PROPOSED APARTMENT DEVELOPMENT

PIONEER CROSSING APARTMENTS,

AUSTIN TEXAS

288 UNITS

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DEVELOPMENT DESCRIPTION

PIONEER CROSSING APARTMENTS

AUSTIN, TEXAS

DEVELOPMENT DESCRIPTION

The proposed Pioneer Crossing Apartment development is located just off the six lane divided Palmer Lane in Austin, Texas, one of the fastest growing areas in North Central Texas, if not the nation. The project is located approximately 3 miles east of IH 35 providing great visibility and access to major freeways in the area. The proposed development is part of a master planned community that will include single family, owner occupied townhomes, an executive golf course, all accompanied by large open spaces and lakes.

This development is near the recently expanded Samsung manufacturing and engineering facility and just east of many major fortune 500 companies.

The site contains 16.129 acres located in the City of Austin ETJ and is zoned for 20 units per acre. The development will have 12 buildings each containing 24 units for a total of 288 units, clubhouse, with 544 parking spaces provided of which there will be 102 garages and 156 carports with an impervious coverage of only 53%. The main access will be off of a new Samsung Blvd that will make a loop through the master development and secondary access will be provided by the existing Yager Lane to the south and east.

The project is being designed by award winning architect BGO of Dallas, Texas. The garden style apartment will include a multi-family concept that has been graciously accepted into nearly 200 communities across the country. The community will be fenced with limited access gates and will contain a resort style pool, lush landscaped court yards that will include a gazebo and tranquil quiet areas. The site will include a fenced pet area with a pet wash. The site has been designed to provide excellent views of the golf course, landscaped court yards and pool views.

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The units offer three stories with a “Texas Hill Country Design”, with a stone and cement board/stucco exterior. The units will offer 9 foot ceilings, fireplaces, with walking in closets, open kitchens with wood cabinets, all electric appliances with furnished washers and dryers, and patios/balconies with separate storage.

AMENDITIES LIST

PIONEER CROSSING APARTMENTS

AUSTIN, TEXAS

List of Amenities

Site Amenities include:

- A fenced and gated community
- Award-winning landscaping
- Garages and carports
- Clubhouse / Leasing Center with private club room / fitness center
- Beautiful Resort pool
- Lush landscaped courtyard with gazebo and quiet areas
- Fence pet area with pet wash

Building Amenities include:

- Award-winning architectural design
- Energy efficient (low-e glass) windows
- Stone facades with cement board/stucco siding
- Private balconies with premium views
- 24 hour lighting

Private Amenities include:

- Spacious one-of-a-kind floor plans
- Nine Foot Ceilings
- Premier *Designer Collection* finishes and lighting fixtures
- Panoramic windows
- Large private balconies with separate storage rooms
- Ceiling fan(s)
- Cable television
- Fireplace / French doors
- Built-in bookcases (selected units)
- High-speed internet access
- Oversized tubs
- Full sized washer/dryer
- Microwave oven

DEVELOPMENT COST PLUS UNIT MIX AND BUDGET SUMMARY

PIONEER CROSSING APARTMENTS

Unit Mix

Number	Type	Market SF/Unit	Total SF	Rent/Mo	Total Rent	Rent/SF
54	A1	738	39,852	$845	$45,630	$1.14
42	A2	856	35,952	$965	$40,530	$1.13
20	B1-1st	963	19,260	$1,080	$21,600	$1.12
40	B1-2nd&3rd	942	37,680	$1,050	$42,000	$1.11
20	B2-1st	1,065	21,300	$1,195	$23,900	$1.12
40	B2-2nd&3rd	1,039	41,560	$1,160	$46,400	$1.12
12	B3	1,133	13,596	$1,250	$15,000	$1.10
10	B4-1st	1,160	11,600	$1,265	$12,650	$1.09
20	B4-2nd&3rd	1,134	22,680	$1,220	$24,400	$1.08
10	C1-1st	1,346	13,460	$1,350	$13,500	$1.00
20	C1-2nd&3rd	1,320	26,400	$1,325	$26,500	$1.00
Total 288			283,340		$312,110	
Average		984		$1,084		$1.10

Stabilized Operating Budget

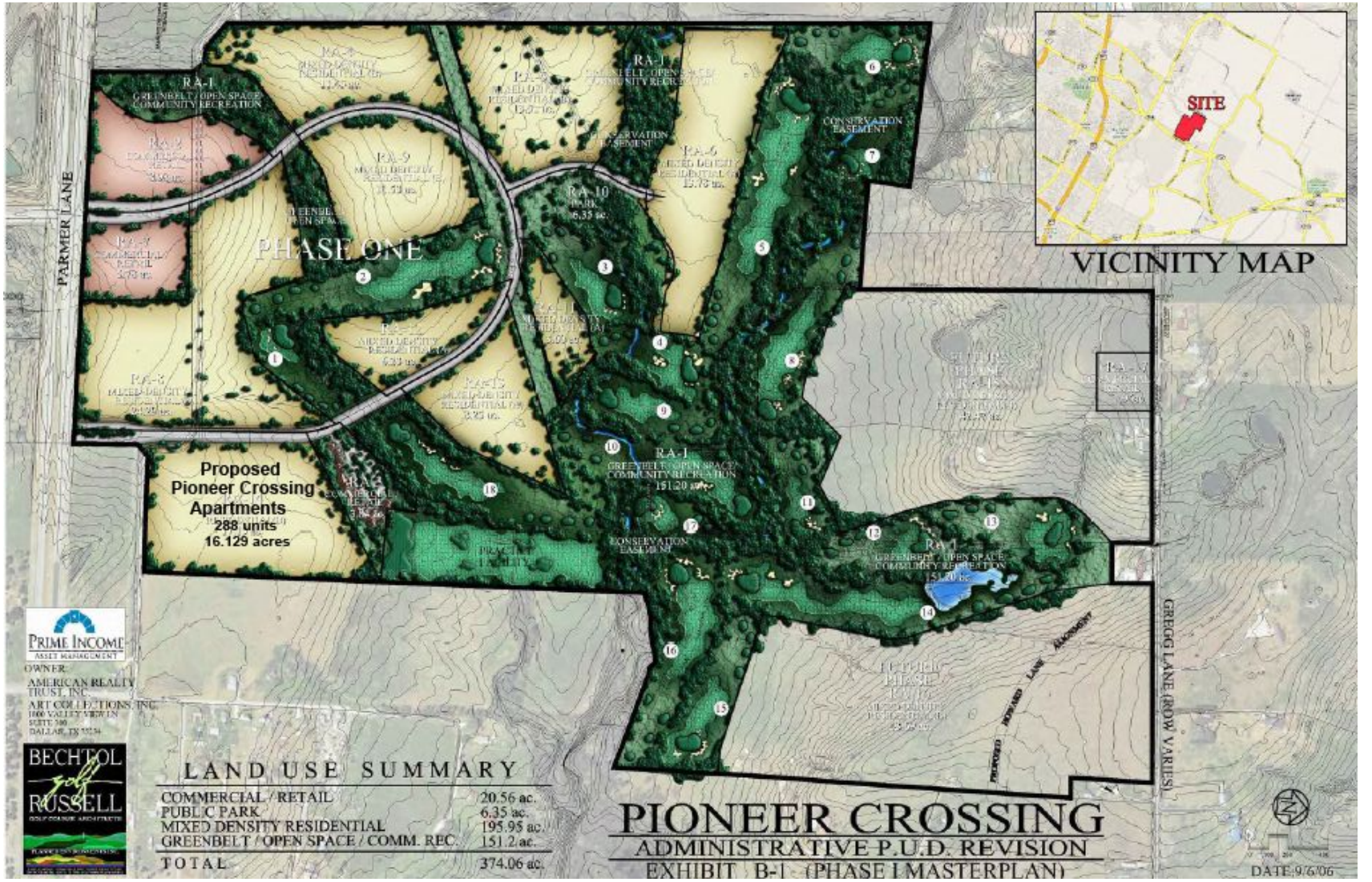
Income					
Rents					$3,745,320
Washer/Dryer in all units		$40.00	per unit		$138,240
Telephone/Cable/Video		$6.00	per unit		$20,736
Administration/General Income		$215.00	per unit		$61,920
Garages	102	$75.00	per month		$91,800
Carports	156	$25.00	per month		$46,800
Pool/Court Views	72	$25.00	per month		$21,600
Golf Course Views	36	$35.00	per month		$15,120
Total Income					**$4,141,536**
Vacancy 6%					$248,492
Effective Gross Income					**$3,893,044**
Expenses				$/SF	$/Unit	
Payroll				$0.81	$800	$230,400
Utilities (Tenant Pays Water)				$0.20	$200	$57,600
Repairs/Maintenance				$0.46	$450	$129,600
Advertising/Promotions				$0.18	$180	$51,840
Administrative				$0.15	$150	$43,200
Management @ 3.0% of EGI		3.00%		$0.41	$406	$116,791
Taxes*				$2.07	$1,630	$586,193
Insurance				$0.20	$200	$57,600
Reserves				$0.25	$250	$72,000
Total Expenses				$4.75	$4,671	**$1,345,225**
Net Operating Income				$8.99	$8,847	**$2,547,819**

*	Calculated as follows:	$2.505100	Per $100	Value =	$23,400,000	Assessed Value
					$81,250	per unit
Value at	Cap rate of	5.75%				$44,309,898

