March 25, 2008

Terracon
Consulting Engineers & Scientists
Terracon Consultants, Inc.
12217 South Lone Peak Parkway, Suite 100
Draper, Utah 84020
1550 North 320 West, Suite J
Layton, Utah 84041
Phone 801.545.8500
Fax 801.545.8600
Hwww.terracon.com

Spanish Fork City
40 South Main Street
Spanish Fork, Utah 84660

Attention: Mr. Trapper Burdick

Re: Geotechnical Exploration
Canyon Drive Area Roadway Reconstruction
Spanish Fork, Utah
Terracon Project No. 61085021

Mr. Burdick:

At your request, Terracon Consultants, Inc. (Terracon) has performed a geotechnical exploration for roadways in the vicinity of Canyon Drive and 900 East in Spanish Fork, Utah. This exploration was authorized by you in February 2008 and performed in conformance with your request and our understanding of the clients needs. This report describes the exploration, summarizes our findings and presents recommendations for asphalt pavement section thickness design along the following roadway segments:

- Canyon Drive between 900 East and Nebo Street
- Flonette Avenue between 900 East and 1150 East
- Sterling Drive between 900 East and 1100 East
- Sterling Circle
- Nebo Street between Sterling Drive and Flonette Avenue
- 410 South Street between Nebo Street and 1150 East
- 900 East Street between Flonette Avenue and Canyon Road
- Mount Loafer Circle

The scope of work included subsurface exploration, field and laboratory testing, engineering analysis and the preparation of this report.

PROJECT DESCRIPTION

We understand that the project consists of reconstructing the existing pavement sections within the project limits. We understand that the new pavement sections will consist of asphaltic concrete supported on untreated base course and granular subbase as appropriate. Pavement loading information was not made available to Terracon at the time of the preparation of this report. For the purpose of this report, the roadways within the area to be reconstructed, with the exception of 900 East Street were considered to be low-volume interior residential streets. Nine-hundred East Street was considered to be classified as a collector type roadway. Design traffic information was estimated based on typical traffic volumes for similar roadway types summarized by the Asphalt Institute. A design Equivalent Single Axel Load (ESAL) of 10,000 was used in our analysis of low-volume interior residential streets and 100,000 ESALs was used in our analysis of 900 East Street.

SITE EXPLORATION PROCEDURES

The subsurface exploration included drilling 12 soil borings to depths of about 5.5 feet below the existing pavement grade. The approximate locations of the borings in relation to the proposed construction are shown on the Boring Location Plan, included in at the end of this report. The borings were located by reference to existing on-site features. The locations are approximate and should be considered accurate only to the degree implied by the means and methods used to determine them.

The borings were drilled with a truck-mounted all-terrain drill rig with continuous flight hollow-stem augers. Disturbed soil samples were collected at various depths utilizing a 2-inch outside-diameter split spoon sampler driven in general accordance with the standard penetration test (SPT). This test consists of driving the sampler into the ground with a 140-pound hammer free-falling through a distance of 30 inches. The number of blows required to advance the sampler the last 12 inches, or the interval indicated, of a typical 18-inch penetration is recorded as the standard penetration resistance value (N-value). These values are indicated on the boring logs at the respective sample depths.

The standard penetration test provides a reasonable indication of the in-place density of sandy type materials, but only provides an indication of the relative stiffness of cohesive materials since the blow count in these soils may be affected by the moisture content. In addition, considerable care should be exercised in interpreting the N-values in gravelly soils, particularly where the size of the gravel particle exceeds the inside diameter of the sampler.

Terracon personnel prepared boring logs during drilling. The soil samples were packaged and transported to our Draper laboratory for further observation.

SITE CONDITIONS

The site consists of existing roadways within a residential development. Existing pavements within the project limits were observed to exhibit minor to moderate cracking and wear. Observed cracking consisted of alligator cracking, longitudinal cracking and transverse cracking. Alligator cracking is often associated with a weak subgrade or an insufficient pavement section thickness. Longitudinal and transverse cracking are more commonly caused by normal freeze thaw cycles or mix design deficiencies. Portions of the asphalt surface appear to have raveled and to be moderately worn.

SUBSURFACE CONDITIONS

Subsurface conditions encountered at the site are indicated on the boring logs at the end of this report. The stratification lines shown on the logs represent the approximate boundary between the soil types encountered; the actual transition may be gradual.

Measured pavement and base course thicknesses are summarized in the following table for the individual borings.

Boring Number	Roadway Segment	Asphaltic Concrete Thickness (in)	Granular Base Course Thickness (in)
B-1	Sterling Drive	4	4
B-2	Sterling Circle	5	2
B-3	Sterling Drive	3	5
B-4	Nebo Street	3	4
B-5	410 South	4	2 to 5
B-6	Canyon Drive	4	3
B-7	Canyon Drive	4	4
B-8	Flonette Avenue	NM	NM
B-9	300 South	NM	NM
B-10	Nebo Street	4	4
B-11	900 East	2	N/R
B-12	900 East	4	N/R

NM = Not Measured, N/R = Not Recorded

Fill was encountered in boring B-12 to a depth of 3.5 feet. The fill was observed to consist of sandy gravel.

