineering recommendations for use by you and the other design professionals in the planning of the development of the property. A final report will be completed as soon as the proposed site plan is available.

Background

A previous exploration of this site was performed by Whitlock Dalrymple Poston & Associates, Inc. (WDP). The WDP exploration consisted of excavating 13 test pits across the project site. The details of the exploration are provided in WDP, Inc. Geotechnical Feasibility Study dated November 20, 1998 (WDP Project No. 06-98106). The test pits encountered existing fills with significant amounts of construction debris. The debris caused shallow refusal of test pits at several locations, and the depth of the fill was not able to be determined.

Topographic plans of the site show that original ground surface elevations across the majority of the site were on the order of 20 to 40 feet below the now existing ground surface. The deepest fills are located in areas where natural drainage valleys previously existing. The purpose of this exploration was to confirm the fill depths and to determine the characteristics of the fill for consideration in foundation design and site improvements.

Proposed Construction

Based on the conceptual site plan provided to us, we understand that the project will consist of developing the site with approximately six garden style apartment buildings and associated improvements. These structures are expected to be two-story wood frame with slab-on-grade construction. At this time, no detailed information regarding structural loads were available.

Subsurface Exploration Procedures

A total of 12 soil borings were performed for this study to characterize the general subsurface conditions at the site. All borings were performed with an all-terrain vehicle (ATV) mounted drill rig utilizing continuous flight, hollow stem augers to advance the boreholes. The boring locations were selected and located in the field by Engineering Consulting Services, Ltd.

Representative soil samples were obtained by means of the split-barrel sampling procedures in accordance with ASTM Specifications D-1586. In the split-barrel sampling procedure, a 2-inch O.D., split-barrel sampler is driven into the soil a distance of 18 inches by means of a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler through a 12-inch interval is termed the Standard Penetration Test (SPT) value and is indicated for each sample on the boring logs. This value can be used to provide a qualitative indication of the in-place relative density of cohesionless soils. In a less reliable way, it also indicates the consistency of cohesive soils. This indication is qualitative, since many factors can significantly affect the SPT value and prevent a direct correlation between drill crews, drill rigs, drilling procedures, and hammer-rod-sampler assemblies.

A field log of the soils encountered in the borings was maintained by the drill crew. After recovery, each sample was removed from the sampler and visually classified. Representative portions of each sample were then sealed and brought to our laboratory for further visual examination and laboratory testing.

Laboratory Testing Program

Representative soil samples were selected and tested in our laboratory to check field classifications and to determine pertinent engineering properties. The laboratory testing program included visual classifications and moisture content tests. The laboratory tests were not complete for inclusion in this letter. Boring logs, boring locations and laboratory test results will be forwarded under separate cover.

Findings

Our exploration has confirmed that the subsurface conditions within the limits of the proposed development are consistent with those described in previous studies, and the historical topographic plans. Fill materials as deep as 40 feet were encountered in our borings within the limits of the proposed development. The fill material contained significant amounts of debris which caused auger refusal in certain borings. In borings where auger refusal was encountered, the borings were offset and reattempted.

The fill contained significant amounts of asphalt, concrete, brick, wood, steel, glass, paper and rubber. In general, fill materials with this type and amount of debris is considered unsuitable for use as structural fill. In addition, there is only very limited compaction test data available. The compaction data submitted by Cohen Engineers, dated November 14, 1986 do not provide depths of compaction tests. Only 25 compaction tests were taken on one day (October 7, 1986). Considering these facts, it is our opinion that the majority of the fill was placed in an uncontrolled manner and that the existing fills in their present state are unsuitable for direct support of conventional shallow foundations. Therefore, ground improvement will be required in order to develop the site using conventional spread footing foundation systems.

Analysis and Recommendations

Given the proposed development, two-story apartment buildings with related site improvements, and the existing subsurface conditions, it is our opinion that Deep Dynamic Compaction (DDC) will be the most effective method of ground improvement. Considering the large amount of fill, complete removal and replacement will not be an economic alternative. In addition, the large amount of debris will make deep foundations difficult and costly to construct.

DDC is a ground modification technique where loose fill materials can be densified in place. The technique consists of the repeated impacting of the soils by a heavy weight dropped from heights of up to 120 feet. The weight drops are performed in a preplanned grid pattern, the depth and degree of improvement being dependent on the tonnage of the weight, height of the fall and the degree of suitability of the soils being compacted.

Based on the depth and nature of the existing fill, we recommend that the heavy DDC consist of repeated drops of at least 15 ton weight, dropped from a height of at least 60 feet, over the extended building pad areas in a grid pattern. These pads are to be extended beyond the intended building limits, including any attached stoops, by a minimum of ten feet in all dimensions. It is important that the extended building pad is sufficiently large so that the building does not extend beyond the DDC improved pad, as significant differential settlements may occur. On a site such as this, the DDC can create craters as deep as 3 to 5 feet. The craters must be filled with select granular fill, which is then compacted with a lighter weight, in a process known as an "ironing

pass". The "ironing pass" in the building, pavement and utility areas should be an 8 ton weight dropped about 30 feet, in a regular overlapped pattern.

In areas where deepest existing fills are known to exist, we recommend undercutting the existing fills a minimum of 5 feet before DDC operations begin. 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.

Additional Studies

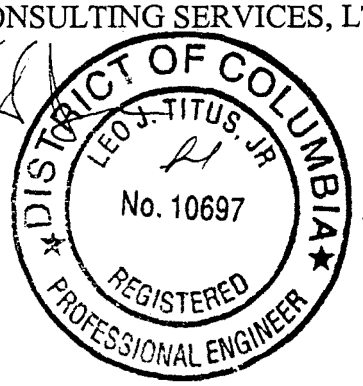
The primary purpose of this study was to evaluate the potential ground improvement methods for development of the site. Once the final building locations and proposed grading plan has been developed, we recommend that the final geotechnical report be completed including recommendations for DDC procedures, floor slab and pavement construction, and other construction considerations. In addition, we believe it is necessary that a comprehensive slope stability analysis will be required for the slope on the northwest side of the site. These additional studies may require additional borings or test pits to be performed within the proposed development and in the area of the proposed slope.

