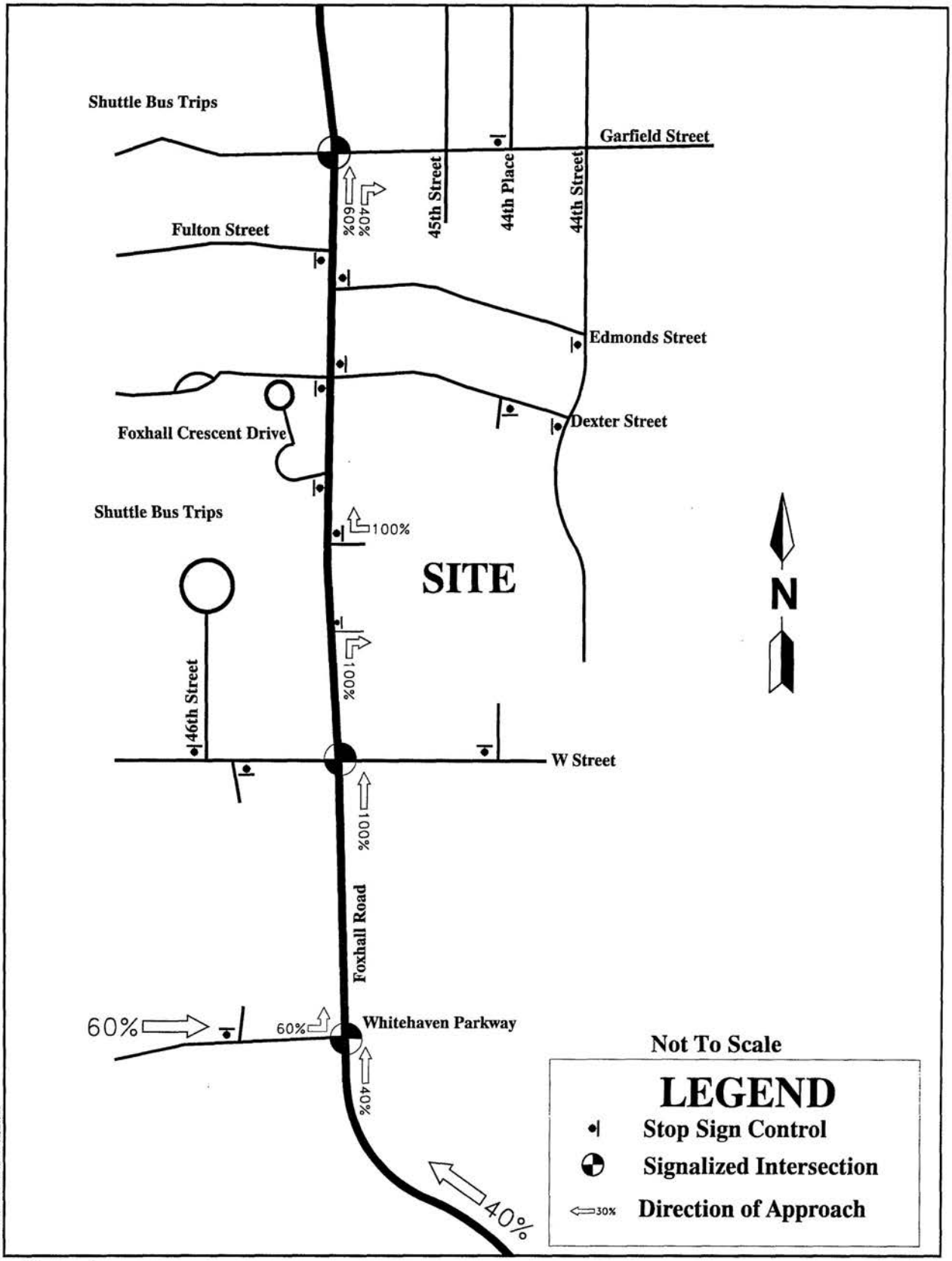


Figure 4
Directional Distribution

Board of Zoning Adjustment
District of Columbia
CASE NO.16559
EXHIBIT NO.42A2

Future Traffic Volumes

Using existing traffic volumes as a baseline level of traffic activity, future volumes were determined by adding the proposed vehicular trip generation to the existing traffic volumes and by applying the directional distribution percentages to account for the origins and destinations of the school-related traffic. Figure 5 presents the site generated traffic volumes for the Field School. Figure 6 presents the future traffic volumes with the projected future GW/MVC development and with the relocation of the Field School to Foxhall Road.

Total Future Levels of Service

In response to community concerns regarding delays associated with turning onto Foxhall Road from minor street approaches and general traffic safety in the Foxhall Road corridor, the District of Columbia Department of Public Works (DCDPW) has proposed to install traffic signals at the intersections of Foxhall Road/W Street and Foxhall Road/Whitehaven Parkway. The installation of these signals will provide the opportunity for motorists to turn to and from Foxhall Road safely with acceptable delays. It is expected that the Foxhall Road/Whitehaven Parkway will have a fully functioning traffic signal by August 2000.

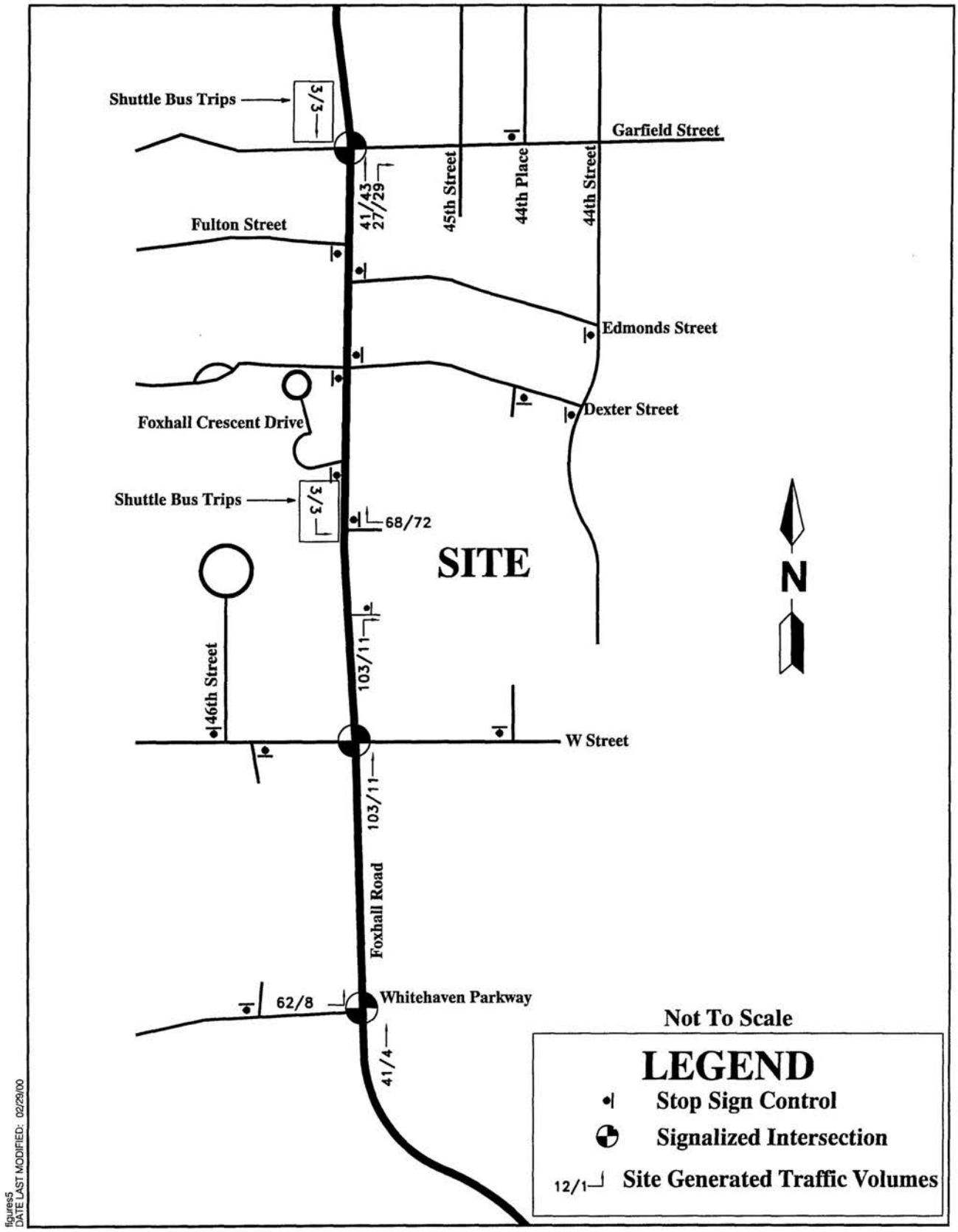
As part of the future traffic capacity analysis, the proposed signals at W Street and at Whitehaven Parkway along Foxhall Road were accounted for. In addition, the future traffic associated with the Master Plan development of George Washington University at Mount Vernon College was also accounted for in the future capacity analysis. Table 3 summarizes the total future traffic operations within the study area designated for the proposed school relocation during the critical AM and PM peak hours.

TABLE 3

Total Future Capacity Analysis Levels of Service (LOS)

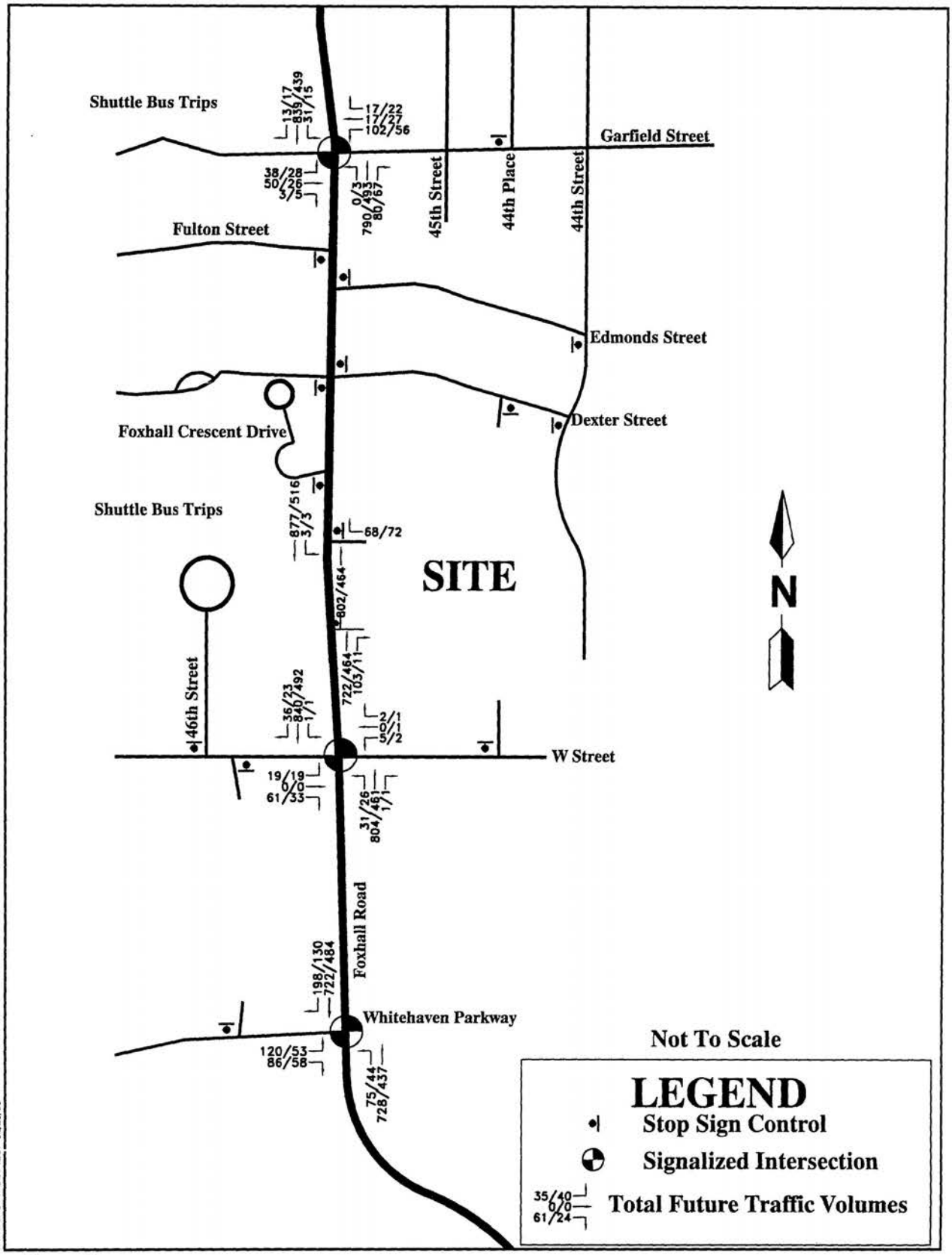
Roadway Intersection	**AM Peak Hour**	**PM Peak Hour**
Signalized Intersections	***LOS***	***LOS***
Foxhall Road and Garfield Street	C	B
Foxhall Road and W Street	C	B
Foxhall Road and Whitehaven Parkway	A	A

The results of the total future capacity analysis indicate that all of the studied intersections along Foxhall Road are projected to operate at an overall acceptable level of service during the AM and PM peak hours.



figures5
DATE LAST MODIFIED: 02/29/00

Figure 5
Future Site Generated Traffic Volumes
of Passenger Vehicles to Site



figures5
DATE LAST MODIFIED: 02/29/00

Figure 6
Future Traffic Volumes

Shuttle Bus Program

As identified by the survey responses, shuttle bus linkages to the Metrorail and Metrobus systems are an important part of the school transportation system. In addition to providing shuttle service for Metrorail users, the school has decided that it will expand and promote the shuttle bus service to pick up students at remote pick-up points for the convenience of the parents and to meet the simultaneous goal of keeping Field School-related vehicles away from the Foxhall Road corridor.

