



United States Department of the Interior

NATIONAL PARK SERVICE

National Capital Region

1100 Ohio Drive, S.W.

Washington, D.C. 20242

IN REPLY REFER TO:

L30 (NCR-LRP)

MAY 19 2005

By Hand

Gerrily Kress
Director
District of Columbia Office of Zoning
441 4th Street, N.W. Suite 210 South
Washington, D.C. 20001

RECEIVED
D.C. OFFICE OF ZONING
2005 MAY 19 PM 3:27

Re: *BZA Appeal No. 17285*

Dear Ms. Kress:

Enclosed for filing and inclusion is a supplemental brief of the National Park Service in the above referenced Appeal, and for distribution to the members of the Board of Zoning Adjustment, are an original and twenty copies which we are submitting as requested by the Board on May 10, 2005.

Sincerely,

David J. Murphy
Park Ranger, Adjacent Lands Liaison
Lands, Resources and Planning

Enclosures

cc w/ enclosures (by hand):

Richard L. Aguglia, Esq., Hunton & Williams

Alma Gates, ANC

David Murphy, U.S. Park Service

Jeffrey Bernstein, U.S. Dept. of Interior

Lisa Bell, DCRA

Patrick J. Carome, Esq., Wilmer Cutler Pickering

Hale and Dorr LLP

BZA

Case No. 17285

Exhibit No. 81



Board of Zoning Adjustment
District of Columbia
CASE NO. 17285
EXHIBIT NO. 81

**BEFORE THE BOARD OF ZONING ADJUSTMENT
OF THE DISTRICT OF COLUMBIA**

Appeal of Patrick J. Carome

of Building Permit
No. B460927

4825 Dexter Terrace, NW
Frank & Dina Economides, Owners

BZA Appeal No. 17285

Hearing Date: March 1, 2005

AFFADAVIT OF JOSEPH S. KISH

I, Joseph S. Kish, being duly sworn, depose and say:

1. My named is Joseph S. Kish. I am an employee of the Department of the Interior, National Park Service, National Capitol Region. I am a Resource Management Specialist of Rock Creek Park, Washington, D.C. I reside in Arlington, Virginia.

2. I hold a Bachelor of Science Degree in Wildlife Management from The Ohio State University.

3. Among my duties as a Resource Management Specialist, I have the responsibility to inspect the park wide boundaries of the parks administered by Rock Creek Park (approximately 71 miles) on foot at least once each year to detect encroachments, other environmental threats, and compliance concerns. Researching property records, maintaining park data and files, installing Carsonite at monuments, and providing boundary assistance to others are performed as needed throughout the year. I identify activities that do, or could, cause harm to the natural or cultural resources and report such incidences to my supervisors.

4. On a couple of occasions during the summer of 2002, I showed and explained to Mr. Economides and his contractors the iron pipes which are the property corners of his property and are also on the property line of the National park Service. The iron pipes marking the limits of the respective ownerships and the Carsonite markers that are witness posts indicating the proximity of the property corners were also pointed out.

5. In mid July of 2004, I became aware of a silt deposit in the park, and found that it came from 4225 Dexter Terrace. I notified the individual identified as the job site supervisor of the situation and stated that the silt needed to be removed and the silt fences needed to be fixed and maintained. A letter dated August 6, 2004 was sent to the homeowner with the same notification. At that time there was no evidence of a masonry structure being constructed.

6. Towards the end of July, 2004, I became aware of a "divergence agreement" that had been entered with the owner of 4225 Dexter Terrace. At that time, I did not see indication that construction was going to take place where the masonry structure is currently located. At that time, I did not see or have reason to be aware of any subsurface construction relating to the masonry structure. I was relying upon my understanding of the divergence agreement and that the owner of 4225 Dexter Terrace would not enter upon park land due to the conditions of the agreement.

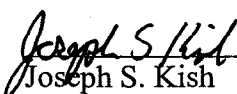
7. The first opportunity I had to observe the activities of the construction of the masonry structure was when the masonry block structure was established above the surface of the current grade. At no time was I aware of, or saw evidence of, any subsurface construction or footer for the structure.

8. Since my job was to see to that no further harm was done on park land and the structure did not have any obvious outward appearance of encroaching upon park land, I had no reason to comment on the wall other than to identify a number of pipes that appeared to be capable of releasing concentrated waters onto park land which would likely cause erosive harm to park land.

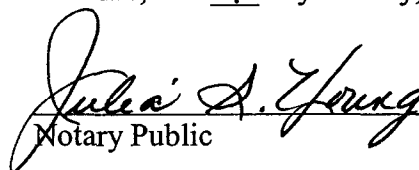
10. The extent of my conversation with any owner or potential representative of the owner of 4225 Dexter Terrace concerning the masonry structure was to identify my concern relative to the aforementioned pipes and to the ongoing siltation and erosion on park land that was evidently emanating from 4225 Dexter Terrace.

I declare under penalty of perjury that the foregoing is true and correct.

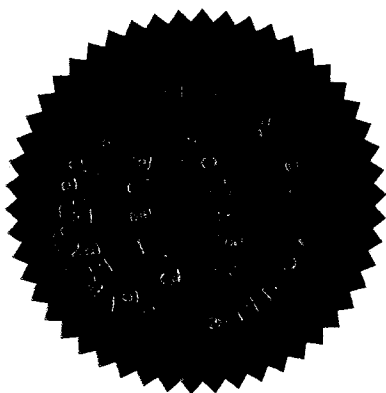
Executed on this 19th day of May, 2005.


Joseph S. Kish

SUBSCRIBED AND SWORN TO before me, this 19th day of May, 2005.


Notary Public

Julie S. Young
Notary Public, District of Columbia
My Commission Expires 06-31-2009



**BEFORE THE BOARD OF ZONING ADJUSTMENT
OF THE DISTRICT OF COLUMBIA**

Appeal of Patrick J. Carome	:	
	:	
of Building Permit	:	BZA Appeal No. 17285
No. B460927	:	
	:	Hearing Date: March 1, 2005
4825 Dexter Terrace, NW	:	
Frank & Dina Economides, Owners	:	
	:	

AFFADAVIT OF LEON CHMURA

I, Leon Chmura, being duly sworn, depose and say:

1. My name is Leon Chmura. I am employed as a Cadastral Surveyor by the United States Department of the Interior, Bureau of Land Management (BLM), Eastern States Office, Branch of Cadastral Survey. Our office is located at 7450 Boston Boulevard, Springfield, Virginia, 22153. I hold a Bachelor of Science Degree in Surveying from Pennsylvania State University and have been with the BLM for 7 years.
2. The BLM has the responsibility for official surveys of Federal Interest Lands and under an Interagency Agreement with the National Park Service (NPS), dated August 6, 1993, amended April 14, 1999, to provide surveys for the National Park Service, National Capitol Region (NCR).
3. In response to a phone conversation with Mr. David Murphy, Park Ranger, NPS, NCR, on April 26, 2005, a survey crew from our office assisted NPS personnel by placing offset points along a portion of the boundary of Reservation No. 529, Rock Creek Park, in Washington D.C. The purpose was to select suitable sites within the bounds of the Park to conduct bore testing of the soil. This descriptive report of the process is made at their request.
4. The dependent resurvey of Reservation No. 529 was executed under Group No. 10, Washington D.C. and approved on February 12, 2004. Reference should be made to the field note record in regard to monumentation and measurements along the boundary.
5. Mr. Murphy and I had a discussion on the site as to the work to be done, at which time he indicated that he wanted offsets to be marked 1 in. from the Park Service line. After conferring with Mr. Robert D. Pinciotti, P.E., Principle Geotechnical Engineer of URS Corporation, a consultant firm contracted by NPS, Mr. Murphy showed us the specific points

where they wanted to extract the samples. He initially pointed out four sites. A fifth site was added at the request of Detective Jon Crichfield, United States Park Police.