Closing

We appreciate having the opportunity to provide this service to you. If you have any questions with regard to the information and recommendations presented in this letter report, please do not hesitate to contact us.

Respectfully,

ENGINEERING CONSULTING SERVICES, LTD.



Leo J. Titus, Jr., P.E
Project Engineer

James W. Eckert, P.E.
Principal Engineer

LJT/tr:geotech/report/5349rse

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)	180	12
10	5	SS	18	18		175	10
15	6	SS	18	12	Clayey SAND, With Quartz Gravel, Tannish Brown, Moist, Medium Dense, (SC-FILL)	170	20
20	7	SS	12	10		165 ▽	50/6
25	8	SS	18	8	ASPHALT, Trace Sand and Clay, Black, Dry to Moist, Dense to Extremely Dense, (FILL)	▽	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 WD	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 (TD)	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

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION: 188.00

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

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

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	12	Fine Sandy CLAY, Trace Roots, Brown, Moist, Medium Stiff to Stiff, (CL-FILL)		185	8
	2	SS	18	10	Fine Sandy CLAY and ASPHALT, Trace Roots, Brown and Black, Moist, Medium Dense, (CL-FILL)			14
5	3	SS	18	12	Clayey Fine SAND, With Asphalt, Brown, Moist, Loose, (SC-FILL)		180	8
	4	SS	18	14		▽		7
10							175	
	5	SS	18	6	Sandy CLAY, With Gravel, Brown, Wet to Saturated, Stiff to Very Hard, (CH)			10
15							170	
	6	SS	0	0				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 ▽D	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

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 188.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS (▽)	ELEVATION (FT)
0							185
5							180
10							175
15							170
20							165
25	1	SS	18	18	Fine Sandy CLAY, Trace Gravel, Tannish Brown, Moist, Very Stiff to Very Hard, (CL)		160
30	2	SS	18	18			

⊗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 (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-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)			
	3	SS	18	16	CLAY, With Fine Sand, Trace Gravel, Tannish Brown, Moist, Hard, (CL)		155	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 (TD)	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 WD	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

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.
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 (WD)	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

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 200.00

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 ⓓ	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	WATER LEVELS (▽) 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)		20
	2	SS	18	18		195	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	
10	4	SS	18	12			11
	5	SS	18	14		185	12
15					CLAY, With Fine Sand, Trace Silt and Roots, Light Purplish Brown, Moist, Hard, (CL-Possible FILL)		
	6	SS	18	18		180	43
20							
	7	SS	18	14		175	29
25					Fine to Medium SAND, With Silt, Tannish Brown,		
	8	SS	11	8		170	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 ▽	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

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					ENGLISH UNITS			
					SURFACE ELEVATION 200.00			
					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+)

DESCRIPTION OF MATERIAL

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								

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 (WD)	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

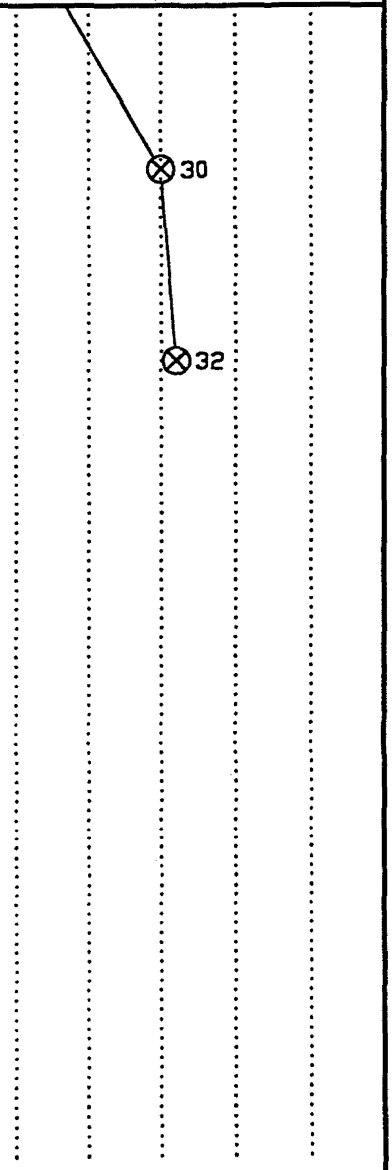
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
					ENGLISH UNITS
					SURFACE ELEVATION 186.00
30					Silty Fine SAND, Trace Clay, Brown to Tan, Moist, Loose to Medium Dense, (SM)
	9	SS	18	18	
35					CLAY, Trace Fine Sand, Purplish Brown, Moist, Hard, (CL)
	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 D	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

ENGLISH UNITS

SURFACE ELEVATION 188.00

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	Gravelly Silty CLAY, With Construction Debri, Brown and Black, Moist, Very Hard, (CL-FILL)		185	15
	2	SS	18	16				84
5	3	SS	18	12				22
					Fine to Medium Sandy SILT, Trace Gravel and Construction Debri, Brown, Moist, Medium Dense, (ML-FILL)		180	
	4	SS	18	10				16
10							175	
	5	SS	18	8				13
15							170	
	6	SS	18	14				14
20					CLAY, With Fine to Medium Sand, Trace Construction Debri, Brown and Gray, Moist, Stiff to Very Stiff, (CL-FILL)		165	
	7	SS	18	18				16
25							160	
	8	SS	18	7				13
30								

CONTINUED ON NEXT PAGE.

