

August 31, 2000

**GEOTECHNICAL ENGINEERING STUDY
Pflugerville High School No. 3
Pflugerville, Texas**

Prepared for:

**PFLUGERVILLE I.S.D.
Pflugerville, Texas**

Prepared by:

**HBC ENGINEERING, INC.
Geotechnical Engineering Division
Austin, Texas**

HBC Project No. 96005142

August 31, 2000

Mr. Randy Rose
Pflugerville I.S.D.
1401 West Pecan
Pflugerville, Texas 78660

Re: Geotechnical Engineering Study
Pflugerville High School No. 3
Pflugerville, Texas
HBC Project No. 96005142

Dear Mr. Rose:

Enclosed is our geotechnical engineering report for the above referenced project. We trust that this report is responsive to your project needs. Please contact us if you have any questions or if we can be of further assistance.

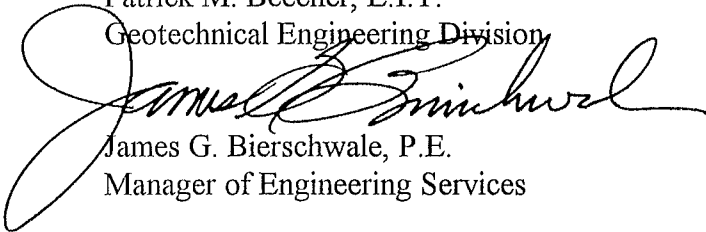
We appreciate the opportunity to work with you on this phase of the project, and look forward to the opportunity to provide additional services as the project progresses.

Sincerely,

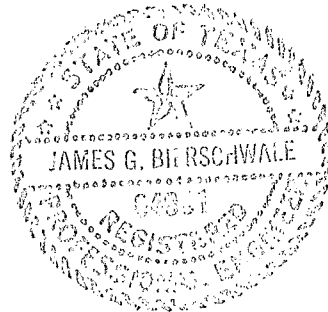
HBC ENGINEERING, INC.



Patrick M. Beecher, E.I.T.
Geotechnical Engineering Division



James G. Bierschwale, P.E.
Manager of Engineering Services



PMB/JGB/ca
Copies Submitted:
Pflugerville I.S.D. (2)
SHW Group, Inc. – Austin (1)
SHW Group, Inc. – Dallas (1)

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	PROJECT DESCRIPTION	1
3.0	SCOPE OF SERVICES.....	1
4.0	FIELD PROGRAM.....	2
4.1	Sampling Procedures.....	2
4.2	Sample Disposal.....	3
5.0	LABORATORY TESTING.....	3
6.0	SITE CONDITIONS.....	3
6.1	Surface Conditions.....	3
6.2	Site Geology	4
6.3	Subsurface Conditions.....	4
6.4	Groundwater Conditions	5
7.0	ENGINEERING ANALYSIS.....	5
7.1	Drilled Pier Foundations.....	6
7.2	Floor Slab Design.....	7
7.3	Slab-On-Grade Foundations	9
7.4	Foundation Construction.....	13
7.4.1	<u>Drilled Pier Foundations</u>	13
7.4.2	<u>Slab-On-Grade Foundations</u>	14
7.4.3	<u>Foundation Construction Monitoring</u>	14
7.5	Excavation	14
7.6	Lateral Earth Pressures.....	15
7.7	Site Preparation.....	16
7.7.1	<u>Fill Compaction Requirements</u>	17

7.7.2	<u>Imported Select Fill</u>	17
7.7.3	<u>Use of On-Site Material for Fill in Building Areas</u>	17
7.7.4	<u>Use of On-Site Material for Fill in Pavement or General Areas</u>	18
7.8	Drainage	19
7.9	Pavement Design	20
8.0	DESIGN REVIEW	23
9.0	CONSTRUCTION MONITORING	23
10.0	LIMITATIONS	24

1.0 INTRODUCTION

This report presents the results of our geotechnical engineering study for the proposed Pflugerville High School No. 3 in Pflugerville, Texas. This project was authorized by Mr. Randy Rose, Director of Support Services for Pflugerville I.S.D., through signature of our “Agreement for Consulting Services” on May 24, 2000. The scope of services for this project was performed as outlined in our proposal dated May 23, 2000.

2.0 PROJECT DESCRIPTION

The project is to involve the proposed construction of a high school complex on a site located near the intersection of Highway 685 and Kelly Lane, just south of Murchison Elementary School, in Pflugerville, Texas. We understand that this complex will include a main high school building, a stadium, two fieldhouses, tennis courts, and several athletic fields. Adjacent surface pavement areas are also planned. The site location and project layout are located in the Appendix on Pages A-1 and A-2, respectively.

3.0 SCOPE OF SERVICES

Our scope of services for this project consisted of:

1. Drilling test borings at selected locations within the project site to evaluate subsurface stratigraphy and groundwater conditions.
2. Performing geotechnical laboratory tests on recovered samples to evaluate the physical and engineering properties of the strata encountered.
3. Engineering analyses to develop design and construction recommendations with respect to:
 - Site and subgrade preparation;
 - Reuse of on-site materials for fill;
 - Foundation design and construction; and
 - Pavement design guidelines.

4.0 FIELD PROGRAM

4.1 Sampling Procedures

Subsurface conditions were evaluated by drilling 19 test borings to depths ranging from about 20 to 25 feet in the proposed high school building area, eleven borings to depths of 10 to 20 feet in the proposed stadium, field houses, and tennis courts, and eleven borings to depths of 5 to 10 feet in the proposed athletic fields, roadways, and detention pond area. The three-inch nominal diameter borings were drilled with truck-mounted rotary drilling equipment at the approximate locations shown on Page A-2. Boring depths were measured from existing ground surface at the time of our field activities. Sampling procedures were performed in general accordance with the appropriate ASTM standard procedures.

The Logs of Borings, which include the soil/rock descriptions, types of sampling used, and additional field data, are presented on Pages A-3 through A-43 of the Appendix. The Symbol Key Sheet, which defines the terms and descriptive symbols used on the logs, is presented on Page A-44.

Soil samples were generally recovered using thin-walled, open-tube samplers (Shelby tubes). All samples were removed from samplers in the field, visually classified, and appropriately sealed in sample containers to preserve their in-situ moisture contents. Pocket penetrometer tests were performed on samples of cohesive soils in the field to serve as a general measure of consistency.

Soils/rock for which good quality thin-walled tube samples could not be recovered were sampled by means of the Standard Proctor Test (SPT). This test consists of measuring the number of blows required for a 140 pound hammer free falling 30 inches to drive a standard split-spoon sampler 12 inches into the subsurface material after being seated six inches. This blow count or SPT "N" value is used to evaluate the engineering properties of the stratum.

Once rock was encountered, the deeper borings were generally advanced with Nx coring equipment. During drilling, the bit pressure and drilling rate were monitored to detect voids and/or soil seams in the rock formation. Visual classification of all of the samples were performed in the field and

percentages of recovery and Rock Quality Designation (RQD) were calculated from recovered rock cores. (Recovery is defined as the percentage of core recovered as a function of the length of core run drilled. The RQD is a modified measurement of core recovery which indirectly takes into account fractures and/or softening in the rock mass by summing up only pieces of sound core which are four inches or greater in length as a percentage of the total core run.) The rock samples were then placed in core boxes for transportation to the laboratory.

4.2 Sample Disposal

All samples were returned to our laboratory in Austin, Texas. Samples not tested in the laboratory will be stored for a period of 60 days subsequent to submittal of this report and will be discarded after this period, unless we are notified otherwise.

5.0 LABORATORY TESTING

Samples obtained during the field program were visually classified in the laboratory by a geotechnical engineer or senior technician. A testing program was conducted on selected samples, as directed by the geotechnical engineer, to aid in classification and evaluation of engineering properties required for analyses. Laboratory tests were performed in general accordance with the applicable ASTM standard procedures.

Results of the laboratory tests are presented on the Logs of Borings, located on Pages A-3 through A-43 of the Appendix, and are discussed in the following section. Laboratory test results were used to classify the soils encountered as outlined by the Unified Soil Classification System.

6.0 SITE CONDITIONS

6.1 Surface Conditions

The ground surface slopes generally downhill radially away from two peaks, one located in the northeast corner of the site and the other adjacent to the western corner of the site. A drainage channel traverses the site in a northwest to southeast direction across the central portion of the site. A corn field located in the area of the proposed high school building existed during our field program.

Drilling of many of the borings in this area was delayed until the corn was harvested. An existing well was observed near boring location B-36.

6.2 Site Geology

The site lies within an outcrop area of the Austin Group of upper Cretaceous Age¹. The Austin Group is generally comprised of tan to gray chalky limestones and marls. The Austin Chalk is commonly overlain by a variable thickness of moderate to high plasticity clayey soils.

6.3 Subsurface Conditions

The generalized subsurface stratigraphy at the site, as evaluated from our field and laboratory programs is tabulated below:

STRATUM	RANGE IN DEPTH (FT) ¹	SOIL/ROCK DESCRIPTION AND CLASSIFICATION
I ²	0 – 6	Very stiff to hard dark brown to brown clay (CH) to silty clay (CL)
II ³	2 – 15	Hard tan and gray silty clay (CL) to clay (CH)
III	2 – 25	Tan limestone (Austin Group)

1 Approximate depth below ground surface.

2 Not observed at boring B-14.

3 Not observed at borings B-3, B-6, B-7, B-9, B-13, B-16, B-17, B-18, B-29, B-30, B-34, and B-36.

The Stratum I dark brown to brown clayey soils typically exhibit a moderate to high potential for volumetric change during moisture variations, as indicated by measured plasticity indices of 19 to 55 percent. In-situ moisture contents ranged from 14 percent dry to 9 percent wet of the corresponding plastic limits. Measured undrained shear strengths from unconfined compression tests varied from approximately 3,000 to 13, 200 pounds per square foot (psf).

The Stratum II tan and gray clayey soils generally exhibit a variable shrink/swell potential, with measured plasticity indices of 11 to 45 percent, and measured percentage of fines (percent passing the No. 200 sieve) of 76 to 92 percent. In-situ moisture contents varied from 9 percent dry to 17

percent wet of the corresponding plastic limits. Measured SPT “N” values ranged from 24 blows per foot to 50 blows for two inches of penetration. Measured undrained shear strengths from unconfined compression tests for this stratum varied from approximately 6,000 to 10,900 psf.