6. Two iron pipes identified as points on the boundary line in the 2004 dependent resurvey were located, one on either side of the test area. Current conditions make these two pipes inter-visible, where at the time of our original field work there were obstructions. A Topcon GTS 300 total station survey instrument was set up on a tripod over the pipe east of the test area. The pipe to the west was covered with cut firewood and a plastic mesh fence. A range pole with a bipod and reflective prism were set up over this pipe. The index point on top of the mirror was then sighted with the total station.

7. Before offsets from the boundary could be made, points on the line (POLs) were established. This was done by fixing the instruments sight on the prism and then passing a mobile range pole through the instrument's sights until it was centered. The scope of the instrument was then inverted and the process repeated. Upon determining the POL, an offset distance of 0.15 ft. (1.8 ins.) into the Park was measured using a tape measure. I increased the distance from the original 1 in. to allow for the fact that the offset was oriented by eye perpendicular to the construction near the park. A nail was then set to mark the point.

8. A total of 6 nails were set. Two were set several feet apart at the first site to provide a range within which the sample could be taken. After all the offsets had been made, the direction and distance to each was observed using the total station instrument and mobile range pole. Upon returning to our office, I computed the actual offsets and their distance, measured at right angles, along the boundary line. The results are in the table at the end of this document.

9. The POLs, marked by indentations left in the ground by the mobile range pole, were checked again using a plumb bob, a sight which is more precise but not necessarily more accurate than the prism pole. In each case, the plumb bob was within the indentation left by the range pole. The same process was used, essentially meaning that each POL was checked four times.

10. Within the past few weeks, wood stakes marked "POL" have been placed along the line. We evaluated these positions much in the same way as we established the points on line. All the stakes, at grade level, are on, or are in close proximity to the line. Though distances between our sighted line and the lathes were not directly measured, it appears that the distances are, in extreme cases, between 0.2 ft. to 0.3 ft. While most of the discrepancies place the lathes on the Park side of the line, the differences are random, not of a pattern to suggest that they are on a different alignment than the sighted line.

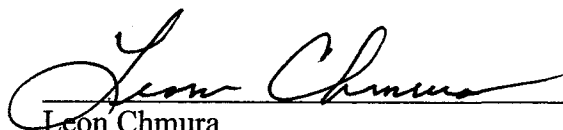
11. POLs, marked with nails, were set near existing NPS Carsonite markers. This will enable Park personnel to reset them in accordance with the sighted line.

12. The following table shows the down-line distance (DLD), starting at the pipe to the east, to each of the 6 POLs and the corresponding offset distances as measured with the total station instrument.

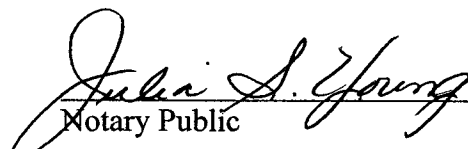
OFFSET NO.	OFFSET DIST. (in feet / in inches)	DLD (in feet)
1	0.12 / 1.4	29.35
2	0.16 / 1.9	68.10
3	0.13 / 1.6	101.31
4	0.17 / 2.0	133.30
5	0.13 / 1.6	155.90
6	0.14 / 1.7	161.58

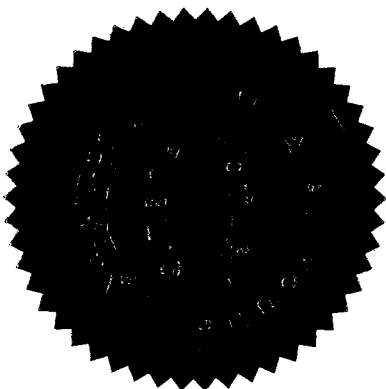
I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 19th day of May, 2005.


Leon Chmura

SUBSCRIBED AND SWORN TO before me, this 19th day of May, 2005.


Notary Public



Julia S. Young
Notary Public, District of Columbia
My Commission Expires 05-31-2009

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No. B460927	)	
	)	
4825 Dexter Terrace, NW	)	Supplemental Brief
Frank & Dina Economides, Owners	)	National Park Service
	)	

This responds to the Board's May 10, 2005, request to the National Park Service for supplemental briefing regarding NPS's contention that the Zoning Administrator wrongfully issued a permit which predictably would result in encroachment on NPS lands.

Protecting parklands, open spaces, and recreational opportunities for the benefit of District residents, visitors to our Nation's capital, and posterity, is a responsibility of

Washington area government officials involved in local land use decisions. Applicable zoning laws and regulations should be interpreted by officials to ensure that this responsibility is met to the greatest extent possible. (See 11 D.C.M.R. 101.1)

As will be discussed, in this case the Zoning Administrator had both the ability and the responsibility to interpret zoning law to prevent the encroachment of the Economides' structure on NPS property. He did not and therefore his decision to permit the structure was in error.

The NPS relies on the Zoning Administrator to assist in protecting NPS property from impairment both now and in the future. Rock Creek Park, which includes the park unit in question, has over 70 miles of boundaries within the District alone. NPS has only a relative handful of employees to patrol these boundaries. The Zoning Administrator is often the first government official to receive detailed information about proposed construction activities near park boundaries. Therefore, the Zoning Administrator must exercise reasonable care in evaluating all such proposals to determine whether some aspect of the proposal, falling within his jurisdiction, may negatively affect parklands. By intervening in this matter, NPS is asking this Board to remind the Zoning Administrator of his duty to use reasonable care in the exercise of his responsibilities where parkland is concerned.

I. The Economides' Walled Structure Has Encroached on Parkland

On May 10, 2005, Mr. Robert Pinciotti, P.E., testified as follows:

On April 26, 2005, I was present on site to assist in the sampling and classification of the soils in 7 exploration borings. The purpose of this test was to determine whether the leveling pad [also referred to as a “footer”] was indeed located on NPS property and, if so, whether it met the Mechanically Stabilized Earth (MSE) design prepared by Ryan Associates. The initial boring, designated Boring T, was used as a control test and was located several feet away from the property line and the potential zone of construction activity. The other 6 borings, designated Borings A through F were located approximately 8 inches on the park side of the property line.

In all 6 of the borings adjacent to the property line we encountered fill from the ground surface down to a depth of 2.5 to 3.5 feet In Boring D and Boring F we encountered crushed stone, approximately 6 and 7 inches thick, respectively. The crushed stone is part of the leveling pad for the MSE structure. There was a sheet of heavy plastic on top of the crushed stone in Boring F. From these borings we were able to confirm that portions of the leveling pad are located on park property. This finding is not inconsistent with the MSE design and boring analysis conducted by the Economides engineers.

The NPS has determined that the structure has encroached onto parkland. Counsel for the Economides suggests that the encroachment is somehow NPS’s fault. NPS disagrees.¹

¹ The Economides’ May 17, 2005, filing states in part that “with respect to the alleged encroachment of the underground gravel leveling pads of the wall in Mr. Pinciotti’s statement, we note that NPS did not rebut our testimony (Hugo Ardon) that Joseph Kish, the park service boundary line specialist, monitored the construction of the wall from start to finish and found no encroachment.” On the contrary, while the

Moreover, whether or not the Economides have some defense to a suit for trespass is immaterial to the question of whether the Zoning Administrator erred in permitting the structure initially. As is discussed below, information contained in materials submitted with the Economides' permit application clearly demonstrated the potential for an encroachment onto park property.