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

WL WS OR WD	BORING STARTED 01-18-99	
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 (▽)	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 (TD)	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

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						185	
5						180	
10						175	
15							
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 ▽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-8B	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)
					ENGLISH UNITS		
					SURFACE ELEVATION 190.00		
30					Fine SAND, With Silt, Yellowish Brown, Moist, Medium Dense, (SP-SM)		
	4	SS	18	18			155
35					Fine SAND, Trace Silt, Orangish Yellowish Brown, Saturated, Extremely Dense, (SP)	▽	
	5	SS	3	3			150
40					END OF BORING @ 40.0'		
45							145
50							140
55							135
60							

⊗ 29

⊗ 50/3

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

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)
30					CLAY, Trace Fine Sand, Purplish Brown, Moist, Hard to Very Hard, (CL)	170
35	9	SS	18	18		165
40	10	SS	18	18		▽ 160
45	11	SS	18	18		155
50	12	SS	18	0	END OF BORING @ 50.0'	150
55						145
60						

⊗ 50 (at 35)
⊗ 37 (at 40)
⊗ 54 (at 45)
⊗ 60 (at 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

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 204.00

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							185
20	1	SS	18	14	SILT, With Fine Sand and Construction Debri, Medium to Dark Brown, Moist, Medium Dense, (ML-FILL)		180
25	2	SS	18	18			175
30	3	SS	18	14			

⊗ 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 WD	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 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)
					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 ▽	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

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	12	Sandy SILT and CLAY, With Cobbles, Wood and Asphalt, Brown and Gray, Moist, Medium Dense to Dense, (ML/CL-FILL)		⊗ 10
	2	SS	18	14			⊗ 9
5	3	SS	14	12		185	⊗ 94/8
10					END OF BORING @ 8.5'	180	
15						175	
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-11	1 OF 2

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

SITE LOCATION: WASHINGTON D.C. SE

ENGLISH UNITS

SURFACE ELEVATION: 208.00

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					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			9
	3	SS	18	16		200	12
10	4	SS	18	16		195	20
15	5	SS	18	14		190	27
20	6	SS	18	14		185	19
25	7	SS	18	16	Sandy CLAY, With Cobbles, Brown, Moist to Wet, Dense, (CL)	180	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

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
					ENGLISH UNITS
					SURFACE ELEVATION 208.00
30					Sandy CLAY, With Cobbles, Brown, Moist to Wet, Dense, (CL)
					Fine to Coarse SAND, Brown, Moist to Wet, Medium Dense to Dense, (SM)
	8	SS	18	14	
35					
	9	SS	18	16	
40					END OF BORING @ 40.0'
45					
50					
55					
60					

WATER LEVELS (▽) ELEVATION (FT): 175, 170, 165, 160, 155, 150

STANDARD PENETRATION BLOWS/FT.: 33 at ELEVATION 175; 19 at ELEVATION 170

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-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	7	SS	18	16	Silty Fine to Medium SAND, Light Gray and Brown, Moist to Wet, Dense, (SM)		190	45
25	8	SS	18	18			185	38
30								

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

WL DRY WS OR WD	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

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)
30					Silty Fine to Medium SAND, Light Gray and Brown, Moist to Wet, Dense, (SM)	
	9	SS	12	12		
35						175
	10	SS	18	18		
40					END OF BORING @ 40.0'	170
45						165
50						160
55						155
60						

⊗ 50/6 at 35'; ⊗ 43 at 40'

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
20					END OF BORING @ 17.0'		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 (D)	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

JECT NAME	ARCHITECT-ENGINEER
ORT 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 204.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)
0	1	SS	18	8
	2	SS	18	6
5	3	SS	18	10
	4	SS	18	0
10	5	SS	18	14
15				
20				
25				
30				

Sandy SILT and CLAY, With Gravel, Brick and Asphalt, Brown, Gray and Red, Moist, Medium Stiff to Very Stiff, (ML/CL-FILL)

WATER LEVELS (▽) ELEVATION (FT)
200
195
190
185
180
175

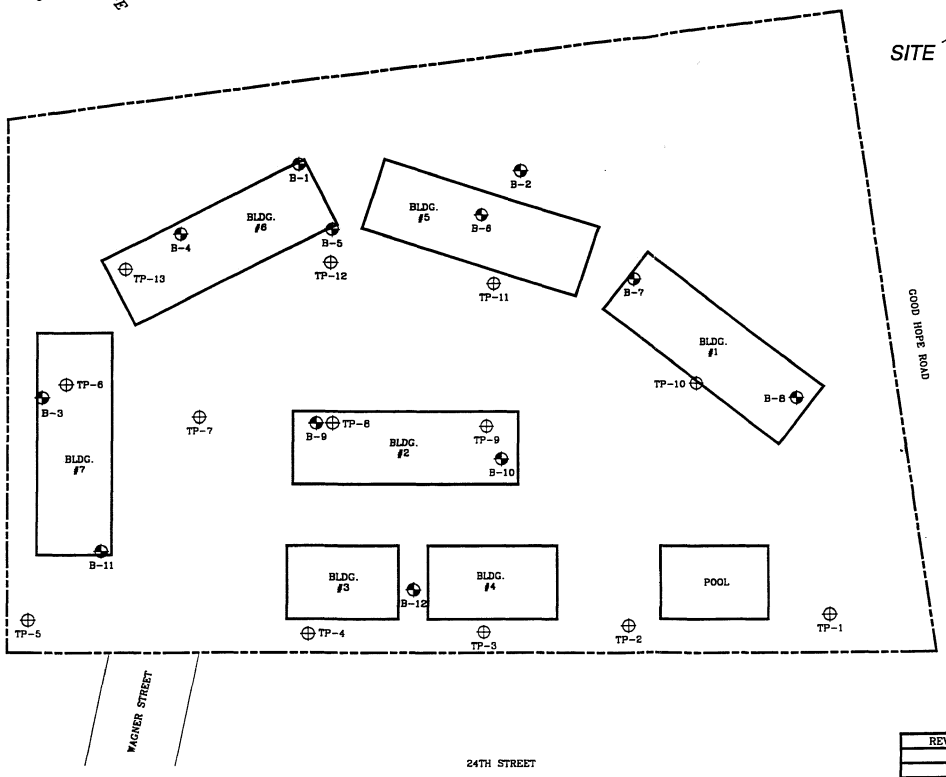
9 22 20 19 43

END OF BORING @ 18.5'

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

WL	WS OR ▽	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

ECS LTD





VICINITY MAP
NTS

LEGEND:
- APPROX. BORING LOCATION (ECS)
- APPROX. TEST PIT LOCATION (WDP)

REVISIONS	ECS LTD ENGINEERING CONSULTING SERVICES, LTD	BORING LOCATION DIAGRAM FORT STANTON KSI SERVICES INC.					
		RAC	LJT	02-09-99	1"=80'	5349	1 OF 1

KSI SERVICES, INC.

