

FILE COPY

**Haston Associates**

*Engineering the Future*

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15 January 1999

Mr. John W. Birkhoff, P.E.  
Shimek, Jacobs & Finklea, L.L.P.  
Consulting Engineers  
8333 Douglas Avenue, #820  
Dallas, Texas 75225

**Re: Addison Road from Beltline to Keller-Springs**

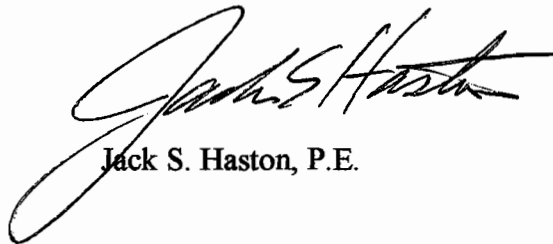
Dear Mr. Birkhoff:

Attached is our report of the pavement investigation for the referenced project. This report gives details of the field exploration, laboratory testing, and results.

It has been a pleasure to perform this work for you and we look forward to an opportunity to be of additional service. If you have any questions or if we may be of additional assistance, please call.

Very truly yours,

**Haston Associates**



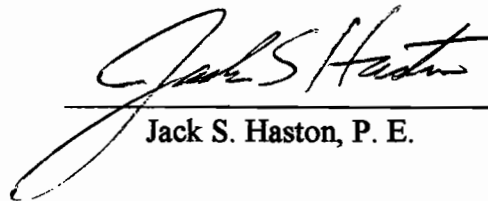
Jack S. Haston, P.E.

**REPORT OF  
PAVEMENT INVESTIGATION  
FOR  
ADDISON ROAD  
FROM BELTLINE ROAD TO KELLER-SPRINGS ROAD  
ADDISON, TEXAS**

Prepared For:

Mr. John W. Birkhoff, P.E.  
Shimek, Jacobs & Finklea, L.L.P.  
Consulting Engineers  
8333 Douglas Avenue, #820  
Dallas, Texas 75225

Prepared by:

  
\_\_\_\_\_  
Jack S. Haston, P. E.



*15 January 99*

**Haston Associates**  
1824 Holm Oak St.  
Arlington, TX 76012  
(817) 265-2253

15 January 1999  
Job No. H9812

**SUBSURFACE INVESTIGATION  
ADDISON ROAD  
FROM BELTLINE ROAD TO KELLER-SPRINGS ROAD  
ADDISON, TEXAS**

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## **I. INTRODUCTION**

This report contains the details of field exploration and laboratory testing performed for the proposed reconstruction of Addison Road from Beltline Road to Keller-Springs Road in Addison, Texas.

### **A. Authorization**

This study was authorized by Mr. John Birkhoff, P.E., of Shimek, Jacobs and Finklea, L.L.P.

### **B. Purpose**

The purpose of this investigation was to determine the subsurface materials and conditions present at the site and to make recommendations concerning pavement design.

### **C. Scope**

In order to accomplish the purpose of the study, the following scope of services was provided:

1. A geologic reconnaissance at the site and the area was conducted.
2. Eleven exploratory borings were drilled to depths ranging from 3.0 feet to of 10.0 feet below the existing pavement surface to determine subgrade soil types and to obtain samples.
3. Laboratory tests were conducted to determine pertinent engineering properties of the subsurface materials.

## II. FIELD AND LABORATORY SERVICES

To accomplish the proposed scope of services, field and laboratory studies were conducted. These activities are described in the following paragraphs.

### A. Field Activities

The signatory of this report conducted a site visit and windshield survey of the area to determine site conditions and geology. This reconnaissance included a preliminary review of available published geological and topographic information. This activity encompassed about four hours and was conducted before field exploratory drilling.

Subsurface materials and conditions were explored 6 November 1998 by means of eleven borings located approximately as shown on attached Sheet 1. The borings were advanced through the pavement with an auger and then Shelby-tube samplers were used to obtain relatively undisturbed samples. The samples were labeled, sealed in moisture-proof containers, and transported to the laboratory for further examination and analysis.

Observations for the presence of groundwater were made during and after the drilling operations. Results of groundwater observations are shown by the notes on the attached Logs of Borings.

### B. Laboratory Testing

Samples were selected to determine pertinent engineering properties. After tests were complete, the field logs were edited to prepare final Logs of Borings (attached) in general accordance with ASTM D 2487, Standard Test Method for Classification of Soils for Engineering Purposes.

#### ***Atterberg Limits Tests***

Atterberg Limits tests were performed on selected samples to assist in identification and classification. The method was in general accordance with ASTM D 4318, Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

***Minus 200-Mesh Sieve Tests***

The primary purpose of sieve tests was also to aid in proper classification of the soils. The method used was in general accordance with ASTM D 1140, Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75µm) Sieve.

***Moisture Content Tests***

The soil moisture condition of selected samples was determined in general accordance with ASTM D 2216, Standard Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures.

***pH Lime Series Tests***

Two tests were performed to determine the subgrade soil reaction with lime. These were performed in accordance with ASTM C 977 Appendix X.1. Results are shown in the appendix.

***Unconfined Compressive Strength Tests***

Unconfined compressive strength tests were performed on selected undisturbed samples to determine strength and consistency properties. The method used was in general accordance with ASTM D 2166, Standard Test Method for Unconfined Compressive Strength of Cohesive Soils.

### III. SITE CONDITIONS

Based on the results of field reconnaissance, exploration, testing, literature review, and experience, site and subsurface conditions are interpreted as described in the following paragraphs.