Section 3202.1 provides that "a building permit shall not be issued for the proposed erection, construction, conversion, or alteration of any structure unless that structure complies with the provisions of this title." During the April 5, 2005, BZA hearing in this matter, the Zoning Administrator testified that consistent with § 3202.2(b), he used the official building plat submitted with the Economides' permit application to determine that the structure's footer did not cross onto park service property in violation of Section 3202.1. (April 5, 2005, Tr. at 209). However, § 3202.2 does not restrict the Zoning Administrator to reviewing the plat to ensure compliance with § 3202.1. The Zoning Administrator also reviews as necessary "scaled drawings showing the . . . plan, elevation, and location by dimensions of all . . . proposed structures and the proposed uses of those structures . . . [and] other information necessary to determine compliance with this title." § 3202.2 (a). The Zoning Administrator had scale drawings in his possession prior to permit issuance which, when read in conjunction with the plat, indicated that the footer for the structure could encroach onto NPS property.

transcript of the hearing is not yet available, it will reflect that Mr. Ardon could not say if Mr. Kish was present when the encroaching below ground sections of the leveling pad were constructed. Once construction is complete the leveling pads are not visible. Moreover, Mr. Kish has no engineering background, was not privy to the engineering plans regardless, has no legal ability to estop the United States from protecting federal property, and was only able to comment on the fact that the above ground portions of the structure did not appear to encroach on the park boundary.

The official plat depicts, in relevant part, a 1 foot wide - plus or minus – “typ” or typical buffer between the face of the walled structure and the NPS boundary line. (Appendix A). The wall is also depicted as 1 foot wide - plus or minus - typically. However, the Ryan Associates design plan for the structure, which was also in the possession of the Zoning Administrator and the DCRA prior to permit issuance, contains a full page scale drawing depicting a 4-foot wide footer. (Appendix B). This footer would extend approximately 1.5 feet beyond the face of the wall. Thus, when read in conjunction with the official plat, the design plan raises the possibility that the footer would be located on NPS property where it was ultimately found.

According to the Ryan Associates design, how far the footer protrudes from the face of the wall is a function of how dense the soil under the footer is. In this regard, Mr. Pinciotti also testified to the following:

Design and the soil borings [were] conducted by the Economides’ engineer as part of the infiltration trench study. (Appendix C). According to these documents the leveling pad, at the design depth, would have to be 48 inches to 72 inches wide, 12 inches to 18 inches thick and reinforced with 2 or 3 layers of geogrid. Thus, the pad should extend 18 to 30 inches beyond the face of the wall. A plat drawing showing a 1 foot plus or minus buffer between the face of the MSE structures outer wall and the park boundary was also part of the permit package (Appendix A). When the plat is read together with the MSE design and the boring

information, it should have been clear that the leveling pad would extend beyond the approximate 1 foot buffer and onto NPS property.²

The boring information is dated October 7, 2002, and therefore predates permit issuance. A simple phone call to the applicant by the Zoning Administrator could have produced it. No such call was made. In sum, the Zoning Administrator did not exercise reasonable care in evaluating the implications of the permit application on neighboring NPS lands. Had he, it would have been apparent that the project, as proposed, would encroach on federal property in violation of district zoning regulations. Additionally, issuance of such a permit exceeds the Zoning Administrator's legal authority. Applicable zoning regulations and the scope of the Zoning Administrator's authority is discussed below.

II. The Zoning Administrator Mistakenly Issued a Permit for a Structure that Encroaches on NPS Property in Violation of the Zoning Code and his Legal Authority

A. The Zoning Code Favors Interpretations of Regulations that are Protective of Parklands

The Preamble to the Zoning Code instructs that:

In their interpretation and application, the provisions of this title shall be held to be the minimum requirements . . . to . . . provide . . . use of land that will tend to create conditions favorable to . . . protection of property, civic activity, and recreational, educational, and cultural opportunities

² Note: the original citations were deleted and replaced with citations to the same documents as they appear

11 D.C.M.R. § 101.1. Thus, when possible, the Zoning Administrator is instructed to interpret zoning regulations to permit him to take measures to ensure protection of NPS property interests, and civic activity, recreation, educational, and cultural opportunities on parkland. Encroachments on parkland are contrary to NPS property rights, and the activities and values contained in § 101.1.

B. The Zoning Administrator Could Not Issue a Permit for a Party Wall Without NPS's Written Consent

Assuming, arguendo, that the face of the structure is a retaining wall, pursuant to 11 D.C.M.R. § 2503.3 a retaining wall may only be located in a required yard provided that it is constructed consistent with the building code. Pursuant to 12 DCMR § 3110.2:

Those portions of a length of fence [or fence wall] *including footings*, which are partly on each side of a party line, shall be considered as party fences. Permit applications for party fences shall be signed by the owners of the property on which the fence is to be located.

Italics added. A retaining wall which by engineering design requires the placement of a footer on adjoining property is also a fence wall and is subject to the requirements of § 3110.2. As was discussed in detail, information reviewed by and available to the Zoning Administrator prior to permit issuance indicated that the footer would encroach onto park property. Therefore, the Zoning Administrator could not sign-off on the zoning

as appendices in this brief.

aspects of the permit without receiving the prior written approval of NPS. Since he did not, he erred in issuing the permit.

B. The Zoning Administrator did not use Reasonable Care in Evaluating the Permit Application

The Zoning Administrator has testified that the “DCRA did not issue a permit to a private citizen to construct a structure that allows encroachment on federal parkland.” DCRA power-point presentation entitled *Response of the District of Columbia Zoning Administrator*. Additionally, counsel for DCRA has stated that “we don’t have any legal authority to issue a permit to anyone to build or construct on federal parkland” (April 5, 2005, Tr. at 197). The NPS does not contend that the Zoning Administrator knowingly issued a permit allowing construction on federal land. Rather, NPS contends that the Zoning Administrator had an obligation to use reasonable care in evaluating permit applications which, if authorized, could result in an encroachment on parkland. In this instance the Zoning Administrator had sufficient information in the record before him to put him on notice of this potentiality. He did not exercise reasonable care in investigating the permit application and therefore negligently issued a permit. NPS lands and the public should not suffer damage because of the Zoning Administrator’s inattention.

It may be suggested that BZA jurisdiction may not extend below four feet above adjacent grade and therefore the BZA lacks jurisdiction to find error on the part of the Zoning Administrator. The better view is that the zoning laws apply to the location and specifications of all components of a structure authorized by the Zoning Administrator. In

this case the Zoning Administrator permitted, in part, a wall that is upwards of 32 feet high and 400 feet long. The wall's footer cannot be lopped off for purposes of the Zoning Administrator's evaluation because it is an integral part of the structure; nor did the Zoning Administrator argue in this case that he cannot consider the footer in his permit evaluation. Moreover, as discussed § 3202.1 of the zoning code incorporates the building code requirement that the application must be signed by the adjacent property owner where the footer of a proposed wall creates a fence wall by extending onto the adjacent owner's land. Thus, in this instance at least, the Zoning Administrator has jurisdiction over below grade structures. Lastly, the NPS questions whether the Zoning Administrator and the BZA believe they have no jurisdiction with respect to below grade structures such as an underground parking garages. Holding that the Zoning Administrator's jurisdiction ends below four feet above adjacent grade here could set a precedent which greatly restricts the ability of the Zoning Administrator and the BZA to protect the District's interests in other important areas.

III. The Encroachment is Properly before the BZA; This is not an Enforcement Action that should be Investigated Solely by the Zoning Administrator

Counsel for the Zoning Administrator has argued that "if we subsequently learned, as a result of information, that one of the permits that we issued, as well as the CFO issued, was issued inappropriately, then we would take remedial action to resolve that issue." Notwithstanding this statement, the DCRA has been aware for some time that an encroachment has been, at the very least, alleged. DCRA has taken no steps to investigate this matter let alone initiate an enforcement action. Moreover, the BZA exists

to hear appeals regarding the actions of the Zoning Administrator. Counsel for the Zoning Administrator suggests that the DCRA has a right to self-police. This would defeat the regulatory scheme that places the BZA in a review capacity.

Conclusion

For all the foregoing reasons, and for all the reasons set forth in the filings and arguments made by the NPS made during this appeal, the Board should reverse the decision of the DCRA to issue the Economides a building permit for the Economides walled structure and order the Economides to take such actions, including removal of the wall and associated materials in an environmentally safe manner, as is necessary to redress the harm done to NPS.