Shuttle bus service will be provided for students to and from the Tenleytown station (Red Line), the Foggy Bottom station (Blue and Orange Lines), and other off-site locations in the vicinity of the intersections of MacArthur Boulevard/Loughboro Road and Massachusetts Avenue/Nebraska Avenue. The two planned shuttle bus routes would consist of a route from the Foggy Bottom station to the Field School and of a circular route that would serve the off-site locations in the vicinity of the intersections of MacArthur Boulevard/Loughboro Road and Massachusetts Avenue/Nebraska Avenue and would continue to the Tenleytown station before arriving at the Field School campus. This expanded service was geared to meet the demand of parents for this alternative transportation solution. Connections to the Tenleytown and Foggy Bottom stations would serve the nearest and most convenient Metrorail stations to the school relocation site. The school is investigating other possible remote pick-up/drop-off locations.

Circulation and Stacking Considerations

The existing school site at Wyoming Avenue experiences relatively small queues for both AM drop-off and PM pick-up operations. During the AM peak hour, the maximum queuing consisted of 4 vehicles arriving at the school at one time to drop off their children. Similarly, during the PM peak hour, the maximum queuing also resulted in 4 vehicles arriving at the school at one time to pick up children. In order to accommodate the anticipated traffic demand at the relocation site, it is recommended that the on-site stacking capacity be sufficient to accommodate a maximum of 10 vehicles waiting to pick up or drop off students. Based on the submitted site plan, the site will be able to accommodate this queuing requirement with significant additional capacity remaining.

Due to the presence of two driveways, it is recommended that the roadway in front of the school be two-way to allow for vehicles from either driveway to access the front door of the school. It is recommended that a travel lane in each direction, as well as a pull-off lane in each direction be provided to allow for efficient and safe pick up and drop off operations.

The school will provide a traffic officer on duty to assist with safe access and traffic control during the morning and afternoon peak periods. This officer would also ensure compliance of no left turns into the school during the morning peak period. School zone warning signs and beacons will be installed along Foxhall Road at the appropriate locations in coordination with the District of Columbia Department of Public Works to reduce the speed limit during school arrival and dismissal to 15 mph. These traffic control signs and devices would facilitate the speed control of vehicles in the vicinity of the Field School on Foxhall Road.

Projected Parking Demand

In order to determine the minimum parking requirements for the Field School, the zoning regulations mandate the following parking requirements:

- 2 spaces for every 3 employees (based on 74 employees): 50 parking spaces
- 1 space for each 10 seats in the largest public assembly area (assuming 400 seats): 40 spaces

The minimum parking requirement as specified by zoning regulations is 90 parking spaces.

Because there is no convenient on street parking areas, it is important for the school to provide sufficient parking on-site. Based on the trip generation projected for the Field School, the following parking requirements were identified:

- Spaces for employees (based on 74 employees): 50 spaces
- 1 space per student driver: 38 spaces
- Parking for visitors based on experience at the existing site: 10 spaces

Based on the requirements detailed above, the practical parking requirement for the Field School is 98 parking spaces. The parking proposed for the relocation site is 128 parking spaces, which will be sufficient to accommodate the parking demand experienced on a daily basis.

CONCLUSIONS

The objective of this study was to determine the traffic issues and possible solutions surrounding the proposed relocation and expansion of The Field School in Washington, D.C. The major findings and conclusions reached through this study are as follows:

Existing Conditions

- For the studied intersections, the Foxhall Road approaches currently operate at acceptable levels of service during the AM and PM peak hours. For the minor street approaches of W Street and Whitehaven Parkway to Foxhall Road, extensive delays occur due to the heavy commuter through volumes along Foxhall Road, thus making it difficult for motorists to turn onto Foxhall Road.
- The major community-related traffic issues consist of poor sight distances along Foxhall Road, excessive vehicular speeds within the Foxhall Road corridor, and excessive delays for traffic entering Foxhall Road from unsignalized local streets.

Future Proposed Conditions

- The Field School will generate traffic levels which can be accommodated by the public street system without adverse impacts.
- All of the studied intersections will operate at acceptable levels of service during the AM and PM peak hours with the installation of traffic signals at the intersection of W Street/Foxhall Road and Whitehaven Parkway/Foxhall Road proposed by DCDPW.
- Access to the site would only be provided from Foxhall Road. The new plan maintains the existing northern entrance, removes the existing southern driveway, and proposes an additional right-turn in/right-turn out driveway along Foxhall Road to accommodate the anticipated traffic flow of vehicles into and out of the campus, while providing the opportunity for access with adequate sight distance. Left turns into the site would only be allowed at the northern entrance and would be restricted for passenger vehicle traffic between 7:30 AM and 9:00 AM. However, shuttle bus traffic would be allowed to turn left into the site between 7:30 AM and 9:00 AM. Left turns out of the sight would only be allowed at the northern entrance during non-peak hours. Right turns into and out of the site will be allowed at both entrances.
- Shuttle bus service will be provided for students to and from the Foggy Bottom station (Blue and Orange Lines), the Tenleytown station (Red Line), and other off-site locations in the vicinity of the intersections of MacArthur Boulevard/Loughboro Road and Massachusetts Avenue/Nebraska Avenue. In addition to providing shuttle service for Metrorail users, the school has decided that it will expand and promote the shuttle bus service to pick up students at remote pick-up points for the convenience of the parents and to meet the simultaneous goal of keeping Field School-related vehicles away from the Foxhall Road corridor.
- The proposed development plan will adequately provide 128 parking spaces to accommodate the projected parking demand of approximately 98 parking spaces.
- The school will provide a traffic officer on duty to assist with safe access and traffic control during the morning and afternoon peak periods. This officer would also ensure

compliance of no left turns into the school during the morning peak period. This situation will also be conducive to controlling vehicular speeds along Foxhall Road in the vicinity of the Field School.

- School zone warning signs and beacons will be installed along Foxhall Road at the appropriate locations in coordination with the District of Columbia Department of Public Works to reduce the speed limit during school arrival and dismissal to 15 mph. These traffic control signs and devices would facilitate the speed control of vehicles in the vicinity of the Field School on Foxhall Road.

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THE FIELD SCHOOL
TRANSPORTATION MANAGEMENT PLAN

February 29, 2000

The Transportation Management Plan (TMP) for the Field School provides strict guidelines and policies for managing the following elements of the school transportation system:

- Access and Circulation
- Shuttle Bus Program
- Parking
- Safety
- Enforcement and Community Coordination

The following sections present the specific guidelines for each component of the TMP.

Access, Circulation, and Carpool Operations

- Access to the site will only be provided from Foxhall Road. No access to the campus will be provided from 44th Street.

- Right turns into and out of the school are allowed at all times.

- Left turns into and out of the school are only allowed at the northern entrance, where sight distance is adequate.

- Left turns into the school are only allowed during the non-school peak hours of the day. Left turns into the school are explicitly prohibited for passenger vehicles between 7:30 AM and 9:00 AM. However, shuttle buses and emergency vehicles will be allowed to turn left into the school between 7:30 AM and 9:00 AM.

- All exiting vehicles during the AM peak period must turn right to exit the campus.

- The internal circulation and stacking capacity will be adequate to serve the peak morning and afternoon queues associated with the drop-off and pick-up operations.

- Morning drop-off operations will be staggered with 7th and 8th graders (50 students) starting at 8:00 AM and 9th-12th graders (270 students) starting at 8:20 AM. This will allow for all of the 7th and 8th graders to arrive before most of the 9th-12th graders arrive.

- Afternoon pick-up operations are naturally staggered due to the participation of a large majority of the student population in physical education, interscholastic athletics, and extracurricular activities.

- Faculty and staff driving to the Field School will be required to arrive before 7:30 AM.

- Field School will not provide lighted outdoor athletic facilities that will generate traffic in the evenings.

Shuttle Bus Program

- Shuttle bus service will be provided for students to and from the Tenleytown station (Red Line), the Foggy Bottom station (Blue and Orange Lines), and other off-site locations in the vicinity of the intersections of MacArthur Boulevard/Loughboro Road and Massachusetts Avenue/Nebraska Avenue.

- The school will expand and promote the shuttle bus service to pick up students at remote pick-up points for the convenience of the parents and to meet the simultaneous goal of keeping Field School-related vehicles away from the Foxhall Road corridor. The school will arrange for off-site pick-up points, such as near the intersections of MacArthur Boulevard/Loughboro Road and Massachusetts Avenue/Nebraska Avenue and other commuting arteries into the District of Columbia in order to avoid adding traffic onto Foxhall Road.

- The two planned shuttle bus routes would consist of a route from the Foggy Bottom station to the Field School and of a circular route that would serve the off-site locations in the vicinity of the intersections of MacArthur Boulevard/Loughboro Road and Massachusetts Avenue/Nebraska Avenue and would continue to the Tenleytown station before arriving at the Field School campus.

- The school is investigating other off-site shuttle bus locations that could be used as drop-off and pick-up points for parents to utilize.

- The current school location has limited parking. As a result, some Field School employees have utilized public transportation to arrive at work. The shuttle bus service will allow for some employees to continue to use public transportation to arrive at work.

Parking

- Adequate parking is provided to meet the projected daily parking demands of faculty/staff, students, and visitors driving to the Field School.

- All faculty/staff, students, and visitors driving to the Field School are required to park on campus.

- Student drivers will be required to bring at least one additional student with him or her as a requirement of their parking privilege.

- Student drivers will be issued parking stickers that will readily identify his or her vehicle as a Field School-related vehicle. Students who do not have a parking sticker will be prohibited from driving to school. Enrollment contracts will mandate the loss of driving privileges for students who attempt to park in the neighborhood. Disciplinary measures up to and including suspension and/or expulsion will be utilized to enforce parking regulations.

- Faculty and staff will be encouraged to carpool or take public transportation and the associated shuttle bus program to the Field School. Based on the existing parking patterns and the shuttle bus program, it is projected that 50 parking spaces will be needed to meet the faculty/staff parking demand. This demand can be adequately served by the proposed supply of 128 parking spaces.

- For special events that occur no more than four times a year, Field School will operate shuttle buses to available off-site parking locations. Field School will enforce its ban on neighborhood parking during these events.

Safety

- Field School will install a sidewalk for public use within the school's property with a significant buffer between the sidewalk and Foxhall Road.

- A traffic control officer will be present to assist vehicles entering and exiting the property during the AM and PM peak period. The presence of this officer will be conducive to controlling vehicular speeds along Foxhall Road in the vicinity of the Field School.

- Flashing school zone warning signs reducing the speed limit to 15 mph will be installed along Foxhall Road at the appropriate locations in coordination with the District of Columbia Department of Public Works. These traffic control signs and devices will be installed in accordance with guidelines set in the Manual on Uniform Traffic Control Devices (MUTCD) and will facilitate the speed control of vehicles in the vicinity of the Field School on Foxhall Road.

Enforcement and Community Coordination

- Parking enforcement of student drivers will consist of students registering their vehicles and requiring them to park on campus. Students who do not register their vehicles and attempt to park in the neighborhood will be subject to disciplinary measures up to and including suspension and/or expulsion.

- Field School will meet quarterly with a neighborhood committee to address any traffic issues that may arise. This neighborhood committee would consist of one representative from the Field School, the Neighborhood Alliance, Foxhall Crescents Citizens Association, Palisades Citizens Association, ANC 3D, and from the neighboring properties along W Street and Foxboro Place.

- Field School will cooperate with other schools in the area to address community concerns.