Stratum III generally consists of tan limestone of the Austin Group. Measured uniaxial compressive strengths of intact rock cores from this stratum range from 11 to 66 tons per square foot (tsf). Measure values of Recovery and RQD vary from 42 to 100 percent and zero to 93 percent, respectively. The varying RQD values are generally the result of increased weathered zones and/or fracturing of portions of the Austin Group observed at the site, typically within the upper 3 to 5 feet of this stratum.

6.4 Groundwater Conditions

The borings were dry augered to depths ranging from about 2 to 15 feet in an attempt to observe groundwater conditions; no groundwater was observed in any of the borings during dry augering. Many of the deeper borings were drilled to completed depths using wet rotary techniques, making subsequent groundwater readings difficult.

We anticipate that groundwater at the site should typically be in the form of seepage traveling along the soil/limestone interface or in fissures/fractures in the limestone. Groundwater at the site will likely be more prevalent during and soon after periods of wet weather. We should note that our field program was performed during an extended period of dry weather in Central Texas.

7.0 ENGINEERING ANALYSIS

The following analyses are based upon the data obtained in our field and laboratory programs, information provided to us, and our experience with similar subsurface and site conditions.

Based on the field and laboratory data available, along with our previous experience, it is our opinion that drilled straight-sided piers founded into the Austin Group limestone at the site would be the most appropriate foundation system to support the proposed high school building. For the field houses,

tennis courts, and stadium structures, slab-on-grade beam foundation systems may be considered, provided proper subgrade preparation is implemented in these areas. Recommendations for foundation types are presented in the following subsections, along with other geotechnical engineering considerations for this project.

7.1 Drilled Pier Foundations

Principal column and wall loads for the proposed high school building may be supported on drilled piers (straight-sided) embedded at least four feet into the Stratum III Austin Group marly limestone. The piers should be designed for a net allowable total load bearing pressure of 25,000 pounds per square foot (psf). In addition, a net allowable side friction value of 2,000 psf may be utilized for shaft portions embedded into the limestone beyond the four foot minimum penetration. A minimum shaft diameter of 18 inches is recommended. Piers should be extended through weathered seams/layers in the limestone and placed to bear upon competent rock.

Post construction settlement of properly constructed drilled piers should be less than one-half inch, assuming proper construction practice. The settlement response of the piers will be more dependent upon the quality of construction than upon the response of the limestone to the foundation loads.

Grade beams spanning between drilled piers may be cast at grade, provided the building subgrade in the grade beam areas is prepared as outlined in "Floor Slab Design". The beams should be designed to span across the pier foundations.

We recommend that on-site Stratum I soils be utilized for backfill adjacent to tilt-wall panels or grade beams at the exterior of the building (to reduce potential infiltration of surface water into the subgrade in these areas). The backfill should be compacted to at least 90 percent of the ASTM D 698 maximum dry density at a moisture content at or above optimum moisture.

7.2 Floor Slab Design

The ground-level floor slabs for the high school building may be grade supported and designed as independent of the foundation system. However, as previously stated, the Stratum I dark brown to brown clayey soils at this site, as well as portions of the Stratum II tan and gray clayey soils, generally exhibit a moderate to high shrink/swell potential, with a Potential Vertical Rise (PVR) as high as approximately 2¾ inches, as estimated by the Texas Department of Transportation (TxDOT) Method TEX-124-E. We therefore recommend that pad of select fill soils be provided underneath all floor slab areas to protect the slab from volumetric changes which could occur in the subgrade soils as a result of in-situ moisture variations.

Based on site grading information for the main high school building provided to HBC, we understand that the gymnasium, classrooms, and auditorium sections of the high school building have finished floor elevations of about 720, 726, and 723 feet, respectively. Existing grade within the gymnasium area varies from approximately 713 to 721 feet. Existing grade within the classrooms ranges from about 716 to 730 feet. Existing grade within the auditorium ranges from approximately 718 to 729 feet.

GYMNASIUM

We recommend that the Stratum I dark brown to brown clayey soils be removed to a depth of at least 36 inches below existing grade and select fill be used to raise grade. The requirement to excavate the Stratum I clayey soils may be omitted in areas where at least 7 feet of select fill will be required to achieve final subgrade elevation. In cut areas where the underlying tan and gray clayey soils and/or tan limestone is exposed, the 36-inch cut may be reduced.

CLASSROOMS

We recommend that the Stratum I/II clayey soils be removed to a depth of at least 5 feet below existing grade and select fill be used to raise grade. The requirement to excavate the Stratum I/II soils may be omitted in areas where at least 5 feet of select fill will be required to achieve final subgrade elevation. In cut areas where the tan limestone is exposed, the 5-foot cut may be reduced.

AUDITORIUM

We recommend that the Stratum I/II clayey soils be removed to a depth of at least 4½ feet below existing grade and select fill be used to raise grade. The requirement to excavate the Stratum I/II soils may be omitted in areas where at least 3 feet of select fill will be required to achieve final subgrade elevation. In cut areas where the tan limestone is exposed, the 4½-foot cut may be reduced.

GENERAL RECOMMENDATIONS

In floor slab areas where the site is cut to expose the Stratum III limestone, a minimum of 12 inches of select fill should be placed under all areas of the floor slabs. Select fill should be utilized for all fill applications in the building areas. The above measures should reduce the potential floor slab movements due to volumetric changes of the surficial soils to less than one inch. Material and placement requirements for select fill, as well as other subgrade preparation recommendations, are presented in the “Site Preparation” subsection. We suggest the use of crushed limestone base in the upper 6 inches of the fill pad from a standpoint of construction access during wet weather, as well as from a standpoint of floor slab support. For any flatwork outside of the building area which will be sensitive to movement, subgrade preparation as discussed above should be considered.

Just prior to placement of select fill in the building area, exposed soil subgrade areas should be scarified to a depth of six inches, moisture conditioned, and recompact to at least 95 percent of the Standard Proctor (ASTM D 698) maximum dry density. Exposed Stratum I clayey subgrade areas should be moisture conditioned to between optimum and +4 percent of optimum moisture content. Exposed Stratum II tan clayey subgrade areas should be moisture adjusted to between -3 and +3 percent of optimum moisture content. The subgrade should not be allowed to dry out prior to placement of fill.

We recommend placement of a polyethylene moisture barrier under the floor slab to reduce the possibility of moisture migration through the slab.

7.3 Slab-On-Grade Foundations

Based on topographic and site grading information provided to HBC, we understand that the finished floor elevations of the large fieldhouse (associated with borings B-20 through B-22) and tennis courts is planned to be 722 and 714 feet, respectively. This will result in a fill condition over the proposed building areas with fill depths varying from approximately 2 to 10 feet. A finished floor elevation for the small fieldhouse (associated with boring B-24) was not provided to HBC.

As stated previously, slab-on-grade foundation systems may be utilized to support the proposed tennis courts, field houses, and stadium structures. Some of the structures (in particular the tennis courts) may potentially utilize post-tensioned foundations. The foundations will be subjected to potential movements due to volumetric changes in the clay subgrade soils resulting from moisture variations. Although measures can be taken to reduce such movements, they cannot be eliminated. Presented below are design parameters commonly used in the Austin area for slab-on-grade foundation design for subsurface conditions such as those observed in the aforementioned building areas at this site.

Estimated Potential Vertical Rise (PVR)	up to 4 inches
Net Allowable Bearing Pressure:	
Total Load	2500 psf
Dead Load	1700 psf
Design Plasticity Index (PI)	55
Climatic Rating (C_w)	18
Unconfined Compressive Strength	1.0 tsf
Soil Support Index (C)	0.63
Edge Moisture Variation Distance, e_m (Center Lift)	5.5 feet
Edge Moisture Variation Distance, e_m (Edge Lift)	3.0 feet
Differential Soil Movement, y_m (Center Lift)	3.0 inches
Differential Soil Movement, y_m (Edge Lift)	1.7 inches
Slab-Subgrade Coefficient of Friction, μ	0.75

As can be interpreted from the PVR and differential soil movement values reported for this site, the slab-on-grade foundations could be subject to significant foundation movements due to volumetric changes of the subgrade soils if moisture variations occur. In addition, although the PTI design

procedure is intended to result in a foundation system designed to tolerate such movements, the foundation movements can result in distress to the structure itself (such as cracking in masonry veneer walls and sheetrock, jamming of doors due to differential movements in the door frames, etc.). For these conditions, the building subgrade should be prepared to reduce the shrink/swell potential of these soils to more tolerable levels.

One method of subgrade preparation would be to excavate a portion of the near-surface soils and replace them with a fill pad of properly placed and compacted select fill beneath the foundations. The corresponding decrease in the potential soil movement is primarily a function of the fill pad thickness. These recommendations represent a compromise between economics and risk of foundation distress. While the indicated preparations do not eliminate the potential for soil movement, the magnitude of such movements should be reduced to more acceptable levels. Design parameters for various thicknesses of select fill soils to be placed in the various building areas are presented below.

LARGE FIELDHOUSE
(associated with borings B-20 through B-22)

Fill Required to Achieve Final Grade, ft.	Estimated Potential Vertical Rise (PVR), in.	Estimated Differential Soil Movements (y_m), in.	
		Center Lift	Edge Lift
6 – 9 *	0.9 – 1.3	1.1	0.6

* The PVR and differential soil movement values indicated assume that select fill will be used for the entire thickness of the fill body required to achieve final grade.

SMALL FIELDHOUSE
(associated with boring B-24)

Thickness of Select Fill Soils, ft.*	Estimated Potential Vertical Rise (PVR), in.	Estimated Differential Soil Movements (y_m), in.	
		Center Lift	Edge Lift
1.0	0.9 – 1.3	0.9	0.5
2.0	less than one inch	0.7	0.4

* Assumes that no more than one foot of fill will be required to achieve final grade. If more than one foot of fill is required to achieve final grade, HBC should be contacted for additional recommendations.