Respectfully Submitted

By: 

Jeffrey P. Bernstein
United States Department of the Interior
Office of the Solicitor
1849 C Street, NW
Mail Stop 3217
Washington, DC 20240
Tel: 202-208-7957
Fax: 202-208-3877

Counsel for the National Park Service

Appendix A

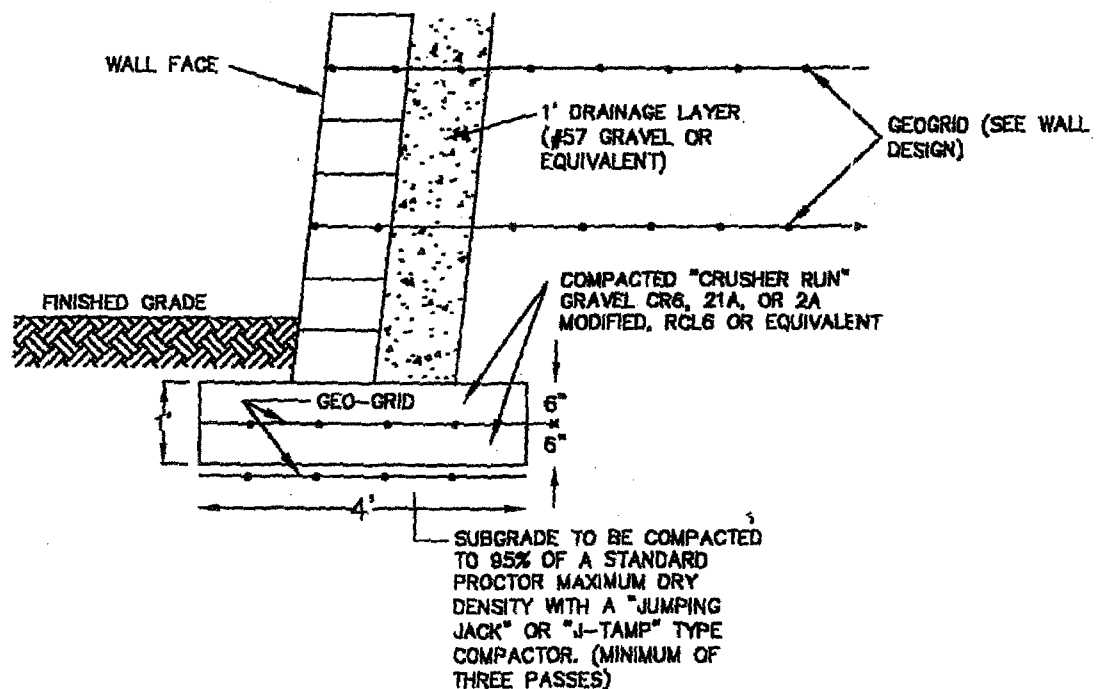
Plat

Appendix B

Geogrid Reinforced Leveling Pad

GEOGRID REINFORCED LEVELING PAD

for building segmental retaining walls on fill soils or to enhance the soil's bearing capacity



NOTE: THIS 1' x 4' LEVELING PAD WILL IMPROVE THE SOIL'S BEARING CAPABILITIES BY A MINIMUM OF 1,000 PSF. A 1.5' X 6' LEVELING PAD WILL INCREASE THE SOIL'S BEARING CAPABILITIES BY A MINIMUM OF 2,000 (3 LAYERS OF GEOGRID REQUIRED)

RYAN & ASSOCIATES— Consulting & Design Engineers
68 West King Street, P.O. Box 6, Shippensburg, PA 17257-0006
PHONE 717-477-8400 FAX 717-477-8410

Appendix C

Boring Data

**INFILTRATION RATE STUDY
STORMWATER MANAGEMENT FACILITIES
PROPOSED RESIDENTIAL DWELLING
4825 DEXTER TERRACE, NW
WASHINGTON, DC
SPECIALIZED ENGINEERING #021625**

Prepared for:

**Mr. Frank Economides
Economides Development
4825 Dexter Terrace, NW
Washington, D. C. 20007**

Prepared by:

**Ronald L. Pyles, P. E.
Specialized Engineering
9607 Dr. Perry Road, Suite 102
Ijamsville, Maryland 21754**



SPECIALIZED ENGINEERING
Geotechnical - Environmental - Materials

SPECIALIZED ENGINEERING

Engineers • Geologists • Inspectors

October 9, 2002

Mr. Frank Economides
Economides Development
4825 Dexter Terrace, N.W.
Washington, D. C. 20007

Principals

David I. Wiegand, P.G.
Charles R. Mitchell, P.E.
Gregory S. Seldon
Ronald L. Pyles, P.E.

Re: Infiltration Rate Assessment
Stormwater Management Facilities
Proposed Residential Dwelling
4825 Dexter Terrace, N. W.
Washington, D. C.
Specialized Engineering #021625

Dear Mr. Economides:

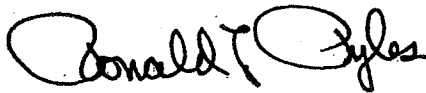
Specialized Engineering is pleased to submit our report concerning the infiltration testing for the stormwater management facilities proposed to accommodate the development at 4825 Dexter Terrace, N. W., Washington, D. C.

The report explains the exploration procedures and presents conclusions relevant to infiltration rate considerations for the project. The project civil engineers provided the siting and project characteristics used in the evaluation. If site or project characteristics are changed, this office should be notified so that the conclusions may be reviewed and revised, if necessary.

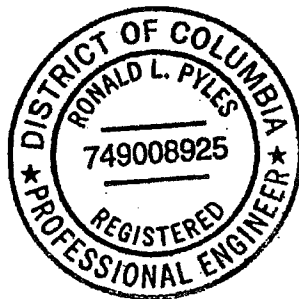
Soil samples obtained during the field investigation phase of the study will be stored for a period of 30 days from the date of this report. It will be necessary to discard the samples at the end of this period unless an alternate disposition for the samples is specified prior to the termination of the storage period.

We appreciate the opportunity to be of service to you in the subsurface investigation phase of this project. If you have any questions concerning this report or if we can be of further assistance on the project, please do not hesitate to contact this office.

Respectfully,
Specialized Engineering



Ronald L. Pyles, P. E.
Principal



CC: Mr. Curt Schreffler, P.E.
CAS Engineering

9607 Dr. Perry Road, Suite 102 • Ijamsville, Maryland 21754
Phone: 301-607-4180 • Fax: 301-607-4331 • E-mail: SpecEngr@aol.com

Serving Maryland, DC, Virginia, West Virginia and Pennsylvania

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APPENDICES

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INFILTRATION RATE ASSESSMENT
STORMWATER MANAGEMENT FACILITIES
PROPOSED RESIDENTIAL DWELLING
4825 DEXTER TERRACE, N. W.
WASHINGTON, D. C.
SPECIALIZED ENGINEERING #021625

AUTHORIZATION

In accordance with the approval of our proposal dated September 10, 2002, Specialized Engineering has conducted an infiltration rate assessment for the stormwater management facilities proposed to accommodate the development at 4825 Dexter Terrace, N. W. located in Washington, D. C.

PURPOSE AND SCOPE

The purpose of the study was to define and evaluate the generalized subsurface conditions in the areas of and to the depths of various test borings and conduct in-situ infiltration testing at appropriate levels based on the results of the test borings.

To accomplish these tasks, the following scope of services was performed:

- a. Review the site developmental plan.
- b. Implement an exploration and testing program defined by the civil engineer for the project.
- c. Obtain a total of three (3) test borings in accessible areas in areas proposed to accommodate the stormwater management facilities.
- d. Determine the generalized subsurface conditions in the area of and to the depth of the test borings.
- e. Conduct in-situ infiltration testing based on an assessment of the findings from Item d above.
- f. Evaluate all the data obtained and submit this report of findings, conclusions, and recommendations.