THE FIELD SCHOOL

OPERATIONS PLAN

- The School will inaugurate staggered hours between the Lower and Upper Schools with an 8 a.m. start for seventh and eighth graders (approximately 50-60 students) and 8:20 a.m. start for ninth through twelfth graders (approximately 250-260 students).

- The School will strictly enforce carpooling among students so that no student can have the privilege of driving to the campus without at least two passengers, either students or faculty.

- The School will not start any outdoor athletic event after 6 p.m.

- No athletic events will be held on Sunday.

- The School will prohibit students from leaving the campus during the school day except for emergencies.

- The School will permit local residents to utilize the athletic field and tennis court and walk or stroll the campus grounds when these areas are not being used for School purposes.

- The School will shut the lights to the southernmost parking lot at 9 p.m. and not turn on the lights at this parking lot on Saturday and Sunday except for special events.

- The School will not allow any outside group to rent its facilities.

- The School will not install any exterior lighting on the athletic field or tennis courts.

- All lighting on the parking facilities will be directionally down lit with minimum light candle power.

- The School shall meet quarterly with the Liaison Committee which consists of representatives of the School, ANC 3D, the Neighborhood Alliance, the Palisades Citizen's Association, the Foxhall Crescents Homeowner's Association and representatives of the adjacent properties along 44th Street, W Street and Foxboro Place.

- The School will coordinate and work with the other schools located in the area to address community concerns.



Geotechnical Engineering Report
The Field School
2301 Foxhall Road, N.W.
Washington, D.C.

Prepared For: Realco Project Management Services
201 North Union Street, Suite 110
Alexandria, Virginia 22314

GeoConcepts Engineering, Inc.
8-C South Street, S.W. Leesburg, Virginia 20175

GeoConcepts Engineering, Inc.

8-C South Street, S.W., Leesburg, Virginia 20175 (703) 443-0309 * Fax (703) 589-1592

September 10, 1999

Mr. Ken Aultice
Realco Project Management Services
201 North Union Street
Suite 110
Alexandria, Virginia 22314

Subject: ***Geotechnical Engineering Report, The Field School, 2301 Foxhall Road, N.W., Washington, D.C. (Our 991047)***

Dear Mr. Aultice:

GeoConcepts Engineering, Inc. (GeoConcepts) is pleased to present this geotechnical engineering report for the above referenced project. These services have been performed in accordance with our proposal/agreement dated June 25, 1999. A preliminary geotechnical engineering report dated April 22, 1999 was prepared for this site by our firm under our Contract 991009.

1.0 Scope of Services

This study includes the field investigation, soil laboratory testing and engineering analysis of the geotechnical data to develop a geotechnical report. This report specifically addresses the following:

- An evaluation of subsurface conditions within the proposed site development, including recommendations regarding the feasibility of stormwater management by infiltration.
- Foundation recommendations for support of the proposed buildings, building additions, floor slabs on grade, and site retaining walls.
- Lateral earth pressures for use in design of building walls below grade and site retaining walls.

- Subdrainage design recommendations for handling of ground water.

- Assessment of subgrade conditions for support of flexible and rigid pavements, including estimated California Bearing Ratio (CBR) values based on soil laboratory test results.

- Earthwork recommendations for construction of loadbearing fills, including an assessment of on-site soils to be excavated for re-use as fill.

Services with respect to construction dewatering recommendations, environmental matters, temporary slopes, erosion control, cost or quantity estimates, plans, specifications, construction observation and testing, or services not identified above are not included in the scope of services.

2.0 Executive Summary

Based on our evaluation of the subsurface conditions and the project data furnished to us, we have developed the following summary of recommendations. Detailed recommendations are presented in the body of this report.

- The proposed buildings may be supported on spread footings placed on either natural soils or new compacted structural fill. We recommend using a design soil bearing pressure of 3,000 psf for footings supported by natural soils or compacted structural fill. Lower floor slabs may be supported on grade.

- The soft existing fill present in the northeast corner of the proposed gymnasium must be removed down to natural soils and replaced with new compacted fill.

- Soils from on-site cuts may generally be re-used as compacted fill; however, there are clay layers within Stratum B that will not be suitable for re-use as fill in building and pavement areas. In addition, the residual silt soils of Stratum C may be difficult to work with due to in-place moisture contents above optimum for compaction. Drying of these soils by spreading and aerating may be necessary to obtain proper compaction.

- Deep uncontrolled existing fill is present in the area of proposed stormwater management by infiltration. This existing fill is not to be considered suitable for infiltration purposes, and accordingly, stormwater management by infiltration is not recommended at this location on the site.

3.0 Site Description and Proposed Construction

The Field School site is located at 2301 Foxhall Road in Northwest, Washington, D.C. and occupies approximately 10 acres. Currently, the site contains a residential structure (The Cafritz House) on the northern portion of the property, while the remainder of the property consists of open grassed areas. Topographic relief at the site is considerable, with a total topographic relief of about 140 feet across the site. In general, the residence occupies the highest portion of the site. The remainder of the site slopes down towards the southeast, with slope gradients ranging from 2H:1V to 14H:1V.

We understand that the proposed improvements are to include three academic buildings (Buildings 1 through 3), a gymnasium, a theatre, associated parking and roadway areas, and subsurface utilities. Figure 6 in Appendix A shows the proposed building layout. We also understand one floor of new construction will be added onto the existing garage. We understand estimated maximum column and wall loads for the proposed construction are 80 kips and 10 kips per linear foot, respectively. Due to significant topographic relief across the site, site retaining walls are also planned. The proposed lower floor elevations, and maximum cuts and fills to reach these lower floor levels for each building are presented in the table below:

Building Identification	*Proposed Lower Floor Elevation*	*Maximum Cut (ft)*	*Maximum Fill (ft)*
Building 1	EL 305	9	11
Building 2	EL 317	11	7
Building 3	EL 294 to EL 321	25	--
Gymnasium	EL 294 to 306	23	15
Theatre	EL 291 to EL 305	--	23

4.0 Subsurface Conditions

Subsurface conditions were investigated using a combination of soil test borings and a shallow test pit. A total of 12 soil test borings were drilled in the area of the proposed buildings and one test pit was excavated in the area of the existing garage to evaluate the existing footing conditions. Test boring logs, an existing garage footing profile and a subsurface investigation location plan, are presented in Appendix A. Test boring logs from our preliminary geotechnical study were used to aid in this analysis and are also presented in Appendix A.

4.1 Stratification

The subsurface materials encountered have been stratified for purposes of our discussions herein. These stratum designations do not imply that the materials encountered are continuous across the site. Stratum designations have been established to characterize similar subsurface conditions based on material gradations and parent geology. The subsurface materials encountered in the test borings completed at the Field School site have been assigned to the following strata:

Stratum A (Existing Fill)	At the ground surface in Borings B-2, B-4, B-11 and B-12 to a maximum depth of 22 feet.	loose to firm clayey sand, silty sand, sandy silt FILL and PROBABLE FILL, with gravel, wood, asphalt and brick, moist, yellow-brown, and brown.
Stratum B (Cretaceous Potomac Group)	At the ground surface, and below Stratum A to a maximum depth of 20 feet in Borings B-1, B-2, and B-6.	generally firm to compact or medium stiff to stiff LEAN CLAY (CL), FAT CLAY (CH), SILT (ML), silty SAND (SM) and clayey SAND (SC), with gravel, moist, reddish-brown, yellow-brown.
Stratum C1 (Ordovician Residual)	Below Strata A and B to a maximum depth of 25 feet in Boring B-11.	medium stiff to stiff sandy SILT (ML) and ELASTIC SILT (MH), micaceous, moist, reddish-brown yellow-brown, purple, and gray
Stratum C2 (Ordovician Residual)	Below Strata A, B and C1 to a maximum depth of 30 feet in Boring B-4.	firm to compact silty SAND (SM), micaceous, moist, yellow-brown, white, and gray

Topsoil was encountered to depths ranging from 0.2 to 0.3 feet. Topsoil depths presented on the test boring logs should not be considered as stripping depths, as topsoil depths are expected to vary across the site, particularly in wooded areas.

The two letter designations included in the Strata descriptions presented above and on the test boring logs represent the Unified Soil Classification System (U.S.C.S.) designations for the samples based on visual classifications conducted in the field during the subsurface

investigation. These designations may not match classifications determined by laboratory testing. Visual classifications were conducted using the methods described in ASTM D-2488.

4.2 Geology

The Field School site lies within the Piedmont Physiographic Province. The Piedmont is bordered to the east by the Coastal Plain Physiographic Province and to the west by the Blue Ridge Physiographic Province. The dividing line between the Coastal Plain and the Piedmont is locally referred to as the "Fall Line". This name comes from the waterfalls that form as a result of the differential erosion that occurs as streams cross the Piedmont/Coastal Plain contact. The Field School site lies just west of the Fall Line. Bedrock in the Piedmont generally consists of various metamorphic and igneous rock. Surface topography in the Piedmont is the result of millions of years of erosion.

An isolated pod of coastal plain sediments are present along the upper portions of Foxhall Road. This sequence of sediments represents an erosional remnant consisting of marine deposits. These sediments correlate with Stratum B in this report, and are believed to belong to the Potomac Group from the Cretaceous Geologic Period. The lower portions of Stratum B become quite gravelly, which can be difficult to excavate in confined or trench excavations.

The bedrock beneath the Field School site consists of a granitic gneiss rock that is a member of the Daleclaria Intrusive Suite from the Ordovician Geologic Period. The residual materials derived from the physical and chemical weathering of the parent bedrock generally consists of micaceous silts and sands, which correlate with Strata C1 and C2 in this report.

The existing fill soils of Stratum A are associated with previous grading at the site. The fills become quite deep (maybe greater than 25 feet) on the lower, southeast portion of the property.

4.3 Ground Water

Ground water was not encountered in the test borings completed for this project. Additionally, observations made about a day after drilling did not indicate the presence of ground water to the depths the boreholes caved. Based on these data, it is not expected that special underfloor subdrainage will be required at the Field School site. Ground water observations provide representations of the ground water levels at the time the measurements

were made. It should be noted that the soil borings were completed during a period of extended dry weather. Fluctuation in the water table should be expected with seasons of the year, construction activity, precipitation, or other such factors.

4.4 Soil Laboratory Test Results

Selected soil samples were tested for sieve analysis, Atterberg limits, and natural moisture contents. A summary of laboratory test data for the samples tested is presented in Appendix B. The results of natural moisture content testing are presented on the test boring logs in Appendix A.

Samples tested from Stratum A classified as clayey SAND (SC) with between 33 and 45 percent fines passing the U.S. Standard No. 200 sieve. The liquid limit and plasticity index for this material was 38 and 17, respectively. Natural moistures ranged from about 13 to 22 percent.

Samples tested from Stratum B classified as FAT CLAY (CH), sandy LEAN CLAY (CL), and clayey SAND (SC) with about 37 to 91 percent fines passing the U.S. Standard No. 200 sieve. Liquid limits and plasticity indices ranged from 42 to 54 and 22 to 26, respectively. Natural moisture contents ranged from about 10 to 24 percent.

4.5 Stormwater Management by Infiltration

Two soil test borings (B-11 and B-12) were drilled in the area of planned infiltration basins. The borings indicated uncontrolled existing fill is present up to 22 feet in depth. Due to their fine-grained nature and irregular deposition, existing fill materials should not be considered suitable for use for infiltration purposes. Accordingly, stormwater management by infiltration is not recommended in this part of the site.

4.6 Test Pit Excavation

A shallow test pit was excavated on the west side of the existing garage to document existing foundation conditions. Our observations indicate that the top of the existing footing is located about 1.75 feet below exterior grade. The concrete spread footing extended approximately 5-inches beyond the foundation wall. The bottom of the footing was approximately 2.8 feet below exterior grade. An undocumented waterline was encountered approximately 3-inches below existing grade that runs parallel to the garage wall.

5.0 Engineering Analysis

Spread footing foundations were considered for support of the proposed buildings. Recommendations regarding foundations, lower floor slabs on grade, lateral earth pressures, subdrainage, pavements, and earthwork are presented herein.

5.1 Foundations

Based on the proposed lower floor elevations for the planned improvements, we generally expect that firm to compact natural soils or new compacted fill will be encountered at normal spread footing depths for the proposed buildings. Spread footings founded on these materials are considered suitable for support of the proposed buildings. Spread footings bearing on the natural soils or new compacted fill may be designed with an allowable soil bearing pressure of 3,000 psf. Retaining wall footings founded on these materials may also be designed for an allowable soil bearing pressure of 3,000 psf. In addition, the soils at the existing garage footing subgrade levels should provide an allowable soil bearing pressure of 3,000 psf.