TENNIS COURTS

Thickness of Select Fill Soils, ft.	Estimated Potential Vertical Rise (PVR), in.	Estimated Differential Soil Movements (y _m), in.	
		Center Lift	Edge Lift
3 – 8 *	0.9 – 1.4	1.1	0.6

* The PVR and differential soil movement values indicated assume that select fill will be used for the entire thickness of the fill body required to achieve final grade.

GENERAL RECOMMENDATIONS

In building areas where the Stratum II clayey soils and/or Stratum III tan limestone is exposed, the select fill thickness can be reduced to a minimum of 12 inches. Select fill should be used for all fill applications within the building limits.

We suggest the use of crushed limestone base in the upper 6 inches of the fill pads from a standpoint of construction access during wet weather, as well as from a standpoint of floor slab support. Material and compaction requirements for select fill are indicated in the “Site Preparation” subsection.

Just prior to fill placement, exposed soil subgrade areas should be scarified to a depth of six inches, moisture conditioned, and then recompact to at least 95 percent of the Standard Proctor (ASTM D 698) maximum dry density. Exposed Stratum I dark brown to brown clayey soil subgrade areas should be moisture adjusted to between optimum and +4 percent of optimum moisture. Exposed Stratum II tan and gray clayey soil subgrade areas should be moisture adjusted to between –3 and +3 percent of optimum moisture. The subgrade should not be allowed to dry out prior to placement of fill.

We should note that the Center Lift and Edge Lift differential soil movements estimated in the above tables are based upon reductions in potential soil movements (PVR) as a result of the select fill placement. These values cannot be determined for various thicknesses directly from the PTI Manual.

The parameters indicated for the above design conditions are based on criteria published by the Post Tensioning Institute (PTI) and the Building Research Advisory Board (B.R.A.B.). The PVR values were estimated based on Texas Department of Transportation method TEX-124-E. The PTI and B.R.A.B. methods are essentially empirical design techniques and the parameters provided are based on our interpretation of the project soil borings and criteria published in the respective design manuals. The edge moisture variation distances (e_m) are based on the Thornthwaite Moisture Index (I_m) chart provided in the PTI manual. Selection of this parameter from the chart can result in a range of values for e_m in the Pflugerville area from about 4.3 to 5.8 feet for center lift and from 2.4 to 3.1 feet for edge lift. The parameters necessary to complete the PTI design are based on data the authors acquired on performance of an undetermined number of slab foundations. We should note that moisture variations in the subgrade soils due to poor drainage, leakage of utilities, etc. could induce volumetric changes resulting in movements which are in excess of those estimated by the PVR and PTI procedures.

We recommend that grade beams extend at least 24 inches below final grade. This recommendation is to reduce surface water migration below the foundation elements and to develop proper end bearing and is not based on structural considerations. The grade beam width and depth should be properly evaluated by the structural engineer. Grade beams may be thickened and widened at column locations to serve as spread footings at concentrated loads areas.

For slab-on-grade foundations, we recommend that measures be taken whenever practical to increase the tolerance of the buildings to post-construction foundation movements. An example of such measures would be to provide frequent control joints for rock/masonry veneer exteriors to control cracking across such walls and concentrate movement along the joints. For any flat work outside of the structures which will be sensitive to movement, subgrade preparation as discussed previously should be considered.

Post construction settlements for the slab foundations described in this subsection should be less than one inch, assuming proper construction and site preparation. Settlement response of surface slabs is influenced more by the quality of construction and fill placement than by soil-structure interaction.

7.4 Foundation Construction

7.4.1 Drilled Pier Foundations

Drilled pier foundations should be augered and constructed in a continuous manner. Concrete should be placed in the pier excavations following drilling and evaluation for proper bearing stratum, embedment, and cleanliness. The piers should not be allowed to remain open overnight before concrete placement. Surface runoff or groundwater seepage accumulating in the excavation should be pumped out and the condition of the bearing surface should be evaluated immediately prior to placing concrete. The drilling equipment utilized should be capable of readily penetrating the Austin Group limestone observed at the site.

Although groundwater was not observed during our test boring program, we should note that zones of sloughing soils and/or groundwater inflow are a possibility during pier construction. We therefore recommend that provisions be incorporated into the plans and specifications to utilize casing to control sloughing and/or groundwater seepage during pier construction should it occur. If casing is utilized, removal of the casing should be performed with extreme care and under proper supervision to minimize mixing of the surrounding soil and water with the fresh concrete. Concrete should be poured with a tremie and should exhibit a six inch slump with a $\pm$ one inch tolerance. Under no circumstances should loose soil be placed in the space between the casing and the pier sidewalls.

If groundwater seepage occurs in the limestone, the use of casing should help to minimize groundwater inflow into the pier excavation. If seepage persists even after casing installation, the water should be pumped out of the excavation immediately prior to placing concrete. If groundwater inflow is too severe to be controlled by pumping, the concrete should be tremied to the full depth of the excavation to effectively displace the water. In this case, a “clean-out” bucket should be utilized to remove loose soil and/or rock fragments from the pier bottom before placing steel and concrete.

7.4.2 Slab-On-Grade Foundations

Grade beams for the slab-on-grade foundations should preferably be neat excavated. If neat excavation is not possible, the foundations should be properly formed. If a toothed bucket is used, excavation with this bucket should be stopped six inches above final grade and the excavation completed with a smooth-mouthed bucket or by hand labor. In limestone subgrade areas, excavation with rock trenching equipment or similar equipment capable of excavating limestone may be necessary. Debris in the bottom of the excavation should be removed prior to steel placement. The foundation excavation should be sloped sufficiently to create internal sumps for runoff collection and removal. If surface runoff water or groundwater seepage accumulates at the bottom of the foundation excavation, it should be collected and removed and not allowed to adversely affect the quality of the bearing surface.

The post-tensioned slab-on-grade construction technique should be carefully monitored by qualified personnel. The sophistication of this construction procedure requires careful attention to details such as concrete integrity and anchorages, along with tendon spacing, support, covering and stressing. Poor construction could result in a non-functional slab foundation system.

7.4.3 Foundation Construction Monitoring

The performance of the foundation systems for the proposed structures will be highly dependent upon the quality of construction. Thus, we recommend that the foundation installation be monitored by HBC Engineering, Inc. to identify the proper bearing strata and depths and to help evaluate foundation construction.

7.5 **Excavation**

Excavation operations at the site for the proposed construction may penetrate into limestone. Our past experience with the Austin Group limestone, along with the data obtained during our field and laboratory programs, indicates that much of the upper limestone at this site should be rippable with the proper heavy equipment. However, zones of more resistant limestone which could require

sawcutting, jackhammering, milling or similar techniques to excavate are possible. In addition, the limestone generally becomes more competent with depth.

Our comments on rippability are based on our experience with the rock formation and examination of the core samples. Rock rippability depends on not only the rock hardness, weathering and fracture frequency, but also the contractor's equipment, capabilities, and experience. Therefore, it should be the contractor's responsibility to determine the most effective methods for excavation. The above comments are intended for informational purposes for the design team only and may be used to review the contractor's proposed excavation methods.

7.6 Lateral Earth Pressures

Presented below are at-rest, active and passive earth pressure coefficients for various backfill types adjacent to below-grade walls or retaining walls. At-rest earth pressures are recommended in cases where little wall yield is expected (such as structural below-grade walls). Active earth pressures may be utilized in cases where the walls can exhibit a certain degree of horizontal movement (such as cantilevered retaining walls).

Backfill Type	Estimated Total Unit Weight (psf)	Lateral Earth Pressure Coefficients		
		At Rest (K _o)	Active (K _a)	Passive (K _p)*
Crushed Limestone	140	0.45	0.3	3.0
Clean Sand	120	0.5	0.35	2.8
Clean Gravel	120	0.45	0.3	3.0
On-site Crushed/Processed Rock **	130	0.5	0.35	2.8

* Passive coefficients represent ultimate values. Appropriate safety factors should be applied.

** Contingent upon preparation of the on-site rock as recommended in the "Site Preparation" subsection.

The above values do not include a hydrostatic or ground level surcharge component. The effect of surcharge loads, where applicable, should be incorporated into wall pressure diagrams by adding a

pressure component equal to the applicable lateral earth pressure coefficient times the surcharge load to the full height of the wall.

The compactive effort should be controlled during backfill operations. Overcompaction can produce lateral earth pressures in excess of at-rest magnitudes. Compaction levels adjacent to below-grade walls should be maintained between 95 and 100 percent of standard Proctor (ASTM D 698) maximum dry density.

For retaining walls or below grade wall footings bearing on limestone subgrade, an allowable coefficient of sliding resistance of 0.7 (maximum of 1,000 pf) and a maximum allowable bearing footing capacity of 4,000 psf should be considered. For wall footings bearing on soil subgrade or properly compacted fill, an allowable coefficient of sliding resistance of 0.4 (maximum of 500 psf) and a maximum footing bearing capacity of 2,500 psf should be utilized. All retaining walls should be checked against failure due to overturning, sliding, and overall slope stability.

A wall drain is recommended for collection and removal of surface water percolation along the base of the walls. Proper control of surface water percolation will help to prevent buildup of higher wall pressures. The final 12 inches of backfill in unpaved areas should preferably consist of cohesive soil to help reduce percolation of surface water into the backfill.

7.7 Site Preparation

Construction areas should be stripped of all vegetation, and loose topsoil. (The loose soils resulting from past plowing should also be removed to expose the underlying undisturbed subgrade.) Once final subgrade elevations have been achieved, exposed soil subgrade should be proofrolled with at least a 20-ton pneumatic roller or equivalent to detect weak areas. Weak areas detected during proofrolling should be removed and replaced with soils exhibiting similar classification, moisture content, and density as the adjacent in-situ soils. Exposed limestone subgrade areas should be cleaned sufficiently and any voids filled with crushed limestone base material. Proper site drainage should be maintained during construction so that ponding of surface runoff does not occur and cause

construction delays and/or inhibit site access. Please note that subgrade preparation specific to building foundations, pavements, etc. are located in the sections of this report which address these topics. The above subgrade preparation refers to general site preparation only.

7.7.1 Fill Compaction Requirements

All fill material should be placed in uniform lifts (lift thicknesses are discussed below). Fill should be compacted to at least 95 percent of the Standard Proctor (ASTM D 698) maximum dry density at a moisture content ranging between -3 and +3 percent of optimum moisture content, unless stated otherwise. For building areas to receive more than 4 feet of fill, fill material placed at depths in excess of 4 feet should be compacted to at least 100 percent of the ASTM D 698 maximum dry density.