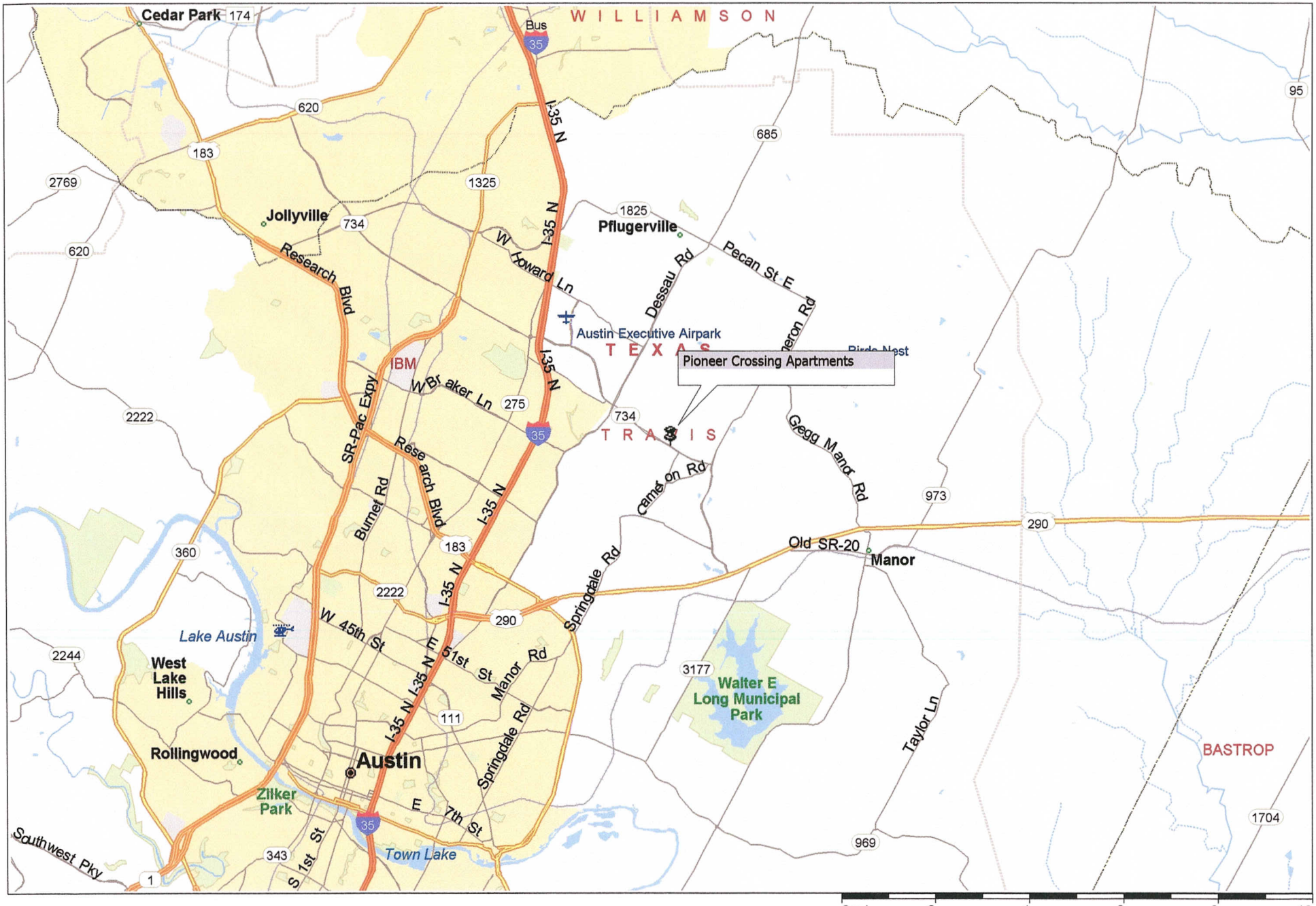
DEVELOPMENT COST ESTIMATE

			Total Project Costs
Land Costs			
Land			$3,600,000
Ground Lease Buyout			$0
Total Land Costs			$3,600,000
Hard Costs			
Sitework(Included in Bldg. Costs)			$0
Utilities & Infrastructure(Off-Site)			$125,000
Building Costs		$72.00	$20,531,664
Club House			$347,480
Carports			$124,800
Garage			$561,000
Sub-Total Hard Costs		$76.06	$21,689,944
Hard Cost Contingency	3.00%		$650,698
Total Hard Costs		$78.34	$22,340,642
Soft Costs			
Appraisal			$15,000
Market Study			$8,000
Phase I Environmental			$3,500
Survey			$12,500
Impact Fees			$550,000
Geo Reports			$18,500
Architect/Engineers/Testing			$525,000
Legal/Accounting, Title Closing			$75,000
Taxes			$175,000
Insurance			$100,000
Signage, Furniture, Fixtures & Equip.			$350,000
Marketing			$150,000
Construction Interest Carry			$1,200,000
Lender Loan Fee			$145,000
Miscellaneous			$130,000
Soft Cost Contingency			$300,000
Developer's Fee (3%)			$900,000
Total Soft Costs			$4,657,500
Total Project Costs		$106,244	**$30,598,142**

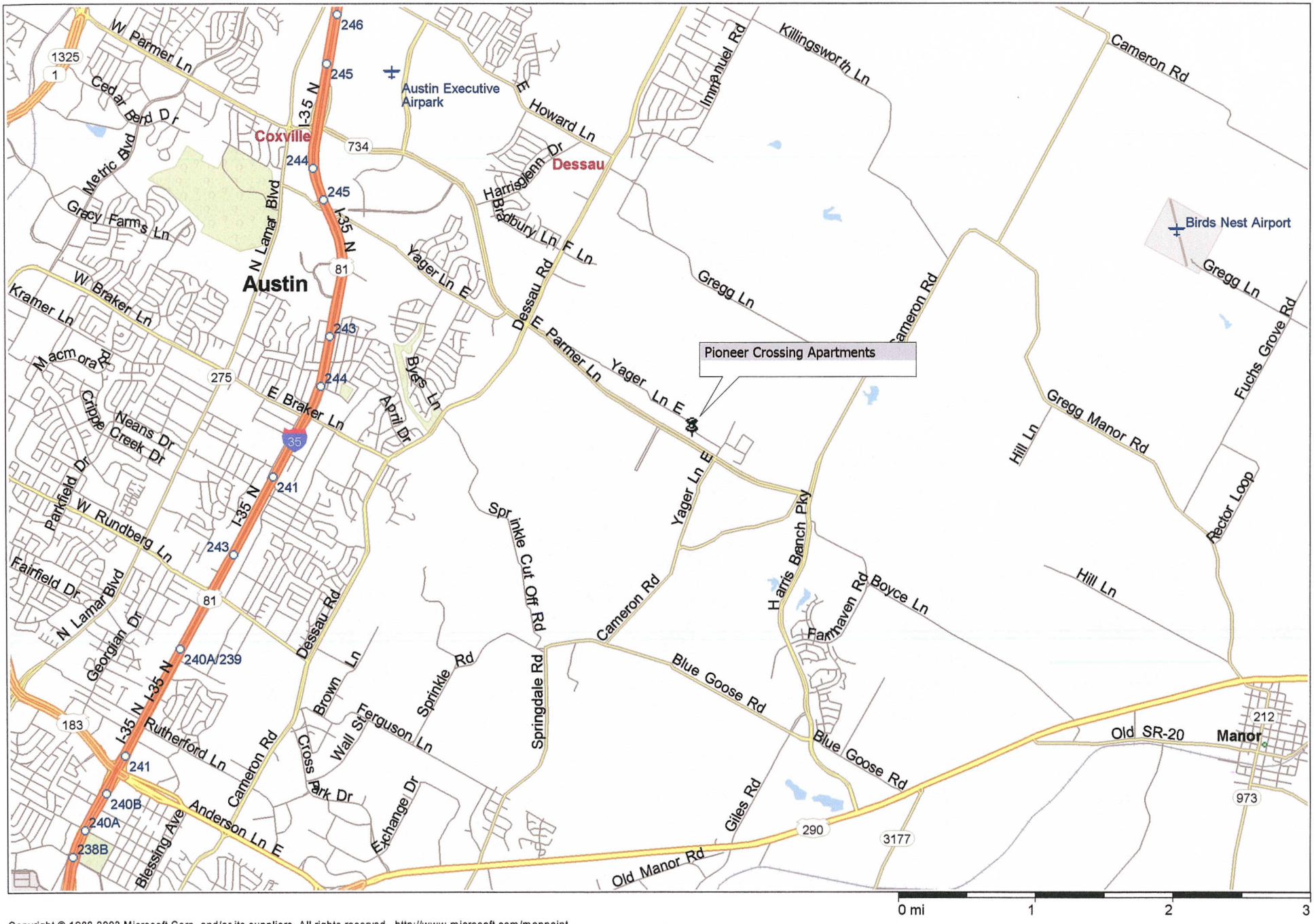
AERIAL/LOCATION MAPS


PARMER LANE
PHASE ONE
Proposed
Pioneer Crossing
Apartments
288 units
16.129 acres
RA-1
GREENBELT / OPEN SPACE / COMMUNITY RECREATION
RA-10
PARK
6.35 ac.
CONSERVATION EASEMENT
PRACTICE FACILITY
PROPOSED HOWARD LANE ALIGNMENT
GREGG LANE (ROW VARIES)
SITE
VICINITY MAP
PRIME INCOME
ASSET MANAGEMENT
OWNER:
AMERICAN REALTY TRUST, INC.
ART COLLECTIONS, INC.
BECHTOL golf RUSSELL
LAND USE SUMMARY
COMMERCIAL / RETAIL 20.56 ac.
PUBLIC PARK 6.35 ac.
MIXED DENSITY RESIDENTIAL 195.95 ac.
GREENBELT / OPEN SPACE / COMM. REC. 151.2 ac.
TOTAL 374.06 ac.
PIONEER CROSSING
ADMINISTRATIVE P.U.D. REVISION
EXHIBIT B-1 (PHASE I MASTERPLAN)
DATE: 9/6/06