The soft existing fill present in the northeast corner of the proposed gymnasium (Boring B-4) should be removed down to natural soils and replaced with new compacted fill. The new fill should extend at least 10 feet beyond exterior wall lines.

New compacted fill requirements are presented in Section 5.5 of this report and are illustrated by Figure 1. Exterior footing subgrades should be located at least 2.5 feet below final exterior grade for frost considerations. Individual column footings and continuous wall footings should be at least 30-inches and 16-inches wide, respectively for shear considerations. A maximum slope of 1H:1V should be maintained between the bottom edges of adjacent footings. We estimate that settlement of individual spread footings will not exceed 1-inch and differential settlement between adjacent foundation elements will not exceed one-half this amount.

5.2 Lower Floor Slabs on Grade

Earth supported floor slabs are considered feasible at the Field School site. Based on the proposed elevations previously described, we expect that firm natural soils or new compacted fill will be encountered at floor slab subgrades. We recommend that a 4-inch minimum thickness of washed gravel or crushed stone meeting the requirement of AASHTO No. 57 be placed below floor slabs on-grade to serve as a moisture barrier. An impermeable plastic membrane should be

placed on top of the crushed stone layer to prevent concrete infiltration into the crushed stone during concrete placement. All debris and soft soils near the final floor slab subgrade as a result of construction operations should be stripped and removed prior to placement of underfloor stone.

5.3 Lateral Earth Pressures and Subdrainage

Building walls below grade and site retaining walls must be designed to withstand lateral earth pressures. We recommend using an average equivalent fluid pressure of 50H (psf) for design of building walls below grade, and an average equivalent fluid pressure of 40H (psf) for design of site retaining walls, where H refers to the height of the wall in feet. Retaining walls may be designed to include a passive equivalent fluid pressure of 360D (psf), where D represents the depth of wall embedment below the exposed wall face. The upper 1.5 feet of soil at the base of retaining walls should not be included in the design of passive soil resistance. A coefficient of friction of 0.30 may be used for sliding resistance at the soil/concrete interface. Recommended lateral earth pressure diagrams for use in the design of building walls below grade and site retaining walls are represented as Figures 2 and 3, respectively.

Hydrostatic pressures are not included in the lateral earth pressure diagrams assuming the use of relatively permeable backfill and subdrainage at the base of walls below grade and site retaining walls. Subdrainage recommendations are presented on Figures 3 and 4 for retaining walls and building walls, respectively. Underfloor subdrainage is not considered necessary since ground water is expected to be below the lower floor levels. Recommendations for backfill against walls below grade are presented in Section 5.5 of this report.

5.4 Pavements

Pavement subgrades are expected to consist of natural sand and silt soils, or new compacted fill. These materials are considered suitable for support of the planned roadways and parking areas. Based on the soil laboratory results for the materials expected at pavement subgrades, we recommend that a preliminary California Bearing Ratio (CBR) value of 5 and 8 be used for pavements bearing on the Stratum C1 silts and Stratum B sands, respectively. CBR tests should be performed on pavement subgrade soils after rough grading and installation of utilities within roadways. Final pavement sections should be based on CBR tests taken on

subgrade soils at the time of construction. Concrete pavements should be utilized in loading dock areas and for dumpster pads. Concrete used in rigid pavement sections should have a minimum 28-day compressive strength of 4,000 psi, and should be reinforced with No. 4 rebar at 12-inches on center in each direction.

5.5 Earthwork

Fill is required for site grading in building and pavement areas. The areas to be filled should be cleared and grubbed prior to placing fill. Unsuitable existing fill, soft or loose natural soils, organic material and rubble should be subcut to approved subgrades as determined by the geotechnical engineer. All subgrades should be proofrolled with a minimum 10-ton loaded dump truck or suitable rubber tire construction equipment under the observation of the geotechnical engineer, prior to the placement of new fill.

Materials used for compacted fill for support of footings, floor slabs, pavements, and against walls below grade and retaining walls should consist of soils classifying ML, SC, SM, SP, SW, GC, GM, GP or GW per ASTM D-2487. Materials used for backfill against walls below grade must have a liquid limit and plasticity index less than 45 and 20, respectively. It is expected that the majority of soils excavated from Strata B, C1 and C2 will generally be suitable for re-use as fill in building and pavement areas, except that there are clay layers in Stratum B that will not be suitable for re-use as fill. The existing fill of Stratum A was observed to contain a significant amount of deleterious material, and therefore, is generally not considered suitable for re-use as fill without screening or separation of these deleterious materials.

Drying of on-site soils by spreading and aerating may be necessary to obtain proper compaction. This, however, may not be practical during the wet period of the year. Earthwork operations should be planned for early spring through late fall when drier weather conditions can be expected. Individual borrow areas, both from on-site and off-site sources, should be sampled and tested to verify classification of materials prior to their use as fill.

Fill material should be compacted in lifts not exceeding 8-inches loose thickness to at least 95 percent of the maximum dry density per ASTM D-698. The upper 6-inches of pavement subgrades should be compacted to at least 100 percent of the maximum dry density per ASTM D-698. Fill placed along slopes steeper than 5H:1V should be benched into the existing slope.

Benches should consist of a minimum 8 feet wide level cut, and at least one such bench should be used for each 3 feet of vertical rise of fill placed.

6.0 General Limitations

Recommendations contained in this report are based upon the data obtained from the relatively limited number of soil test borings and one test pit excavation. This report does not reflect conditions which may occur between the points investigated. The nature and extent of variations between test borings and test pits may not become evident until the course of construction. It is therefore essential that on-site observations of subgrade conditions be performed during the construction period to determine if re-evaluation of the recommendations in this report must be made. It is critical to the successful completion of this project that GeoConcepts Engineering, Inc. be retained during construction to observe the implementation of the recommendations provided herein.

This report has been prepared to aid in the evaluation of the site and assist your office and the design professionals in the design of this project. It is intended for use with regard to the specific project as described herein. Substantial changes in proposed construction, site grading, structure loads, etc. should be brought to our attention so that we may determine any effect on the recommendations given herein.

An allowance should be established for additional costs that may be required for foundation and earthwork construction as recommended in this report. Additional costs may be incurred for various reasons including unanticipated existing fill conditions, wet fill materials, unanticipated ground water problems, etc.

This report should be made available to bidders prior to submitting their proposals and to supply them with facts relative to the subsurface conditions revealed by our investigation and the results of analyses and studies which we have performed for this project. In addition, this report should be given to the successful contractor and subcontractors for their information only.

This report was prepared using generally accepted geotechnical engineering practices. No warranties, expressed or implied, are made as to the professional services included in this report.

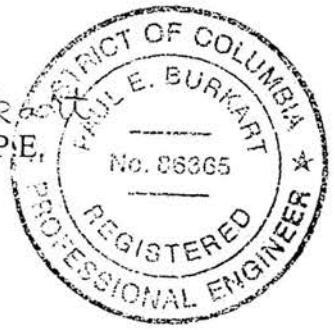
We appreciate the opportunity to be of service for this project. Please contact the undersigned if you require clarification of any aspect of this report.

Sincerely,

GEOCONCEPTS ENGINEERING, INC.

R. Drew Thomas, C.P.G.
Senior Geologist

Paul E. Burkart, P.E.
Principal



RDT/PB/TL

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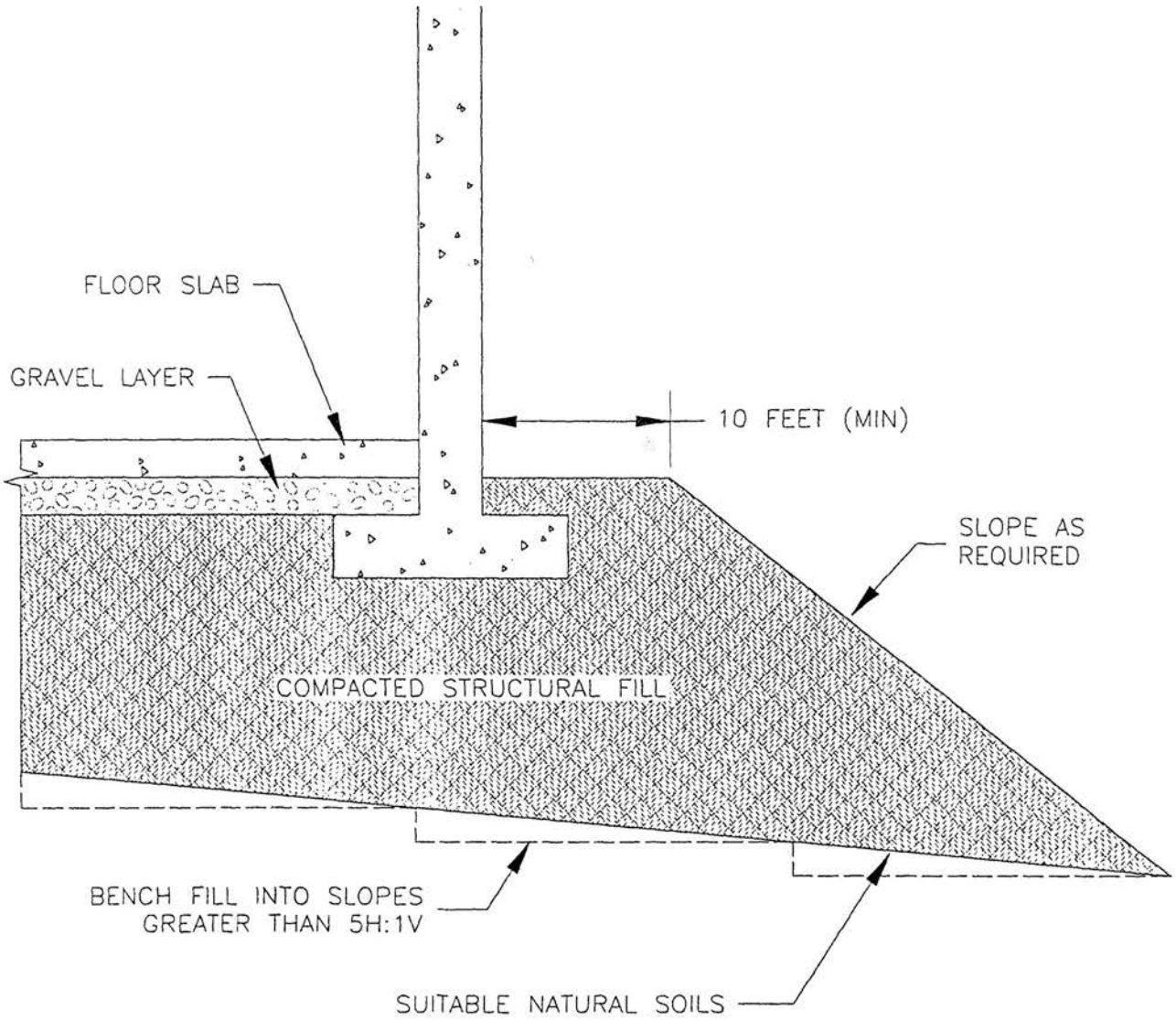
copy: Mr. Tom Wheeler
KressCox Associates

Mr. David Linton
McMullan & Associates

Mr. R.J. Keller
R.C. Fields, Jr. & Associates

Figure 1: Compacted Structural Fill Diagram
Figure 2: Design Earth Pressure for Building Walls
Figure 3: Design Earth Pressure for Retaining walls
Figure 4: Foundation Subdrainage Design Recommendations

Appendix A: Subsurface Investigation Report
Appendix B: Soil Laboratory Test Report