Prior to fill placement in building areas, soil subgrade areas should be scarified, moisture conditioned, and recompacted as stated in the "Floor Slab Design" and "Slab-On-Grade Foundation" subsections.

7.7.2 Imported Select Fill

Imported select fill material to be utilized within the building limits should consist of crushed limestone base material meeting the requirements of the Texas Department of Transportation (TxDOT) 1993 Standard Specifications Item 247, Type A, Grade 4. As an alternative, low-plasticity granular fill material which does not meet these specifications may be utilized only if approved by HBC. Imported select fill should be placed in compact lifts not exceeding 6 inches in thickness.

7.7.3 Use of On-Site Material for Fill in Building Areas

Excavated Stratum III limestone from cut areas of the site may be considered for use as select fill in the building areas provided that it is processed such that a relatively well graded grain size distribution with a maximum rock size of 4 inches is achieved (although a small percentage of rocks as large as 6 inches would be acceptable provided they are broken down with heavy equipment during compaction of each lift). In addition, the plasticity index of the minus No. 40 sieve fraction should generally be at or below 20 percent. (Please note that segregation of higher plasticity Stratum I dark brown to brown clayey soils and more highly plastic zones of the Stratum II tan and gray clayey soils

will likely be necessary to keep the plasticity indices within tolerable limits. In some situations the difference between more highly plastic clay and lower plasticity silty clay soils may not be readily distinguishable without performance of appropriate laboratory testing.) After initial processing of on-site material, samples should be submitted to HBC for approval of proper gradation, plasticity index, and maximum rock size prior to use as select fill. Maximum loose lift thickness should be 8 inches (corresponding to a lift thickness of about twice the maximum rock size).

It has been our experience that proper processing of excavated limestone often involves such processes as breaking down of larger rock with equipment, screening, etc. The Contractor's proposed methods of processing these materials should be reviewed prior to initiation of construction to check that these methods will produce an acceptable select fill material with a proper grain size distribution.

We understand that the use of Stratum II soils for select fill may be desired. Our laboratory data indicated zones of lower plasticity soils within the Stratum II soils, which would be suitable for use as select fill soils, and areas of higher plasticity, which would not be allowed for use within the building areas. Due to the higher plasticity indices measured in some areas for the Stratum II soils (as high as 45 percent), we highly recommend that additional testing be performed during excavation and stockpiling of the Stratum II soils to help identify layers or pockets of soils within these soils, if any, that have higher plasticity indices (greater than 20 percent). If layers and pockets of these soils that exhibit higher plasticity indices are identified, they should be segregated from the building pad fill. In addition, we also recommend that proposed borrow areas be sampled and tested through multiple test pits prior to the initiation of earthwork activities to determine the suitability of the material in these areas for select fill.

7.7.4 Use of On-Site Material for Fill in Pavement or General Areas

Excavated limestone from the site may be considered for fill in pavement areas or general areas provided the criteria stated below are satisfied.

- The maximum lift height recommended is 1.5 feet, which will be controlled by the maximum boulder size. A maximum nominal rock size of 9 inches should be maintained (although a small percentage of rocks as large as 12 inches would be acceptable).
- The largest nominal rock size of any given lift shall not exceed one-half of the lift height.
- The final two subgrade lifts shall be no more than 6 inches in thickness and contain no rocks larger than four inches in their largest dimensions.
- The rock fill shall be of sufficient size distribution such that no voids are present between larger rock sizes during placement.
- Such a rock fill placement operation should be continuously monitored by HBC personnel to check that the fill operation is in accordance with the recommendations stated herein. (In-place density testing for such a fill operation is often not practical).

Excavated on-site soils, if free of organics and debris, may be considered for use as fill in pavement or general areas (not in building areas). The Stratum I clayey soils should be compacted as stated above for select fill soils, at a moisture content between optimum and +4 percent of optimum moisture content. The Stratum II clayey soils should be moisture conditioned and compacted as stated for select fill soils.

7.8 Drainage

The performance of foundation systems for the proposed structures will not only be dependent upon the quality of construction, but also upon the stability of the moisture content of the near surface soils. Therefore, we highly recommend that site drainage be developed so that ponding of surface runoff near the structures does not occur. Accumulation of water near the structures may cause significant moisture variations in the subgrade adjacent to the floor slabs, thus increasing the potential for structural distress. In addition, the owner and/or builder should be made aware that placing large bushes and trees adjacent to the structures may cause significant moisture variations in the soils underlying the structures. Watering of vegetation should be performed in a timely and controlled

manner and prolonged watering should be avoided. Special care should be taken to insure that underground utilities do not develop leaks with time.

Based on the topographic and site grading information provided to HBC, we understand that significant cuts are planned for portions of the site. The possibility of groundwater seepage along such cut areas exists. We recommend that interceptor drains and/or drainage swales be placed adjacent to these cuts to intercept and remove groundwater which could otherwise infiltrate pavement/building subgrade areas. If utilization of interceptor drains and/or drainage swales is desired, HBC should be contacted for further recommendations.

7.9 Pavement Design

Both flexible pavement systems (consisting of asphalt and crushed limestone base) and reinforced concrete pavement systems may be considered for this project. Detailed traffic loads and frequencies were not available. However, we anticipate that traffic will consist primarily of passenger vehicles in the parking areas and passenger vehicles combined with delivery trucks and buses in driveways. Many of the trucks will most likely be heavily loaded. Tabulated below are the assumed traffic frequencies and loads used to design pavement sections for this project.

Pavement Type	Traffic Design Index	Description
Parking Areas:	DI-1	Light traffic (few vehicles heavier than passenger cars, no regular use by heavily loaded two axle trucks or larger vehicles) (EAL* $\leq$ 5)
Driveways (Light duty):	DI-2	Medium to light traffic - Similar to DI-1 including not over 50 loaded two axle trucks or lightly loaded larger vehicles per day. No regular use by heavily load trucks with three or more axles. (EAL=6-20)
Driveways (Heavy Duty), Loading Areas:	DI-3	Medium traffic - Including not over 300 heavily loaded two axle trucks plus lightly loaded trucks with three or more axles and no more than 30 heavily loaded trucks with more than three axles per day (EAL=21-75)

* Equivalent daily 18-kip single axle load applications.

Listed below are pavement component thickness for the subgrade conditions observed at the site which may be used as a guide for pavement systems for the traffic classifications stated herein, assuming that the Stratum I clayey soils will generally act as the pavement subgrade, and that the pavement subgrade is prepared as outlined in the "Site Preparation" subsection. We should note that these systems were derived based on general characterization of the subgrade. No specific testing (such as CBR's, resilient modulus tests, etc.) was performed for this project to evaluate the support characteristics of the subgrade.

FLEXIBLE PAVEMENT SYSTEM

Component	Material Thickness, Inches	
	DI-1	DI-2
Asphaltic Concrete	1.5	2.0
Crushed Limestone Base	9.0 *	10.0 *
Moisture Conditioned Subgrade	6.0	6.0

* In pavement areas where the subgrade is cut to expose the underlying Stratum III tan limestone, as well as subgrade areas where at least 6 inches of select fill or processed on-site limestone is placed above the clay subgrade, the recommended base thickness may be reduced by two inches.

RIGID PAVEMENT SYSTEM

Component	Material Thickness, Inches		
	DI-1	DI-2	DI-3
Reinforced Concrete*	5.0	6.0	7.0
Moisture Conditioned Subgrade	6.0	6.0	6.0

* A thin course of crushed limestone base or clean sand is recommended under the reinforced concrete in exposed limestone subgrade areas.

Reinforcing Steel: #3 bars spaced at 12 inches or #4 bars spaced at 18 inches on centers in both directions.

Control Joint Spacing: Maximum of 15 feet. If sawcut, control joints should be cut within 6 to 12 hours of concrete placement.

Expansion Joint Spacing: Maximum of 75 feet.

Dowels at Expansion Joints: 3/4 inch bars, 18 inches in length, with one end treated to slip, spaced at 30 inches on centers at each joint.

Presented below are our recommended material requirements for the various pavement sections.

Hot Mix Asphaltic Concrete Surface Course - The asphaltic concrete surface course should be plant mixed, hot laid Type D (Fine Graded Surface Course) meeting the master specifications requirements in TxDOT Item 340. The HMAC should be designed for a stability of at least 35 and should be compacted to between 91 and 97 percent of the maximum theoretical density as measured by ASTM D 2041.

Reinforced Concrete - Concrete should be designed to exhibit a flexural strength (3 point loading) of at least 500 psi at 28 days. The flexural strength (M_f) may be approximated by the following formula from ACI 330R: $M_f = 2.3(f_c^{2/3})$, where f_c is the compressive strength of the concrete. The actual relationship between flexural and compressive strength for the proposed mix should be evaluated in the laboratory. As an option, a 28-day compressive strength requirement of 4,000 psi may be considered.

Crushed Limestone Base - Base material should be composed of crushed limestone meeting the requirements of TxDOT Item 247, Type A, Grade 1, or City of Austin standard specifications Item 210. The base should be compacted to a minimum of 95% of the maximum density as determined by the modified moisture/density relation (ASTM D 1557) at -3 to +3 percent of optimum moisture content. (As an option, compaction to be at least 100 percent of the TEX113E maximum dry density may be considered).

Moisture Conditioned Subgrade - Soil subgrade areas should be scarified to a depth of six inches, moisture adjusted, and then recompact to at least 95 percent of the maximum dry density as determined by ASTM D 698. Exposed Stratum I subgrade areas should be moisture conditioned to between optimum and +4 percent of optimum moisture content. Exposed Stratum II subgrade areas should be moisture conditioned to between -3 and +3 percent of optimum moisture content. Care should be taken to insure that the subgrade does not dry out or become saturated prior to pavement construction. Moisture conditioning is not required for exposed limestone subgrade areas.

It is important that proper perimeter drainage be provided so that infiltration of surface water from unpaved areas surrounding the pavement is minimized, or if this is not possible, curbs should extend through base and into the subgrade. A crack sealant compatible to both asphalt and concrete should be provided at concrete-asphalt interfaces. We should note that the post-construction subgrade movements and some cracking of asphaltic pavements is not uncommon for clayey subgrade conditions such as those observed at this site.