FACSIMILE TRANSMITTAL SHEET

TO:	FROM:
Ms. Thelma Jones	Sarah Davidson
COMPANY:	DATE:
Fairlawn Civic Association	02/28/00
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER:
202-678-2420	

Dear Ms. Jones:

I look forward to meeting with the Fairlawn Civic Association next Tuesday (March 7) at 6:30pm at the public library to discuss and answer questions that residents of Fairlawn raised at the BZA hearing last week.. I wonder if you would allow me to bring some of KSI's design, geotechnical and environmental consultants to this meeting in order to provide the fullest and most accurate responses to your questions as possible. In the meantime, I will be submitting some written materials that directly address the geotechnical and environmental questions that you have raised..

I will call you on Thursday of this week to confirm our March 7th meeting, to elicit any other questions you would like to see us address on the 7th, and to give you a list of the consultants we would like to bring to your meeting.

We appreciate the opportunity to come before Fairlawn residents again.

Please call me at 703-205-5553 if you have any questions or if I can be of any assistance to you.

Sincerely,

Sarah Davidson
Development Manager
KSI Service, Inc.

8081 WOLFTRAP ROAD,SUITE 300
VIENNA, VIRGINIA 22182-5100
(703)641-9000
FAX (703)641-5351

KSI
SERVICES INC.

February 17, 2000

Ms. Thelma Jones
President
Fairlawn Civic Association
2217 T Place, SE
Washington, DC 20020

Dear Ms. Jones:

Thank you for agreeing to give KSI Services, Inc. the opportunity to meet with your organization on March 7th to discuss and try to address your remaining concerns about the proposed Homes at Woodmont. However, based on some of the issues that you raised at the BZA hearing on February 16th, we wonder if there might be an opportunity to meet with you and other Fairlawn representatives in advance of March 7th and even in advance of the February 23rd continuation of the BZA hearing. Dick Knapp will be calling you to try to set up such a meeting.

We would like to reiterate that we are committed to working with Fairlawn and the surrounding community. We believe that the Homes at Woodmont Committee that has been established by ANC 6C, ANC 8B and the Frederick Douglass Community Improvement Council, will be a good formal forum for KSI's continued work and discussion with the community, and we encourage members of Fairlawn to attend these meetings. Mr. Gray of the Frederick Douglass Community Improvement Council will be contacting you regarding future meetings of the Committee.

In the meantime, please call me if you have any outstanding questions about the proposed development you or KSI.

Thank you for your time.

Sincerely,

Sarah Davidson
Development Manager

FAIRLAWN CITIZENS ASSOCIATION, INC.

2217 T Place, S.E. - Washington, D.C. 20020

February 28, 2000

Ms. Sarah Davidson
Development Manager
KSI Services, Inc.
8087 Wolf Trap Road, Suite
Vienna, VA 22182

Dear Ms. Davidson:

This letter is to acknowledge receipt of your letter by fax on today regarding your attendance at our Executive Committee Meeting. The meeting which you will be attending on March 7, is not a meeting of the full Fairlawn Citizens Association. The Executive Committee is comprised of only the officers of the Association. The full Association meeting will be held on March 21, 2000.

I am looking forward to receiving the material which the Board of Zoning Adjustment Chairperson instructed you to send for our review before the meeting on March 7 at 6:30 PM.

Sincerely,

Thelma E. Jones

Thelma E. Jones
President

DISTRICT OF COLUMBIA
OFFICE OF ZONING
'00 MAR 20 P4:26

FAIRLAWN CITIZENS ASSOCIATION, INC.

2217 T Place, S.E. - Washington, D.C. 20020

March 13, 2000

Ms. Sarah Davidson
Development Manager
KSI Services, Inc.
8081 Wolftrap Road, Suite 300
Vienna, VA 22182

Dear Ms. Davidson:

After carefully reading your letter dated March 9, 2000, and speaking with you on the telephone that evening, I advised you that your letter included things that were not discussed at our meeting on Tuesday, March 7, 2000. Copies of your letter was shared with the attendees of the March 7, 2000, meeting.

Mr. Howard Terry specifically asked to be provided with a summary of the Fairlawn meeting. I pointed out to you that Ms. Diane Fleming's concerns were regarding selling the apartments as condominiums and if the apartments were going to be rented to Section 8 tenants. Mr. Knapp's response was yes. He went into detail about the economics of the profit KSI couldn't make if they sold them as condominiums at the finish of construction. Evidently you missed that part of the discussion when you left the room to talk to Ms. Rosalyn Styles. I thought it would have been included after you called back later and said corrections had to be made to the second page.

There was participation other than myself which you didn't address. A great deal of discussion was held on the subject of architecture layout on Page 3 -- water drainage and you breaking the ice to get water samples. Mr. Burnice Kearney and Mr. Wendell Wallace were very concerned about taking soil and water samples while the soil and water were frozen. We asked who you had hired from the community and Mr. Knapp's response was 2 people. But we have been told about an additional person being hired. Your traffic engineer is still trying to convince us with his traffic statistics from the 1990 Census Report. Fairlawn members updated your traffic engineer's statistics and informed him of the great increase in traffic from side streets leading into Good Hope Road. I am sure that you know from the input from the Executive Board that we want home ownership from the apartments as condominiums at the completion of construction and that the houses be completed at the same time.

Thanks for informing me in your letter that the updated Phase I Environmental Report will be submitted to the Board of Zoning Adjustment. As you know, you also provided us with the other environmental reports which you had: ECS Job No. 5349 dated February 3, 1999; ECS Job No. 5349

dated April 19, 1999, from the Engineering Consulting Services LTD; also the February 16, 2000, Blueridge Environmental, Inc., letter to Mr. Doug Surges of KSI.

As you know, the reports were given to us on Friday at dusk dark which made it difficult for me to have copies made and distributed to the Executive Board. All in all, thanks for attending our meeting and hearing our concerns.