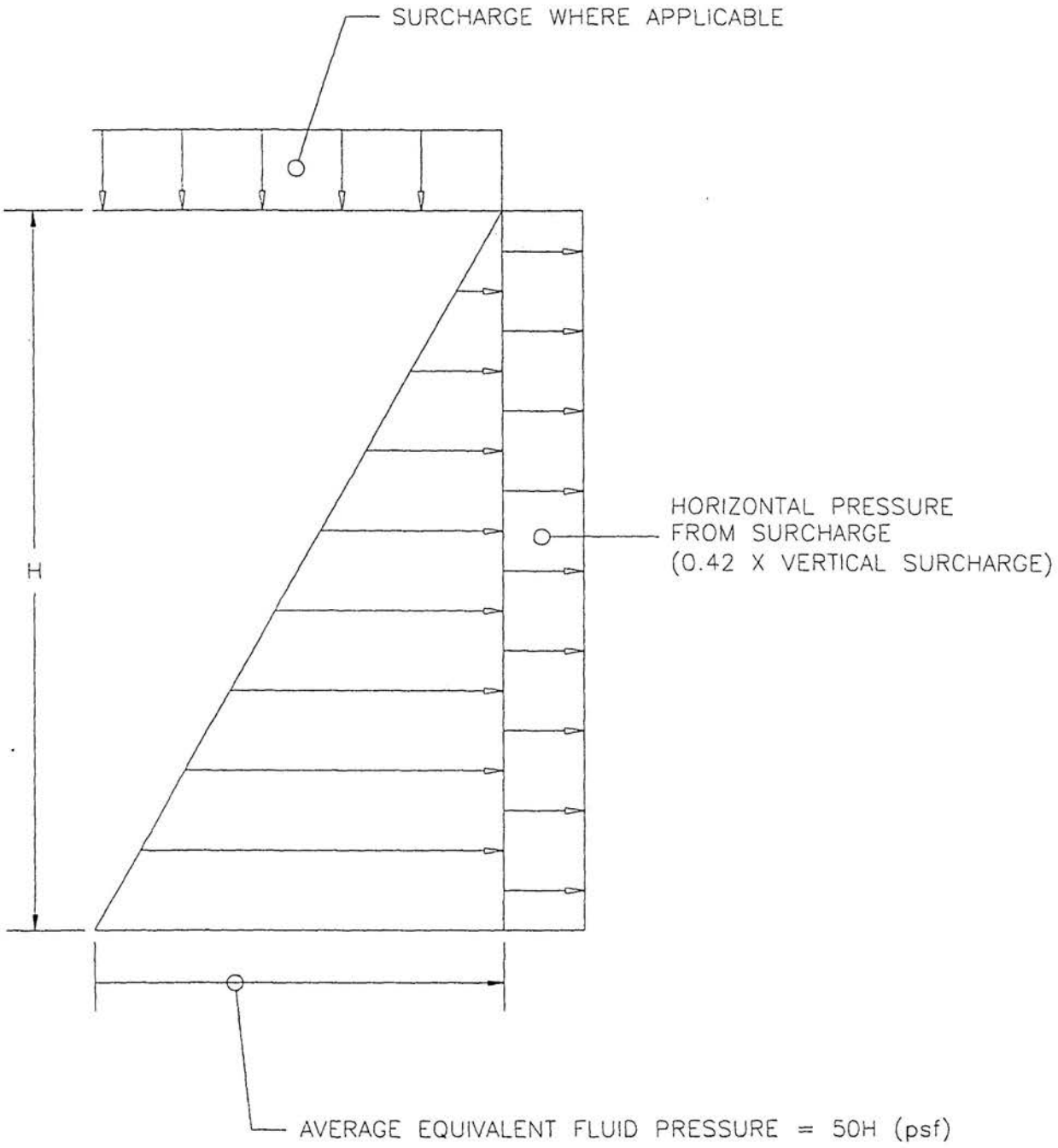


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THE FIELD SCHOOL 2301 FOXHALL ROAD, N.W., WASHINGTON, D.C.			
COMPACTED STRUCTURAL FILL DIAGRAM		Scale: N.T.S.	Fig. 1
Date: AUG 20, 1999	Checked By: R.D.T.	Project No.: 991047	



NOTES:

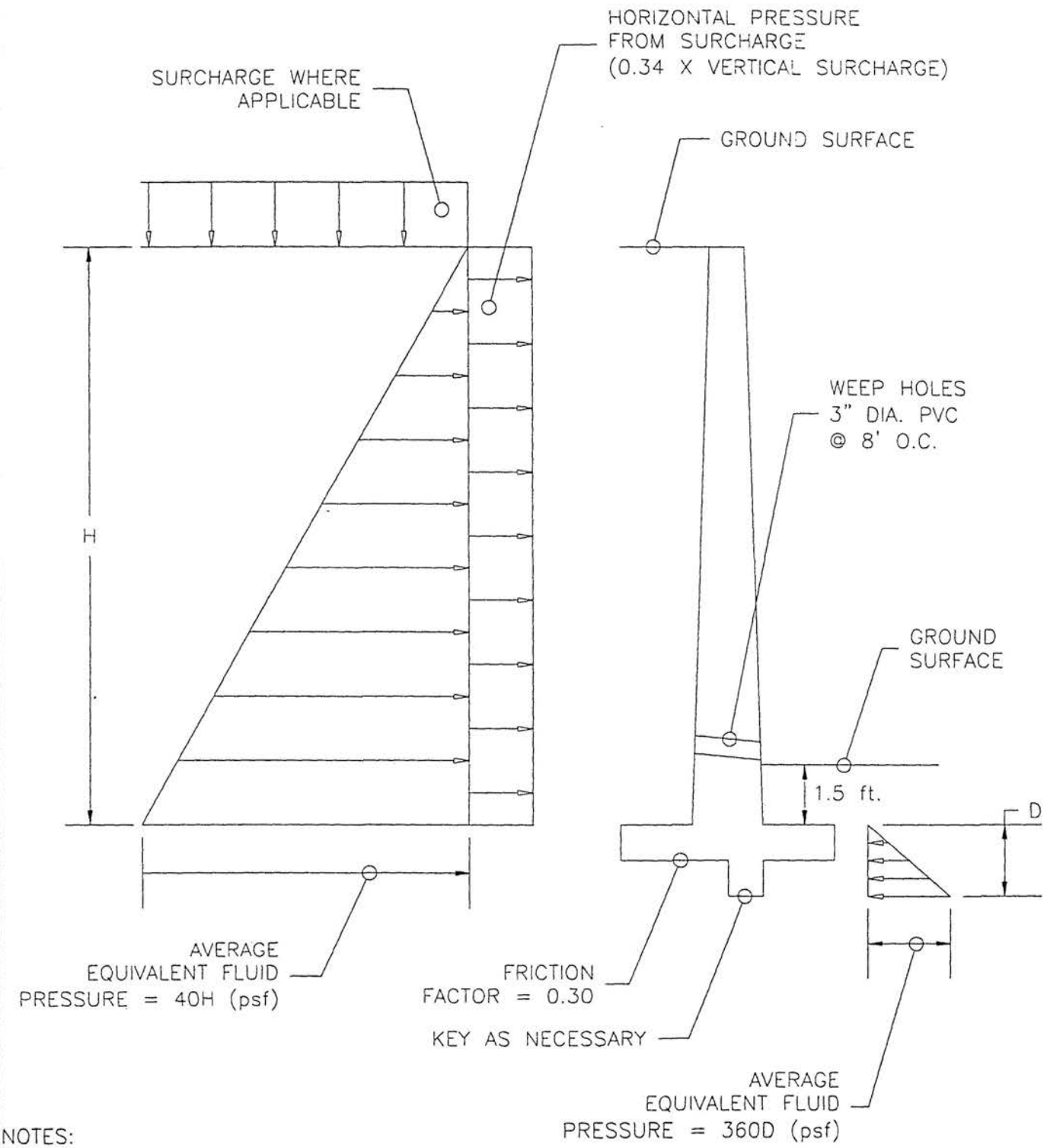
1) PRESSURE DIAGRAM SHOWN ASSUMES HORIZONTAL GROUND BEHIND WALL, FULL DRAINAGE OF HYDROSTATIC PRESSURE, AND BACKFILL CONSISTING OF MATERIAL CLASSIFIED AS ML, SC OR MORE GRANULAR PER ASTM D-2487. THE LIQUID LIMIT AND PLASTICITY INDEX OF THE BACKFILL MATERIAL SHOULD NOT EXCEED 45 AND 20, RESPECTIVELY.

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THE FIELD SCHOOL 2301 FOXHALL ROAD, N.W., WASHINGTON, D.C.			
LATERAL EARTH PRESSURE DIAGRAM FOR BUILDING WALLS		Scale: N.T.S.	Fig. 2
Date: AUG 18, 1999	Checked By: R.D.T.	Project No.: 991047	



NOTES:

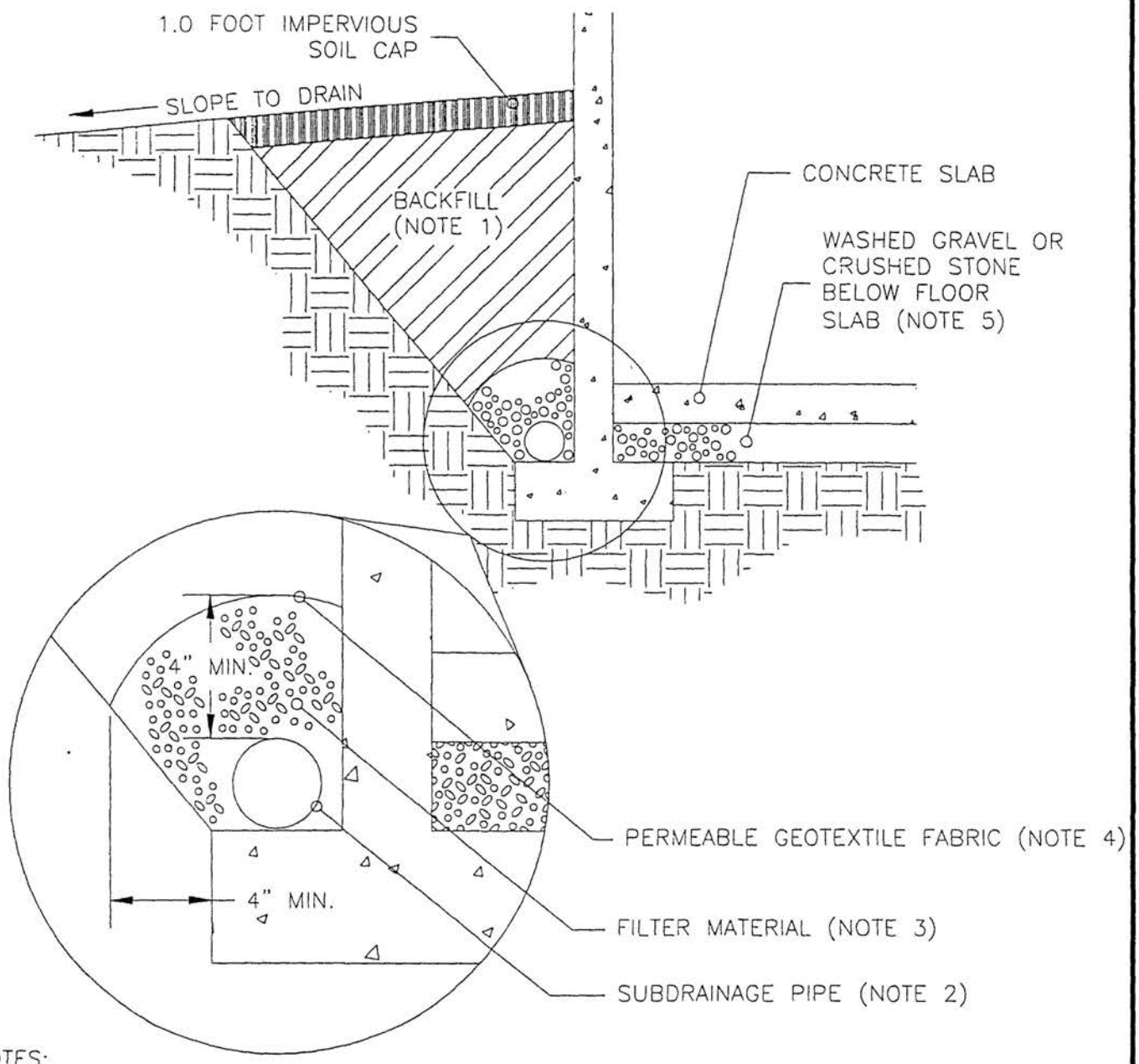
1) PRESSURE DIAGRAM SHOWN ASSUMES HORIZONTAL GROUND BEHIND WALL, FULL DRAINAGE OF HYDROSTATIC PRESSURE, AND BACKFILL CONSISTING OF MATERIAL CLASSIFIED AS ML, SC OR MORE GRANULAR PER ASTM D-2487. THE LIQUID LIMIT AND PLASTICITY INDEX OF THE BACKFILL SHOULD NOT EXCEED 45 AND 20, RESPECTIVELY.

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THE FIELD SCHOOL 2301 FOXHALL ROAD, N.W., WASHINGTON, D.C.			
LATERAL EARTH PRESSURE DIAGRAM FOR RETAINING WALLS		Scale: N.T.S.	Fig. 3
Date: AUG 18, 1999	Checked By: R.D.T.	Project No.: 991047	



NOTES:

1) Backfill should consist of material classified ML, SC, SM, SP, SW, GC, GM, GP or GW per ASTM D-2487. The Liquid Limit and Plasticity Index of the backfill material should not exceed 45 and 20, respectively.
2) Subdrainage piping should be 4" dia. slotted corrugated polyethylene (PE) tubing according to ASTM F-405 with 1/8 inch slot width. Piping should connect to a sump for discharge or to a suitable gravity outlet.
3) Filter material should satisfy requirements for AASHTO No. 7.
4) Permeable fabric should have an equivalent opening size not greater than the U.S. Standard No. 70 sieve.
5) Washed gravel or crushed stone should satisfy gradation requirements for AASHTO No. 57.