#### A. General Description

The roadway alignment is located on fairly level ground with only about 5-10 of ground surface elevation rise from Beltline Road to Keller-Springs Road, based on the USGS Addison, Texas, Quadrangle Map.<sup>1</sup> The existing roadway is a four-lane road with asphalt pavement.

#### B. Subsurface Materials and Conditions

The site is situated on the mapped outcrop of the Austin Chalk geologic formation.<sup>2</sup> The Austin chalk is a marine deposited marl, or chalky limestone, which is gray in its unweathered state and changes color to tan or white due to leaching during the weathering process. The obark brown or black soils at the ground surface are derived from further weathering of the formation. Shallow water tables and seepage are common in the Austin Chalk.

The depth and thickness of each soil stratum may vary between borings. However, the subsurface materials at the site can be generally described as follows:

- 5 to 10 inches of asphalt pavement (or concrete with asphalt overlay);
- 0 to 4 inches of crushed stone base;
- 0.0 to 5.1 feet of dark brown clay;
- 0.0 to 3.5 feet brown clay;
- 0.0 to 3.0 feet of tan or tan and brown clay; and,

---

<sup>1</sup> *Addison Quadrangle, Texas-Dallas Co., 7.5 Minute Series (Topographic), 1959, photorevised 1981, for sale by the U. S. Geological Survey, Denver, Colorado 80225.*

<sup>2</sup> *Geologic Atlas of Texas, Dallas Sheet, published by the Bureau of Economic Geology, The University of Texas at Austin, Austin, Texas 78712, 1972, Revised 1988.*

Austin Chalk limestone down to at least the bottoms of the borings.

**D. Groundwater**

Groundwater was encountered in only one boring, No. 11, at the 6.5-foot depth. This groundwater may originate as precipitation, lawn and landscape irrigation, leakage, or spillage. The porous soils and fractured rock in the upper portion of the Austin chalk are an unconfined aquifer. Shallow seepage is common in the area.



#### IV. ANALYSIS AND RECOMMENDATIONS

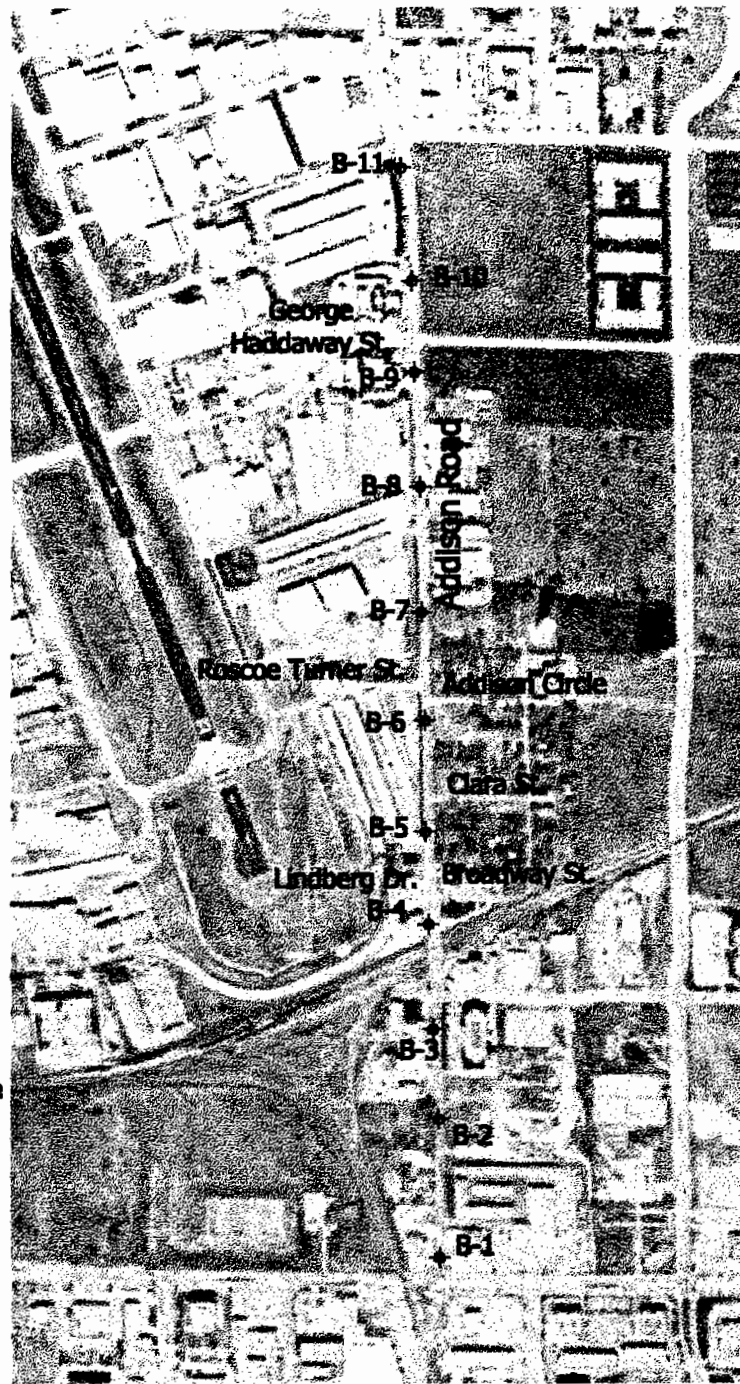
We understand that jointed reinforced concrete pavement is to be used for reconstruction of Addison Road, in accordance with the City's General Design Standards. Based on the AASHTO-86 pavement design method (data sheets attached), the concrete pavement thickness should be 10 inches with 3,500 psi concrete.