Sincerely,

Thelma E. Jones
President

Feb 23, 2000 Hearing on Traffic

My Name is Richard Kilgore
1930 T St S.E. PSA 609 Ward 6

My family and I have live in the Area over 30 ~~decades~~ years

I have work in and with Fairlawn Citizens Association over 20 years

A realistic rebuttal to Mr. Elton George, 1738 Elton Road, Silver Spring, Md. Montgomery County KSE's Traffic Expert Representative

I am in the relevant location Approximately 7 Days per Week and I firmly believe the very best observation of the congestion Problems are the residence who live, drive and WALK the Area bounded by Good Hope Road, S.E. between 23rd St. S.E. to the east, and 18th St S.E. to the west.

Lets deal with Daily facts from the horses mouth Not Periodical Visitors from KSI's Traffic Experts or other Infrequent Visitors

Takes ~~30~~ 15 ~~45~~ 30 Minutes just to get out of your Street Now during morning rush hour and evening Rush Hours

Present Congestion And Traffic

1. Sr. Citizens Bldg. - 25th Good Hope Rd Sr.
2. Barber Shop 25th Good Hope Rd "
3. Cleaners / Shoe Shop - " " " " "
4. Carry Out Shops
5. Dental Office
6. Beauty Shop
7. Skyland Liquor CVS Drug Store
8. Burger King MacDonalds Kentucky Fried Chicken Pop Eyes
9. Rec Training Center
10. 2 Gasoline Stations
11. Murphy's Body Shop Old AC Chrysler Dealer
12. Ancestral Library 18th Good Hope - Many children
13. Mason Funeral Home 17th Good Hope Very Busy
14. Laundry Mat

Apartment Bldg.

1. Marbury Plaza
2. Skyline Apartments
3. Wagner Street Apts

Metro Traffic

1. 32 Friendship Gts
2. V-5 Fairfax Village
3. 90 Bus Annandale
4. 92 Garfield
5. B-2 Annandale Sta.
6. Duke Ellington
7. McClaine Garden
8. Handicapped Vans and Buses

Schools Day Cares

1. Stanton ES
2. Ketchum ES
3. Ambassador Gants
4. Outreach Center
5. Annandale Bible School

Auto speeding is not control satisfactorily

For Example:

IF you travel down Good Hope on Nayton Rd from the Good Hope Market Place your car will reach 45 MPH in A 25 MPH speed limit before you reach Traffic Light turning into Mathony Plaza 2300 Good Hope Rd.

I believe the DC Traffic Regulation states that 20 MPH over the speed limit is regarded as ~~Careless~~ Reckless Driving 5 points and Drivers license suspension.

The Traffic Safety Factor just to cross Good Hope Rd for Senior Citizens and others

25 MPH = Approx 60 ft for complete Stop

5,280 ft = 1 Mile on land
60 MPH = 88 ft per second
30 MPH = 44 Ft per second
15 MPH = 22 ft per second
~~5,280~~ 63,360" in 1 Mile

A car going 30 MPH child or Sr. Yr sec to look Yr sec. to react the person will be hit before the next intersection

8 out of 10 or 80% Out of State Drivers.

Parking Parking

AM Rush Hour 7 - 9:30 AM
PM Rush Hour 4 - 6:30 PM

1 MP Dept Tow Truck for Service

176 Luxury garden Apartments

176 x 3 Cars 528 Cars Apts

33 x 3 Cars 99 Cars Homes

527

375 Parking Spaces 375

152 Cars in Gateway Carts

Please Don't Forget the junked cars illegally parked cars burned cars paper Tag Cars etc.

We don't Need Additional Apartments because there are too many vacant and boarded up Apartments in the Immediate New Construction K St Area.

Single Family Homes is the Answer to prevent Additional traffic congestion and Safety for the Stokes Community.

Mr. Richard E. Kilgore
1430 T St. SE
Washington, DC 20020-5651

(6)

17,000 Vehicles Per ~~Hour~~ DAY

17,000 X 365 = 6.2 Million Per Year

2080 ÷ 6.2 Million = Approx 3,000 Per Hour

~~1.25 Sec - 3.45 Minutes~~
1.25 Minutes - 3.45 Minutes Traffic Light Time

30 MPH = Approx 44 ft/Seconds

In summation I recommend that Application No. 16457 be denied!!

Time Factor
KSL = 60 Min Mr Dobbins

March 8th Feb 23rd Afternoon
1:00 PM

Howard L. Terry, Sr.
1932 Good Hope Road SE
Washington, D.C. 20020-4602
(202) 889-9612

March 20, 2000

Board of Zoning Adjustment

Subject: Case # 16457

Madam Chairman and Distinguished Panel:

The Fairlawn Citizens Association, met with the KSI Development team Tuesday, March 7, 2000 at the Anacostia Library. My most specific concerns about the project in the Geo-technical area were not answered to my satisfaction.

Geotechnical Concerns

1. KSI exhibit F-4 the Geotechnical Feasibility Study by **WHITLOCK DALRYMPLE POSTON & ASSOCIATES, INC (WDP)** Project No. **06-98106** dated November 20, 1998, the last ln. 1st para. of pg. 3 stipulates, ***"Some slight to moderate organic odors were detected during test pit explorations at random locations/elevations."*** It is significant to note that these findings have never surfaced in any subsequent testing. Please focus on these two words, "***random locations***." None of these reports give the locations or the sources of these odors. The developers have also failed to provide answers.

This uninterrupted, untended and uncontrolled land-fill is subject to contain organic matter and consequently, the odor even now. Therefore, I believe with those unknowns still looming over this property. ***It has the potential to open up a health hazard to the residents of this community.*** I further believe that the subsequent studies were short sighted and failed to follow-up on the initial test pit drilling.

2. **ENGINEERING CONSULTING SERVICES LTD. (ECS)** Job. No. **5349** dated **February 3, 1999** pg. 2 1st para. stipulates, "***six garden styled two-story wood frame...***" The 4th para. emphasizes Direct Density Compaction (DDC) as a means to correct the soil for building those apartments. Spread footings for a net soil bearing pressure of 2000 psf., width and other dimensions were also given. Later specifications have changed these buildings to four-story. KSI has not made it clear with Fairlawn whether or not the altered building heights would affect the 2000 psf and the given dimensions of the footings.