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THE FIELD SCHOOL 2301 FOXHALL RD., N.W., WASHINGTON, D.C.			
FOUNDATION SUBDRAINAGE DESIGN RECOMMENDATIONS		Scale: N.T.S.	Fig. 4
Date: AUG. 20, 1999	Checked By: R.D.T.	Project No.: 991047	

Appendix A
Contract No. 991047

Subsurface Investigation Report

Subsurface Investigation Procedures (1 page)
Identification of Soil (1 page)
Test Boring and Test Pit Notes (1 page)
Test Boring Logs, This Contract (12 pages)
Test Boring Logs, Our Previous Contract 991009 (3 pages)
Existing Garage Footing Profile (1 page)
Subsurface Investigation Location Plan (1 page)

Subsurface Investigation Procedures

1. ***Test Borings–Hollow Stem Augers***

The borings are advanced by turning an auger with a center opening of 2-¼ inches. A plug device blocks off the center opening while augers are advanced. Cuttings are brought to the surface by the auger flights. Sampling is performed through the center opening in the hollow stem auger, by standard methods, after removal of the plug. Usually, no water is introduced into the boring using this procedure.

2. ***Standard Penetration Tests***

Testing is performed by driving a 2-inch O.D., 1-⅜ inch I.D. sampling spoon driven with a 140 pound hammer falling 30-inches, according to ASTM D-1586. After an initial 6-inches to assure the sampling spoon is in undisturbed material, the number of blows required to drive the sampler an additional 12-inches is generally taken as the N value. In the event 30 or more blows are required to drive the sampling spoon the initial 6-inch interval, the sampling spoon is driven to a total penetration resistance of 100 blows or 18-inches, whichever occurs first. The sampling operation is terminated after a total of 100 hammer blows and the depth of penetration is recorded.

3. ***Test Pit Excavations***

The test pits were excavated by hand shoveling. Following our observations and measurements, test pit excavations were backfilled with the excavated spoils without compaction.

4. ***Test Boring and Test Pit Locations and Grades***

The test boring location and elevation survey was provided by R.C. Fields, Jr. & Associates, P.C.

GeoConcepts Engineering, Inc.

IDENTIFICATION OF SOIL

DEFINITION OF SOIL GROUP NAMES	ASTM D-2487-98		Symbol	Group Name
Coarse-Grained Soils More than 50% retained on No. 200 sieve	**Gravels** - More than 50% of coarse fraction retained on No. 4 sieve Coarse, ¾" to 3" Fine, No. 4 to ¾"	Clean Gravels Less than 5% fines	GW	WELL GRADED GRAVEL
			GP	POORLY GRADED GRAVEL
		Gravels with Fines More than 12% fines	GM	silty GRAVEL
			GC	clayey GRAVEL
	Sands - 50% or more of coarse fraction passes No. 4 sieve Coarse, No. 10 to No. 4 Medium, No. 40 to No. 10 Fine, No. 200 to No. 40	Clean Sands Less than 5% fines	SW	WELL GRADED SAND
			SP	POORLY GRADED SAND
		Sands with fines More than 12% fines	SM	silty SAND
			SC	clayey SAND
Fine-Grained Soils 50% or more passes the No. 200 sieve	**Silts and Clays** - Liquid Limit less than 50 Low to medium plasticity	Inorganic	CL	LEAN CLAY
			ML	SILT
		Organic	OL	ORGANIC CLAY
				ORGANIC SILT
	Silts and Clays - Liquid Limit 50 or more Medium to high plasticity	Inorganic	CH	FAT CLAY
			MH	ELASTIC SILT
		Organic	OH	ORGANIC CLAY
				ORGANIC SILT
Highly Organic Soils	Primarily organic matter, dark in color, and organic odor		PT	PEAT

II. DEFINITION OF MINOR COMPONENT PROPORTIONS

Minor Component Adjective Form	Approximate Percentage of Fraction by Weight
Gravelly, Sandy	30% or more coarse grained
With	
Sand, Gravel	15% or more coarse grained
Silt, Clay	5% to 12% fine grained
Trace	
Sand, Gravel	Less than 15% coarse grained
Silt, Clay	Less than 5% fine grained

III. GLOSSARY OF MISCELLANEOUS TERMS

SYMBOLS - Unified Soil Classification Symbols are shown above as group symbols. Use "A" Line Chart for laboratory identification. Dual symbols are used for borderline classification.

BOULDERS & COBBLES - Boulders are considered pieces of rock larger than 12 inches, while cobbles range from 3 to 12 inches.

DISINTEGRATED ROCK - Residual rock material with a standard penetration test (SPT) resistance between 60 blows per foot and refusal. Refusal is defined as a SPT of 100 blows for 2" or less penetration.

ROCK FRAGMENTS - Angular pieces of rock, distinguished from transported gravel, which have separated from original vein or strata and are present in a soil matrix.

QUARTZ - A hard silicate mineral often found in residual soils.

CEMENTED SAND - Usually localized rock-like deposits within a soil stratum composed of sand grains cemented by calcium carbonate, iron oxide, or other minerals. Commonly encountered in Coastal Plain sediments.

MICA - A plate-like phyllosilicate mineral found in many rocks, and in residual or transported soil derived therefrom.

ORGANIC MATERIALS (Excluding Peat) -

Topsoil - Surface soils that support plant life and which contain 8 to 20 % organic matter;
Organic Matter - Soil containing organic colloids throughout its structure;
Lignite - Hard, brittle decomposed organic matter with low fixed carbon content (a low grade of coal).

FILL - Man made deposit containing soil, rock and often foreign matter.

PROBABLE FILL - Soils which contain no visually detected foreign matter but which are suspect with regard to origin.

LENSES - 0 to ½ inch seam of minor soil component.

LAYERS - ½ to 12 inch seam of minor soil component.

POCKET - Discontinuous body of minor soil component.

COLOR SHADES - Light to dark to indicate substantial difference in color.

MOISTURE CONDITIONS - Wet, moist, or dry to indicate visual appearance of specimen.

Test Boring And Test Pit Notes

1. Classification of soil is by visual inspection and is in accordance with the Unified Soil Classification System.

2. Estimated ground water levels are indicated on the logs. These are only estimates from available data and may vary with precipitation, porosity of soil, site topography, etc.

3. Sampling data presents standard penetrations for 6-inch intervals or as indicated with graphic representations adjacent to the sampling data.

4. The logs and related information depict subsurface conditions at the specific locations and at the particular time when drilled. Soil conditions at other locations may differ from conditions occurring at the test locations. Also, the passage of time may result in a change in the subsurface conditions at the test locations.

5. The stratification lines represent the approximate boundary between soil types as determined in the sampling operation. Some variation may be expected vertically between samples taken. The soil profile, water level observations and penetration resistances presented on the logs have been made with reasonable care and accuracy and must be considered only an approximate representation of subsurface conditions to be encountered at the particular location.

6. Test pit excavations are logged to provide a record for geotechnical evaluation, construction inspection or other specialized purpose. Any significant features, such as fill conditions, underground structures, ground water seepage conditions, etc. are recorded.

7. Disintegrated rock is defined as residual earth material with a penetration resistance between 60 blows per foot and refusal. Refusal at the surface of rock, boulders, or obstruction is defined as penetration resistance of 100 blows for 2-inches penetration or less.

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Project No: 991047 — *Boring No.: B-1*

Project: The Field School — **Elevation:** 341.6

Client: Realco Project Management Services — **Engineer:** K.Patterson

Location: Washington, D.C. — **Date Drilled:** 7-25-99

Depth (ft)	Description	Elevation (ft)	Stratum	SAMPLE: SPT Results	SAMPLE: Recovery	SPT Results: N-Value (blows/ft)	% Moisture	Remarks
0	Ground Surface	341.6	B					
	Topsoil							
2	Clayey SAND (SC), with gravel, and lean clay layers, moist, reddish-brown			6+12+12	14"			
4				8+12+13	14"		17.6	
6				10+15+15	18"			
8								
10				10+14+14	18"			
12								
14				8+16+16	18"			
16		324.6						
18	sandy LEAN CLAY (CL), moist, purple, gray, reddish-brown, and yellow-brown	321.6		6+8+18	18"			
20	Bottom of Boring							
22								
24								
26								
28								
30								



Drilling Contractor: Stevens Drilling

Drilling Method: 2.25" Diameter H.S.A

Drilling Foreman: Cave

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry — Caved: 15 ft

Long Term

Date: 7-26-99

Depth: Dry — Caved: 15 ft

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Project No: 991047 — *Boring No.: B-2*

Project: The Field School — **Elevation:** 328.2

Client: Realco Project Management Services — **Engineer:** K.Patterson

Location: Washington, D.C. — **Date Drilled:** 7-24-99

Depth (ft)	Description	Elevation (ft)	Stratum	SPT Results	Recovery	% Moisture	Remarks
0	Ground Surface	328.2					
	Topsoil						
2	clayey sand with gravel FILL, with asphalt, brick, and trace organic matter, moist, brown	324.7	A	7+9+11	14"		
4	Clayey SAND (SC), with gravel, moist, reddish-brown		B	8+15+20	18"		
6				8+9+9	18"		
8				3+6+10	18"		
10							
12		316.2					
	Clayey SAND (SC), with gravel, moist, gray, reddish-brown, and yellow-brown						
14				10+10+17	18"		
16							
18							
20		308.2		28+28+11	18"		
	Bottom of Boring						
22							
24							
26							
28							
30							

SPT Results
N-Value (blows/ft)
20 40 60 80



Drilling Contractor: Stevens Drilling

Drilling Method: 2.25" Diameter H.S.A

Drilling Foreman: Cave

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry Caved: 17 ft

Long Term

Date: 7-25-99

Depth: Dry Caved: 17 ft

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Project No: 991047 — *Boring No.: B-3*

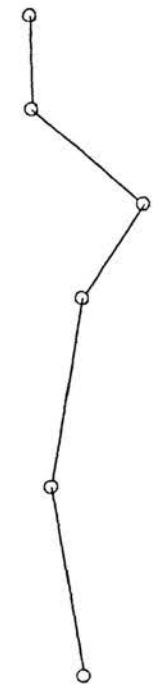
Project: The Field School — **Elevation:** 320.0

Client: Realco Project Management Services — **Engineer:** K.Patterson

Location: Washington, D.C. — **Date Drilled:** 7-24-99

Depth (ft)	Description	Elevation (ft)	Stratum	SPT Results	Recovery	% Moisture	Remarks
0	Ground Surface	320	B				
	Topsoil						
2	clayey SAND (SC), moist, yellow-brown			9+12+12	18"		
4				9+11+14	18"		
6				11+31+31	14"	10.2	
8		311.5					
10	clayey SAND (SC), with gravel, moist, reddish-brown	308		23+23+18	14"		
12	Sandy SILT (ML), micaceous, moist, yellow-brown and gray		C1				
14				8+13+18	18"		
16							
18							
20		300		10+17+25	18"		
	Bottom of Boring						
22							
24							
26							
28							
30							

SPT Results N-Value (blows/ft): 20 40 60 80



Drilling Contractor: Stevens Drilling

Drilling Method: 2.25" Diameter H.S.A

Drilling Foreman: Cave

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry — Caved: 15 ft

Long Term

Date: 7-25-99

Depth: Dry — Caved: 15 ft

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Project No: 991047 — *Boring No.: B-4*

Project: The Field School — **Elevation:** 291.3

Client: Realco Project Management Services — **Engineer:** K.Patterson

Location: Washington, D.C. — **Date Drilled:** 7-24-99

Depth (ft)	Description	Elevation (ft)	Stratum	SAMPLE: SPT Results	SAMPLE: Recovery	SPT Results N-Value (blows/ft) 20 40 60 80	% Moisture	Remarks
0	Ground Surface	291.3						
0	Topsoil							
2	clayey sand with gravel FILL, with brick and asphalt, moist, brown			10+14+10	14"			
4			A	3+2+2	12"			
6				2+2+100	12"			
8		282.8						
10	Sandy SILT (ML), micaceous, moist, yellow-brown and gray			42+32+11	14"			
14			C1	3+6+6	18"			
18				6+6+8	18"			
22		267.3						
24	Silty SAND (SM), micaceous, moist, gray, yellow-brown, and white			7+10+10	18"			
26			C2					
28				10+40+60	18"			
30		261.3						Bottom of Boring