In our opinion, lime stabilization of the subgrade soils is the best method of providing a durable non-pumping subbase at this site. The recommended application rate for hydrated lime is 7 percent, or 30 pounds per square yard for a 6-inch compacted thickness<sup>3</sup>.

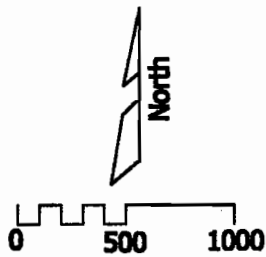
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<sup>3</sup> Haston, J.S., "A Quick Method for Selecting the Optimum Lime content for Subgrade Stabilization," approved in 1996 for publication in as a technical note in the ASCE *Journal of Construction Engineering and Management*, publication in progress.

APPENDIX



DART Rail Line



<b>Plan of Borings</b> Addison Road from Beltline Road to Keller-Springs Road		<b>Haston Associates</b>	
		<b>Sheet 1</b>	
Drawn by JSH	Scale: As Shown		
Date 02-Nov-98	Job No. H9812		

=====

AASHTO '86 -- Pavement Analysis Program (1)

=====

Addison Road H9812

\*\*\*\*\* Rigid Analysis \*\*\*\*\*

* Pavement Depth	=	9.32	inches
* Design E 18's	=	5,000,000	
* Reliability	=	85.00	percent
* Overall Deviation	=	0.35	
* Modulus of Rupture	=	705.0	psi
* Modulus of Elasticity	=	4,018,000	psi
* Load Transfer, J	=	3.20	
* Mod. of Subgrade Reaction	=	11	psi/in
* Drainage Coefficient	=	0.90	
* Initial Serviceability	=	5.00	
* Terminal Serviceability	=	2.50	

**SUMMARY OF LABORATORY TEST RESULTS**

CT Job No. : 98.0850  
 Date : 11/9/98  
 Haston Job No. : H9812

**Location:** Addison Road (Between Belt Line  
 & Keller Springs)  
 Addison, Texas

Boring No.	Depth Feet	Soil Description	Class	Water Content %	Dry Unit Weight pcf	Liquid Limit %	Plastic Limit %	Plasticity Index %	Unconfined Compressive Strength ksf	Unit Strain %
1	0-1.5	CLAY, dark brown,	CH	8.1						
1	1.5-3.0	CLAY, dark brown,	CH	30.4	94	64	21	43		
						68.5 % Passing # 200 Sieve				
1	3.0-4.5	CLAY, dark brown,	CH	31.3	91				3.1	7.6
1	4.5-5.0	CLAY, dark brown,	CH	23.5						
1	9	LIMESTONE, tan, weathered	LS							
2	0-1.5	CLAY, brown, (Fill)	CH	18.7	108					
2	1.5-3.0	CLAY, brown, (Fill)	CH	19.7	111					

**SUMMARY OF LABORATORY TEST RESULTS**

CT Job No. : 98.0850  
 Date : 11/9/98  
 Haston Job No. : H9812

**Location:** Addison Road (Between Belt Line  
 & Keller Springs)  
 Addison, Texas

Boring No.	Depth Feet	Soil Description	Class	Water Content %	Dry Unit Weight pcf	Liquid Limit %	Plastic Limit %	Plasticity Index %	Unconfined Compressive Strength ksf	Unit Strain %
3	0-1.5	CLAY, dark brown, (Fill)	CH	11.8	116					
3	1.5-3.0	CLAY, dark brown,	CH	30.1	92					
3	3.0-4.5	CLAY, brown,	CH	29.0	94				2.3	4.7
3	4.5-6.0	CLAY, brown,	CH	29.8						
3	6.0-7.5	CLAY, tan,	CH	29.9		60	19	41		
						76.8 % Passing # 200 Sieve				
3	7.5-9.0	CLAY, tan,	CH	21.1						

**SUMMARY OF LABORATORY TEST RESULTS**

CT Job No. : 98.0850  
 Date : 11/9/98  
 Haston Job No. : H9812

**Location:** Addison Road (Between Belt Line  
 & Keller Springs)  
 Addison, Texas

Boring No.	Depth Feet	Soil Description	Class	Water Content %	Dry Unit Weight pcf	Liquid Limit %	Plastic Limit %	Plasticity Index %	Unconfined Compressive Strength ksf	Unit Strain %
4	0-1.5	CLAY, dark brown, (Fill)	CH	15.5	105					
4	1.5-3.0	CLAY, dark brown, (Fill)	CL	20.3	103	39	14	25		
						39.6 % Passing # 200 Sieve				
4	3.0-4.5	CLAY, dark brown,	CH	34.8						
4	4.5-6.0	CLAY, dark brown,	CH	33.5						
4	6.0-7.5	CLAY, brown & tan,	CH	34.2						
4	7.5-9.0	CLAY, brown & tan,	CH	32.8						
5	0-1.5	CLAY, dark brown,	CH	35.4	109					
5	1.5-3.0	CLAY, brown,	CH	32.9	87					

**SUMMARY OF LABORATORY TEST RESULTS**

CT Job No. : 98.0850  
 Date : 11/9/98  
 Haston Job No. : H9812

**Location:** Addison Road (Between Belt Line  
 & Keller Springs)  
 Addison, Texas

Boring No.	Depth Feet	Soil Description	Class	Water Content %	Dry Unit Weight pcf	Liquid Limit %	Plastic Limit %	Plasticity Index %	Unconfined Compressive Strength ksf	Unit Strain %
6	0-1.5	CLAY, dark brown,	CH	30.8	93					
6	1.5-3.0	CLAY, dark brown,	CH	29.7	92					
7	0-1.5	CLAY, brown, with limestone particles (Fill)	CL	13.3	112	25.7 % Passing # 200 Sieve				
7	1.5-3.0	CLAY, dark brown,	CH	30.3	94					
7	3.0-4.5	CLAY, dark brown,	CH	34.4						
7	4.5-6.0	CLAY, dark brown,	CH	34.0		70	22	48		
						78.2 % Passing # 200 Sieve				
7	6.0-7.5	CLAY, brown & tan, with limestone particles	CH	27.3						