Soil conditions encountered below the pavement sections and observed fill consisted predominantly of lean clay, silty clay and silty sand extending to the maximum depth explored.

The clay was observed to be very soft to very stiff with N-values ranging between 1 and 23 blows per foot of penetration. The sand was observed to be very loose to medium dense with N-values ranging between 3 and 21 blows per foot of penetration. Laboratory test results are summarized on the attached boring logs.

During drilling, the presence and level of groundwater were noted. At the time of our field exploration, groundwater was not encountered within the depths explored. It should be recognized that fluctuations of the groundwater table may occur due to seasonal and longer-term variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Evaluation of these factors is beyond the scope of this exploration.

ENGINEERING ANALYSIS AND RECOMMENDATIONS

Based on the results of our exploration, it is our opinion that the site is suitable for the proposed construction. Pavement sections should be constructed on properly prepared subgrade soils.

Some of the near-surface native soils are fine-grained and may be susceptible to disturbance or rutting under the weight of construction equipment if they become wet. If these soils are very moist to wet during construction, dump and spread procedures, and the use of geotextiles in combination with angular granular fill may be required to reduce the potential for disturbance of the soils.

Pavement Section

Design traffic loading information was not provided to Terracon for pavement section thickness design. For the purpose of analysis, we have assumed that the roadways within the area to be reconstructed, with the exception of 900 East Street would be classified as low-volume interior residential streets. Nine-hundred East Street was considered to be classified as a collector type roadway. Design traffic information was estimated based on typical traffic volumes for similar roadway types summarized by the Asphalt Institute. A design Equivalent Single Axel Load (ESAL) of 10,000 was used in our analysis of low-volume interior residential streets and 100,000 ESALs was used in our analysis of 900 East Street.

Pavement section thickness design was performed using procedures outlined in the UDOT Pavement Management and Pavement Design Manual, dated November 1998 with input parameter modifications outlined in a UDOT design memorandum, dated September 27, 2007 and in general conformance with the 1993 AASHTO "Guide for the Design of Pavement Structures". An assumed California Bearing Ratio (CBR) of 4 was used to represent subgrade conditions at the site. The following pavement sections, or an approved equivalent, should be placed on the properly prepared subgrade soils as described below.

Traffic Area	Recommended Pavement Sections (Inches)			
	Asphalt Concrete Surfacing	Aggregate Base Course	Granular Subbase	Total
900 East Street	4	6	6	16
Canyon Dr. Sterling Dr. Sterling Cr. Nebo St. 410 South Flonette Av. Mount Loafer Cr.	3	8	--	11

Paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course and underlying subgrade. Permanent drainage should be incorporated into the pavement grading design.

The asphaltic concrete should be placed and compacted to at least 95 percent of the maximum density as determined by ASTM D 1559 (50 blows each end). Aggregates, granular subbase, and asphaltic concrete should conform to local city or Utah Department of Transportation (UDOT) specifications.

The pavement sections provided in this report are minimums for the given design criteria and as such, periodic maintenance should be expected. A maintenance program that includes surface sealing, joint cleaning and sealing, and timely repair of cracks and deteriorated areas will increase the pavement's service life. As an option, thicker sections could be constructed to decrease future maintenance.

If actual traffic data varies from that described above Terracon should be contacted so that modifications can be made to the recommendations presented in this report.

Earthwork

Existing fill, disturbed soils and other deleterious materials should be removed from beneath pavement areas. Excavations resulting from the removal of these materials should be backfilled with structural fill. Following removal of these materials, the exposed native soils should be proof-rolled to aid in assessing subgrade condition. Soft areas encountered during proof-rolling should be excavated and replaced with structural fill properly placed and compacted as described below.

The near-surface native soils encountered may be susceptible to disturbance or rutting under the weight of construction equipment if they become wet. In order to reduce the potential for disturbance or rutting, excessive water should not be applied to the surface during earthwork operations and construction should occur during dryer weather. Soils that become excessively rutted, are pumping or otherwise disturbed are not suitable for support of pavements and should be removed and replaced with structural fill.

Structural fill used for site grading below pavement sections should consist of well graded, granular soil with a maximum particle size of 3 inches, 25 to 60 percent passing the No. 4 sieve and having less than 15 percent fines.

All fill should be approved by the geotechnical engineer, should be moisture conditioned to near optimum water content, placed in uniform lifts not exceeding 8 inches in loose thickness, and be compacted to a minimum of 95 percent of the maximum density as determined by ASTM D 1557 (Modified Proctor).

It is the responsibility of the contractor to provide safe working conditions in connection with underground excavations. Temporary construction excavations should be properly sloped or shored. All excavations should be accomplished in accordance with applicable federal, state, and local standards.

GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide testing and observation during excavation, grading, foundation and construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather.

The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is

concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

We appreciate the opportunity to provide our services on this project. Should you have any questions concerning the information contained in this letter, please contact us at your convenience.