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SITE CONDITIONS

Site Vicinity and Location maps are attached to the end of the text portion of this report as Figures 1 and 2 respectively. As shown, the site is located in the northwest portion of Washington, D. C. The site is bordering on the north, east, and west by private property, while Dexter Terrace borders the site to the south.

At the time of the investigation, the project site was an active residential facility. As a result, the subject areas consisted of a combination of domestic grass growth, planter areas, and wooded land.

PROJECT DESCRIPTION

Stormwater management is required for the project site for water quality and water quantity control purposes. Stormwater management is proposed to consist of infiltration trenches that will be situated within a northern or southern portion of the rear yard of the project site.

Based on discussions with the project civil engineers, it is understood that the base level of the trenches can be varied and will be situated at applicable depths wherein infiltration is established to be feasible (based on test boring results).

PROJECT SITE GEOLOGY

An excerpt of the geological map for the project site is included on Figure 3 to this report. A review of the Geological Map will indicate that the parent bedrock formation for the project site is the Paleozoic aged (300 +/- million year old) Kensington Quartz Diorite member of the Eastern Piedmont Plutonic Province.

In-situ chemical decomposition of the materials generally occurs as the result of percolating groundwater charged with carbon dioxide. The process typically produces a surficial layer of residual soils (soils formed in place and hence a resident of the area) having variable thickness and situated over the parent bedrock materials. Typically, the residual soils are silty and generally quite high in mica content. With depth, the soils generally increase in density and develop a remnant rock structure.

FIELD EXPLORATION

To establish an approximation of the generalized subsurface conditions in applicable areas of the site, a total of three (3) test borings (A, B, and C) were drilled in various potential proposed infiltration areas. The test borings were drilled in the approximate areas depicted in plan on Figure 4 of the attached.

For the test borings, samples were taken by driving a 1-3/8 inch ID (2 inch OD) split-spoon sampler in accordance with ASTM D-1586 specifications. The sampler was first seated 6 inches, to penetrate any loose cuttings, then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required for driving the sampler the final foot often is designated as the "Penetration Resistance" or "N" value. The N-value is an indication of soil density and excessively dense materials are generally not considered feasible for infiltration. Therefore, in-situ testing was done at depths as deep as feasible provided that excessively dense materials were not encountered.

Samples of the subsurface materials from the test borings were examined by a geotechnical engineer and visually classified in accordance with the Unified Soil Classification system. The estimated Unified Soil Classification Symbols and a description of the materials encountered for the test borings appear on the Records of Subsurface Exploration contained in Appendix A of this report.

After assessing the test boring information, PVC pipe was installed in areas slightly offset from the test boring location for each of the A, B, and C locations. The holes were then presoaked with a minimum of 2.5 gallons of water.

Subsequent to a 24-hour time interval following the drilling operation, in-situ infiltration testing was done in each of the borings. Infiltration test results are included in Appendix B. A review of the results will indicate that the residual infiltration rates were 0.96 inches per hour, 0.96 inches per hour, and 1.44 inches per hour respectively for Locations A, B, and C.

Groundwater observations were made during the fieldwork at the project site. Groundwater was not encountered in any of the borings at the time of the investigation or at the time of the infiltration testing. Long-term readings have not been obtained to date. Variations in the presence and the depth to groundwater should be expected to occur due to seasonal changes and fluctuations in rainfall intensities during a particular season.

CONCLUSIONS AND RECOMMENDATIONS

General ----

In summary, infiltration for the proposed stormwater management facilities would generally appear to be feasible in the potential areas proposed. Groundwater is generally not anticipated to impact the proposed construction, based on the results of the various test borings.

For the design of the facilities, the following rates are recommended:

Location	Maximum Infiltration Rate, inches/hour	Base Level of the Facility Beneath Existing Grades
A	1.00	From 7+/- feet to up to 10 +/- feet*
B	1.00	Up to 10 +/- feet
C	1.50	Up to 9 +/- feet

*Fill present above the 7-foot depth level

Site Preparation ----

Prior to the construction of the facilities, all organic, frozen, wet, soft or loose soils, existing fill, and other deleterious materials should be removed.

After the excavating has been completed the geotechnical engineer should inspect the exposed subgrade soils. The purpose of the inspection would be to ascertain that the facilities are based in naturally occurring materials suitable to accommodate the various design infiltration rates. All unsuitable areas should be modified as defined by the geotechnical engineer.

Rains prior to or during construction could significantly impact the progress of work at the site due to excessively wet soils. Due to the fine-grained nature of the on-site soils, the action of equipment and foot traffic may very well create pumping and a general deterioration of the soils if conducted in the presence of high moisture contents. The work should, therefore, be carried out during a dry season, if at all possible. If problems arise, the geotechnical engineer should be consulted for an evaluation of the conditions.

Fill Selection and Placement ----

After construction of the various facilities, it is anticipated that backfill for the project typically will consist of on-site materials. At the time of construction, the

various soil materials may have moisture contents either dry or wet of the optimum moisture level. Accordingly, the contractor may have to adjust moisture levels by adding water, air drying the soils, or stabilizing (wet) soils to permit construction to continue in a satisfactory manner.

All backfill should be placed in horizontal loose lifts not in excess of 8 inches thick and compacted with a heavy walk-behind sheepsfoot roller or similar approved equipment. Smaller, confined areas may necessitate the use of 4 inch or thinner loose lifts and a J-tamper. Backfill should be compacted to at least 95% of the standard Proctor maximum dry density value. Moisture content levels for the soil materials should be maintained within +/- 3 % of the optimum level as defined using the standard Proctor procedure.

All lift depths, compaction equipment, moisture levels, and compactive effort should be monitored and approved by the geotechnical engineer. Also, the work should be done in accordance with applicable governmental criteria, if more stringent than required herein.

Groundwater and Drainage ----

Based on the results of the borings, groundwater related problems are generally not anticipated during construction.

ADDITIONAL SERVICES RECOMMENDED

Additional engineering, testing, and consulting services recommended for this project are summarized below:

General Review ----

It is recommended that Specialized Engineering be given the opportunity to review the final design drawings and specifications in order to ascertain that our recommendations are properly implemented.

Site Preparation and Proofrolling ----

The geotechnical engineer should inspect the site after it has been excavated. The Inspector should determine if any modifications to the proposed construction are necessary.

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Fill Placement and Compaction

The geotechnical engineer should witness any required backfill operations and should verify that an adequate degree of compaction is achieved. The Inspector should observe and approve all on-site or borrow materials used and should determine if they are suitable.