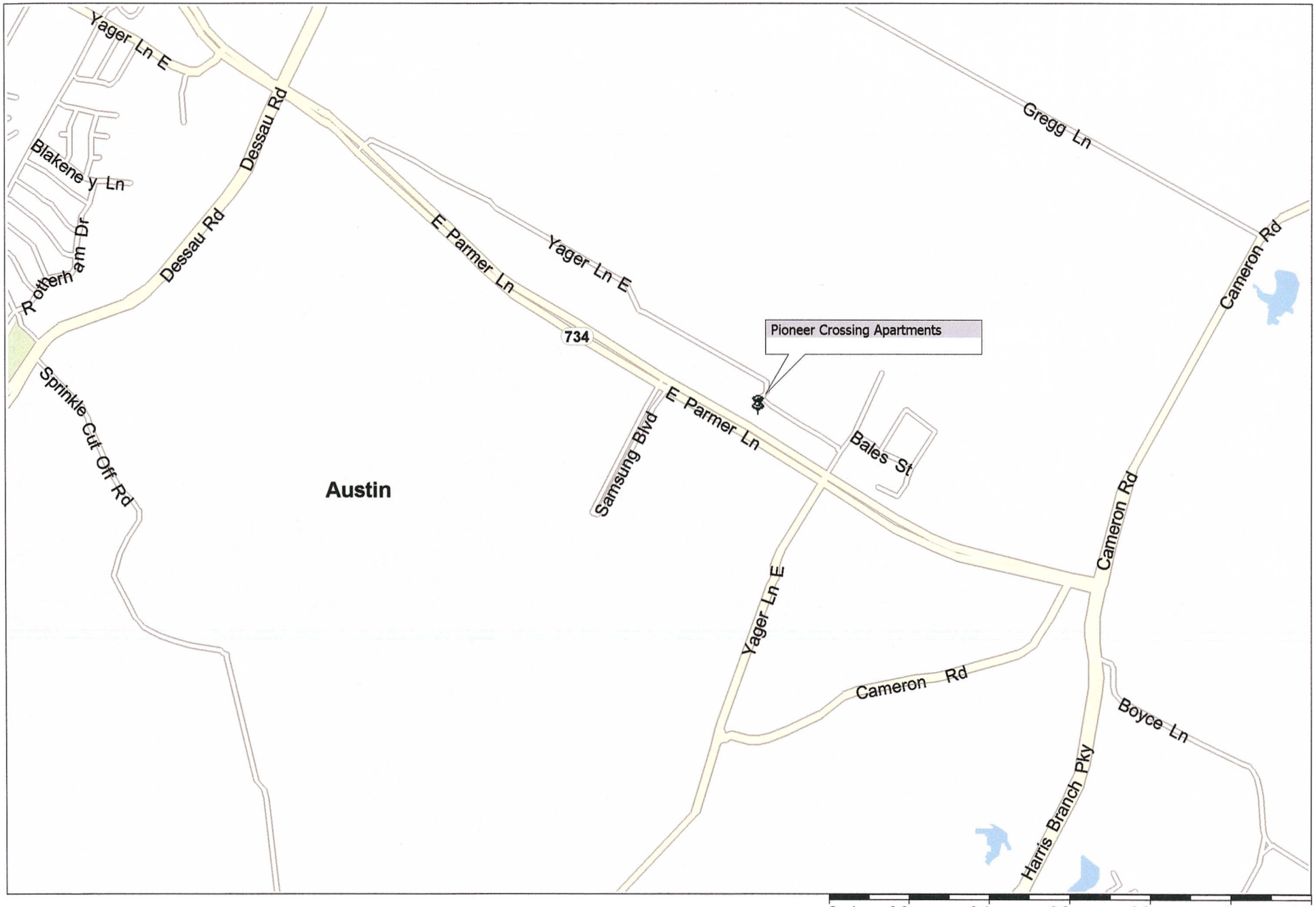
Pioneer Crossing Apartments, Austin, TX



Pioneer Crossing Apartments, Austin, TX



Pioneer Crossing Apartments, Austin, TX



ARCHITECTURAL – SITE PLAN, BUILDING PLANS, FLOOR PLANS (UNDER SEPARATE COVER)

SURVEY (UNDER SEPARATE COVER)
PLUS METES AND BOUNDS DESCRIPTION

Landesign Services, Inc.
555 Round Rock West Drive
Bldg. D, Ste. 170
Round Rock, Texas 78681
512-238-7901 office
512-238-7902 fax

EXHIBIT " "
METES AND BOUNDS DESCRIPTION

BEING 16.129 ACRES OF LAND, AS SURVEYED BY LANDESIGN SERVICES, INC., BEING OUT OF THE MARIGUITA CASTRO SURVEY NO. 50, ABSTRACT NO. 160, TRAVIS COUNTY, TEXAS, AND BEING A PART OF A CALLED 367.425 ACRE TRACT OF LAND DESCRIBED IN DEED TO PALMER LANE GOLF, INC. RECORDED IN DOCUMENT NO. 2003234940 OF THE OFFICIAL PUBLIC RECORDS OF TRAVIS COUNTY, TEXAS AND A PART OF YAGER LANE, A PUBLIC ROAD; AND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING at a 1/2 inch iron rebar found in the existing north right-of-way line of Yager Lane for the southern most corner of said 367.425 acres and the westernmost corner of a called 40.00 acre tract of land described in deed to Everett R. and Frieda M. Ryden recorded in Volume 2270, Page 378 of the Deed Records of Travis County, Texas;

THENCE North 61°10'52" West with the existing north right-of-way line of Yager Lane and the south line of said 367.425 acres passing a spindle found at 592.41 feet (record North 61°09'51" West, 592.25 feet) in the existing east right-of-way line of Yager Lane and continuing through the right-of-way of Yager Lane and the 367.425 acres a total distance of 653.34 feet to a 1/2 inch iron rebar with cap marked "LANDESIGN" set in the proposed southeast right-of-way line of Samsung Boulevard (proposed public road);

THENCE crossing through the 367.425 acres along the proposed southeast right-of-way line of proposed Samsung Boulevard the following four (4) courses:

1. North 61°10'52" West a distance of 6.39 feet a 1/2 inch iron rebar with cap marked "LANDESIGN" set;

2. Along a curve to the right having a radius of 20.00 feet, a delta angle of 85°10'45", a length of 29.73 feet and a chord which bears North 18°35'30" West a distance of 27.07 feet to a 1/2 inch iron rebar with cap marked "LANDESIGN" set;

3. Along a curve to the left having a radius of 1000.00 feet, a delta angle of 01°51'55", a length of 32.56 feet and a chord which bears North 23°03'55" East a distance of 32.56 feet to a 1/2 inch iron rebar with cap marked "LANDESIGN" set;

4. North 22°07'58" East a distance of 31.07 feet a 1/2 inch iron rebar with cap marked "LANDESIGN" set;

THENCE crossing through the 367.425 acres and Yager Lane along the proposed southeast right-of-way line of proposed Samsung Boulevard along a curve to the right having a radius of 700.00 feet, a delta angle of 10°30'31", a length of 128.39 feet and a chord which bears North 27°23'13" East a distance of 128.21 feet to a 1/2 inch iron rebar with cap marked "LANDESIGN" set;

THENCE crossing through Yager Lane along the proposed southeast right-of-way line of proposed Samsung Boulevard along a curve to the right having a radius of 965.00 feet, a delta angle of 03°55'43", a length of 66.17 feet and a chord which bears North 34°36'20" East a distance of 66.15 feet to a 1/2 inch iron rebar with cap marked "LANDESIGN" set in the existing north right-of-way line of Yager Lane;

THENCE crossing through the 367.425 acres along the proposed southeast right-of-way line of proposed Samsung Boulevard the following two (2) courses:

1. North 36°34'12" East a distance of 220.76 feet to a 1/2 inch iron rebar with cap marked "LANDESIGN" set;

2. Along a curve to the left having a radius of 735.00 feet, a delta angle of 27°39'40", a length of 354.84 feet and a chord which bears North 22°44'22" East a distance of 351.40 feet to a 1/2 inch iron rebar with cap marked "LANDESIGN" set;

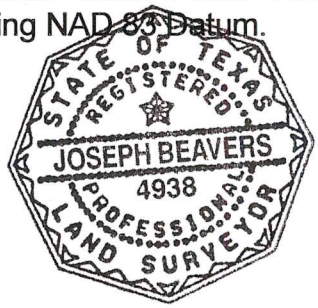
THENCE South 89°36'00" East through the 367.425 acres a distance of 800.83 feet to a 1/2 inch iron rebar with cap marked "LANDESIGN" set in the east line of the 367.425 acres and the west line of said 40.00 acres;

THENCE South 29°27'53" West (record South 29°29'25" West) along the east line of the 367.425 acre tract and the west line of the 40.00 acres a distance of 1224.93 feet to the POINT OF BEGINNING.

This parcel contains 16.129 acres of land, more or less, out of the Mariguita Castro Survey No. 50, Abstract No. 160, Travis County, Texas. Description prepared from an on-the-ground survey. All bearings are based on the Texas State Plane Coordinate System, Central Zone, with all distances and coordinates being NAD 83 Datum.

7 SEP 07

Joseph Beavers — Date
Registered Professional Land Surveyor
State of Texas No. 4938



Project Number: 01106010
Attachments: Survey Drawing L:\LONGARO & CLARKE\PNRXNG\DGN\01101002.dwg
L:\LONGARO & CLARKE\PNRXNG\FNOTES\01101002.doc
Created on 09/06/2007

GEOTECHNICAL INVESTIGATION

GEOTECHNICAL INVESTIGATION
PIONEER CROSSING APARTMENTS
CAMERON AND PARMER ROAD
AUSTIN, TEXAS

HENLEY
JOHNSTON
& ASSOCIATES, INC.
engineering geoscience consultants

(214) 941-3808 fax (214) 943-7645
235 Morgan Ave., Dallas, Texas 75203-1025

Henley
Johnston
& Associates, Inc.
engineering geosciences consultants since 1951

June 22, 2007
Report No. 9161

Pioneer Crossing Apartments Ltd.
Pioneer Crossing Genpar, L.P.
Care of: First Enterprise Corporation
13455 Noel Road, Suite 1000
Dallas, Texas 75240

Through:

Oakwood Development & Consulting, L.L.C.
7309 Williamswood Drive, Suite 100 E
Dallas, Texas 75252
ATTN: Mr. James R. Grose

RE: Geotechnical Investigation
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

Gentlemen:

Presented herein is the report of a geotechnical investigation conducted by Henley-Johnston & Associates, Inc. for the above referenced project.

We appreciate the opportunity to provide this report to you. If we can be of further service or if you desire any additional information, please do not hesitate to call.

Signed,

HENLEY-JOHNSTON & Associates, Inc.

STATE OF TEXAS
27 JUN 07
JAMES F. PHIPPS
84778
LICENSED
PROFESSIONAL ENGINEER

Shaun P. Alimbini
Project Geologist

James F. Phipps, P.E.
Principal Geotechnical Engineer

Copies submitted (3) Professional Services Group – Mr. James Grose
(1) BGO Architects – Mr. Gary Pitts

Henley
Johnston
& Associates, Inc.
engineering geosciences consultants since 1951

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235 Morgan Avenue Dallas, Texas 75203-1025 Phone 214-941-3808 Facsimile 214-943-7645

INVESTIGATION AND ANALYSIS

Introduction

A geotechnical investigation has been conducted to evaluate subsurface conditions for the Pioneer Crossing Apartments development in Austin, Texas. The purpose of this investigation has been to provide recommendations for design and construction of the foundation systems and earthwork criteria. This investigation has consisted of drilling and sampling, laboratory testing, engineering analysis, and preparation of this report. Recommendations are presented in the following sections.

The project consists of a 300-unit, twelve building apartment development with a detached clubhouse and associated paving. The layout of the complex is shown on Plate 1. It is anticipated that ground supported, post-tensioned slabs will be used to provide foundation support.

This report is specific to this site. Persons using the recommendations herein for projects and/or designs not covered by this report do so at their own risk.

Field and Laboratory Investigation

A total of 14 borings were drilled within this phase to evaluate subsurface conditions. Drilling and sampling were done in general accordance with applicable ASTM standards and generally accepted methods. A single boring was drilled in or near each of the apartment building pads.

Boring locations are shown on Plate 1. Each borings was drilled to a depth of 25 feet using a truck-mounted rig equipped with continuous flight augers. Clays and weathered calcareous shale encountered in the borings were sampled using three-inch diameter "Shelby" tubes.

All samples were logged in the field according to the Unified Soil Classification System (USCS) (ASTM D2488). Cohesive soils and weathered shale were evaluated using a hand held pocket penetrometer. Visual descriptions and field test results are shown on the attached Boring Logs. A key to terms and symbols used on the Borings Logs is attached as well.