3. **ECS** Job No. **5349** on pg. 3 paras. 3 and 4 speak about isolated areas of perched water. This is a primary concern to single family residents on Good Hope Road because of recent overflow of underground streams. It is my understanding that the Developer intends to work with the Department of Public Works on this matter. In the middle of Good Hope Road between Marbury Plaza is still one such site. This underground seepage under the main roadway should be prepared before any development is planned before attempting to further overload an ailing drainage system.

Traffic Study

1. I disagree with the O. R. George traffic study for the following reasons:
   a. The initial report used outdated data.
   b. The sampling period for an overall traffic summary is tainted. (It skips years 1995/1997 which breaks continuity).
   c. They reflect a street on their map which doesn't exist across GHR (19TH Street).
   d. Statistics provided for 19th Place appears skewed because residential homeowners experienced more than two accidents to their vehicles while parked during 1995.
2. KSI** has offered to provide Metro transit passes to Prime Resident for five years as an inducement to keep him/her off the roadway. (Metro @ $10 weekly x 52 wks. x 176 tenants x 5 years = $525,200).
3. KSI** proposes to redesign the houses at an expense of $10k each for a total of $260k.

CONCLUSION

As a concerned member of the Fairlawn Citizens Association who participates in most of its functions maintain my opposition to the KSI Woodmont Development because of the following:

1. I do not believe that this ***uncontrolled land-fill*** of about ***ten years*** has been properly maintained or settled sufficiently to support apartment buildings.
2. My experiences of twenty-seven years on GHR have convinced me that more serious study needs to be done on our underground aqueducts before permitting additional strain on the current ones.
3. KSI or any future developer should be aggressive enough to find and address the ***organic odor*** situation.
4. I am not fully convinced that KSI** will not devise another mechanism to either raise the price of the single family dwelling, or increase the rental fee on the apartments to offset and recover that ***$785,200***.
5. I believe that this area should have more ***Single Family Houses*** as opposed to Apartment Buildings. (Statics will show that single family communities are more stable, provide a greater tax base to their local governments, and have less crime).

I therefore request that this application for development be denied at this time until this property has a chance to do more settling and more complete studies can be done by a prospective developer.

Respectfully submitted,

Howard L. Terry
Fairlawn Citizen's Association

(**) Denotes linking concerns

DISTRICT OF COLUMBIA BOARD OF EDUCATION

BENJAMIN BONHAM
WARD 6 REPRESENTATIVE
825 NORTH CAPITOL ST., NE
WASHINGTON, D.C. 20002
(202) 442-4289, FAX 442-5198

March 20, 2000

Sheila Cross Reid
Chairperson
Board of Zoning Adjustments
Suite # 210
441 4th Street, NW
Washington, DC 20001

'00 MAR 20 P4:25

Re: BZA Application No. 16457
The Homes at Woodmont, Post-Hearing Submission

Dear Ms. Reid:

This is to address the March 13, 2000 letter Wilkes, Artis, Hedrick & Lane, Attorneys at Law sent you. One would think from reading the letter that an agreement has been reached and all parties are aware and agree with the resolution. This is far from the true!

On February 25, 2000, at 9:30am Sarah Davidson and I had a scheduled an appointment to meet and she never showed or gave me the common courtesy of a call to say she would not be there. A week later she called to schedule another appointment. We finally met on March 6, 2000 at 10:00am.

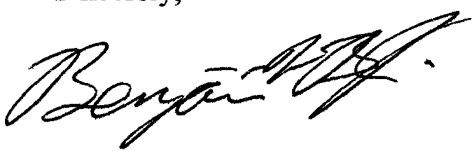
The letter reference information regarding ward 6 schools but not the information Sarah Davidson and I discussed. Ms. Davidson was to schedule an appointment for us with the principals at Ketcham Elementary, Kramer Middle and Anacostia Senior High Schools to identfy the actual needs of each school. That way KSI developer can determine if they are still willing to help the schools in ward 6. This has not happened and there is no indication that this is going to happen after reading the Memorandum of understanding agreed to with William Lockridge the ward 8 representative on the Board of Education.

As I mention at the hearing, there are only 16 schools targeted for special assistance of the 150 in our school system. Ketcham and Kramer are two of them. I also mentioned that arbitrary programs at schools are not necessarily effective. But programs that can show measurable outcomes do. The Memorandum of Understanding shows a substantial amount of money to be invested by KSI. However, the money could every well be wasted without a clearly identified plan to address each schools need.

Please don't be mislead by KSI's letter. KSI and I have not yet had a good faith meeting to resolve the issues regarding the schools in ward 6. KSI never informed me that it had

a Memorandum of Understanding with Mr. Lockridge regarding a ward 6 school. KSI has yet to schedule an appointment to meet with the ward 6 principals as promised. I found out about KSI's letter and Memorandum of Understanding only because Mrs. Thelma Jones faxed me a copy over the weekend.
Giving the circumstances, I currently have no confidence in KSI. KSI has not been working in good faith with me. If this is an indication of how KSI will work with the community it is unacceptable. I continue to oppose the building of multi-family home by KSI.