**SUMMARY OF LABORATORY TEST RESULTS**

**CT Job No. : 98.0850**  
**Date : 11/9/98**  
**Haston Job No. : H9812**

**Location:** Addison Road (Between Belt Line  
 & Keller Springs)  
 Addison, Texas

Boring No.	Depth Feet	Soil Description	Class	Water Content %	Dry Unit Weight pcf	Liquid Limit %	Plastic Limit %	Plasticity Index %	Unconfined Compressive Strength ksf	Unit Strain %
8	0-1.5	CLAY, dark brown,	CH	16.3						
8	1.5-3.0	CLAY, dark brown,	CH	34.9	90					
8	3.0-4.5	CLAY, brown,	CH	30.6						
8	4.5-6.0	CLAY, tan,	CH	30.3		65	23	42		
						70.6 % Passing # 200 Sieve				
8	6.0-7.5	CHALKY CLAY, tan,	CL	18.1						
9	0-1.5	CLAY, brown, with limestone particles	CL	27.3		22.4 % Passing # 200 Sieve				

**SUMMARY OF LABORATORY TEST RESULTS**

CT Job No. : 98.0850  
 Date : 11/9/98  
 Haston Job No. : H9812

**Location:** Addison Road (Between Belt Line  
 & Keller Springs)  
 Addison, Texas

Boring No.	Depth Feet	Soil Description	Class	Water Content %	Dry Unit Weight pcf	Liquid Limit %	Plastic Limit %	Plasticity Index %	Unconfined Compressive Strength ksf	Unit Strain %
10	0-1.5	CLAY, dark brown,	CH	15.1	112					
10	1.5-3.0	CLAY, dark brown,	CH	28.6		61	23	38		
						65.0 % Passing # 200 Sieve				
10	3.0-4.5	CLAY, brown & tan, with limestone particles	CH	25.8						
11	0-1.5	CLAY, brown, with limestone particles (Fill)	CH	27.0	95					
11	1.5-3.0	CLAY, brown, with limestone particles (Fill)	CH	25.2	95	54	25	29		
						60.4 % Passing # 200 Sieve				
11	3.0-4.5	CLAY, dark brown,	CH	35.9						
11	4.5-6.0	CLAY, dark brown,	CH	35.7	85				1.9	10.3

# pH Lime Series

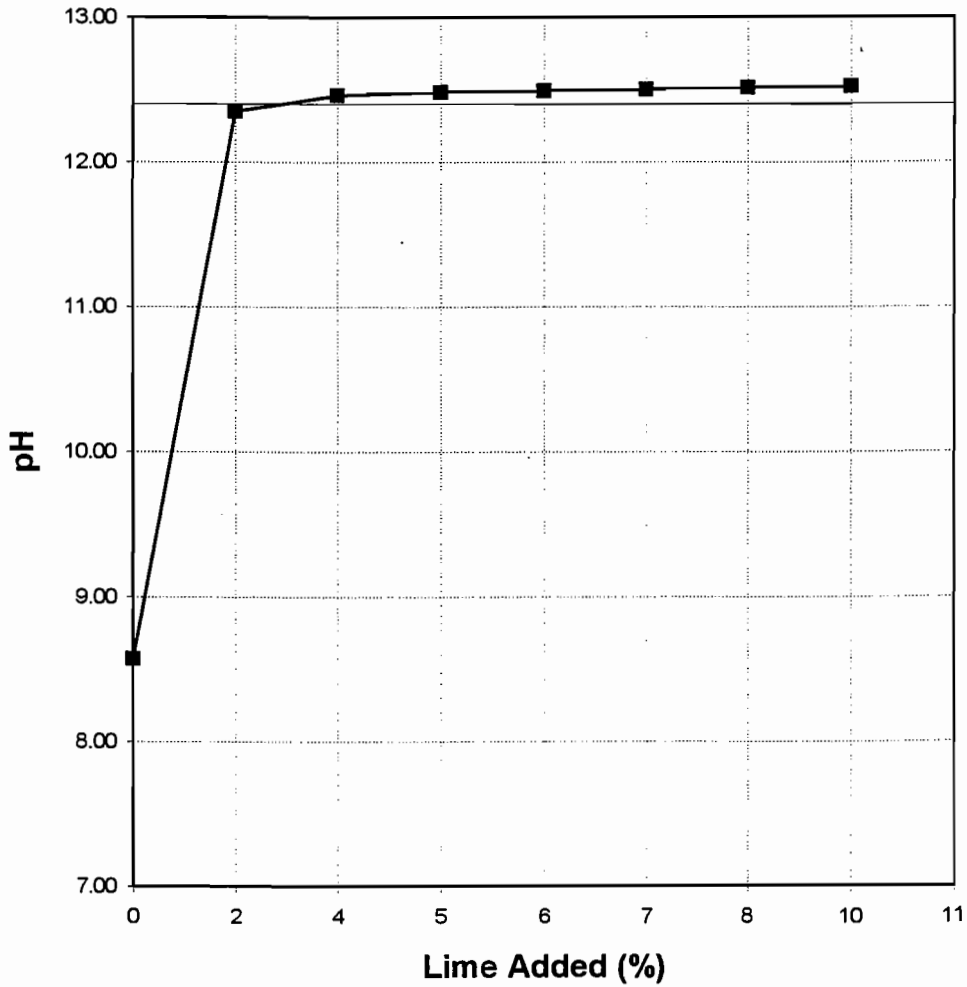
# ASTM C977

## Haston Job Number H 9812

Addison Road (Between Belt Line & Keller Springs)