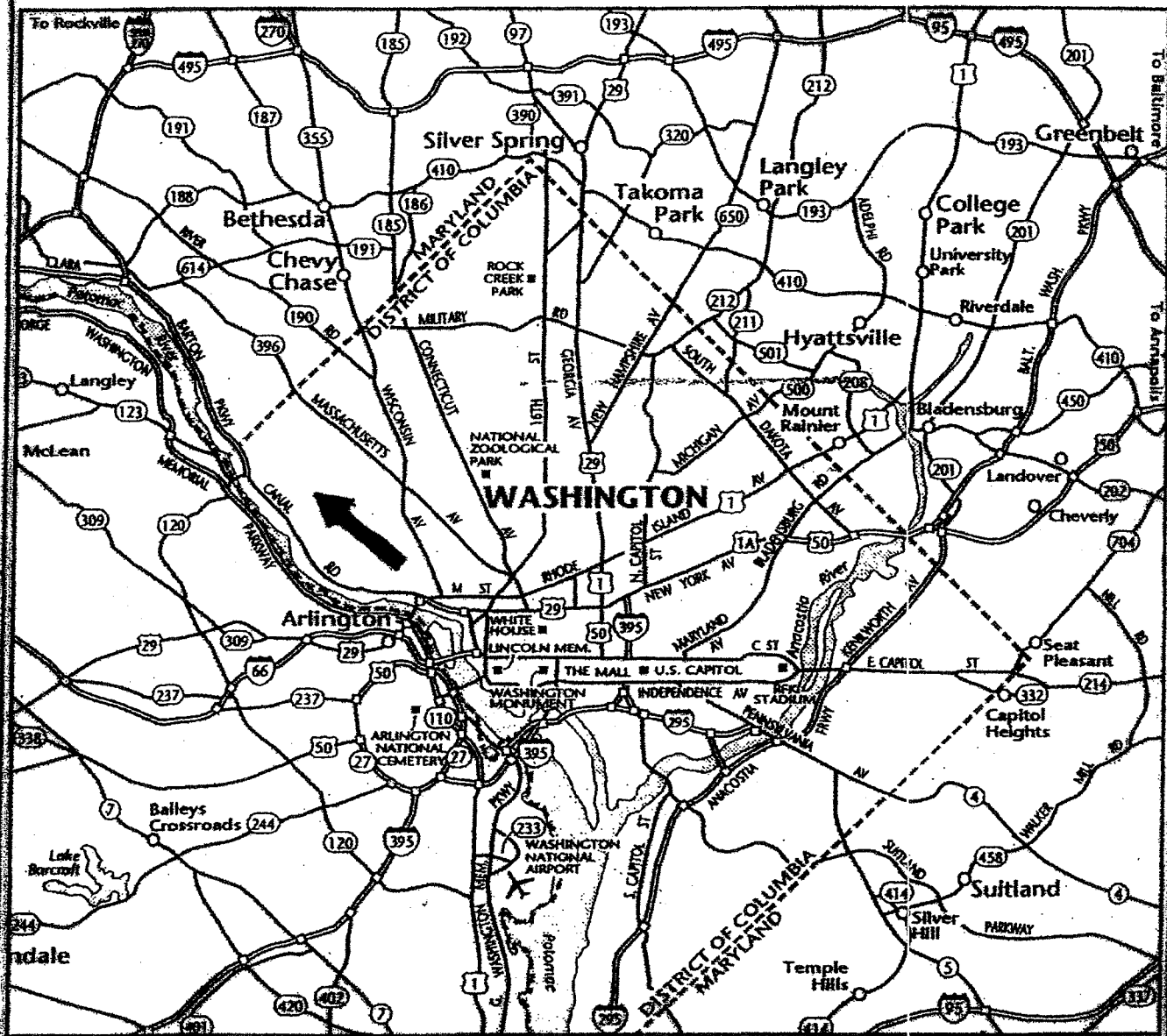
REMARKS

This report has been prepared for the sole and exclusive use of Economides Development and CAS Engineering to aid in the evaluation of the infiltration rate for the proposed stormwater management facilities. It is considered that adequate recommendations have been provided to serve as a basis for design and preparation of plans and specifications. Additional recommendations can be provided as needed or as established to be necessary in the field.

Due to the fact that our study is for design guideline purposes only, potential contractors should be required to conduct their own individually tailored studies to assess soils conditions, excavation slope gradients, and groundwater/perched water levels and conditions. Specifically, our report has been prepared for generalized design and planning purposes not for bid preparation purposes.

These analyses and recommendations are, of necessity, based on the information made available to us at the time of the actual writing of the report and the on-site conditions, surface and subsurface, that existed at the time the exploratory investigation was made. Further assumption has had to be made that the limited exploratory techniques, in relation both to the areal extent of the site and to the depth, are representative of conditions across the site. Subsurface conditions may be present, and encountered, that differ significantly from those reported herein. If this occurs, this office should be notified immediately so that the analyses and recommendations can be reviewed and/or revised as necessary.

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted engineering principles and practices. No warranty is either expressed or implied. Specialized Engineering assumes no responsibility for interpretations made by others based upon work or recommendations made by us.



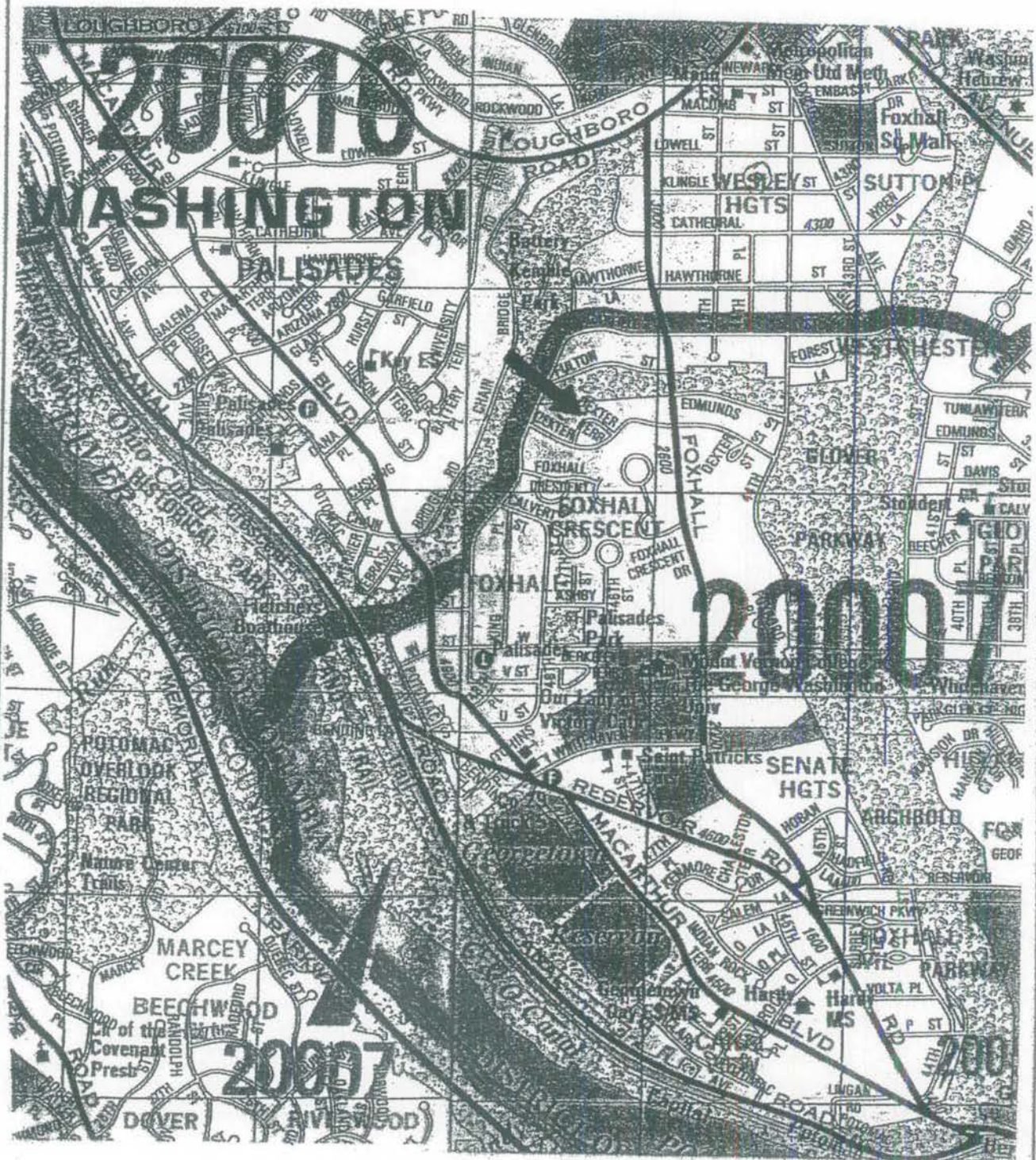
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Project Vicinity