Selected samples were submitted for Atterberg Limits (ASTM D-4318) and moisture content (ASTM D-2216). Results of these tests are presented on Plates 2 to 6. The potential for soil movement was also evaluated using absorption pressure-swell tests. Results of the swell tests are presented on Plate 7.

Surface Conditions and Site Geology

At the time of the field investigation, the property was undeveloped. A tree line was encountered running northeast to southwest and bounded the western edge of the property. Two small ponds were also encountered at the north end of the property.

This site is located within the Upper Cretaceous Navarro Group and Marlbrook Marl Formation. At the locations drilled during the field investigation, subsurface conditions consisted of residual clays soils over weathered calcareous shale.

At the surface, residual clays were encountered in each boring across the property. The residual clays varied from dark brown to light brown and gray in appearance. These clays ranged from highly plastic (CH) to moderately plastic (CL) soils and extended to depths of 12 to 24 feet below existing grades.

Weathered calcareous shale of the Navarro Group and Marlbrook Marl group was present below the residual soils. This weathered shale was soft (rock hardness classification), light olive-brown and light gray in appearance and continued through the termination depths of all 14 borings. This weathered shale possessed the engineering properties of highly plastic clay and is noted in the lab summary.

Pocket penetrometer and soil moisture test results indicate the majority of residual soils were relatively moist while the majority of weathered shale was generally dry at the time of the field investigation.

Seepage was encountered during drilling and post-drilling water level observations. Where present, ground water was noted at depths of 1-1/2 to 22 feet. The presence of near surface ground water may be due to the high volume of rainfall at the time of the field investigation. The depth to and amount of water will vary with changes in seasonal and yearly rainfall.

Potential Vertical Movements

Potential Vertical Movements (PVM) were evaluated using the TxDOT Method 124E and results of the absorption-pressure swell tests. In clayey residual soils, volumetric changes are seasonal and will be seen as heave within the wet times of the year, and as settlement during periods of dry weather. The depth of seasonal movement generally coincides with the top of the weathered shale layer. Potential movements within this seasonal zone are anticipated to be on the order of 1-1/2 to 2 inches for current conditions.

Volumetric change of weathered shale below the depth of seasonal movement will be seen as heave as moisture contents increase. Potential movement associated with heave of the lower soils is estimated to be on the order of 1 to 1-1/2 inches.

Total heave considering current soil conditions within the seasonal zone and underlying weathered shale are estimated to be on the order of 2-1/2 to 3-1/2 inches.

Total heave during dry conditions within the seasonal zone and underlying weathered shale are estimated to be on the order of 4 to 5 inches. It is recommended that if construction is delayed after the end of July 2007 that shallow borings be drilled to evaluate the subsurface moisture conditions. If it is found that the subsurface conditions are dry then soil remediation may be necessary to reduce these movements to 4-1/2 inches or less to allow for construction of ground-supported slabs. Soil remediation options may be provided based on the findings of the shallow borings.

DESIGN AND CONSTRUCTION RECOMMENDATIONS

Introduction

It is anticipated that post-tensioned, ground-supported foundations will be used for structural support of the apartment buildings and clubhouse.

Recommendations for design and construction of the foundations and associated paving are presented in the following sections. Recommendations for construction of the pool shell are included as well.

Foundation Recommendations

Current literature indicates that a well-designed and constructed post-tensioned slab is capable of withstanding approximately 4-1/2 inches of differential movement. Considering movements of 3 to 3-1/2 inches, ground-supported stiffened slabs may be used, however, some differential post-construction movement of the foundations should be anticipated.

Differential movements (y_m) for center lift and edge lift conditions for design of slabs according to the Post-Tensioning Institute (PTI) are presented in Table 1. Differential movements presented within the PTI design manual are based on type of clay minerals, velocity of moisture flow through the subgrade, and depth to constant soil suction[1]. If the adverse effects of vegetation, site drainage, and slope have been corrected, differential movements may be calculated using the method presented in the PTI manual.

Based on experience in the North Texas area, differential movements for slabs on-ground can approach the total potential movement estimated from laboratory test results. Therefore, y_m values presented Table 1 are based on potential movements presented in the **Potential Vertical Movements** section.

The edge moisture variation distance (e_m) is based on the amount of anticipated annual rainfall and is derived from the Thornthwaite Index (TI). This index is measured in inches and indicates the amount of rainfall above or below the amount needed to support plant growth. It has been found that irrigation and landscaping can increase the TI by several inches. The e_m values presented in Table 1 are derived considering additional moisture added to the subgrade by landscaping and irrigation. For this site a TI of -10 was used.

Post-Tensioning Institute (PTI) design parameters are presented in Table 1. These values may be used considering the moist soil conditions encountered during the field investigation, and that all fill is placed in accordance with the **Earthwork Recommendations** section of this report.

[1] *Design and Construction of Post-Tensioned Slabs-on-Ground*, 1st Edition, Post-Tensioning Institute, Phoenix, AZ (1991).

Table 1
PTI Design Values
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

Lift Condition	Edge Moisture Variation Distance – e_m (Ft.)	Differential Movement - y_m (in.)
Center Lift	5.2	3.1
Edge Lift	3.8	1.6

Ground supported foundation should also be designed to conform to the stiffness criteria presented in Table 6.2 of the current PTI Manual.

Grade beams should penetrate a minimum of 18 inches below finished grade and rest on undisturbed soil or compacted and tested fill. Beams may be sized using an allowable bearing capacity of 3 kips per square foot (ksf). This allowable bearing value contains a Factor of Safety of 3 considering a shear failure.

It is recommended that interior and exterior beams be used to provide additional stiffness. Consideration should also be given to installing expansion joints within interior partition to accommodate movement of the foundation.

On-site soils may be used to bring the building pads to finished elevations. Soils should be placed under controlled conditions as presented in the **Earthwork Recommendations** section.

Construction Considerations

All loose soils, debris, and water should be removed from grade beam excavations prior to placing concrete. Grade beams should be formed to allow for proper control of beam dimensions. Earth forming of grade beams is not recommended. The width and depth should not vary across the length of the beam.

Utility excavations should be backfilled using on-site soils placed under controlled conditions as outlined in the **Earthwork Recommendations** section.

If possible, utility line excavations should be sloped away from the foundation. Utility trenches often act as conduits for water to infiltrate into the subgrade below the foundation. Sloping of trenches away from the residence will lower the amount of seepage into the subgrade soils.

Plastic sheeting used for vapor retarders below the building slabs should be draped or cut in such a way as to allow concrete to be placed directly against the sidewalls of the grade beam excavations. All penetrations and lap joints in the retarders should be sealed to limit migration of moisture through the slab.

Positive surface drainage away from the foundation should be established during construction and maintained throughout the life of the structure. Water ponding next to the foundation will increase subsurface moisture and consequently increase the potential for soil related movement.

Landscaping beds should be designed to allow for proper drainage of water away from the building. Sprinkler lines and heads should not be placed directly against the building.

Recommended Paving Sections

Site paving may consist of either flexible asphalt pavement, or reinforced concrete. Recommended sections for both types of design are presented below. All fill used below site paving should be placed in a controlled manner as outlined in the **Earthwork Recommendations** section.

Asphalt Pavement:
Flexible asphalt pavement may be used for parking and drives. The upper six inches of subgrade below asphalt pavement should be stabilized using approximately 6% of hydrated lime (27 pounds per square yard) to stabilize the subgrade soils. It is recommended that site specific testing of the subgrade be performed to evaluate the actual amount of cement required to treat the existing materials. Lime should be placed in general accordance with Item 260 of the TxDOT *Standard Specifications for Construction of Highway, Streets and Bridges.*

Lime treated soils should be compacted to a minimum of 95% of the maximum dry unit weight (ASMT D-698) with moisture contents at or above optimum.

For light truck and car traffic the following section is recommended:

1-1/2" Type D Asphalt Surface Course over,

3" Type A or B Coarse Graded Base Course.

For heavy truck traffic up to 6 vehicles per day the following section is recommended:

2" Type D Asphalt Surface Course over,

5" Type A or B Coarse Graded Base Course.

All asphalt should be placed in accordance with either TxDOT Item 334 for cold laid or 340 of hot laid asphalt.

Compaction tests and air void verification should be conducted to evaluate the in-place density of the asphalt pavement.

All joints within asphalt pavements should be sealed and maintained to limit water infiltration into the subgrade soils.

Concrete Pavement:
Sections for reinforced concrete paving were evaluated using the Interim AASHO and PCA methods[2]. Considering light vehicular traffic and less than six, fully loaded trucks per day, the following sections are recommended for a 20-year life span.

For light truck and car traffic the following section is recommended:

5" of 3,000 psi Portland Cement Concrete over,

6" of recompacted subgrade.

For heavy truck traffic up to 6 vehicles per day the following section is recommended:

6" of 3,000 psi Portland Cement Concrete over,

6" of recompacted subgrade.

[2] Yoder, E.J., and Witczak, M.W., *Principles of Pavement Design*, 2nd Ed., John Wiley & Sons, Inc., New York, NY, pp 605 to 608.

Subgrade soils below concrete pavements should be compacted to a minimum of 95% (ASTM D-698) with moisture contents between 0 and +4 percentage points.

Concrete pavement should be reinforced with No. 3 deformed bars on 18-inch centers. No. 4 smooth dowels should be used at expansion and construction joints on 12-inch centers.

Control joints should be installed in the pavement within four hours after concrete has been placed, not after completion of the pour. Joint spacing and depth should conform to the recommendations presented in the latest version of *Joint Design for Concrete Highways and Street Pavements*, produced by PCA. Spacing between control joints should not exceed 15-feet. All joints should be sealed and periodically maintained. This will limit the potential for water to infiltrate into the subgrade.

Expansion joints should be installed using either doweled keyways or wide saw cuts. All expansion joints should have a maximum width of ¼-inch and be filled completely with sealant.

Pool Shell Recommendations

The pool shell may be placed directly on the finished grade if some movement of the pool is acceptable. If no soil related movement of the pool is permissible, then it recommended the shell be suspended using piers for foundation support. A minimum 4-inch void is recommended between the pool bottom and the finished subgrade.

It is recommended a drainage system be installed around the perimeter of the pool and below the pool shell to collect and discharge any water that accumulates below the structure. This drainage system may be connected to the pool drain, however a back-flow device should be installed to prevent water from the pool backing up into the drainage system.

The pool will also need to withstand lateral earth pressures acting along the sides of the shell. Considering the use of on-site soils or similar, the shell may be designed to resist an active earth pressure of 55 pcf, or an at-rest pressure of 70 pcf. These pressures may be used considering drained conditions.