Drilling Contractor: Stevens Drilling

Drilling Method: 2.25" Diameter H.S.A

Drilling Foreman: Cave

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry — Caved: 25 ft

Long Term

Date: 7-25-99

Depth: Dry — Caved: 25 ft

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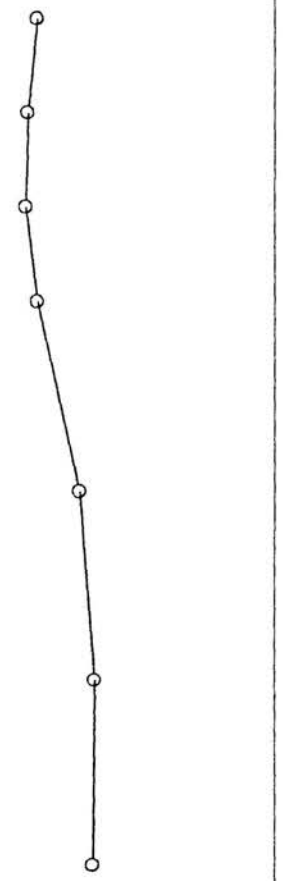
Project No: 991047 — *Boring No.: B-5*

Project: The Field School — **Elevation:** 304.0

Client: Realco Project Management Services — **Engineer:** K.Patterson

Location: Washington, D.C. — **Date Drilled:** 7-24-99

Depth (ft)	Description	Elevation (ft)	Stratum	SAMPLE: SPT Results	SAMPLE: Recovery	SPT Results: N-Value (blows/ft)	% Moisture	Remarks
0	Ground Surface	304						
	Topsoil							
2	Clayey SAND (SC), trace gravel, moist, reddish-brown and yellow-brown		B	8+9+12	14"			
4		299.5		10+10+8	18"			
6	Sandy SILT (ML), micaceous, moist, pink and gray			6+7+10	18"			
8		296						
10	Sandy SILT (ML), micaceous, moist, yellow-brown and gray		C1	6+8+13	18"			
12								
14				10+16+19	18"			
16		287						
18	Silty SAND (SM), micaceous, moist, yellow-brown, gray, and reddish-brown			10+18+22	18"			
20			C2					
22								
24		279		10+16+23	18"			
26	Bottom of Boring							
28								
30								



Drilling Contractor: Stevens Drilling

Drilling Method: 2.25" Diameter H.S.A

Drilling Foreman: Cave

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry — Caved: 21 ft

Long Term

Date: 7-25-99

Depth: Dry — Caved: 21 ft

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Project No: 991047 — *Boring No.: B-6*

Project: The Field School — **Elevation:** 324.1

Client: Realco Project Management Services — **Engineer:** K.Patterson

Location: Washington, D.C. — **Date Drilled:** 7-25-99

Depth (ft)	Description	Elevation (ft)	Stratum	SAMPLE: SPT Results	SAMPLE: Recovery	SPT Results: N-Value (blows/ft)	% M	Remarks
0	Ground Surface	324.1						
	Topsoil							
2	Clayey sand (SC), with gravel, moist, reddish-brown and yellow-brown			20+24+19	18"			
	trace gravel below 3.5 feet							
4				6+10+10	12"			
6				4+11+12	18"			
8		314.6		6+16+16	18"			
10	FAT CLAY (CH), trace sand, micaceous, moist, yellow-brown, redish-brown, purple and gray		B					
12								
14				4+6+8	18"		24.1	
16		307.1						
18	Clayey SAND (SC), with gravel, moist, yellow-brown, reddish-brown, and gray	304.1		10+11+15	18"			
20	Bottom of Boring							
22								
24								
26								
28								
30								



Drilling Contractor: Stevens Drilling

Drill Method: 2.25" Diameter H.S.A

Drilling Foreman: Cave

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry — Caved: 16 ft

Long Term

Date: 7-26-99

Depth: Dry — Caved: 16 ft

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Leesburg, Virginia 20175 (703) 589-1592 fax

Project No: 991047 *Boring No.: B-7*

Project: The Field School **Elevation:** 299.5

Client: Realco Project Management Services **Engineer:** K.Patterson

Location: Washington, D.C. **Date Drilled:** 7-25-99

SUBSURFACE PROFILE				SAMPLE				
Depth (ft)	Description	Elevation (ft)	Stratum	SPT Results	Recovery	SPT Results N-Value (blows/ft) 20 40 60 80	% Moisture	Remarks
0	Ground Surface	299.5						
	Topsoil							
2	Clayey SAND (SC), with gravel, moist, reddish-brown and yellow-brown			10+12+19	14"			
4				12+15+12	14"			
6			B	10+9+12	18"			
8		291.5						
	Sandy SILT (ML), micaceous, moist, yellow-brown and gray			4+5+6	18"			
10								
12			C1					
14		284.5		4+6+8	18"			
16	Bottom of Boring							
18								
20								
22								
24								
26								
28								
30								

Drilling Contractor: Stevens Drilling

Drilling Method: 2.25" Diameter H.S.A

Drilling Foreman: Cave

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry Caved: 13 ft

Long Term

Date: 7-26-99

Depth: Dry Caved: 13 ft

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Project No: 991047 — *Boring No.: B-8*

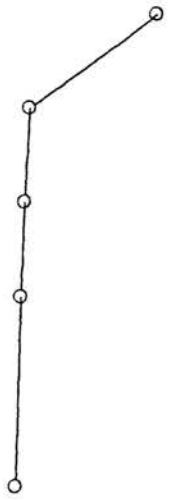
Project: The Field School — **Elevation:** 302.0

Client: Realco Project Management Services — **Engineer:** K.Patterson

Location: Washington, D.C. — **Date Drilled:** 7-25-99

Depth (ft)	Description	Elevation (ft)	Stratum	SPT Results	Recovery	% Moisture	Remarks
0	Ground Surface	302					
	Topsoil						
2	Silty SAND (SM), with gravel, moist, yellow-brown	298.5	B	13+30+30	12"		
4	ELASTIC SILT (MH), trace sand, micaceous, moist, yellow-brown, purple, reddish-brown and gray			6+8+10	12"		
6				5+8+8	18"		
8		294					
	Sandy SILT (ML), moist, yellow-brown, and gray			5+7+8	18"		
10		290	C1				
12	ELASTIC SILT (MH), trace sand, moist, reddish-brown and white						
14		287		4+5+8	18"		
16	Bottom of Boring						
18							
20							
22							
24							
26							
28							
30							

SPT Results — N-Value (blows/ft): 20 40 60 80



Drilling Contractor: Stevens Drilling

Drilling Method: 2.25" Diameter H.S.A

Drilling Foreman: Cave

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry — Caved: 11 ft

Long Term

Date: 7-25-99

Depth: Dry — Caved: 11 ft

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Project No: 991047 — *Boring No.: B-9*

Project: The Field School — **Elevation:** 281.3

Client: Realco Project Management Services — **Engineer:** K.Patterson

Location: Washington, D.C. — **Date Drilled:** 7-25-99

Depth (ft)	Description	Elevation (ft)	Stratum	SAMPLE: SPT Results	SAMPLE: Recovery	SPT Results: N-Value (blows/ft)	% Moisture	Remarks
0	Ground Surface	281.3						
	Topsoil							
2	Silty SAND (SM), with gravel, moist, yellow-brown	277.8		10+16+16	14"			
4	Sandy SILT (ML), trace gravel, micaceous, moist, reddish-brown		B	21+18+24	18"			
6		274.3		6+7+8	18"			
8	Sandy SILT (ML), micaceous, moist, pink and gray			6+5+7	18"			
10		269.3	C1					
12	Sandy SILT (ML), moist, yellow-brown and gray							
14		266.3		5+6+10	18"			
16	Bottom of Boring							
18								
20								
22								
24								
26								
28								
30								

SPT Results N-Value (blows/ft): 20 40 60 80

Drilling Contractor: Stevens Drilling

Drilling Method: 2.25" Diameter H.S.A

Drilling Foreman: Cave

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry — Caved: 12 ft

Long Term

Date: 7-25-99

Depth: Dry — Caved: 12 ft

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Project No: 991047 *Boring No.: B-10*

Project: The Field School **Elevation:** 281.5

Client: Realco Project Management Services **Engineer:** K.Patterson

Location: Washington, D.C. **Date Drilled:** 7-24-99

SUBSURFACE PROFILE				SAMPLE				
Depth (ft)	Description	Elevation (ft)	Stratum	SPT Results	Recovery	SPT Results N-Value (blows/ft) 20 40 60 80	% Moisture	Remarks
0	Ground Surface	281.5						
	Topsoil							
2	Clayey SAND (SC), with gravel, moist, yellow-brown and reddish-brown	278.5	B	7+10+8	14"			
4	Sandy SILT (ML), micaceous, moist, pink, reddish-brown and yellow-brown			6+8+9	18"			
6			C1	4+6+7	18"			
8								
10		271.5		4+5+6	18"			
	Bottom of Boring							
12								
14								
16								
18								
20								
22								
24								
26								
28								
30								

Drilling Contractor: Stevens Drilling

Drilling Method: 2.25" Diameter H.S.A

Drilling Foreman: Cave

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry Caved: 7.5 ft

Long Term

Date: 7-25-99

Depth: Dry Caved: 7.5 ft

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Project No: 991047 *Boring No.: B-11*

Project: The Field School **Elevation:** 263.4

Client: Realco Project Management Services **Engineer:** K.Patterson

Location: Washington, D.C. **Date Drilled:** 7-24-99

SUBSURFACE PROFILE				SAMPLE				
Depth (ft)	Description	Elevation (ft)	Stratum	SPT Results	Recovery	SPT Results N-Value (blows/ft) 20 40 60 80	% Moisture	Remarks
0	Ground Surface	263.4						
	Topsoil	262.4						
2	Silty sand with gravel FILL, moist, yellow-brown			7+7+5	12"			
	clayey sand with gravel, FILL and wood, moist, gray and yellow-brown							
4				14+12+18	18"			
6				5+3+3	18"		12.5	
8								
				3+2+2	18"			
10			A					
12								
14				2+3+3	18"		22.0	
16								
18		245.4						
	Sandy elastic silt FILL, with wood, dark gray			4+5+7	18"			
20								
22		241.4						
	Sandy SILT (ML), micaceous, moist, yellow-brown and gray		Cl					
24		238.4		10+20+22	18"			
	Bottom of Boring							
26								
28								
30								

Drilling Contractor: Stevens Drilling

Drilling Method: 2.25" Diameter H.S.A

Drilling Foreman: Cave

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry Caved: 21.5 ft

Long Term

Date: 7-26-99

Depth: Dry Caved: 21 ft

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Project No: 991047 *Boring No.: B-12*

Project: The Field School **Elevation:** 257.0

Client: Realco Project Management Services **Engineer:** K.Patterson

Location: Washington, D.C. **Date Drilled:** 7-25-99

SUBSURFACE PROFILE				SAMPLE				
Depth (ft)	Description	Elevation (ft)	Stratum	SPT Results	Recovery	SPT Results N-Value (blows/ft) 20 40 60 80	% Moisture	Remarks
0	Ground Surface	257						
	Topsoil	256						
2	Sandy silt with gravel FILL, with wood, moist, gray and yellow-brown			9+12+16	14"			
4				10+15+15	18"			
6				8+7+7	18"			
8				4+3+3	18"			
10			A					
12								
14				2+3+4	18"			
16		240						
18	Sandy SILT (ML), micaceous, moist, yellow-brown and gray		C1					
20		237		17+26+27	18"			
	Bottom of Boring							
22								
24								
26								
28								
30								

Drilling Contractor: Stevens Drilling

Drilling Method: 2.25" Diameter H.S.A

Drilling Foreman: Cave

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry Caved: 17 ft

Long Term

Date: 7-26-99

Depth: Dry Caved: 17 ft

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Project No: 991009 — *Boring No.: PB-1*

Project: The Field School — **Elevation:** 331 +/-

Client: Realco — **Engineer:** R. Drew Thomas, C.P.G.

Location: See Boring Location Plan — **Date Drilled:** April 14, 1999

SUBSURFACE PROFILE				SAMPLE				
Depth (ft)	Description	Elevation (ft)	Stratum	SPT Results	Recovery	SPT Results N-Value (blows/ft) 20 40 60 80	% M	Remarks
0	Ground Surface	331						
	Topsoil							
2	silty SAND (SM), trace gravel, moist, reddish-brown	328		3+3+5	18			
4	clayey SAND (SC), moist, reddish-brown			4+5+8	18			
6	with gravel below 5.0 feet		B	14+18+18	18			
8								
10				6+7+10	18			
12								
14		317		100\4"	4			AUGER REFUSAL in GRAVEL @ 14 feet.
	Bottom of Boring							
16								Offset 5 feet - AUGER REFUSAL in GRAVEL @ 13 feet.
18								
20								
22								
24								
26								
28								
30								

Drilling Contractor: Stevens Drilling, Inc.