Project No.: 021625

Figure No.: 1



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Project Location

Project No.: 021625

Figure No.: 2



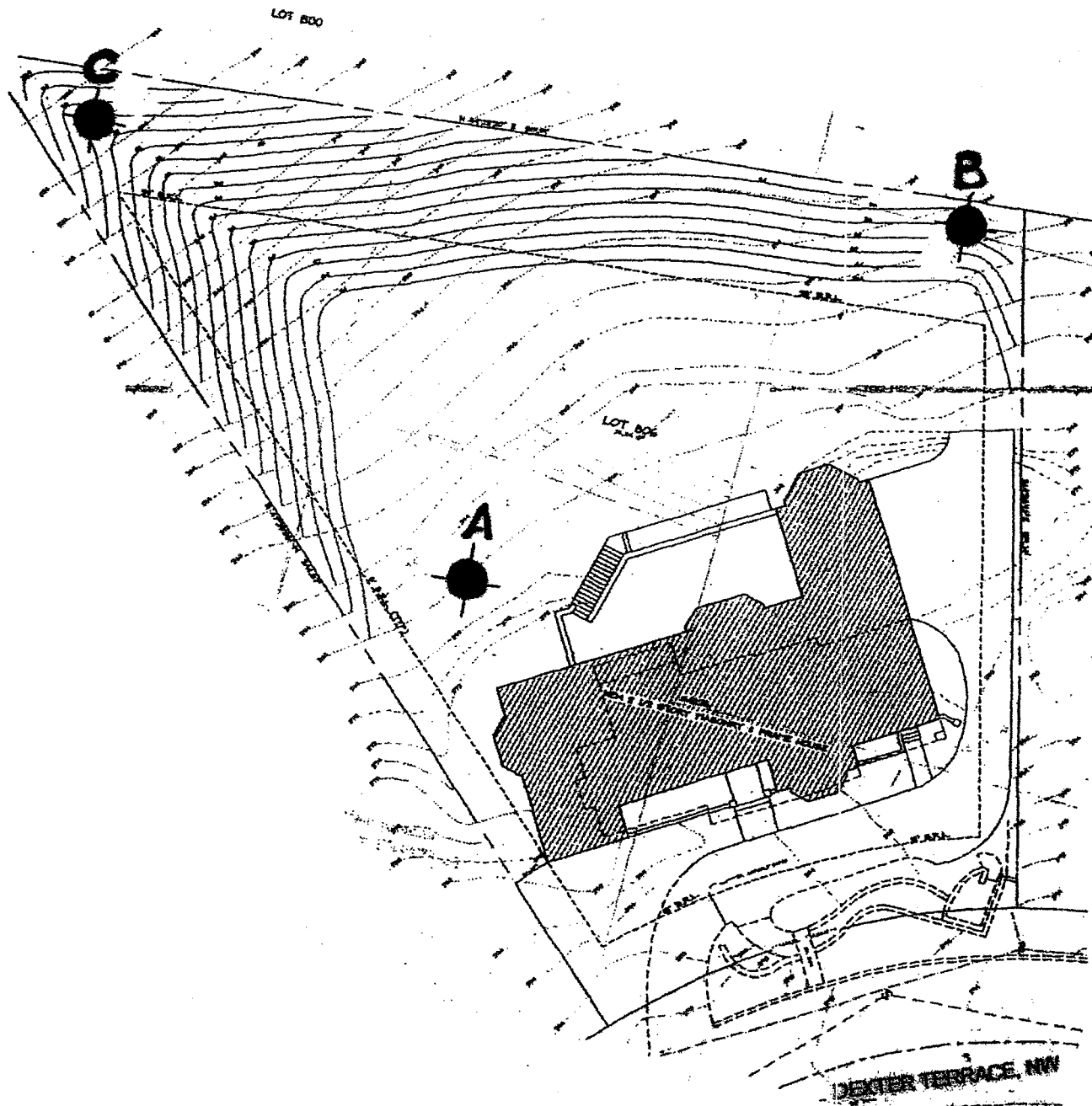
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Geological Map Excerpt

Project No.: 021625

Figure No.: 3



Base drawing by CAS Engineering



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Infiltration Test Locations

Project No.: 021625

Figure No.: 4

APPENDIX A

RECORDS OF SUBSURFACE EXPLORATION



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Major divisions			Group symbol	Typical names	Classification criteria for coarse-grained soils		
Coarse-grained soils (more than half of material is larger than No. 200)	Gravels (more than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_U = D_{60}/D_{10} > 4$ $C_C = 1 < D_{30}^2/D_{10} \times D_{60} < 3$		
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW		
		Gravels with fines (appreciable amount of fines)	GM	$d \geq z$	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below A line or $I_p < 4$	Above A line with $4 < I_p < 7$ are borderline cases requiring use of dual symbols
			GC		Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above A line with $I_p > 7$	
	Sands (more than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_U = D_{60}/D_{10} > 5$ $C_C = 1 < D_{30}^2/D_{10} \times D_{60} < 3$		
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW		
		Sands with fines (appreciable amount of fines)	SM	$d \geq z$	Silty sands, sand-silt mixtures	Atterberg limits below A line or $I_p < 4$	Limits plotting in hatched zone with $4 \leq I_p \leq 7$ are borderline cases requiring use of dual symbols
			SC		Clayey sands, sand-clay mixtures	Atterberg limits above A line with $I_p > 7$	
Fine-grained soils (more than half of material is smaller than No. 200)	Sils and clays (liquid limit < 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity		1. Determine percentages of sand and gravel from grain-size curve. 2. Depending on percentages of fines (fraction smaller than 200 sieve size), coarse-grained soils are classified as follows: Less than 5%—GW, GP, SW, SP More than 12%—GM, GC, SM, SC 5 to 12%—Borderline cases requiring dual symbols		
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays				
		OL	Organic silts and organic silty clays of low plasticity				
	Sils and clays (liquid limit > 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts				
		CH	Inorganic clays of high plasticity, fat clays				
		OH	Organic clays of medium to high plasticity, organic silts				
	Highly organic soils	Pt	Peat and other highly organic soils				

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Unified Soil Classification System

<u>NON COHESIVE SOILS</u> (Silt, Sand, Gravel and Combinations)		<u>COHESIVE SOILS</u> (Clay, Silt and Combinations)	
<u>Density</u>	<u>SPT VALUE</u>	<u>Consistency</u>	<u>SPT VALUE</u>
Very loose	5 blows/ft. or less	Very Soft	3 blows/ft. or less
Loose	6 to 10 blows/ft.	Soft	4 to 5 blows/ft.
Medium Dense	11 to 30 blows/ft.	Medium Stiff	6 to 10 blows/ft.
Dense	31 to 50 blows/ft.	Stiff	11 to 15 blows/ft.
Very Dense	51 blows/ft. or more	Very Stiff	16 to 30 blows/ft.
		Hard	31 blows/ft. or more

<u>Relative Proportions</u>	
<u>Descriptive Term</u>	<u>Percent</u>
Trace	1-10
Little	11-20
Some	21-35
And	36-50

Classification on logs are made by visual inspection of samples.

Ground Water Observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., should be expected to cause changes in the water levels indicated on the logs.

*Standard Penetration Test (SPT Value) - Driving a 2.0" O.D., 1-3/8' I.D. sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30.0 inches. It is customary to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the test are recorded for each 6.0 inches of penetration on the drill log (Example-6/8/9). The standard penetration test result, or N-value, can be obtained by adding the last two figures (i.e. 8 + 9 = 17 blows/ft.; ASTM D-1586-67).