If piers will be used to support the shell, these foundations should be designed as straight-shaft piers and bear a minimum of 15 feet below existing (May 2007) grades in light olive-brown and light gray weathered shale.

Piers should be designed for an allowable end bearing of 4 ksf, and skin friction of 1 ksf. Both of these values may be used considering a Factor of Safety of 3 against a shear or plunging failure. The piers may also be designed against uplift using a negative skin friction of 0.8 ksf. The skin friction values should only be applied to that portion of the pier shaft below a depth of 14 feet from finished grade. This is to account for soil pulling away from the shaft during periods of dry weather.

Piers will also be subjected to uplift forces associated with heaving of the subsurface soils. These forces will be approximately 1.2-ksf acting over the upper eight feet of the pier shaft surface area. Resistance to uplift will be a function of the dead weight of the concrete in the pier, foundation loads, and negative skin friction.

The weight of the concrete may be neglected when determining foundation loads.

Settlements of approximately ½-inch should be anticipated with a pier foundation.

Pier shaft excavations should be clean of all debris and dry prior to placement of concrete. Ground water was not encountered during drilling operations. Concrete should be placed within four hours after each shaft is drilled.

Excess concrete at the top of the pier shaft should be removed prior to placement of the exterior grade beam. This is to reduce the potential for soils to swell against the foundation.

Earthwork Recommendations

Prior to construction of any ground-supported slabs, the pad areas should be stripped of all organic soils. The majority of tree root systems should be removed from within the pad areas. Sections that will underlie fill should be ripped to a depth of 8 inches and compacted to a minimum of 95% of the maximum dry unit weight as determined by ASTM D-698.

All on-site soils should be placed in maximum eight-inch loose lifts and compacted to a minimum of 95% of the maximum density as determined by ASTM D-698. Moisture content should be +1 to +4 percentage points above optimum.

If additional fill will be required to bring the pads to finished subgrade, on-site soils or equivalent should be used. These soils should be placed and compacted to the moisture and density as outlined above.

Fill around perimeter grade beams should be cleaned of all construction debris and placed in a controlled manner. Use of clean, compacted fill will lower the potential for water to migrate below the slab and into the subgrade soils.

Fill around perimeter grade beams should be cleaned of all construction debris and placed in a controlled manner. Use of clean, compacted fill will lower the potential for water to migrate below the slab and into the subgrade soils.

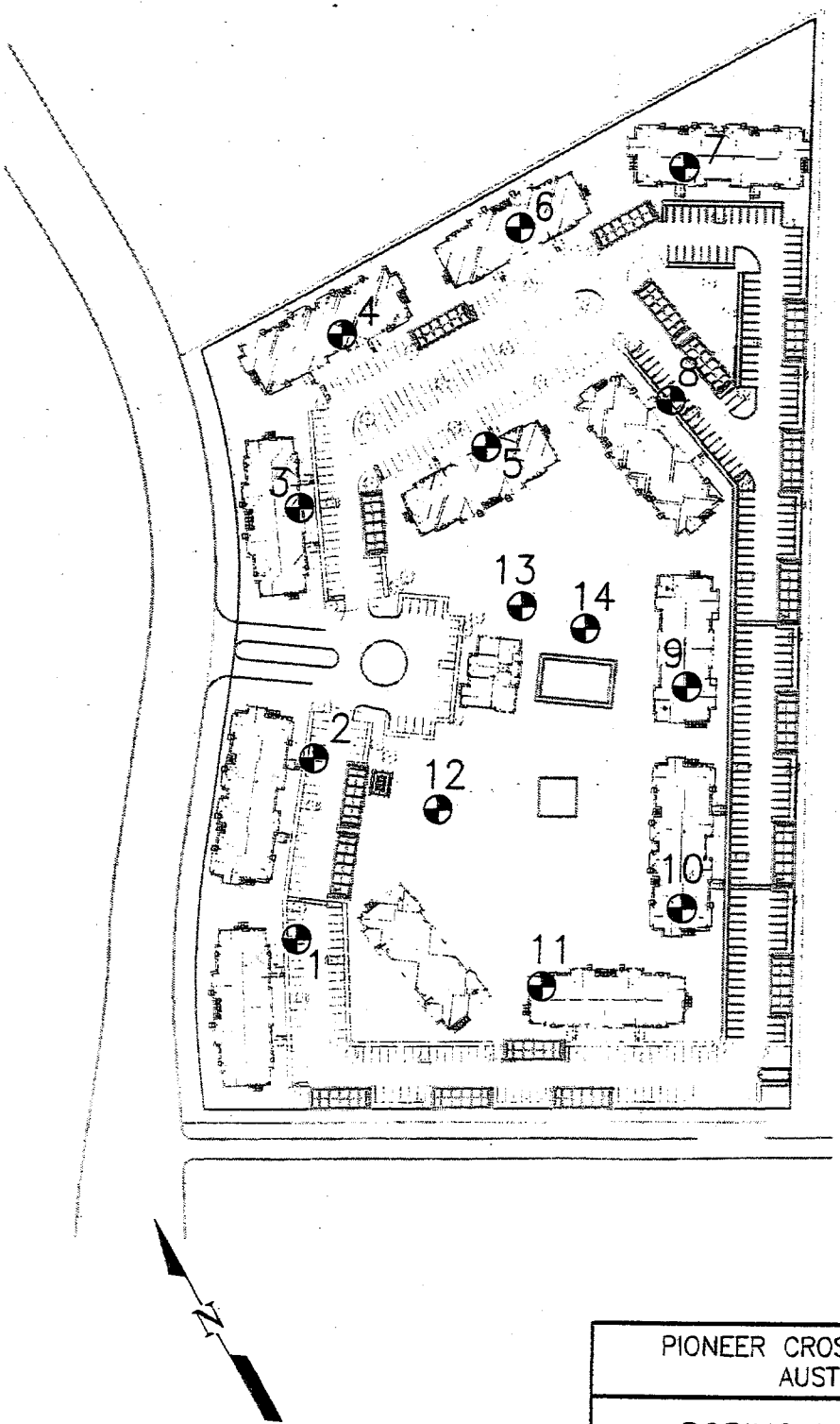
Soils used as backfill for utility trenches should be placed in maximum six-inch loose lifts and compacted to a minimum of 95% of the maximum density as determined by ASTM D-698. Moisture contents should be +1 to +4 percentage points above optimum.

Construction Testing

It is recommended a representative of Henley-Johnston & Associates, Inc. be retained to monitor all on-site earthwork activities and perform field density tests to verify proper compaction and moisture conditioning. Field density tests should be taken at a rate of one per lift for every 4,000 square feet of fill area of fraction thereof. Paved areas should have a minimum of one test per lift for every 6,000 square feet.

LEGEND

SOIL BORING



N

0 100 200 400

SCALE FEET

PIONEER CROSSING APARTMENTS
AUSTIN, TEXAS

BORING LOCATION PLAN

HENLEY–JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

HJA No.: 9161

DATE: JUNE 2007

PLATE 1

GEOTECHNICAL INVESTIGATION
REPORT NO. 9161
PIONEER CROSSING APARTMENTS
AUSTIN, TEXAS

SUMMARY OF INDEX PROPERTIES

BORING NUMBER	DEPTH (ft.)	Liquid Limit (%)	Plasticity Index	Moisture Content (%)	UNIFIED SOIL CLASSIFICATION
1	0.0 – 1.0			11.6	
1	0.0 – 2.0			34.6	
1	2.0 – 4.0	54	29	26.8	CH
1	4.0 – 6.0			29.2	
1	6.0 – 8.0	35	17	18.4	CL
1	8.0 – 10.0			26.2	
1	14.0 – 15.0			27.3	
1	19.0 – 20.0			27.7	
1	24.0 – 25.0			29.6	
2	0.0 – 2.0			25.9	
2	2.0 – 4.0			34.9	
2	4.0 – 6.0	42	25	20.8	CL
2	6.0 – 8.0			21.4	
2	8.0 – 10.0			22.0	
2	14.0 – 15.0			25.3	
2	19.0 – 20.0	58	34	27.0	CH
2	24.0 – 25.0			29.0	
3	0.0 - 2.0	44	24	21.7	CL
3	2.0 – 4.0			23.8	
3	4.0 – 6.0			15.7	
3	6.0 – 8.0			16.9	
3	8.0 – 10.0			18.2	
3	14.0 – 15.0	79	59	22.9	CH

GEOTECHNICAL INVESTIGATION
REPORT NO. 9161
PIONEER CROSSING APARTMENTS
AUSTIN, TEXAS

SUMMARY OF INDEX PROPERTIES

BORING NUMBER	DEPTH (ft.)	Liquid Limit (%)	Plasticity Index	Moisture Content (%)	UNIFIED SOIL CLASSIFICATION
4	0.0 – 2.0	48	28	21.9	CL
4	2.0 – 4.0			17.7	
4	4.0 – 6.0			16.8	
4	6.0 – 8.0			17.5	
4	8.0 – 10.0	54	38	20.5	CH
4	14.0 – 15.0			22.3	
4	19.0 – 20.0			15.7	
4	24.0 – 25.0			23.9	
5	0.0 – 2.0			27.0	
5	2.0 – 4.0	50	27	22.2	CH
5	4.0 – 6.0			16.0	
5	6.0 – 8.0			16.4	
5	8.0 – 10.0	35	20	14.1	CL
5	14.0 – 15.0			25.8	
5	19.0 – 20.0			26.8	
5	24.0 – 25.0			24.9	
6	0.0 – 2.0			22.5	
6	2.0 – 4.0			20.5	
6	4.0 – 6.0			15.5	
6	6.0 – 8.0	28	14	16.4	CL
6	8.0 – 10.0			17.1	
6	14.0 – 15.0			22.4	
6	19.0 – 20.0	68	40	23.6	CH
6	24.0 – 25.0			23.6	

GEOTECHNICAL INVESTIGATION
REPORT NO. 9161
PIONEER CROSSING APARTMENTS
AUSTIN, TEXAS

SUMMARY OF INDEX PROPERTIES

BORING NUMBER	DEPTH (ft.)	Liquid Limit (%)	Plasticity Index	Moisture Content (%)	UNIFIED SOIL CLASSIFICATION
7	0.0 – 2.0			31.5	
7	2.0 – 4.0			25.4	
7	4.0 – 6.0	45	25	11.0	CL
7	6.0 – 8.0			7.0	
7	8.0 – 10.0	29	15	10.2	CL
7	14.0 – 15.0			26.7	
7	19.0 – 20.0			25.3	
7	24.0 – 25.0			26.7	
8	0.0 – 2.0			30.3	
8	2.0 – 4.0			23.9	
8	4.0 – 6.0	57	36	28.8	CH
8	6.0 – 8.0			18.7	
8	8.0 – 10.0			19.8	
8	14.0 – 15.0	71	47	24.2	CH
8	19.0 – 20.0			27.6	
8	24.0 – 25.0			25.9	
9	0.0 – 2.0			31.8	
9	2.0 – 4.0	62	36	32.4	CH
9	4.0 – 6.0			26.0	
9	6.0 – 8.0			25.2	
9	8.0 – 10.0			29.0	
9	14.0 – 15.0			26.6	
9	19.0 – 20.0	74	49	25.4	CH
9	24.0 – 25.0			20.8	