Boring #1 @ 1.5-3.0' - Dark brown clay

Lime Added (%)	pH
0	8.57
2	12.35
4	12.46
5	12.48
6	12.49
7	12.50
8	12.51
10	12.52



# pH Lime Series

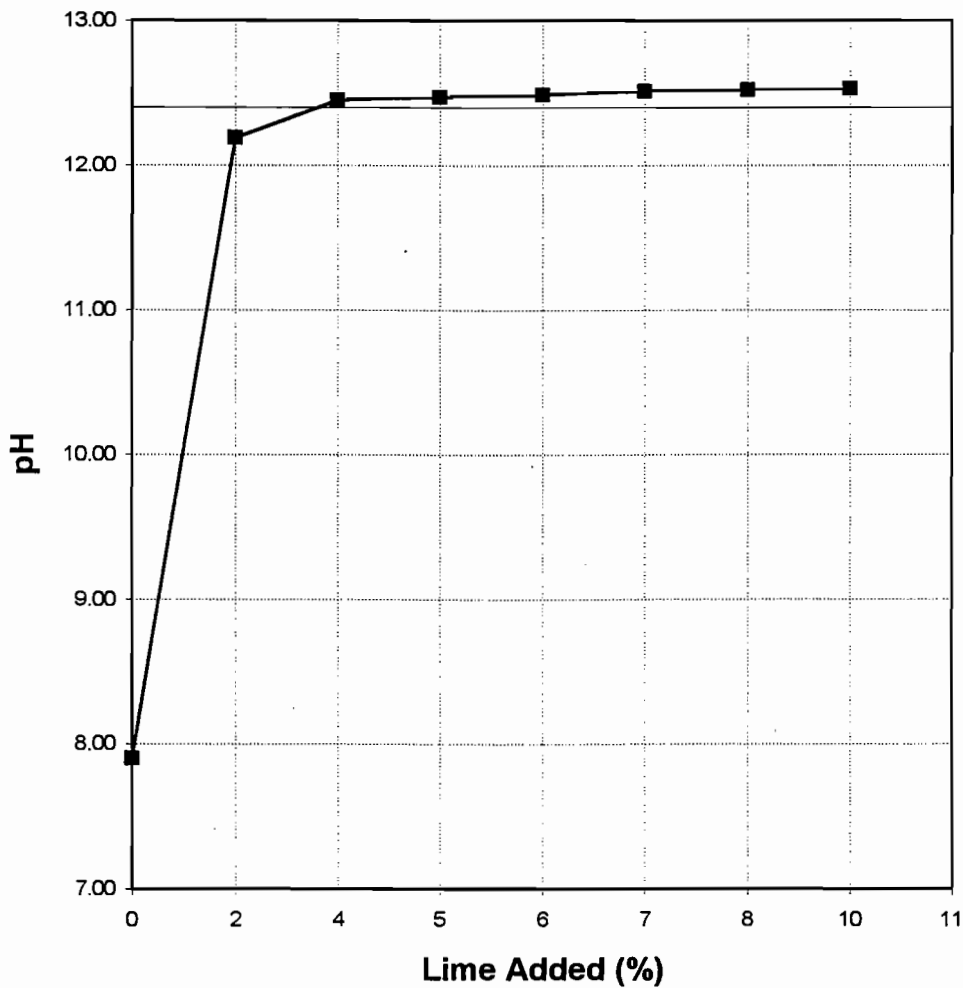
# ASTM C977

## Haston Job Number H 9812

Addison Road (Between Belt Line & Keller Springs)

Boring #4 @ 1.5-3.0' - Dark brown clay

Lime Added (%)	pH
0	7.90
2	12.19
4	12.45
5	12.47
6	12.49
7	12.51
8	12.52
10	12.53