In asphaltic concrete pavement areas, we recommend that waste dumpster areas be constructed of reinforced concrete. The concrete pad areas should be designed so that the vehicle wheels of the collection truck are supported on the concrete while the dumpster is being lifted. Dumpster areas that are not designed in this manner often experience localized failures due to large wheel loading imposed during waste collection.

8.0 DESIGN REVIEW

HBC should be provided the opportunity to review the final plans and specifications to check that these and subsequent recommendations are properly interpreted. HBC cannot be responsible for misinterpretations of our recommendations if we have not had an opportunity to review these documents.

9.0 CONSTRUCTION MONITORING

Construction monitoring services should be provided for subgrade preparation and fill compaction, as well as foundation installation (already discussed).

10.0 LIMITATIONS

We do not anticipate that subsurface conditions which differ significantly from those encountered exist at the site. However, variations may occur due to the geology of the area as well as the filled areas observed which may not have been detected in the boring program. Should any subsurface conditions other than those described in this report be encountered, HBC should be immediately notified so that further evaluation and supplemental recommendations can be provided.

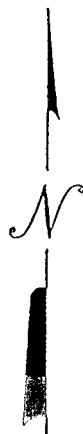
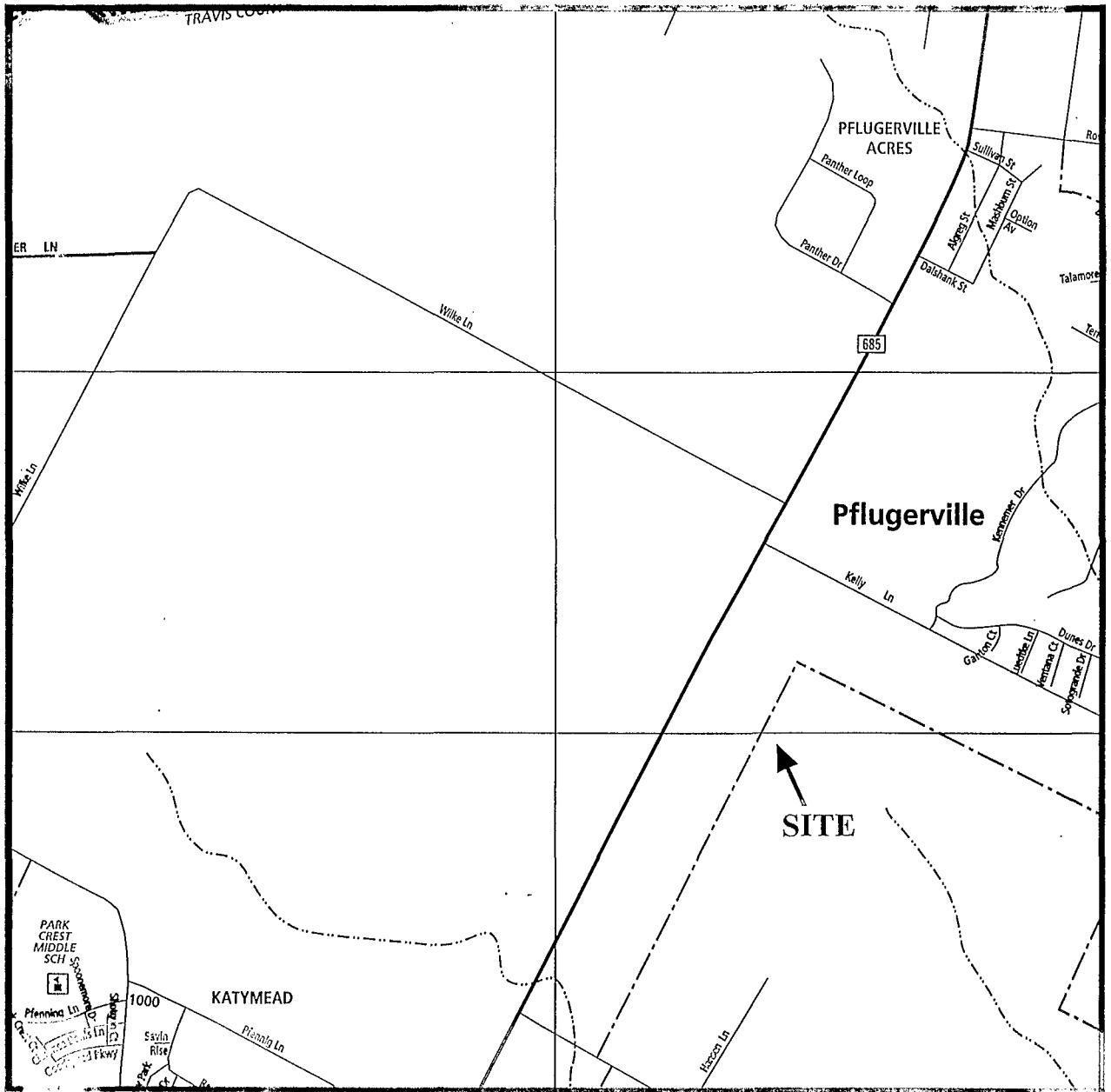
This study was performed in accordance with accepted geotechnical engineering practice. Determination of excavation, trench safety, dewatering and trafficability requirements is the responsibility of others specializing in those areas. In the event that any changes in the nature, design or location of the improvements are made, the conclusions and recommendations in this report should not be considered valid until the changes are reviewed and the conclusions and recommendations modified or verified in writing.

REFERENCES

- ¹ Garner, L.E. and Young, K.P., "Environmental Geology of the Austin Area: an Aid to Urban Planning", Bureau of Economic Geology, The University of Texas at Austin, 1976.

APPENDIX

	<u>PAGE</u>
VICINITY PLAN	A-1
PROJECT LAYOUT	A-2
LOGS OF BORINGS	A-3 THROUGH A-43
SYMBOL KEY SHEET	A-44

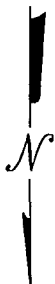


VICINITY PLAN

Pflugerville High School No. 3
Pflugerville, Texas

HBC Project No. 96005142

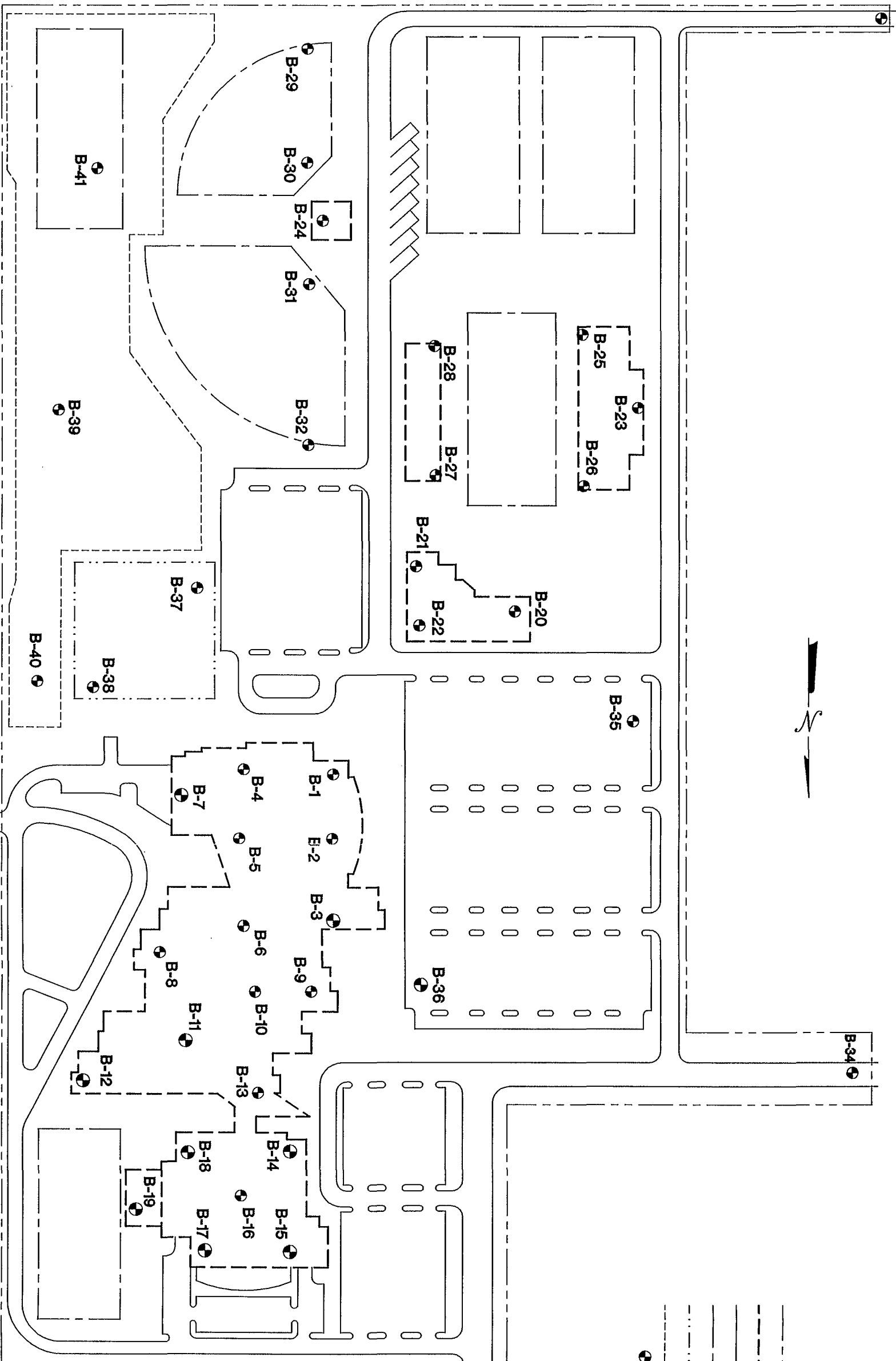
B-33



LEGEND

- Project Limits
- Proposed Building Limits
- Proposed Pavement Area
- Proposed Athletic Fields
- Proposed Tennis Courts
- Proposed Detention Pond Area
- Completed Borings