Sincerely,



Benjamin W. Bonham, Jr.
Ward 6 Representative

Fairlawn Citizens Assn

Board Mtg. - Tues. 3-7-2000, 6PM

Anacostia Library

		Name	Address	Phone
	1	Thelma E. Jones	2217-T Place SE	678-8194
	2	EVELYN COOK	2216 Good Hope Rd	889-6085
	3	Burnice T. Kearney	1911 T. Pl. SE 20020	889-0035
	4	Richard E. Kilgore	1430 T ST SE.	678-365-
	5	Velma Brown		
	6	Diane Flemings	2224 R ST. SE	
	7	PATNEAL	1434 T ST SE	
	8	Elaine Murchison	P.O. BOX 90147, DC 20090	526-2569
	9	Pauline Chaney	1339 "S" St; S.E.	678-5618
INVITED GUEST	10	Hattie R. Thomas	2405 Good Hope Rd #1404 S.E	
	11	Wendell W. Wallace	1934 - Good Hope Rd SE	
KSI	12	RICK HAUSLER	KSI	703 641-9000
KSI	13	Cullen Elros	D.K. George & Assoc.	301 439-7722
KSI	14	KYLE U. OLIVER	VIKA INC 8180 GREENSBORO DR. MCLEAN VA	703 442-7800
KSI	15	RICHARD KNAPP	KSI	703-641-9000
KSI	16	GENE EDGECOMBE	VMS	202-714-0086
	17	Howard L. Terry	1932 Good Hope Rd. S.E.	202-889-4612
	18	Mary Wells	1822 18th St SE	202 889 9258
	19	Velma D. Thomas	1820 - 18th St SE	202/678-3206
KSI	20	Sarah Davidson	KS	(703) 205-553
	21			
	22			
	23			
	24			
	25			

Cecilia E. Westray
2321 Altamont Place, SE, #101
Washington, DC 20020-4151

February 22, 2000

Sheila Cross Reid
Chairperson
Board of Zoning Adjustments
Suite 210
441 4th Street, NW
Washington, DC 20001

'00 FEB 24 A10:41

Re: KASS MA, L.L.C., KSI, Inc.
BZA Application No.: 16457: Letter of Disapproval

Dear Ms. Reid:

Altamont Manor Condominium Association was contacted by KSI Services, Inc. to discuss *The Homes at Woodmont*, a luxury housing community in our neighborhood.

The co-owners of Altamont Manor Condominium Association met to review KSI's proposal to develop the two parcels of land fronted on Good Hope Road, SE (across from Marbury Plaza Apartments). At the meeting, KSI responded to questions by the co-owners.

After the meeting, we participated in a tour of KSI properties to view the housing types being proposed at the site. We visited an apartment complex in Virginia owned and managed by KSI and similar single-family homes in Northeast Washington.

At our Board meeting on February 17, 2000, we made a conscientious decision regarding the KSI development of *The Homes at Woodmont* and voted our disapproval with the project.

Although we are excited about continued growth of our neighborhood east of the Anacostia River, we cannot support an exclusive community that does not afford housing for ALL citizens. Ward 8 (including Altamont Manor Condominium) is home to citizens with wide-ranging incomes yet only those in the middle to high income bracket would be welcome in The Homes of Woodmont.

The addition of 33 single-family homes to this neighborhood could be an added benefit to the long-term stability of the area and should also help to spur economic development east of the Anacostia River, specifically in Historic Anacostia but I don't feel that the rebirth of Anacostia should exclude those who have lived here for years.

BZA
Case No. 16457
Exhibit No. 127

I would suggest that ***The Homes of Woodmont*** take a look at the recent ***Habitat for Humanity*** development in the neighborhood to learn how people from all incomes can benefit from economic development.

Sincerely,

Cecilia E. Westray
Co-President, Altamont Manor
Condominium Association
202-583-4746 (home)
202-606-3672 (work)

cc: KSI Services, Inc.
Rosalind Wheeler Styles, Capitol City Associates, Inc.

FAIRLAWN CITIZENS ASSOCIATION, INC.

2217 T Place, S.E. - Washington, D.C. 20020

February 11, 2000

'00 MAR 20 P4:26

Ms. Ellen McCarthy
Director of Review
Office of Planning
801 North Capitol Street, NW, 4th floor
Washington, D.C. 20002

RE: KSI Reopening of Application 16457

Dear Ms. McCarthy:

I am writing this letter to you as a Party representing the Fairlawn Citizens Association to the above mentioned application to be heard by the Board of Zoning Adjustment (BZA) of Wednesday, February 16, 2000. We the citizens of the Fairlawn community who live in close proximity to this development adamantly oppose the development of anymore apartments being built in South East Washington. We have too many abandoned, boarded up and half-empty multi-family dwellings that could and should be renovated.

The Ward Eight Plan, Title 10 (Chapter 19), August 1995, developed under Mayor Marion Barry and Mayor Sharon Pratt Kelly, encourages renovation of existing buildings and single family houses for home ownership. Also, Mayor Anthony Williams is asking for development of single family houses and home ownership to stabilize communities.

Because of our lack of trust in Mr. Richard Knapp, the developer of this project, we recommend that the following be included in your report to BZA: (1) that the Certificate of Occupancy for the apartment buildings be linked to the completion of the single family homes and the two should be completed for occupancy at the same time; (2) that all structures be compatible to the existing structures already in the community with no aluminum siding; and (3) that the fronts of all of the homes to built on the main thoroughfare face the homes directly across the street on Good Hope Road.

We appreciate your consideration in granting us our requests. Thank you.

Sincerely yours,
Thelma E. Jones
Thelma E. Jones
President

Patricia S. Jones
Corresponding Secretary

FAIRLAWN EXHIBIT (6)

ENGINEERING CONSULTING SERVICES, LTD.
Geotechnical • Construction Materials • Environmental

March 10, 2000

Ms. Thelma Jones, President
Fairlawn Civic Association
2217 T Place, S.E.
Washington, D.C. 20030

'00 MAR 20 P 2:28
OFFICE OF ZONING
DISTRICT OF COLUMBIA

ECS Job No. 5349-C

Reference: Discussion of Subsurface Exploration and Geotechnical Engineering Analysis, Homes of Woodmont, East Parcel, Southeast, Washington, D.C.

Dear Ms. Jones:

At the request of Ms. Sarah Davidson of KSI Services, I am writing to discuss the scope of subsurface exploration and geotechnical studies which Engineering Consulting Services, Ltd. has undertaken at the project site. We have performed two cycles of onsight subsurface investigations at the site. The first was to determine the general site conditions, the depth and nature of the fills placed previously on the site, and to allow for preliminary recommendations as to the constructability of the site. The second was to investigate the natural soils that exist below the old fills in the slope areas, and to establish the design parameters for slopes in the natural soils, the old fills, and the extent of debris in the fills. We believe that we have a good understanding of the on site subsurface conditions, and have shaped our recommendations based on that knowledge.