GEOTECHNICAL INVESTIGATION
REPORT NO. 9161
PIONEER CROSSING APARTMENTS
AUSTIN, TEXAS

SUMMARY OF INDEX PROPERTIES

BORING NUMBER	DEPTH (ft.)	Liquid Limit (%)	Plasticity Index	Moisture Content (%)	UNIFIED SOIL CLASSIFICATION
10	0.0 – 2.0			31.0	
10	2.0 – 4.0			26.5	
10	4.0 – 6.0			25.0	
10	6.0 – 8.0			17.7	
10	8.0 – 10.0	37	20	11.3	CL
10	14.0 – 15.0			27.5	
10	19.0 – 20.0			26.8	
10	24.0 – 25.0			23.8	
11	0.0 – 2.0			27.2	
11	2.0 – 4.0			26.2	
11	4.0 – 6.0	55	32	25.2	CH
11	6.0 – 8.0			20.9	
11	8.0 – 10.0			19.5	
11	14.0 – 15.0			27.9	
11	19.0 – 20.0			27.2	
11	24.0 – 25.0			28.4	
12	0.0 – 2.0			21.5	
12	2.0 – 4.0			19.2	
12	4.0 – 6.0			14.0	
12	6.0 – 8.0	37	22	15.4	CL
12	8.0 – 10.0			19.0	
12	14.0 – 15.0	58	33	29.1	CH
12	19.0 – 20.0			23.5	
12	24.0 – 25.0			27.3	

GEOTECHNICAL INVESTIGATION
REPORT NO. 9161
PIONEER CROSSING APARTMENTS
AUSTIN, TEXAS

SUMMARY OF INDEX PROPERTIES

BORING NUMBER	DEPTH (ft.)	Liquid Limit (%)	Plasticity Index	Moisture Content (%)	UNIFIED SOIL CLASSIFICATION
13	0.0 – 2.0	57	36	32.2	CH
13	2.0 – 4.0			22.7	
13	4.0 – 6.0			17.6	
13	6.0 – 8.0	34	18	16.1	CL
13	8.0 – 10.0			11.7	
13	14.0 – 15.0			25.9	
13	19.0 – 20.0			24.1	
13	24.0 – 25.0			27.6	
14	0.0 – 2.0			36.3	
14	2.0 – 4.0			35.3	
14	4.0 – 6.0			28.6	
14	6.0 – 8.0			16.4	
14	8.0 – 10.0	35	20	16.3	CL
14	14.0 – 15.0	69	41	27.4	CH
14	19.0 – 20.0			27.5	
14	24.0 – 25.0			26.5	

GEOTECHNICAL INVESTIGATION
REPORT NO. 9161
PIONEER CROSSING APARTMENTS
AUSTIN, TEXAS

SUMMARY OF ABSORPTION PRESSURE-SWELL TESTS

BORING NUMBER	DEPTH (ft.)	SWELL PRESSURE (psf)	GAIN IN MOISTURE (%)	PERCENT SWELL (%)	MATERIAL DESCRIPTION
1	6.0 – 8.0	155.22	2.25	0.00	CLAY, Light Brown
2	19.0 – 20.0	1,681.51	5.00	2.48	SHALE, Weathered
3	14.0 – 15.0	2,483.47	3.90	2.16	SHALE, Weathered
6	6.0 – 8.0	97.01	2.76	-0.38	CLAY, Light Brown
7	4.0 – 6.0	155.22	3.76	0.00	CLAY, Brown
7	8.0 – 10.0	19.40	6.11	0.00	CLAY, Light Brown
10	8.0 – 10.0	194.02	5.18	0.00	CLAY, Light Brown
12	6.0 – 8.0	465.65	3.09	0.24	CLAY, Light Brown
12	14.0 – 15.0	1,552.17	6.06	4.60	SHALE, Weathered
13	6.0 – 8.0	116.41	2.47	0.00	CLAY, Light Brown
14	8.0 – 10.0	194.02	3.73	0.00	CLAY, Light Brown
14	14.0 – 15.0	1,746.19	4.01	1.86	SHALE, Weathered

CLASSIFICATION SYMBOLS

SOIL	
	Asphalt or Lignite
	Concrete
	Fill
GW	Gravel or Sandy Gravel well graded
GP	Gravel or Sandy Gravel poorly graded
GM	Silty Gravel or Silty Sandy Gravel
GC	Clayey Gravel or Clayey Sandy Gravel
SW	Sand or Gravelly Sand well graded
SP	Sand or Gravelly Sand poorly graded
SM	Silty Sand or Silty Gravelly Sand
SC	Clayey Sand or Clayey Gravelly Sand
ML	Silts, Sandy Silts, Gravelly Silts, or Diatomaceous Soils
CL	Low Plasticity Clays, Sandy Clays, or Gravelly Clays
OL	Organic Silts or Low Plasticity Organic Clays
MH	Micaceous Clays or Diatomaceous Soil
CH	High Plasticity Clays
OH	High Plasticity Organic Clays
ROCK	
Ls	Limestone
Sh	Shale
	Marl
Ss	Sandstone
	Fracture Zone
S S S	Weathered Zone

ABBREVIATIONS

abnt.	abundant
ang.	angular
aren.	arenaceous
arg.	argillaceous
bdd.	bedded
bdg.	bedding
bent.	bentonite
bldr.	boulder
BT	Brazil Tensile
calc.	calcareous
carb.	carbonaceous
cbl.	cobble
cgl.	conglomerate
clst.	claystone
cmt.	cemented
dia.	diameter
dk.	dark
DUW	Dry Unit Weight
El.	elevation
fossil.	fossiliferous
frac.	fracture
gyp.	gypsiferous
incl.	inclusion
intbdd.	interbedded
jnt.	joint
lam.	laminated
LL	Liquid Limit
lt.	light
MC	Moisture Content
ME	Modulus of Elasticity
med.	medium
min.	minutes
mod.	moderately
nod.	nodule
occ.	occasional
part.	particle
Pen.	Penetrometer
phos.	phosphatic
PI	Plasticity Index
py.	pyritized
Qu	Unconfined Compression
Rec.	recovery
rnd.	rounded
RQD	Rock Quality Designation
sat.	saturated
sept.	septarian
sev.	severely
sil.	siliceous
sli.	slightly
slk.	slickensided
T.D.	Total Depth
v.	very
wea.	weathered

CONSISTENCIES AND HARDNESS DESCRIPTIONS

FOR SANDS, GRAVELS, & SANDY SILTS

Modified from Peck, Hanson & Thornburn (1974)

Consistency	Standard Penetration Resistance N
Very Loose	Less than 4
Loose	4 to 10
Medium Dense	10 to 30
Dense	30 to 50
Very Dense	Greater than 50

FOR CLAYS & SANDY CLAYS (COHESIVE SOILS)

Modified from Peck, Hanson, & Thornburn (1974)

Consistency	Unconfined Compression tsf	Standard Penetration Resistance N
Very Soft	Less than 0.25	Less than 2
Soft	0.25 to 0.5	2 to 4
Medium Stiff	0.5 to 1.0	4 to 8
Stiff	1.0 to 2.0	8 to 15
Very Stiff	2.0 to 4.0	15 to 30
Hard	Greater than 4.0	Greater than 30

RELATIVE HARDNESS MODIFERS (ROCK) (RELATED TO FRESH SAMPLE)

Modified from SCS EWP. Tech Guide No. 4

Hardness	Rule of Thumb Test
Soft	Permits denting by moderate finger pressure
Firm	Resists denting by fingers but can be penetrated by pencil point to medium to shallow depth (No. 2 pencil)
Mod. Hard	Very shallow penetration of pencil point, can be scratched by knife and in some instances cut with knife
Hard	No pencil penetration, can be scratched with knife, can be broken by light to moderate hammer blows
Very Hard	Cannot be scratched by knife, can be broken by repeated heavy hammer blows

LEGEND, LITHOLOGY, SOIL CONSISTENCY, & RELATIVE ROCK HARDNESS

HENLEY–JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

DRILL DATE: 5-18-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 1
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

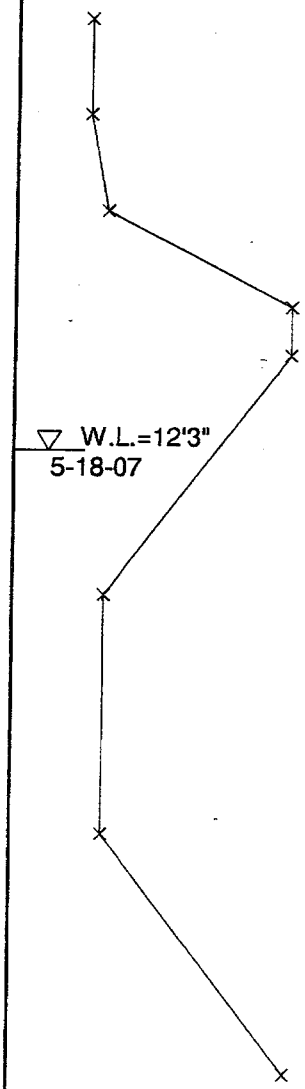
DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules, stiff, brown			
4						
8			CLAY, slightly silty, with calcareous deposits, very stiff, light brown			
12						
16			CLAY, slightly silty, stiff, light brown			
20			SHALE, weathered, calcareous, slightly fissile, soft, light olive-brown and light gray			
24						
			TOTAL DEPTH: 25.0'			
28						

TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5

STANDARD PENETRATION (BPF) + 10 20 30 40 50 60

INFILTRATION TEST ◇ 1 2 3 4 5 6

POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

DRILL DATE: 5-18-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 2
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

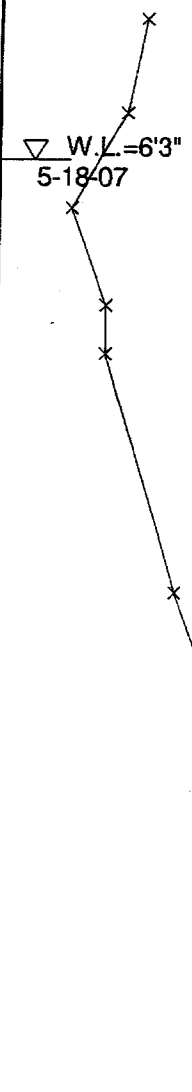
DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules, very stiff, brown			
4			CLAY, with calcareous deposits, silty, stiff, light brown			
8						
12			SHALE, weathered, calcareous, slightly fissile, soft, light olive-brown and light gray			
16						
20						
24			TOTAL DEPTH: 25.0'			
28						

TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5

STANDARD PENETRATION (BPF) + 10 20 30 40 50 60

INFILTRATION TEST ◇ 1 2 3 4 5 6

POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geosciences consultants

DRILL DATE: 5-18-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 3
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

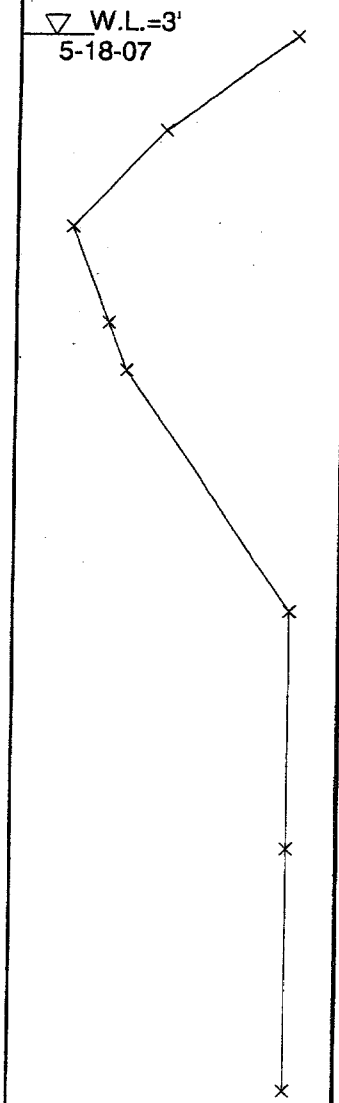
DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous deposits, very stiff, brown			
4			CLAY, with calcareous deposits, silty, very stiff, light brown			
			CLAY, with calcareous nodules, silty, medium to stiff, brown and light brown			
8						
12			SHALE, weathered, calcareous, slightly fissile, soft, light olive-brown and light gray			
16						
20						
24			TOTAL DEPTH: 25.0'			
28						

TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5

STANDARD PENETRATION (BPF) + 10 20 30 40 50 60

INFILTRATION TEST ◇ 1 2 3 4 5 6

POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geosciences consultants

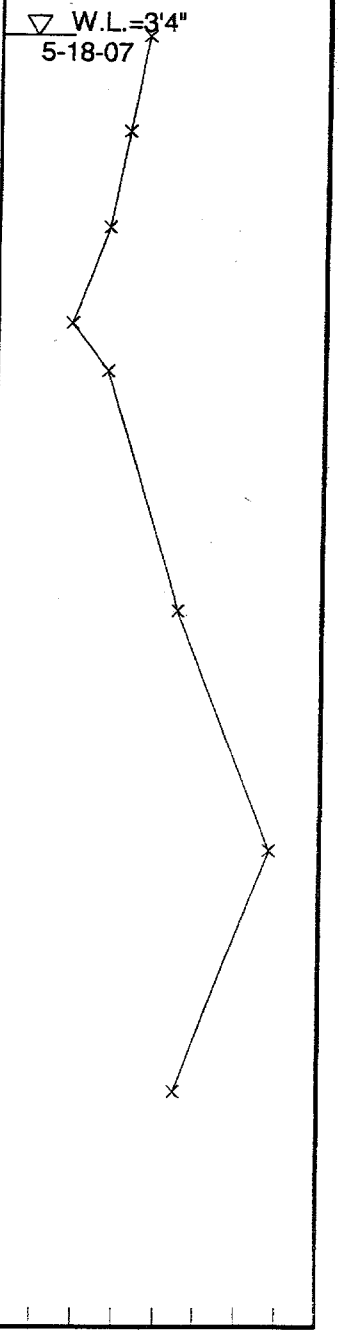
DRILL DATE: 5-18-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 4
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules, very stiff, brown			
4			CLAY, with calcareous deposits, silty, stiff to very stiff, light brown			
8						
12			SHALE, weathered, calcareous, slightly fissile, soft, light olive-brown and light gray			
16						
20						
24			TOTAL DEPTH: 25.0'			
28						

TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5
STANDARD PENETRATION (BPF) + 10 20 30 40 50 60
INFILTRATION TEST ◇ 1 2 3 4 5 6
POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

DRILL DATE: 5-17-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 5
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules, stiff, dark brown			
4						
			CLAY, with calcareous deposits, slightly silty, medium to stiff, light brown			
8						
12			CLAY, some sand, fine to medium grained, calcareous deposits, fossiliferous, very stiff, light brown			
16			SHALE, weathered, calcareous, slightly silty, thinly laminated, stiff to very stiff, light brown			
20						
24						
			TOTAL DEPTH: 25.0'			
28						

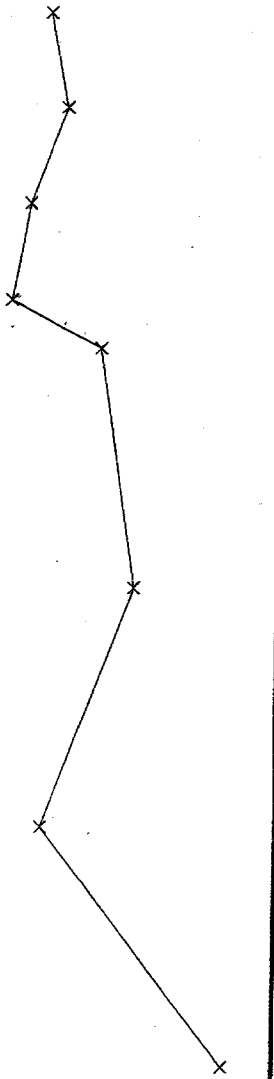
TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5

STANDARD PENETRATION (BPF) + 10 20 30 40 50 60

INFILTRATION TEST ◇ 1 2 3 4 5 6

POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++

▽ W.L.=1'2"
5-18-07



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

DRILL DATE: 5-17-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 6
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

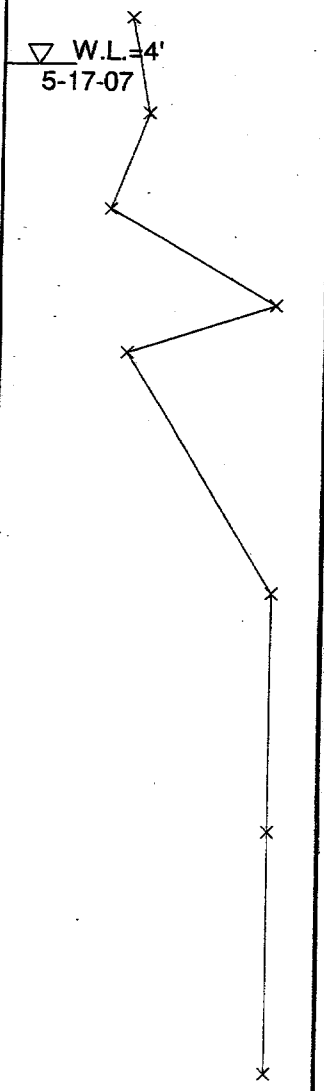
DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules, very stiff, brown			
4			CLAY, with calcareous deposits, slightly silty, very stiff, light brown			
8						
12			SHALE, weathered, calcareous, slightly fissile, soft, light olive-brown and light gray			
16						
20						
24			TOTAL DEPTH: 25.0'			
28						

TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5

STANDARD PENETRATION (BPF) + 10 20 30 40 50 60

INFILTRATION TEST ◇ 1 2 3 4 5 6

POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geosciences consultants

DRILL DATE: 5-17-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 7
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

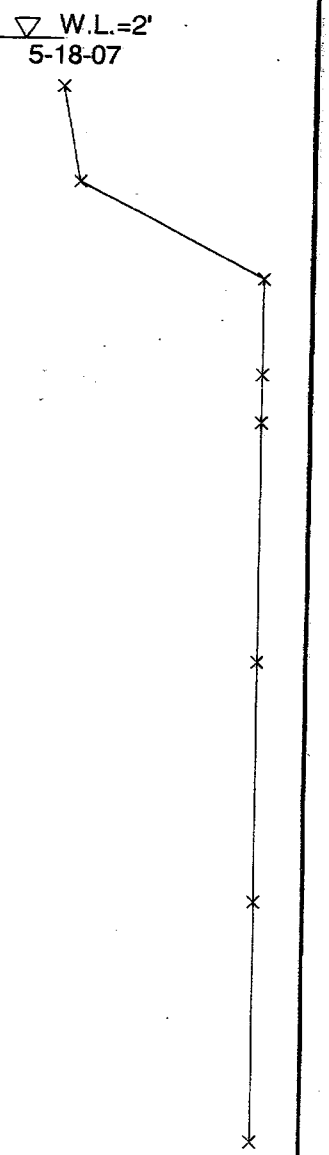
DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules and fossil fragments, stiff, dark brown			
4			CLAY, with gravel and calcareous deposits, slightly silty, fossiliferous, very stiff, light brown			
8						
12			SHALE, weathered, calcareous, slightly fissile, soft, light olive-brown and light gray			
16						
20						
24			TOTAL DEPTH: 25.0'			
28						

TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5

STANDARD PENETRATION (BPF) + 10 20 30 40 50 60

INFILTRATION TEST ◇ 1 2 3 4 5 6

POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

DRILL DATE: 5-17-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 9
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules, medium to stiff, dark brown			
4			CLAY, with calcareous nodules, stiff, brown			
8			CLAY, with calcareous deposits, slightly silty, stiff, light brown and light gray			
16			SHALE, weathered, calcareous, slightly fissile, soft, light olive-brown and light gray			
24			TOTAL DEPTH: 25.0'			
28						

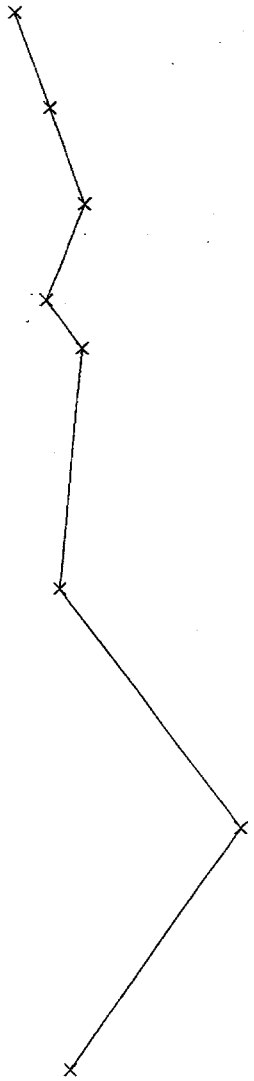
TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5