To Kelly Lane →



PROJECT LAYOUT
Pflugerville High School No.3
Pflugerville, Texas

HBC Project No. 96005142

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-1

PROJECT NO. 96005142

DATE 7-6-00

SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S): Dry Augered 0 to 25 feet	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ.IN)	
						LL	PL	PI					
			P=4.5	32	88	77	25	52		2.99	5		
			P=4.5+	14									
5			R=93 RQD=50										
10			R=88 RQD=77		121					11			
15			R=98 RQD=65										
20			R=100 RQD=35										
25													
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION REMARKS:													

LOB 96005142.GPJ 8/30/00



LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-2
PROJECT NO. 96005142
DATE 7-6-00
SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 4 feet; Wet Rotary 4 to 25 feet	
												GROUNDWATER INFORMATION: No groundwater observed during dry augering.	
												DESCRIPTION OF STRATUM	
			P=4.5	20									Dark brown clay (CH)
			P=4.5+	12	112	31	17	14	76				Hard tan and light gray silty clay (CL)
5													Tan limestone (Austin Group), marly -with weathered seams to 10 feet
			R=87		118					20			
10													
			R=93 RQD=40										
15													
			R=100 RQD=38										
20													
			R=100 RQD=25										
25													Boring Terminated at 25 feet
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-3
PROJECT NO. 96005142
DATE 7-6-00
SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
			P=4.5+	18		52	17	35					
5			R=67 RQD=25										
10			R=93 RQD=37										
15			R=100 RQD=40		132					40			
20			R=100 RQD=50										
Hard dark brown clay (CH)													
Tan limestone (Austin Group), slightly marly													
-marly below 10 feet													
-weathered layer 17 to 18 feet													
Boring Terminated at 20 feet													
25													
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-4

PROJECT NO. 96005142

DATE 7-7-00

SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 6 feet; Wet Rotary 6 to 20 feet	
												GROUNDWATER INFORMATION: No groundwater observed during dry augering.	
DESCRIPTION OF STRATUM													
5			P=4.5	26									Very stiff to hard dark brown clay (CH)
			P=4.0	26	99					4.27	8		
			P=4.5+	14	120	37	16	21					
10			R=89 RQD=0										Tan to light gray limestone (Austin Group), slightly marly -weathered to 10 feet
15			R=70 RQD=33										
20			R=100 RQD=60	7	134					47			
25													Boring Terminated at 20 feet
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

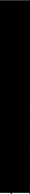
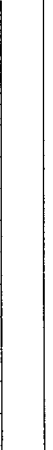
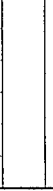
PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-5
PROJECT NO. 96005142
DATE 7-6-00
SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA									DRILLING METHOD(S): Dry Augered 0 to 6 feet; Wet Rotary 6 to 20 feet		
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ.IN)	GROUNDWATER INFORMATION: No groundwater observed during dry augering.		
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI						DESCRIPTION OF STRATUM	
			P=4.5+	17	107	66	19	47					Hard dark brown clay (CH)		
			P=4.5+	18											
5			P=4.5+	13	124	41	16	25	92					Hard tan and gray silty clay (CL) with limestone fragments	
			R=88 RQD=42	11	127					12			Tan limestone (Austin Group), marly -weathered to 8 feet		
10															
			R=100 RQD=55												
15															
			R=100 RQD=52										-weathered layer 17 to 18 feet		
20															
25															Boring Terminated at 20 feet
															
30															
35															
40															
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION											REMARKS:				

LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO.

PROJECT NO.

DATE

SURFACE ELEVATION

B-6

96005142

7-1-00

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
													DRILLING METHOD(S): Dry Augered 0 to 4 feet; Wet Rotary 4 to 20 feet
													GROUNDWATER INFORMATION: No groundwater observed during dry augering.
													DESCRIPTION OF STRATUM
			P=4.5	10									Hard dark brown clay (CH)
			P=4.5+	13	116					13.16	4		
5													Tan limestone (Austin Group) with weathered seams, slightly marly
10			R=85 RQD=43										-complete loss of drilling fluid at 8 feet
15			R=80 RQD=48		130					21			
20			R=73 RQD=43										
25													Boring Terminated at 20 feet
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO.

PROJECT NO.

DATE

SURFACE ELEVATION

B-7

96005142

7-17-00

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ.IN)	
						LL	PL	PI					
Dry Augered 0 to 6 feet; Wet Rotary 6 to 25 feet GROUNDWATER INFORMATION: No groundwater observed during dry augering. DESCRIPTION OF STRATUM													
5				12									Dark brown to brown clay (CH) with limestone fragments
				19		73	25	48					
10			R=85 RQD=23										Tan limestone (Austin Group) with scattered weathered seams -marly to 10 feet
					126					72			
15			R=88 RQD=80										
20			R=100 RQD=93										Boring Terminated at 25 feet
25			R=95 RQD=82										
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-8

PROJECT NO. 96005142

DATE 7-7-00

SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 3 feet; Wet Rotary 3 to 20 feet	
												GROUNDWATER INFORMATION: No groundwater observed during dry augering.	
												DESCRIPTION OF STRATUM	
			P=4.5+	16									Hard dark brown clay (CH)
5			P=4.5+ R=83 RQD=17	14	121	39	18	21					Hard tan and light gray silty clay (CL) with limestone fragments
10			R=100 RQD=53		126					22			Tan limestone (Austin Group), marly
15			R=100 RQD=90										
20			R=100 RQD=50										
25													Boring Terminated at 20 feet
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										REMARKS:			

LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3
Pflugerville, Texas
CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-9
PROJECT NO. 96005142
DATE 7-7-00
SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 2 feet; Wet Rotary 2 to 20 feet	
												GROUNDWATER INFORMATION: No groundwater observed during dry augering.	
DESCRIPTION OF STRATUM													
			P=4.5+	14	106								Hard dark brown clay (CH)
5			R=100 RQD=0										Tan limestone (Austin Group) -weathered to 5 feet
10			R=100 RQD=73										-slightly marly below 10 feet
15			R=95 RQD=53		132					49			
20			R=100 RQD=43										
25													Boring Terminated at 20 feet
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										REMARKS:			

LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-10
PROJECT NO. 96005142
DATE 7-7-00

SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S): Dry Augered 0 to 5 feet; Wet Rotary 5 to 20 feet	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
													GROUNDWATER INFORMATION: No groundwater observed during dry augering.
													DESCRIPTION OF STRATUM
			P=4.5+	13									Hard brown clay (CH)
			P=4.5+	13	107	44	22	22					Hard tan and gray silty clay (CL) with limestone fragments
5													Tan limestone (Austin Group), slightly marly
10			R=100 RQD=62		132					37			
15			R=100 RQD=72										
20			R=93 RQD=33										
25													Boring Terminated at 20 feet
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-11

PROJECT NO. 96005142

DATE 7-18-00

SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
													GROUNDWATER INFORMATION: No groundwater observed during dry augering.
													DESCRIPTION OF STRATUM
			P=4.5+	11									Dark brown to brown clay (CH)
			P=4.5+	13	117					6.04	3		Hard tan silty clay (CL) with limestone fragments
5			N=67	38		61	21	40					Hard tan clay (CH) with limestone fragments
10			R=98 RQD=29										Tan limestone (Austin Group) -marly 10 to 15 feet
15			R=97 RQD=48										
20			R=93 RQD=75										
25													Boring Terminated at 20 feet
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-12
PROJECT NO. 96005142
DATE 7-18-00

SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI					
												DRILLING METHOD(S): Dry Augered 0 to 10 feet; Wet Rotary 10 to 20 feet	
												GROUNDWATER INFORMATION: No groundwater observed during dry augering.	
													DESCRIPTION OF STRATUM
			P=4.5	10									Dark brown clay (CH) with limestone fragments
			N=25	10									Very stiff to hard tan silty clay (CL) with limestone fragments
5			N=38	12									
			N=29	13		46	16	30					
10			N=82/11"	24									
			R=100 RQD=77		120					44			Tan limestone (Austin Group), slightly marly -diagonal fracture at 12 feet
15			R=93 RQD=87										
20													Boring Terminated at 20 feet
25													
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION												REMARKS:	



LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-13
PROJECT NO. 96005142
DATE 7-7-00

SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ.IN)	
						LL	PL	PI					
			P=4.5+	8	91	41	22	19					
5			R=42 RQD=6										
10			R=100 RQD=48										
15					131					22			
20			R=100 RQD=77										
25													
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION REMARKS:													

DRILLING METHOD(S):

Dry Augered 0 to 2 feet; Wet Rotary 2 to 20 feet

GROUNDWATER INFORMATION:

No groundwater observed during dry augering.

DESCRIPTION OF STRATUM

Hard brown silty clay (CL) with limestone fragments

Tan limestone (Austin Group), slightly marly
-weathered to 5 feet

Boring Terminated at 20 feet



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-14

PROJECT NO. 96005142

DATE 7-17-00

SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 4 feet; Wet Rotary 4 to 25 feet	
												GROUNDWATER INFORMATION: No groundwater observed during dry augering.	
DESCRIPTION OF STRATUM													
				7									Tan silty clay (CL) with limestone fragments
				14									
5			R=82 RQD=38										Tan limestone (Austin Group)
10			R=95 RQD=68										
15			R=100 RQD=77										
20			R=100 RQD=75	128					56				-marly below 20 feet
25													Boring Terminated at 25 feet
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

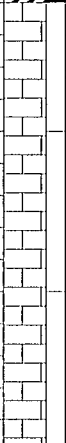
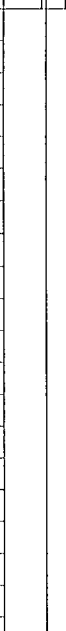
Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-15
PROJECT NO. 96005142
DATE 7-17-00

SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
													DRILLING METHOD(S): Dry Augered 0 to 6 feet; Wet Rotary 6 to 20 feet
													GROUNDWATER INFORMATION: No groundwater observed during dry augering.
													DESCRIPTION OF STRATUM
5			P=4.5	6									Hard brown silty clay (CL) with calcareous nodules
			P=4.5	14		51	20	31					Hard tan clay (CH) with calcareous nodules and limestone fragments
			P=4.5	11									
10			R=85 RQD=73										Tan limestone (Austin Group) -marly to 7 feet
15			R=93 RQD=32										-diagonal fracture at 10.5 feet -diagonal fracture at 13 feet
20			R=95 RQD=82										
25													Boring Terminated at 20 feet
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-16
PROJECT NO. 96005142
DATE 7-10-00

SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 2 feet; Wet Rotary 2 to 20 feet	
												GROUNDWATER INFORMATION: No groundwater observed during dry augering.	
												DESCRIPTION OF STRATUM	
			P=4.5+	11									Hard dark brown clay (CH) with limestone fragments
5			R=47 RQD=0										Tan limestone (Austin Group), slightly marly -weathered to 5 feet
10			R=100 RQD=60		124					41			
15			R=93 RQD=62										
20			R=100 RQD=63										
25													Boring Terminated at 20 feet
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-17
PROJECT NO. 96005142
DATE 7-18-00

SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
DRILLING METHOD(S): Dry Augered 0 to 4 feet; Wet Rotary 4 to 20 feet GROUNDWATER INFORMATION: No groundwater observed during dry augering.													
DESCRIPTION OF STRATUM													
				9									Hard dark brown to brown clay (CH)
				12	112					8.82	4		
5			R=76 RQD=14										Tan limestone (Austin Group) -weathered to 8 feet -diagonal fracture at 16.5 feet -fracture 18 to 19 feet
10			R=100 RQD=68		132					111			
15			R=97 RQD=65										
20													
25													Boring Terminated at 20 feet
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO.	B-18
PROJECT NO.	96005142
DATE	7-18-00
SURFACE ELEVATION	

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 4 feet; Wet Rotary 4 to 25 feet	
												GROUNDWATER INFORMATION: No groundwater observed during dry augering.	
												DESCRIPTION OF STRATUM	
				8		46	19	27					Brown silty clay (CL) with limestone fragments
5			R=96 RQD=53	11									Tan limestone (Austin Group) -weathered to 6 feet
10			R=100 RQD=80										-slightly marly 10 to 20 feet
15			R=100 RQD=63										
20			R=95 RQD=30										-marly below 23 feet
25													Boring Terminated at 25 feet
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3
 Pflugerville, Texas
 CLIENT: Pflugerville Independent School District
 Pflugerville, Texas

BORING NO. B-19
 PROJECT NO. 96005142
 DATE 7-18-00
 SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
													DRILLING METHOD(S): Dry Augered 0 to 6 feet; Wet Rotary 6 to 20 feet
													GROUNDWATER INFORMATION: No groundwater observed during dry augering.
													DESCRIPTION OF STRATUM
5			P=4.5+	14		57	22	35					Hard dark brown clay (CH) with limestone fragments
			P=4.5+	13									
			P=4.5+	21		66	21	45					Hard tan clay (CH) with limestone fragments.
10			R=100 RQD=58										Tan limestone (Austin Group) -marly to 10 feet
15			R=93 RQD=38	135					66				
20			R=100 RQD=57										-weathered layer 19 to 20 feet Boring Terminated at 20 feet
25													
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
 T - TXDOT CONE PENETRATION RESISTANCE
 P - POCKET PENETROMETER RESISTANCE
 R - PERCENTAGE OF ROCK CORE RECOVERY
 RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-20

PROJECT NO. 96005142

DATE 7-5-00

SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT. R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT.	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT.)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN.)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 10 feet; Wet Rotary 10 to 20 feet	
												GROUNDWATER INFORMATION: No groundwater observed during drilling.	
DESCRIPTION OF STRATUM													
5			P=4.0	22									Hard dark brown to brown clay (CH) -with scattered calcareous nodules below 4 feet
			P=4.5+	25									
			P=4.5+	24	104	53	15	38		3.88	6		
			P=4.5+	15	115	33	16	17					Hard tan and gray silty clay (CL) with limestone fragments
10		X	N=50/2"										Tan limestone (Austin Group), marly -slightly marly below 15 feet
15			R=87 RQD=45		129					42			
20			R=98 RQD=33										
25													Boring Terminated at 20 feet
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-21
PROJECT NO. 96005142
DATE 7-10-00
SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 6 feet; Wet Rotary 6 to 20 feet	
												GROUNDWATER INFORMATION: No groundwater observed during dry augering.	
												DESCRIPTION OF STRATUM	
			P=4.5	19		73	23	50					Hard dark brown to brown clay (CH) with limestone fragments
			P=4.5+	30									
5			P=4.5+	13									Hard tan silty clay (CL) with limestone fragments
10			R=94 RQD=22										Tan limestone (Austin Group), slightly marly
15			R=100 RQD=50										
20			R=100 RQD=50										
25													Boring Terminated at 20 feet
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION												REMARKS:	



LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO.	B-22
PROJECT NO.	96005142
DATE	7-10-00
SURFACE ELEVATION	

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S): Dry Augered 0 to 20 feet	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
GROUNDWATER INFORMATION: No groundwater observed during drilling.													
DESCRIPTION OF STRATUM													
5	[Hatched Pattern]		P=4.0	14									Hard dark brown to brown clay (CH) with limestone fragments
			P=4.5			76	21	55					
			P=4.5+	21									
10	[Hatched Pattern]		P=4.5+	14		45	15	30					Hard tan and gray silty clay (CL) with limestone fragments
			N=38	18									
15	[Hatched Pattern]		N=50/2"										Tan limestone (Austin Group), weathered
20	[Hatched Pattern]												Boring Terminated at 20 feet
25													
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										REMARKS:			



LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-23
PROJECT NO. 96005142
DATE 7-5-00
SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S): Dry Augered 0 to 15 feet	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
			P=4.5+	17									GROUNDWATER INFORMATION: No groundwater observed during dry augering.
			P=4.5+	15	116	38	18	20					
5			P=4.5+			39	18	21					
			N=50/4"										
10			N=50/5"										
			N=50/5"										-with limestone seams and fragments below 6 feet
15													
20													
25													
30													Boring Terminated at 15 feet
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-24
PROJECT NO. 96005142
DATE 7-12-00
SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA						LABORATORY DATA						DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
													DRILLING METHOD(S): Dry Augered 0 to 15 feet
													GROUNDWATER INFORMATION: No groundwater observed during drilling.
													DESCRIPTION OF STRATUM
			P=4.5	17	97	75	21	54		8.96	4		Hard dark brown clay (CH) with limestone fragments
			N=24										Very stiff to hard tan silty clay (CL) with limestone fragments
5			N=69/10"	15		31	17	14					
			N=50/6"										
10			N=50/6"										Tan limestone (Austin Group), weathered
			N=50/2"										
15													Boring Terminated at 15 feet
20													
25													
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										REMARKS:			

LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-25
PROJECT NO. 96005142
DATE 7-5-00
SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 15 feet	
												GROUNDWATER INFORMATION: No groundwater observed during drilling.	
												DESCRIPTION OF STRATUM	
			P=4.5+	17	111								Hard dark brown clay (CH)
			P=4.5+	11	113	33	19	14	80				Hard tan silty clay (CL) with calcareous nodules and limestone fragments and seams
5			N=50/3"										
			N=50/3"	13		31	14	17					
10			N=50/5"										
			N=50/2"										Boring Terminated at 15 feet
15													
20													
25													
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO.	B-26
PROJECT NO.	96005142
DATE	7-5-00
SURFACE ELEVATION	

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
													DRILLING METHOD(S): Dry Augered 0 to 4 feet; Wet Rotary 4 to 15 feet
													GROUNDWATER INFORMATION: No groundwater observed during drilling.
													DESCRIPTION OF STRATUM
			P=4.5+	18									Hard dark brown clay (CH) with limestone fragments
			P=4.5+	15	116	35	17	18					Hard tan silty clay (CL) with calcareous nodules and limestone fragments
5			N=71										
			N=48										
10			N=50/5"	12									
			N=50/2"										Tan limestone (Austin Group)
15													Boring Terminated at 15 feet
20													
25													
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										REMARKS:			

LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-27

PROJECT NO. 96005142

DATE 7-5-00

SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
													DRILLING METHOD(S): Dry Augered 0 to 15 feet
													GROUNDWATER INFORMATION: No groundwater observed during drilling.
													DESCRIPTION OF STRATUM
			P=3.0	24	98	64	21	43		3.43	8		Very stiff to hard dark brown clay (CH) with calcareous nodules
			P=4.5+	24									
5			P=4.5+	14	121								Hard tan and light gray silty clay (CL) with calcareous nodules and limestone fragments
			N=33	12		46	17	29					
10			N=61										
15			N=50/2"										
													Boring Terminated at 15 feet
20													
25													
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

LOB 96005142.GPJ 8/30/00



LOG OF BORING

PROJECT: Pflugerville High School No. 3
 Pflugerville, Texas
 CLIENT: Pflugerville Independent School District
 Pflugerville, Texas

BORING NO. B-28
 PROJECT NO. 96005142
 DATE 7-10-00
 SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 15 feet	
												GROUNDWATER INFORMATION: No groundwater observed during drilling.	
												DESCRIPTION OF STRATUM	
			P=4.5+	12		55	19	36					Hard dark brown clay (CH) with limestone fragments
			P=4.5+										
5			P=4.5+	12	115	45	16	29		10.89	4		Hard tan silty clay (CL) with limestone fragments
			P=4.5+										
10			P=4.5+	13									
15			N=50/6"										-with limestone seams below 13 feet
												Boring Terminated at 15 feet	
20													
25													
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
 T - TXDOT CONE PENETRATION RESISTANCE
 P - POCKET PENETROMETER RESISTANCE
 R - PERCENTAGE OF ROCK CORE RECOVERY
 RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-29
PROJECT NO. 96005142
DATE 7-12-00
SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S): Dry Augered 0 to 5 feet	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
			P=4.5+	24									GROUNDWATER INFORMATION: No groundwater observed during drilling.
			P=4.5+	14	112								
5		X	N=50/2"	6									
													Tan limestone (Austin Group) Boring Terminated at 5 feet
10													
15													
20													
25													
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										REMARKS:			