# pH Lime Series

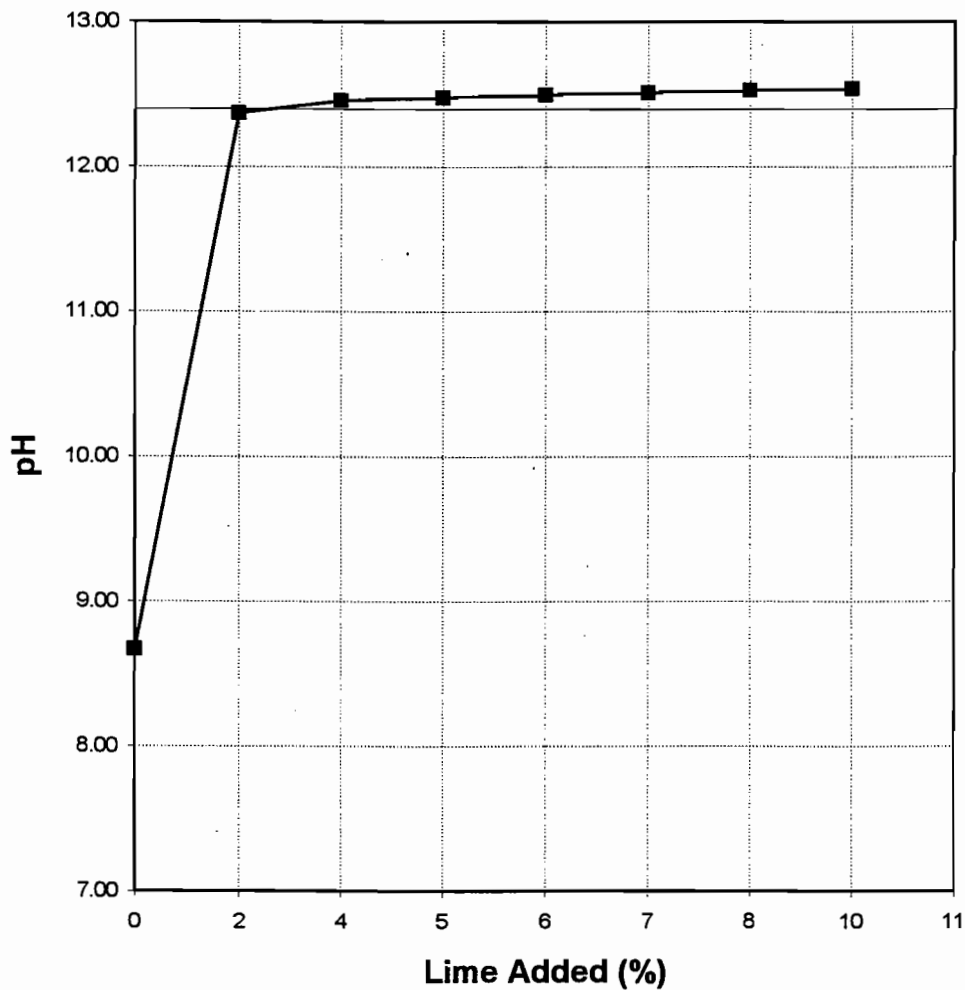
# ASTM C977

## Haston Job Number H 9812

Addison Road (Between Belt Line & Keller Springs)

Boring #8 @ 0-1.5' - Dark brown clay

Lime Added (%)	pH
0	8.67
2	12.37
4	12.46
5	12.48
6	12.50
7	12.51
8	12.53
10	12.54



# LOG OF BORING

PROJECT : Addison Road - # H9812

BORING NO : 1

CLIENT : Haston Associates

LOCATION : Addison, Texas

CT JOB NO : 98.0850

BORING TYPE : CFA

DATE : 11/6/98

DRILLER: Luna

GROUND ELEVATION: -

Depth - Feet	Symbol	Sample Type	Penetrometer Readings, TSF	Penetration Test, Blows/6"	Legend:
					Description of Stratum
		X	-		B - Bag
		S	2.50		C - Core
		S	2.25		X - No Recovery
5		S	3.00		▽ - Water Table
10		TX		50/2.75 50/2.00	Asphalt 10", Base 2" <span style="float: right;">1.0'</span>
					Dark brown clay, very stiff & moist <span style="float: right;">5.0'</span>
15					Tan weathered limestone, soft & dry
					End of boring 10'
20					Note: Boring dry at completion.
25					
30					
35					
40					

# LOG OF BORING

PROJECT : Addison Road - # H9812

BORING NO : 2

CLIENT : Haston Associates

LOCATION : Addison, Texas


CT JOB NO : 98.0850

BORING TYPE : CFA

DATE : 11/6/98

DRILLER: Luna

GROUND ELEVATION: -

Depth -Feet	Symbol	Sample Type	Penetrometer Reading, TSF	Penetration Test, Blows/6"	Legend:		
					S - Shelby Tube	B - Bag	
					P - STD Penetration Test	C - Core	
					T - THD Cone Penetration Test	X - No Recovery	
						▽ - Water Table	
					Description of Stratum		
		X	-		Asphalt 5", Base 1"	0.5'	
		S	4.25		Brown clay, hard & moist (Fill)		
		S	3.75				
5							
10							
15							
20							
25							
30							
35							
40							

End of boring 3'

Note: Stopped boring at 3' due to top of sewer line.

# LOG OF BORING

PROJECT : Addison Road - # H9812

BORING NO : 3

CLIENT : Haston Associates

LOCATION : Addison, Texas

JOB NO : 98.0850

BORING TYPE : CFA

DATE : 11/6/98

DRILLER: Luna

GROUND ELEVATION: -

Depth - Feet	Symbol	Sample Type	Penetrometer Reading, TSF	Penetration Test, Blows/6"	<p><b>Legend:</b></p> <p>S - Shelby Tube P - STD Penetration Test T - THD Cone Penetration Test</p> <p>B - Bag C - Core X - No Recovery ▽ - Water Table</p> <p style="text-align: center;"><b>Description of Stratum</b></p>
	X		-		Asphalt with concrete 8", Base 2" <span style="float: right;">0.8'</span>
	S		4.00		Dark brown clay, hard & moist (Fill) <span style="float: right;">1.5'</span>
	S		2.50		Dark brown clay, very stiff & moist <span style="float: right;">3.0'</span>
5	S		2.50		Brown clay, very stiff & moist <span style="float: right;">6.0'</span>
	S		3.00		
	S		2.75		Tan clay, very stiff & moist <span style="float: right;">9.0'</span>
	S		2.50		
10	TX		50/1.75 50/1.25		Tan weathered limestone, soft & dry           End of boring 10'   Note: Boring dry at completion.
15					
20					
25					
30					
35					
40					