STANDARD PENETRATION (BPF) + 10 20 30 40 50 60

INFILTRATION TEST ◇ 1 2 3 4 5 6

POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++

▽ W.L.=1'9"
5-18-07



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

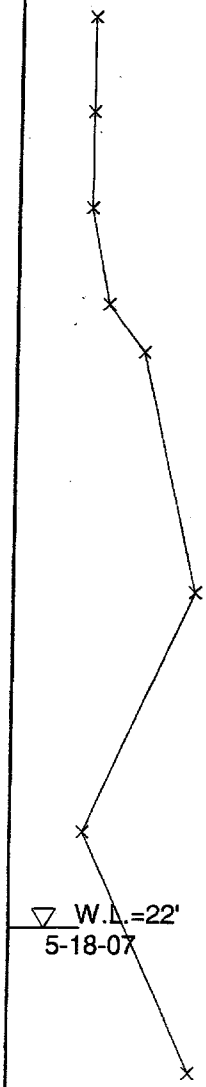
DRILL DATE: 5-17-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 8
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules, medium to stiff, brown			
4						
8			CLAY, with calcareous deposits, silty, stiff to very stiff, light brown			
12						
16						
20						
24			SHALE, weathered, calcareous, slightly fissile, soft, light olive-brown and light gray			
			TOTAL DEPTH: 25.0'			
28						

TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5
STANDARD PENETRATION (BPF) + 10 20 30 40 50 60
INFILTRATION TEST ◇ 1 2 3 4 5 6
POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

DRILL DATE: 5-17-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 10
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules, medium, dark brown			
			CLAY, with calcareous nodules, stiff, brown			
4						
8			CLAY, with calcareous deposits, slightly silty, stiff to very stiff, light brown			
12						
			SHALE, weathered, calcareous, with some gypsum seams, slightly fissile, soft, light olive-brown and light gray			
16						
20						
24						
			TOTAL DEPTH: 25.0'			
28						

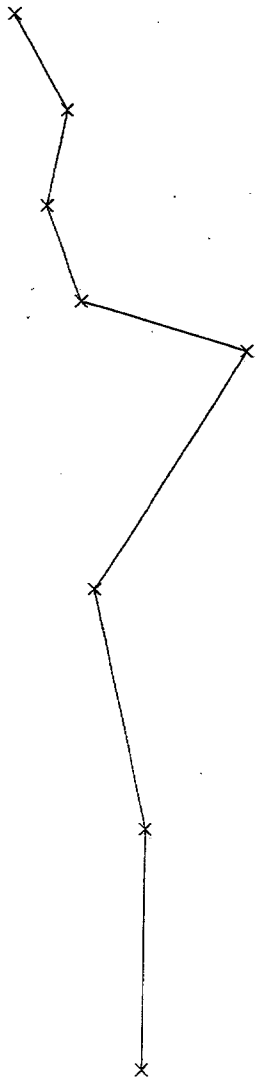
TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5

STANDARD PENETRATION (BPF) + 10 20 30 40 50 60

INFILTRATION TEST ◇ 1 2 3 4 5 6

POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++

▽ W.L.=1'3"
5-18-07



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

DRILL DATE: 5-18-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 11
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

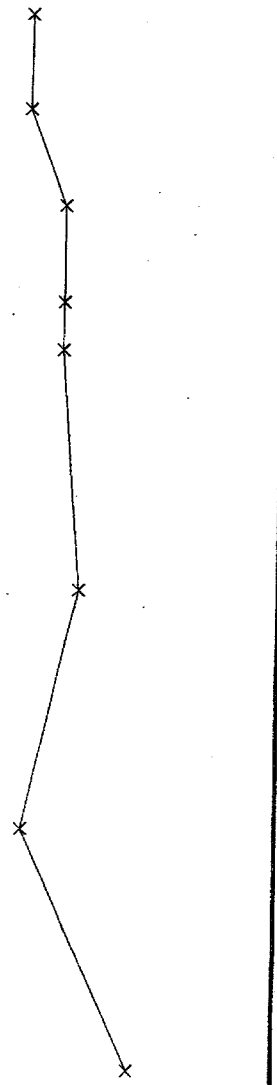
DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules, stiff, brown			
4						
8			CLAY, with calcareous deposits, slightly silty, stiff, light brown			
12			SHALE, weathered, calcareous, slightly fissile, soft, light olive-brown and light gray			
16						
20						
24			TOTAL DEPTH: 25.0'			
28						

TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5

STANDARD PENETRATION (BPF) + 10 20 30 40 50 60

INFILTRATION TEST ◇ 1 2 3 4 5 6

POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

DRILL DATE: 5-18-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 12
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

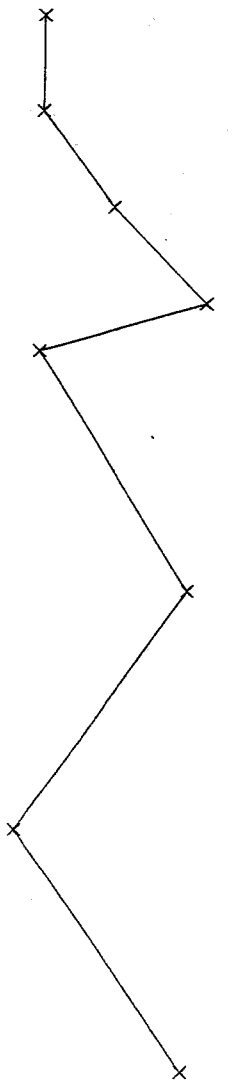
DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules, stiff, brown			
4			CLAY, with trace calcareous deposits, slightly silty, stiff to very stiff, light brown			
8						
12			SHALE, weathered, calcareous, slightly fissile, soft, light olive-brown and light gray			
16						
20						
24			TOTAL DEPTH: 25.0'			
28						

TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5

STANDARD PENETRATION (BPF) + 10 20 30 40 50 60

INFILTRATION TEST ◇ 1 2 3 4 5 6

POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

DRILL DATE: 5-18-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 13
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

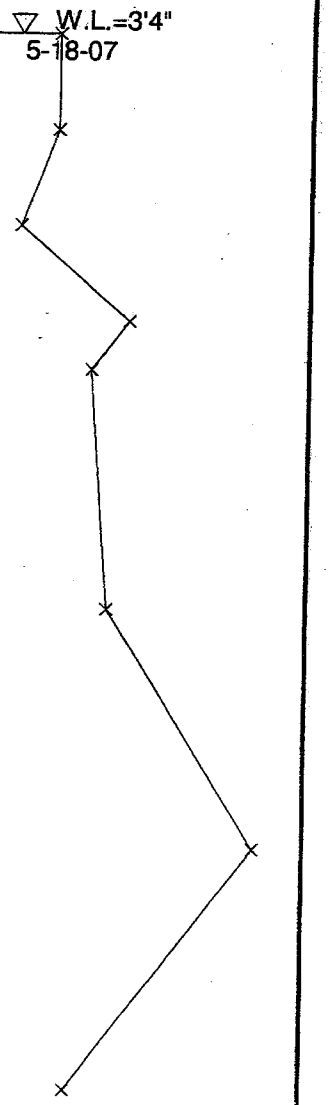
DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules, stiff, dark brown			
4			CLAY, with calcareous nodules, stiff, brown			
			CLAY, with calcareous deposits, slightly silty, medium to very stiff, light brown			
8			CLAY, with some fine sand and calcareous deposits, stiff, light brown			
12			SHALE, weathered, calcareous, slightly fissile, soft, light olive-brown and light gray			
16						
20						
24			TOTAL DEPTH: 25.0'			
28						

TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5

STANDARD PENETRATION (BPF) + 10 20 30 40 50 60

INFILTRATION TEST ◇ 1 2 3 4 5 6

POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++



HENLEY JOHNSTON & ASSOCIATES, INC.
engineering geoscience consultants

DRILL DATE: 5-18-07
METHOD: Shelby Tube to 25'

LOG OF BORING
Pioneer Crossing Apartments
Cameron and Parmer Road
Austin, Texas

PROJECT No.: 9161
BORING No.: 14
SHEET: 1 of 1
LOCATION: See Plate 1
GROUND ELEVATION:

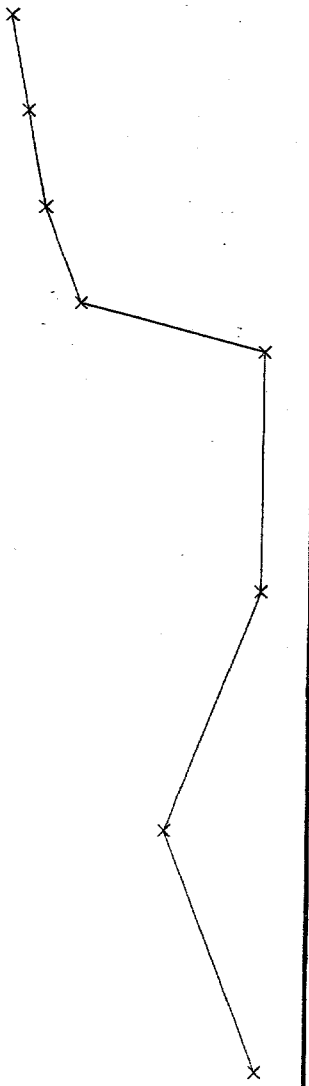
DEPTH (feet)	SYMBOL	SAMPLES	MATERIAL DESCRIPTION	ELEVATION (feet)	CORE DRILLED	CORE RECOVERED
0			CLAY, with calcareous nodules, soft to medium, dark brown			
4						
			CLAY, with calcareous deposits, stiff, brown			
8			CLAY, with calcareous deposits, slightly silty, fossiliferous, stiff to very stiff, light brown			
12			SHALE, weathered, calcareous, slightly fissile, soft, light olive-brown and light gray			
16						
20						
24			TOTAL DEPTH: 25.0'			
28						

TxDOT CPT ⊗ (inches per 100 blows) 1 2 3 4 5

STANDARD PENETRATION (BPF) + 10 20 30 40 50 60

INFILTRATION TEST ◇ 1 2 3 4 5 6

POCKET PENETROMETER × (tsf) 1.0 2.0 3.0 4.0 4.5 4.5+ 4.5++



ZONING AND UTILITY INFORMATION

PIONEER CROSSING APARTMENTS

288 UNITS

AUSTIN, TX

ZONING:

The site is currently zoned multifamily with 20 units per acre**.**

UTILITIES:

All utilities will be bought to the site during the completion of the master plan infrastructure.