LOG 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-30
PROJECT NO. 96005142
DATE 7-12-00
SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S): Dry Augered 0 to 5 feet	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
			P=4.5+	21	99					9.22	3		
			P=4.5+	21									
5		X	N=50/2"	11									
Hard dark brown to brown clay (CH) with limestone fragments													
Tan limestone (Austin Group)													
Boring Terminated at 5 feet													
10													
15													
20													
25													
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										REMARKS:			



LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-31
PROJECT NO. 96005142
DATE 7-12-00
SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S): Dry Augered 0 to 5 feet	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
												GROUNDWATER INFORMATION: No groundwater observed during drilling.	
												DESCRIPTION OF STRATUM	
			P=4.5+	15									Hard dark brown clay (CH) with limestone fragments
			P=4.5+	15	109								Hard tan silty clay (CL) with limestone fragments
5			N=50/4"	14									-with limestone seams below 4 feet Boring Terminated at 5 feet
10													
15													
20													
25													
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-32
PROJECT NO. 96005142
DATE 7-12-00

SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA							DRILLING METHOD(S):		
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
DRILLING METHOD(S): Dry Augered 0 to 5 feet GROUNDWATER INFORMATION: No groundwater observed during drilling. DESCRIPTION OF STRATUM													
	Hatched		P=4.5+	16									Hard dark brown to brown clay (CH) with limestone fragments
	Hatched		P=4.5+	22									
5	Hatched		P=4.5+	10		29	18	11					Hard tan silty clay (CL) with limestone fragments
													Boring Terminated at 5 feet
10													
15													
20													
25													
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-33

PROJECT NO. 96005142

DATE 7-17-00

SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA					LABORATORY DATA							DRILLING METHOD(S): Dry Augered 0 to 5 feet	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
				14		69	18	51					
				15									
5			N=45	15									
DESCRIPTION OF STRATUM													
Dark brown to brown clay (CH) with limestone fragments													
Hard tan silty clay (CL) with limestone fragments													
Boring Terminated at 5 feet													
10													
15													
20													
25													
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-34
PROJECT NO. 96005142
DATE 7-12-00

SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA							DRILLING METHOD(S): Dry Augered 0 to 5 feet		
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
			P=4.5+	20									GROUNDWATER INFORMATION: No groundwater observed during drilling.
			P=4.5+	14		46	15	31					
5		X	N=50/3"	8									DESCRIPTION OF STRATUM
													Hard dark brown to brown silty clay (CL) with limestone fragments
													Tan limestone (Austin Group)
													Boring Terminated at 5 feet
10													
15													
20													
25													
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										REMARKS:			

LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO.	B-35
PROJECT NO.	96005142
DATE	7-12-00
SURFACE ELEVATION	

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S): Dry Augered 0 to 5 feet	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ.IN)	
						LL	PL	PI					
												GROUNDWATER INFORMATION: No groundwater observed during drilling.	
												DESCRIPTION OF STRATUM	
			P=3.5	23	97								Hard dark brown to brown clay (CH) with limestone fragments
			P=4.5	26									
5			P=4.5+	11									Hard tan silty clay (CL) with limestone fragments
													Boring Terminated at 5 feet
10													
15													
20													
25													
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-36
PROJECT NO. 96005142
DATE 7-17-00

SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA							DRILLING METHOD(S):		
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	
						LL	PL	PI					
DRILLING METHOD(S): Dry Augered 0 to 5 feet GROUNDWATER INFORMATION: No groundwater observed during dry augering. DESCRIPTION OF STRATUM													
				22									Dark brown clay (CH) with limestone fragments
				17									
5			N=50/3"	14									Tan limestone (Austin Group)
Boring Terminated at 5 feet													
10													
15													
20													
25													
30													
35													
40													

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-37
PROJECT NO. 96005142
DATE 7-10-00

SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):		
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ.FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ.FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ.IN)		
						LL	PL	PI						
DRILLING METHOD(S): Dry Augered 0 to 10 feet														
GROUNDWATER INFORMATION: No groundwater observed during drilling.														
DESCRIPTION OF STRATUM														
			P=4.0										Very stiff to hard dark brown to brown clay (CH) with limestone fragments	
			P=4.5	22	102	80	23	57		3.35	8			
5			P=4.5+	15										Hard tan silty clay (CL) with calcareous nodules and limestone fragments
			P=4.5+	15	120									
10			P=4.5+											
													Boring Terminated at 10 feet	
15														
20														
25														
30														
35														
40														

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:



LOB 96005142.GPJ 8/30/00

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-38

PROJECT NO. 96005142

DATE 7-10-00

SURFACE ELEVATION _____

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S): Dry Augered 0 to 10 feet	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	GROUNDWATER INFORMATION: No groundwater observed during drilling.
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI					
DESCRIPTION OF STRATUM													
			P=4.5	17	98	64	16	48					Hard dark brown to brown clay (CH) with limestone fragments
			P=4.5	21									
5			P=4.5+	21									Hard tan silty clay (CL) with calcareous nodules and limestone fragments
			P=4.5+	14	123	33	16	17					
10			N=55	16									Boring Terminated at 10 feet
15													
20													
25													
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										REMARKS:			

_OB 96005142.GPJ 8/30/00

A-40

LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO.

PROJECT NO.

DATE

SURFACE ELEVATION

B-39

96005142

7-10-00

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 10 feet	
												GROUNDWATER INFORMATION: No groundwater observed during drilling.	
												DESCRIPTION OF STRATUM	
			P=4.5+	21	101								Hard dark brown to brown clay (CH) with limestone fragments
			P=4.5+	20									
5			P=4.5+	16	109	36	16	20					Hard tan silty clay (CL) with calcareous nodules and limestone fragments
			N=72/10"	14									
10			N=50/1"	12									Tan limestone (Austin Group)
													Boring Terminated at 10 feet
15													
20													
25													
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION												REMARKS:	



LOG OF BORING

PROJECT: Pflugerville High School No. 3

Pflugerville, Texas

CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-40

PROJECT NO. 96005142

DATE 7-7-00

SURFACE ELEVATION

PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):	
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ. FT R: PERCENT RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ. FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ. IN)	
						LL	PL	PI					
												DRILLING METHOD(S): Dry Augered 0 to 10 feet	
												GROUNDWATER INFORMATION: No groundwater observed during drilling.	
DESCRIPTION OF STRATUM													
5	Hatched pattern		P=4.5+	17		62	22	40					Hard dark brown to brown clay (CH) with limestone fragments
			P=4.5+										
			P=4.5+	17	101								Hard tan silty clay (CL) with calcareous nodules and limestone fragments
			N=55	14		31	16	15					
10			N=53	29									
15													Boring Terminated at 10 feet
20													
25													
30													
35													
40													
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										REMARKS:			



LOG OF BORING

PROJECT: Pflugerville High School No. 3
Pflugerville, Texas
CLIENT: Pflugerville Independent School District
Pflugerville, Texas

BORING NO. B-41
PROJECT NO. 96005142
DATE 7-12-00
SURFACE ELEVATION _____

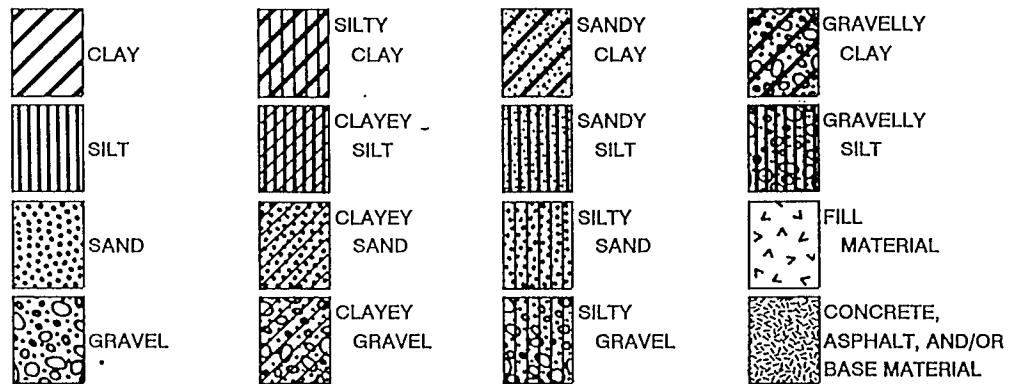
PAGE 1 of 1

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S):		
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ FT R: PERCENT ROD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)		
						LL	PL	PI						
													DRILLING METHOD(S): Dry Augered 0 to 5 feet	
													GROUNDWATER INFORMATION: No groundwater observed during drilling.	
													DESCRIPTION OF STRATUM	
5		P=4.5+		14	106	62	17	45		6.64	4		Hard dark brown clay (CH) with limestone fragments	
				12										Hard tan silty clay (CL) with limestone fragments
				12										
10													Boring Terminated at 5 feet	
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
31														
32														
33														
34														
35														
36														
37														
38														
39														
40														
N - STANDARD PENETRATION TEST RESISTANCE T - TXDOT CONE PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE R - PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										REMARKS:				

LOB 96005142.GPJ 8/30/00

KEY TO SOIL CLASSIFICATIONS AND SYMBOLS

SOIL TYPES



CONSISTENCY OF COHESIVE SOILS

Penetration Resistance (blows per foot)	Consistency	Undrained Compressive Strength (tsf)
0 - 2	Very Soft	0 - 0.25
2 - 4	Soft	0.25 - 0.5
4 - 8	Firm	0.5 - 1.0
8 - 15	Stiff	1.0 - 2.0
15 - 30	Very Stiff	2.0 - 4.0
> 30	Hard	> 4.0

PLASTICITY OF COHESIVE SOILS

Plasticity Index	Degree of Plasticity
0 - 5	None
5 - 10	Low
10 - 20	Moderate
20 - 40	Plastic
> 40	Highly Plastic

RELATIVE DENSITY OF COHESIONLESS SOILS

Penetration Resistance (blows per foot)	Relative Density
0 - 4	Very Loose
4 - 10	Loose
10 - 30	Medium Dense
30 - 50	Dense
> 50	Very Dense

TERMS CHARACTERIZING SOIL STRUCTURE

Slickensided	- having inclined planes of weakness that are slick and glossy in appearance
Fissured	- containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical
Laminated	- composed of thin layers of varying color and texture
Interbedded	- composed of alternate layers of different soil types
Calcareous	- containing appreciable quantities of calcium carbonate

SAMPLER TYPES