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Test Boring Information Explanation

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RECORD OF SOIL EXPLORATION

Project Name 4825 DEXTER TERRACE Boring # B-A
 Location 4825 DEXTER TERRACE, NW, WASHINGTON, DC Job # 21625

SAMPLER

Datum MSL Hammer Wt. 140 Lbs. Hole Diameter 2.25" I.D. Foreman S. Connelly
 Surf. Elev. _____ Hammer Drop 30 Inches Rock Core Dia. N.A. Inspector _____
 Date Started 10.07.02 Pipe Size 2.0 Inches O.C. Boring Method HSA Date Complete 10.07.02

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC. in.	BORING & SAMPLING NOTES
	SURFACE		0.0					
				I	3,4,5	1	15	
				I	5,6,6	2	16	
			5	I	3,3,4	3	16	
				I	4,6,9	4	16	
				I	13,17,11	5	15	
			20					

SAMPLER TYPE
 DRIVEN SPLIT SPOON UNLESS
 OTHERWISE NOTED.
 PT-PRESSED SHELBY TUBE
 CA-CONTINUOUS FLIGHT AUGER
 RC-ROCK CORE

SAMPLE CONDITIONS
 D-DISINTEGRATED
 I-INTACT
 U-UNDISTURBED
 L-LOST

GROUND WATER DEPTH
 AT Completion Dry cl at 9.0 FT.
 AFTER _____ FT.

BORING METHOD
 HSA-HOLLOW STEM AUGERS
 CFA-CONT. FLIGHT AUGERS
 DC-DRIVING CASING
 MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

RECORD OF SOIL EXPLORATION

Project Name	4825 DEXTER TERRACE	Boring #	B-B
Location	4825 DEXTER TERRACE, NW, WASHINGTON, DC	Job #	21625

		SAMPLER					
Datum	MSL	Hammer Wt.	140 Lbs.	Hole Diameter	2.25" I.D.	Foreman	S. Connelly
Surf. Elev.		Hammer Drop	30 Inches	Rock Core Dia.	N.A.	Inspector	
Date Started	10.07.02	Pipe Size	2.0 Inches	OF Boring Method	HSA	Date Complete	10.07.02

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC. in.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Light brown, moist, medium dense Silty SAND (SM)			I	1,2,4	1	10	
				I	2,4,5	2	10	
			5	I	13,13,15	3	18	
				I	8,11,9	4	18	
				I	15,35,56	5	6	
			20					

SAMPLER TYPE
DRIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PT-PRESSED SHELBY TUBE
CA-CONTINUOUS FLIGHT AU-
RC-ROCK CORE

SAMPLE CONDITIONS
D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH
AT Completion Dry cl at 9.0 FT.
AFTER _____ FT.

BORING METHOD
HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

SPECIALIZED ENGINEERING

RECORD OF SOIL EXPLORATION

Project Name	4825 DEXTER TERRACE	Boring #	B-C
Location	4825 DEXTER TERRACE, NW, WASHINGTON, DC	Job #	21625

Datum	<u>MSL</u>	Hammer Wt.	<u>140</u>	Lbs.	Hole Diameter	<u>2.25" I.D.</u>	Foreman	<u>S. Connelly</u>
Surf. Elev.		Hammer Drop	<u>30</u>	Inches	Rock Core Dia.	<u>N.A.</u>	Inspector	
Date Started	<u>10.07.02</u>	Pipe Size	<u>2.0</u>	Inches OC	Boring Method	<u>HSA</u>	Date Complete	<u>10.07.02</u>

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	SAMPLE		REC. In.	BORING & SAMPLING NOTES
				CON	BLOWS 6"		
	SURFACE		0.0				
	Light brown, moist, medium dense Silty SAND (SM)				2,4,5	1	8
					3,3,7	2	10
			5		11,12,14	3	18
					10,12,15	4	18
					13,25,36	5	12
			20				

SAMPLER TYPE DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE CA-CONTINUOUS FLIGHT AUGER RC-ROCK CORE	SAMPLE CONDITIONS D-DISINTEGRATED I-INTACT U-UNDISTURBED L-LOST	GROUND WATER DEPTH AT Completion <u>Dry cl at 9.0</u> FT. AFTER _____ FT.	BORING METHOD HSA-HOLLOW STEM AUGERS CFA-CONT. FLIGHT AUGERS DC-DRIVING CASING MD-MUD DRILLING
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STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

APPENDIX B

IN-SITU INFILTRATION TEST RESULTS



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Geotechnical - Environmental - Materials

INFILTRATION FIELD LOG

Project: 4825 Dexter Terrace NW Date: Oct 8, 2002

Project No.: 021625

Infiltration Test No.: A

Time	Depth to Water Level, feet*	Time Change, Minutes	Depth change, feet	Rate, inches/hour
1150	10.00	15	—	—
1205	10.13		0.13	6.24
1220	10.22		0.09	4.32
1235	10.24		0.02	0.96
1250	10.26		0.02	0.96
1305	10.29		0.03	1.44
1320	10.32		0.03	1.44
1335	10.36		0.04	1.92
1350	10.40		0.04	1.92
1405	10.43		0.03	1.44
1420	10.46		0.03	1.44
1435	10.50		0.04	1.92
1450	10.54		0.04	1.92
1505	10.57		0.03	1.44
1520	10.62		0.05	2.40
1535	10.64		0.02	0.96
1550	10.66		0.02	0.96
1605	10.68		0.02	0.96
1620	11.00	Y	0.02	0.96
1635	—	—	—	—

* As measured from top of pipe.

Total depth of pipe below existing grade = 10 feet

INFILTRATION FIELD LOG

Project: 4825 Dexter Terrace, NW Date: Oct 8, 2002

Project No.: 021625 Infiltration Test No.: B

Time	Depth to Water Level, feet*	Time Change, Minutes	Depth change, feet	Rate, inches/hour
1152	7.52	—	—	—
1206	7.62	15	0.10	4.80
1221	7.64		0.02	0.96
1236	7.67		0.03	1.44
1251	7.71		0.04	1.92
1306	7.73		0.02	0.96
1321	7.76		0.03	1.44
1336	7.78		0.02	0.96
1351	7.82		0.04	1.92
1406	7.86		0.04	1.92
1421	7.89		0.03	1.44
1436	7.93		0.04	1.92
1451	7.95		0.02	0.96
1506	7.98		0.03	1.44
1521	8.01		0.03	1.44
1536	8.03		0.02	0.96
1551	8.05		0.02	0.96
1606	8.07		0.02	0.96
1621	8.09		0.02	0.96
1636	8.11	Y	0.02	0.96

* As measured from top of pipe.

Total depth of pipe below existing grade = 10 feet

INFILTRATION FIELD LOG

Project: 4825 Dexter Terrace, NW Date: Oct 3, 2002

Project No.: 021625

Infiltration Test No.: C

Time	Depth to Water Level, feet*	Time Change, Minutes	Depth change, feet	Rate, inches/hour
1155	9.60	—	—	—
1210	9.67	15	0.07	3.36
1224	9.75		0.08	3.84
~~1239~~	~~9.77~~		0.02	0.96
1254	9.80		0.03	1.44
1309	9.85		0.05	2.40
1324	9.89		0.04	1.92
1339	9.91		0.02	0.96
1354	9.95		0.04	1.92
1409	10.01		0.06	2.88
1424	10.04		0.03	1.44
1439	10.08		0.04	1.92
1454	10.11		0.03	1.44
1509	10.14		0.03	1.44
1524	10.16		0.02	0.96
1539	10.19		0.03	1.44
1554	10.22		0.03	1.44
1609	10.25		0.03	1.44
1624	10.28	Y	0.03	1.44
1639	10.31		0.03	1.44

* As measured from top of pipe.

Total depth of pipe below existing grade = 9 feet

APPENDIX C

ASFE GEOTECHNICAL BULLETIN



SPECIALIZED ENGINEERING

Geotechnical - Environmental - Materials

Important Information About Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one—not even you—should apply the report for any purpose or project except the one originally contemplated.*

Read the full report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report* that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when

it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions *only* at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an *opinion* about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject To Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. *Also, retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications.* Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the

report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time to perform additional study.* Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce such risks, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations", many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any *geoenvironmental* findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own *geoenvironmental* information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Rely on Your Geotechnical Engineer for Additional Assistance

Membership in ASFE exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.



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