Drill Method: 2 1/4" H.S.A. - A.T.V.

Drilling Foreman: Fairfax

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry — Caved: 12 feet

Long Term

Date: April 15, 1999

Depth: Dry — Caved: 12 feet

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Project No: 991009 — ***Boring No.: PB-2***

Project: The Field School — **Elevation:** 291 +/-

Client: Realco — **Engineer:** R. Drew Thomas, C.P.G.

Location: See Boring Location Plan — **Date Drilled:** April 14, 1999

SUBSURFACE PROFILE				SAMPLE				
Depth (ft)	Description	Elevation (ft)	Stratum	SPT Results	Recovery	SPT Results N-Value (blows/ft) 20 40 60 80	% M	Remarks
0	Ground Surface	291						
	Topsoil							
2	sandy ELASTIC SILT (MH), moist, reddish-brown			3+3+3	18			
4		286		4+7+9	18			
6	SILT (ML), trace sand, micaceous, moist, yellow-brown			5+7+9	18			
8				4+5+7	18			
10								
12		277.5	C1					
14	SILT (ML), trace sand, moist, reddish-brown			4+5+7	18			
16								
18				5+7+9	18			
20								
22								
24		266		4+7+9	18			
26	Bottom of Boring							
28								
30								

Drilling Contractor: Stevens Drilling, Inc.

Drill Method: 2 1/4" H.S.A. - A.T.V.

Drilling Foreman: Fairfax

Groundwater Information

Encountered: None

Upon Completion: Dry

After Augers Pulled: Dry — Caved: 21 feet

Long Term

Date: April 15, 1999

Depth: Dry — Caved: 21 feet

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Project No: 991009 — *Boring No.: PB-3*

Project: The Field School — **Elevation:** 300 +/-

Client: Realco — **Engineer:** R. Drew Thomas, C.P.G.

Location: See Boring Location Plan — **Date Drilled:** April 14, 1999

SUBSURFACE PROFILE				SAMPLE				
Depth (ft)	Description	Elevation (ft)	Stratum	SPT Results	Recovery	SPT Results N-Value (blows/ft) 20 40 60 80	% M	Remarks
0	Ground Surface	300						
	Topsoil							
2	silty SAND (SM), micaceous, moist, brown			4+5+5	18			
4			C2	3+5+5	18			
6				4+5+6	18			
8		291.5						
10	sandy SILT (ML), micaceous, moist, brown, reddish-brown, and purple			4+5+7	18			
12		286.5	C1					
14	silty SAND (SM), micaceous, moist, brown			6+9+11	18			
16			C2					
18		281.5						
20	SILT (ML), with sand, moist, brown and reddish-brown			7+11+13	18			
22			C1					
24		275		5+8+11	18			
26	Bottom of Boring							
28								
30								

Drilling Contractor: Stevens Drilling, Inc.

Drill Method: 2 1/4" H.S.A. - A.T.V.

Drilling Foreman: Fairfax

Groundwater Information

Encountered: None

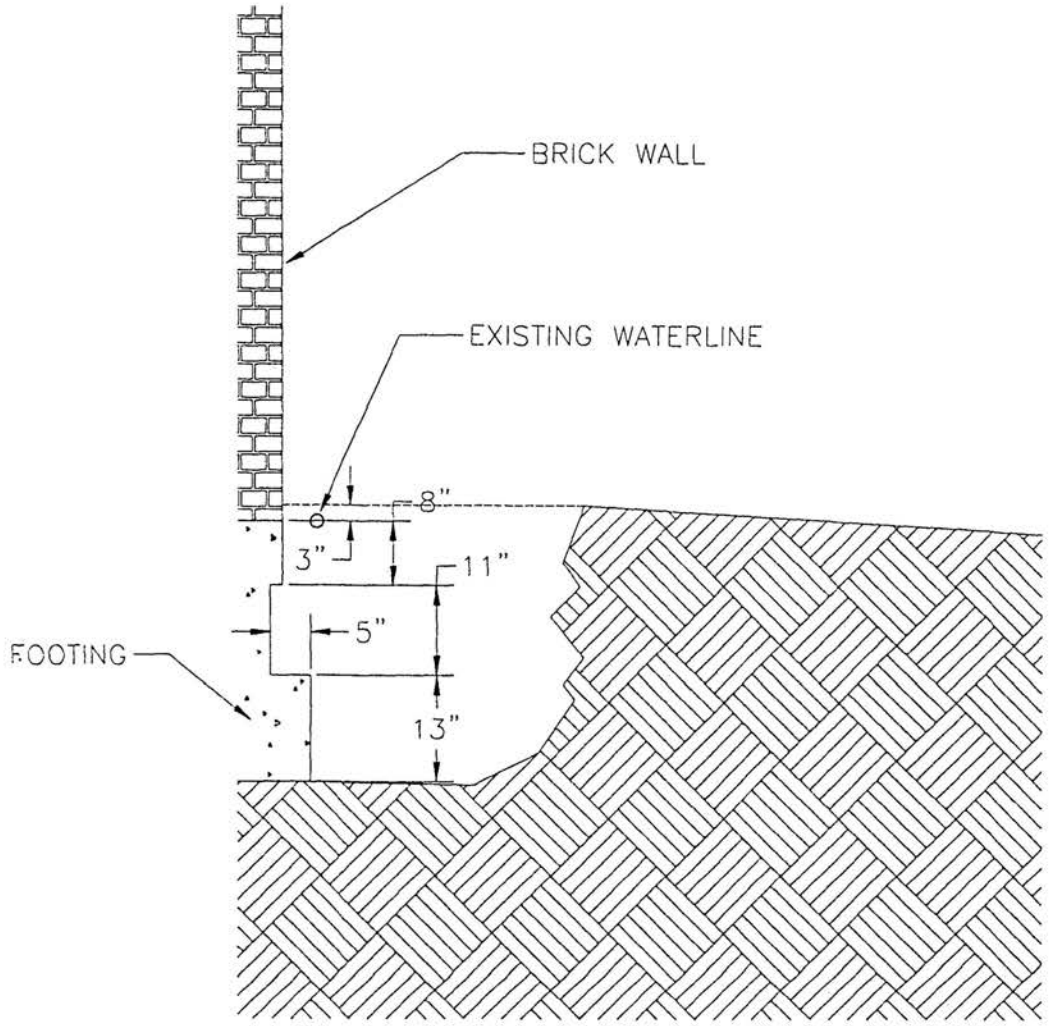
Upon Completion: Dry

After Augers Pulled: Dry — Caved: 20 feet

Long Term

Date: April 15, 1999

Depth: Dry — Caved: 20 feet

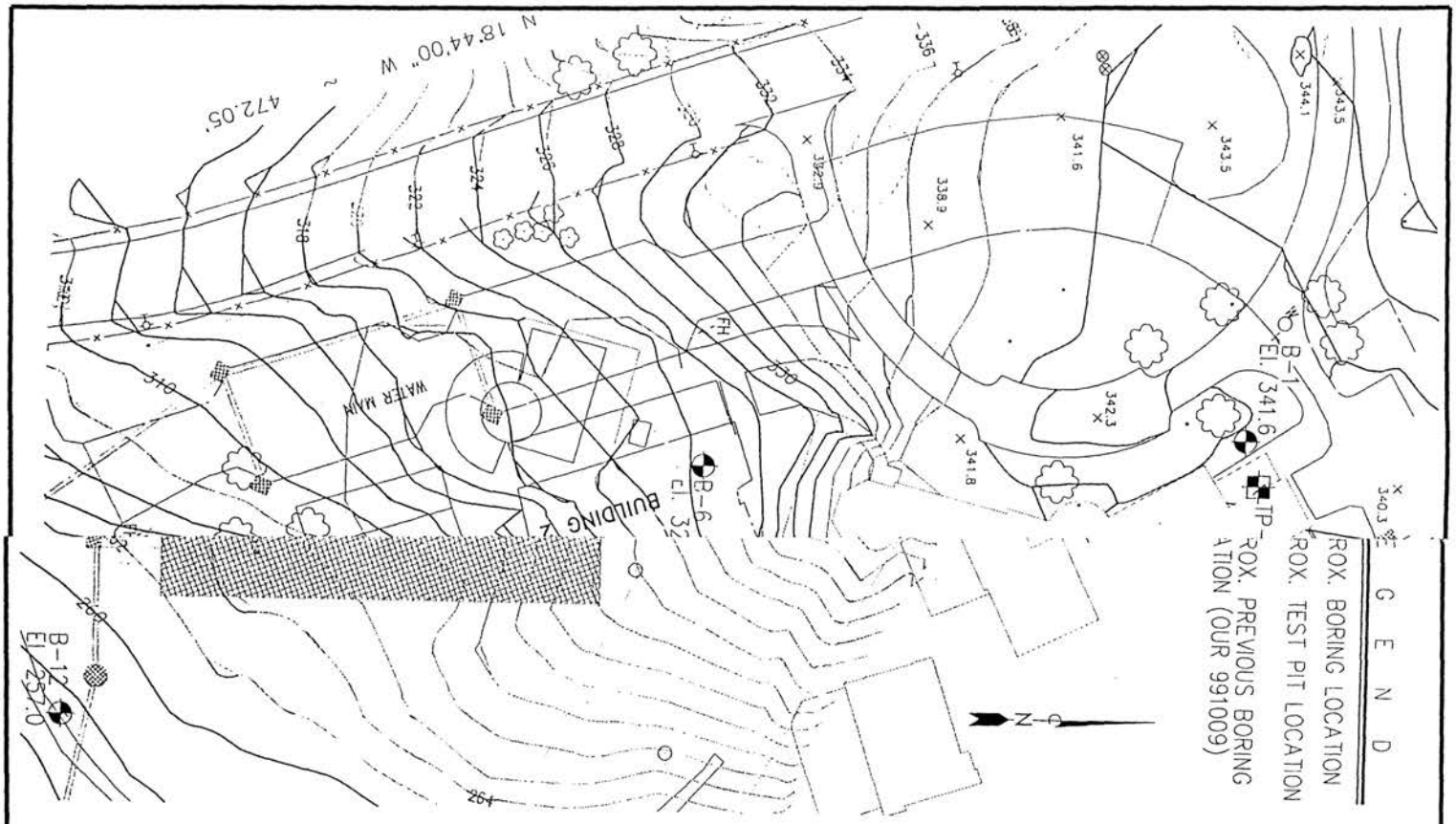


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THE FIELD SCHOOL 2301 FOXHALL ROAD, N.W., WASHINGTON, D.C.			
EXISTING GARAGE FOOTING PROFILE		Scale: 1" = 2'	Fig. 5
Date: JULY 28, 1999	Checked By: R.D.T.	Project No.: 991047	



GeoConcepts Engineering, Inc.	THE FIELD SCHOOL 2301 FOXHALL RD., N.W. WASHINGTON D.C.			
8-C South Street, S.W. Leesburg, Virginia 20175 (703) 443-0309 (703) 589-1592 fax	SUBSURFACE INVESTIGATION LOCATION PLAN		Scale: 1"=50'	Fig. 6
	Date: AUG 19, 1999	Checked By: R.D.T.	Project No.: 991047	

Appendix B
Contract No. 991047

Soil Laboratory Test Report

Summary of Soil Laboratory Test Results (1 page)

Summary of Soil Laboratory Test Results

Contract No.991047

Boring No.	Depth (ft.)	Sample Type	Stratum	Description of Soil Specimen	Sieve Results		Atterberg Limits			Natural Moisture Content (%)	Remarks
					Percent Retained # 4 Sieve	Percent Passing # 200 Sieve	LL	PL	PI		
B-1	4.5	Jar	B	sandy LEAN CLAY (CL), reddish-brown	0.4	57.6	42	20	22	17.6	
B-3	7.0	Jar	B	clayey SAND (SC), yellowish-red	13.4	37.1				10.2	
B-6	14.5	Jar	B	FAT CLAY (CH), dark red	0.0	91.4	54	28	26	24.1	
B-11	7.0	Jar	A	clayey SAND (SC), with gravel, yellow-brown	25.3	33.0				12.5	
B-11	14.5	Jar	A	clayey SAND (SC), with gravel, olive-brown	14.9	44.5	38	21	17	22.0	

Notes:

1. Soil tests are in accordance with applicable ASTM standards.
2. Soil classification symbols are in accordance with Unified Soil Classification System.
3. Visual identification of samples is in accordance with the system used by this firm.
4. Key to abbreviations: LL= Liquid Limit; PL= Plastic Limit; PI= Plasticity Index; NP= Nonplastic

F:\Forms\DPS\summary of soil lab tests