Background

As you are, aware the site was used by WMATA as a repository for construction related fill materials, reportedly placed there in the early 1980's. These materials have been found to consist of silty clayey SANDS (SM/SC), sandy to silty CLAYS (CL), and sandy SILTS (ML), with varying amounts of cobbles, brick, wood, concrete, asphalt pavement, and other construction related debris. Topographic plans of the site show that original ground surface elevations across the site were as much as 40 feet below the now existing ground surface. The deepest fills are located in areas where natural drainage valleys previously existed. Both the original topography of the site and the WMATA fill are steeply sloping, and the old fill has washed downslope onto the Fort Staunton Park. Thus the site presents some particular problems to be addressed in the geotechnical recommendations, and we have addressed each of them.

ECS Subsurface Exploration

A total of 12 soil borings were performed for our first study, and 8 soil borings for the second. In addition we observed test pits excavated in the fills during both studies. The soil borings in the second study were located along the proposed retaining wall alignment, for use in designing the slope stabilization. All borings were performed with an all-terrain vehicle (ATV) mounted drill rig utilizing continuous flight, hollow stem augers to advance the boreholes.

The earliest geotechnical exploration of the site was performed by Whitlock Dalrymple Poston & Associates, Inc., and consisted of excavating 13 test pits across the project site. Their test pits encountered existing fills with significant amounts of construction debris. The debris caused shallow refusal of test pits at several locations, and the depth of the fill was not able to be determined. Our borings were much more successful in penetrating the debris, the fill and reaching the underlying soils.

Representative soil samples were obtained in all borings by means of the split-barrel sampling procedures in accordance with ASTM Specifications D-1586. In the split-barrel sampling procedure, a 2-inch O.D., split-barrel sampler is driven into the soil a distance of 18 inches by means of a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler through a 12-inch interval is termed the Standard Penetration Test (SPT) value and is indicated for each sample on the boring logs. This value can be used to provide a qualitative indication of the in-place relative density of the soils.

A field log of the soils encountered in the borings was maintained by the drill crew. After recovery, each sample was removed from the sampler and visually classified. Representative portions of each sample were then sealed and brought to our laboratory for further visual examination and laboratory testing.

Laboratory Testing Program

Representative soil samples were selected and tested in our laboratory to check field classifications and to determine pertinent engineering properties. The laboratory testing program included visual classifications, moisture contents of soils, Atterberg limits, gradation analyses, and Direct Shear Tests, Residual Parameters. The laboratory test results were used in the formulation of final geotechnical recommendations.

Analysis and Recommendations

Our exploration has confirmed that the subsurface conditions within the limits of the proposed development are consistent with those described in previous studies, and the historical topographic plans. Fill materials as deep as 40 feet were encountered in our borings within the limits of the proposed development. The fill material contained significant amounts of

construction related debris which caused auger refusal in certain borings. In borings where auger refusal was encountered, the borings were offset and reattempted. The debris in the fill consisted of significant amounts of asphalt, concrete, brick, wood, bar steel, etc., spread through much of the fill volume.

In general, fill materials with this type and amount of debris require either replacement or improvement prior to the construction of any buildings on them, or the buildings need to be on a deep foundation system. Also, it is evident that the fill was placed in an uncontrolled manner and that the existing fills in their present state are unsuitable for direct support of conventional shallow foundations without prior improvement. Considering the large amount of fill, complete removal and replacement will not be an economic alternative. In addition, the large amount of debris will make deep foundations difficult and costly to construct. Therefore, the conclusion of our studies was that the old fill soils, with debris, would need to be improved, and that the improvement could best be accomplished with Deep Dynamic Compaction (DDC), in conjunction with the site regrading.

Given the proposed development, with three and four-story apartment buildings along the top of the hillside, with related site improvements, including the retaining walls and slope reinforcement, Deep Dynamic Compaction (DDC) will be the most effective method of ground improvement. DDC is a ground modification technique where loose fill materials can be densified in place by the impact of a heavy weight dropped from a crane. The weight drops are performed in a preplanned grid pattern, the depth and degree of improvement being dependent on the tonnage of the weight, height of the fall and the degree of suitability of the soils being compacted. The vibration from the drops can and will controlled to avoid any off site impacts.

The areas to receive the dynamic compaction will include the enlarged building pads, the alignment of the retaining walls, and a lighter compaction under the on site roadways that are on fills. The size, shape of the weight, and the height of it's drop will be adjusted to reach and densify the effective bottom of the fill, which is up to 40 feet below present grade. On a site such as this, the DDC can create craters as deep as 3 to 5 feet, and the craters must be filled with select granular fill, which is then compacted with a lighter weight, in a process known as an "ironing pass". The "ironing pass" in the building, pavement and utility areas is a lighter weight dropped from less height to tighten the ground surface.

The practice of Deep Dynamic Compaction (DDC) is well proven over several years, and we have participated in similar projects in the area. Once a dynamic compaction contractor is selected by the owner, the contractor's proposed compaction and filling plan will be submitted to ECS, Ltd. for review and acceptance. The dynamic compaction will be observed by an ECS Field Engineer, under the oversight of the undersigned Senior Principal Engineer.

Deep Dynamic Compaction has been performed on more than 60 projects in the greater Washington, D.C. area, and ECS has participated in about a quarter of them. While the method is used for other applications, several of these have been rubble fill sites such as the one in question. Two in particular, the Autumn Chase site in Fairfax County, and the Brentwood Center

in NE were very similar rubble fill sites. Another project in DC was the Washington Post Print Facility, which was an old uncontrolled fill site.

Closing

We come to this project with a considerable amount of experience with old fill sites, dynamic compaction, and slope reinforcement systems. All of these approaches are well within the normal practice of Geotechnical Engineering, and do not represent an extreme or radical approach. We are confident that with good design, and proper care and observation during construction the structures erected will perform satisfactorily, and provide long lived solutions to construction on a difficult site.

Respectfully,
ENGINEERING CONSULTING SERVICES, LTD.

James W. Eckert, P.E.
Senior Principal Engineer

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