# LOG OF BORING

PROJECT : Addison Road - # H9812

BORING NO : 4

CLIENT : Haston Associates

LOCATION : Addison, Texas

JOB NO : 98.0850

BORING TYPE : CFA

DATE : 11/6/98

DRILLER: Luna

GROUND ELEVATION: -

Depth - Feet	Symbol	Sample Type	Penetrometer Reading, TSF	Penetration Test, Blows/6"	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><b>Legend:</b></p> <p>S - Shelby Tube</p> <p>P - STD Penetration Test</p> <p>T - THD Cone Penetration Test</p> </div> <div style="width: 45%;"> <p>B - Bag</p> <p>C - Core</p> <p>X - No Recovery</p> <p>∇ - Water Table</p> </div> </div> <p style="text-align: center; margin-top: 10px;"><b>Description of Stratum</b></p>
	X		-		Asphalt with concrete 9", Base 2" <span style="float: right;">0.9'</span>
	S		4.5+		Dark brown clay, hard & moist (Fill) <span style="float: right;">3.0'</span>
	S		2.50		
	S		1.00		Dark brown clay, stiff & moist <span style="float: right;">6.0'</span>
5	S		2.00		
	S		2.00		Brown & tan clay, very stiff & moist <span style="float: right;">9.0'</span>
	S		2.50		
10	TX		50/3.00 50/2.25		Tan weathered limestone, soft & dry
					End of boring 10'
15					
					Note: Boring dry at completion.
20					
25					
30					
35					
40					

# LOG OF BORING

PROJECT : Addison Road - # H9812

BORING NO : 5

CLIENT : Haston Associates

LOCATION : Addison, Texas

CT JOB NO : 98.0850

BORING TYPE : CFA

DATE : 11/6/98

DRILLER: Luna

GROUND ELEVATION: -

Depth - Feet	Symbol	Sample Type	Penetrometer Readings, TSF	Penetration Test, Blows/6"	Legend:
					Description of Stratum
					B - Bag C - Core X - No Recovery ▽ - Water Table
	X		-		Asphalt with concrete 9" <span style="float: right;">0.8'</span>
	S		3.25		Dark brown clay, very stiff & moist <span style="float: right;">1.5'</span>
5	S		2.50		Brown clay, very stiff & moist <span style="float: right;">5.0'</span>
					Grey limestone, medium hard & dry <span style="float: right;">6.5'</span>
					Tan limestone, medium hard & dry <span style="float: right;">8.0'</span>
10	TX			50/1.25 50/0.75	Grey limestone, medium hard & dry
15					End of boring 10'
20					Note: Boring dry at completion.
25					
30					
35					
40					

# LOG OF BORING

PROJECT : Addison Road - # H9812

BORING NO : 6

CLIENT : Haston Associates

LOCATION : Addison, Texas

CT JOB NO : 98.0850

BORING TYPE : CFA

DATE : 11/6/98

DRILLER: Luna

GROUND ELEVATION: -

Depth -Feet	Symbol	Sample Type	Penetrometer Reading, TSF	Penetration Test, Blows/6"	Legend: S - Shelby Tube P - STD Penetration Test T - THD Cone Penetration Test B - Bag C - Core X - No Recovery ▽ - Water Table
					Description of Stratum
	X		-		Asphalt with concrete 7", Base 4" <span style="float: right;">0.9'</span>
	S		4.5+		Dark brown clay, hard & moist <span style="float: right;">3.0'</span>
5	S		4.00		Tan weathered limestone, soft & dry <span style="float: right;">6.5'</span>
10	TX		50/1.00 50/0.50		Grey limestone, medium hard & dry
15					End of boring 10'
20					Note: Boring dry at completion.
25					
30					
35					
40					

# LOG OF BORING

PROJECT : Addison Road - # H9812

BORING NO : 7

CLIENT : Haston Associates

LOCATION : Addison, Texas

JOB NO : 98.0850

BORING TYPE : CFA

DATE : 11/6/98

DRILLER: Luna

GROUND ELEVATION: -

Depth - Feet	Symbol	Sample Type	Penetrometer Reading, TSF	Penetration Test, Blows/6"	Description of Stratum
					<p><b>Legend:</b></p> <p>B - Bag                      S - Shelby Tube                      P - STD Penetration Test                      T - THD Cone Penetration Test</p> <p style="text-align: right;">B - Bag                      C - Core                      X - No Recovery                      ▽ - Water Table</p>
					<b>Description of Stratum</b>
	X		-		Asphalt with concrete 9", Base 2" <span style="float: right;">0.9'</span>
	S		4.5+		Brown clay with limestone particles, hard & moist (Fill) <span style="float: right;">1.5'</span>
	S		3.00		Dark brown clay, very stiff & moist
5	S		3.00		
	S		2.50		6.0'
	S		4.5+		Brown & tan clay with limestone particles, hard & moist
10	TX		50/2.75 50/2.00		9.0'
					Tan weathered limestone, soft & dry
15					End of boring 10'
20					Note: Boring dry at completion.
25					
30					
35					
40					

# LOG OF BORING

PROJECT : Addison Road - # H9812

BORING NO : 8

CLIENT : Haston Associates

LOCATION : Addison, Texas

JOB NO : 98.0850

BORING TYPE : CFA

DATE : 11/6/98

DRILLER: Luna

GROUND ELEVATION: -

Depth - Feet	Symbol	Sample Type	Penetrometer Reading, TSF	Penetration Test, Blows/6"	<div style="display: flex; justify-content: space-between;"> <div> <p><b>Legend:</b></p> <p>S - Shelby Tube</p> <p>P - STD Penetration Test</p> <p>T - THD Cone Penetration Test</p> </div> <div> <p>B - Bag</p> <p>C - Core</p> <p>X - No Recovery</p> <p>▽ - Water Table</p> </div> </div>
Description of Stratum					
		X	-		Asphalt with concrete 10", Base 2" <span style="float: right;">1.0'</span>
		S	4.5+		Dark brown clay, very stiff & moist
		S	2.50		3.0'
		S	2.25		Brown clay, very stiff & moist
5		S	2.75		4.5'
		S	4.5+		6.0'
		S	4.5+		7.5'
10		TX	50/1.75 50/1.00		Tan weathered limestone, soft & dry
15					End of boring 10'
20					Note: Boring dry at completion.
25					
30					
35					
40					

# LOG OF BORING

PROJECT : Addison Road - # H9812

BORING NO : 9

CLIENT : Haston Associates

LOCATION : Addison, Texas

CT JOB NO : 98.0850

BORING TYPE : CFA

DATE : 11/6/98

DRILLER: Luna

GROUND ELEVATION: -

Depth - Feet	Symbol	Sample Type	Penetrometer Readings, TSF	Penetration Test, Blows/6"	Description of Stratum
					<p><b>Legend:</b></p> <p>S - Shelby Tube                      P - STD Penetration Test                      T - THD Cone Penetration Test</p> <p style="text-align: right;">B - Bag                      C - Core                      X - No Recovery                      ▽ - Water Table</p>
					<b>Description of Stratum</b>
	X		-		Asphalt 1", Concrete 7" <span style="float: right;">0.7'</span>
	S		4.5+		Brown clay with limestone particles, hard & moist <span style="float: right;">1.5'</span>
5	X				Tan weathered limestone, soft & dry <span style="float: right;">6.0'</span>
	S				Grey limestone, medium hard & dry <span style="float: right;">7.0'</span>
10	TX			50/1.25 50/1.00	Tan weathered limestone, soft & dry
15					End of boring 10'
20					Note: Boring dry at completion.
25					
30					
35					
40					

# LOG OF BORING

PROJECT : Addison Road - # H9812

BORING NO : 10

CLIENT : Haston Associates

LOCATION : Addison, Texas

CT JOB NO : 98.0850

BORING TYPE : CFA

DATE : 11/6/98

DRILLER: Luna

GROUND ELEVATION: -

Depth -Feet	Symbol	Sample Type	Penetrometer Reading, TSF	Penetration Test, Blows/6"	Legend:							
					Description of Stratum							
					<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">B - Bag</td> </tr> <tr> <td>S - Shelby Tube</td> </tr> <tr> <td>C - Core</td> </tr> <tr> <td>P - STD Penetration Test</td> </tr> <tr> <td>X - No Recovery</td> </tr> <tr> <td>T - THD Cone Penetration Test</td> </tr> <tr> <td>∇ - Water Table</td> </tr> </table>	B - Bag	S - Shelby Tube	C - Core	P - STD Penetration Test	X - No Recovery	T - THD Cone Penetration Test	∇ - Water Table
B - Bag												
S - Shelby Tube												
C - Core												
P - STD Penetration Test												
X - No Recovery												
T - THD Cone Penetration Test												
∇ - Water Table												
5	X S S S	X S S S	- 4.5+ 4.00 2.50		<table style="width: 100%; border: none;"> <tr> <td style="width: 85%;">Asphalt 8", Base 2"</td> <td style="width: 15%; text-align: right;">0.8'</td> </tr> <tr> <td>Dark brown clay, hard &amp; moist</td> <td style="text-align: right;">3.0'</td> </tr> <tr> <td>Brown &amp; tan clay with limestone particles, very stiff &amp; moist</td> <td style="text-align: right;">4.5'</td> </tr> </table>	Asphalt 8", Base 2"	0.8'	Dark brown clay, hard & moist	3.0'	Brown & tan clay with limestone particles, very stiff & moist	4.5'	
Asphalt 8", Base 2"	0.8'											
Dark brown clay, hard & moist	3.0'											
Brown & tan clay with limestone particles, very stiff & moist	4.5'											
10	TX	TX	50/1.25 50/1.00		<p style="text-align: center;">Tan weathered limestone, soft &amp; dry.</p> <p style="text-align: center;">End of boring 10'</p> <p>Note: Boring dry at completion.</p>							
15												
20												
25												
30												
35												
40												

# LOG OF BORING

PROJECT : Addison Road - # H9812

BORING NO : 11

CLIENT : Haston Associates

LOCATION : Addison, Texas

JOB NO : 98.0850

BORING TYPE : CFA

DATE : 11/6/98

DRILLER: Luna

GROUND ELEVATION: -

Depth - Feet	Symbol	Sample Type	Penetrometer Reading, TSF	Penetration Test, Blows/6"	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><b>Legend:</b></p> <p>S - Shelby Tube</p> <p>P - STD Penetration Test</p> <p>T - THD Cone Penetration Test</p> </div> <div style="width: 45%;"> <p>B - Bag</p> <p>C - Core</p> <p>X - No Recovery</p> <p>∇ - Water Table</p> </div> </div>
Description of Stratum					
	X		-		Asphalt 9" <span style="float: right;">0.8'</span>
	S		2.25		Brown clay with limestone particles, very stiff & moist (Fill) <span style="float: right;">3.5'</span>
	S		3.50		
5	S		2.00		Dark brown clay, stiff & moist <span style="float: right;">6.0'</span>
	S		1.00		
	TX		50/0.75 50/0.25		Tan weathered limestone, soft & dry <span style="float: right;">∇ 6.5'</span>
10					End of boring 10'
15					
20					Note: Water at completion of boring 10.0'.
25					
30					
35					
40					