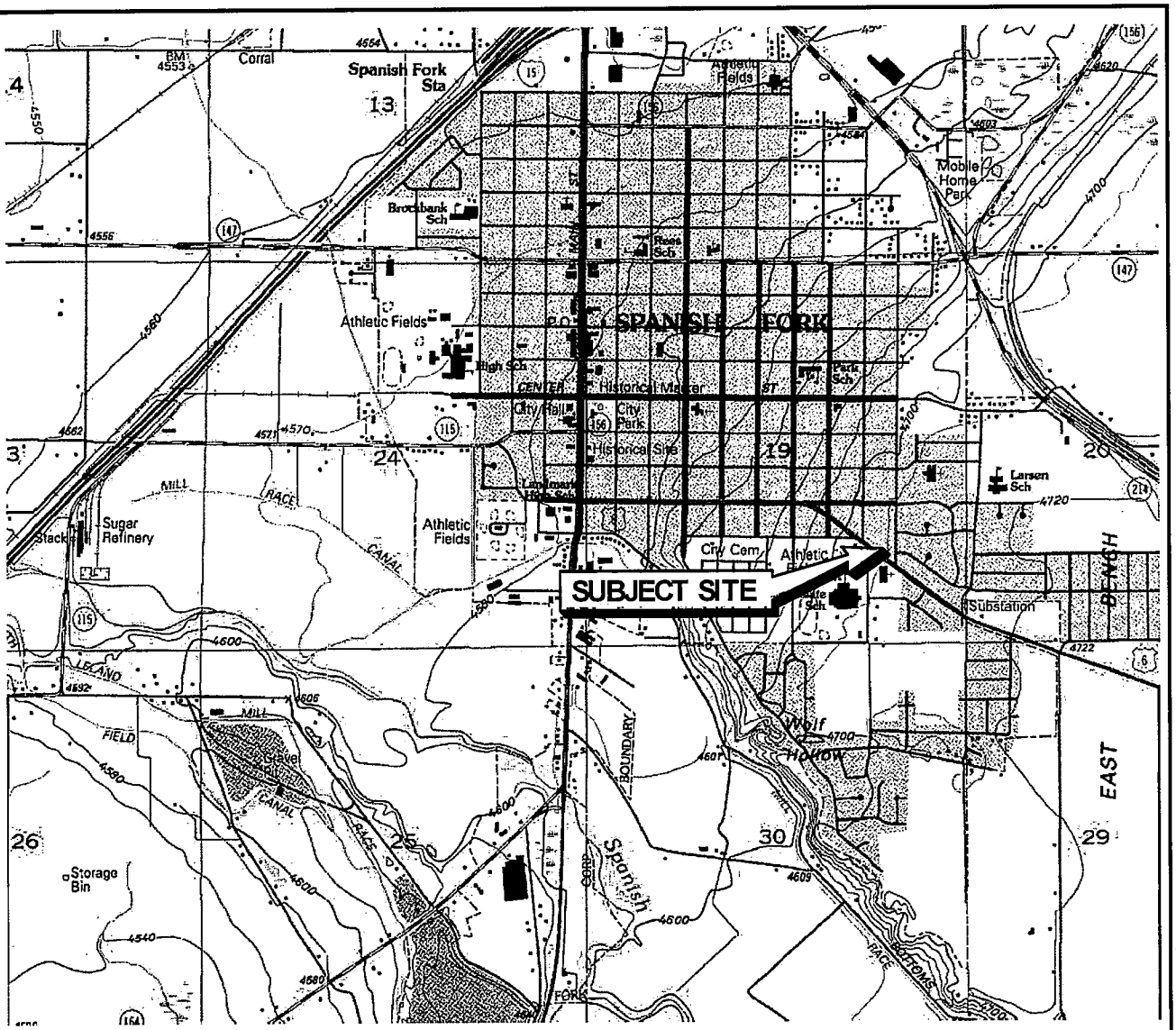
Sincerely,
TERRACON CONSULTANTS

Reviewed By:

Rick L. Chesnut, P.E.
Principal

Curtis J. Tanner, P.E.
Geotechnical Department Manager

RLC/CJT/smm
Copies to: Addressee (2, Electronic)
N:\Projects\2008\61085021\61085021 Pavement.doc



SCALE 1:24,000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

FIGURE 1 – TOPOGRAPHIC MAP
CANYON DRIVE AREA RAODWAY RECONSTRUCTION
SPANISH FORK, UTAH

SPANISH FORK CITY

USGS 7.5 MINUTE SERIES TOPOGRAPHIC MAP
SPANISH FORK, UTAH QUADRANGLE

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

N

Project Mngr:	BBB	Terracon	Project No. 61085021
Designed By:	USGS	12217 S. Lone Peak Pkwy. Ste. 100 Draper, Utah 84020 801.545.8500 fax: 801.545.8600	Scale: 1:24,000
Checked By:	MSP		Date: 3/26/2008
Approved By:	MSP		Drawn By: AC (61)
File Path: N:\Projects\2008\61085021\Figure 1 Topo.ppt			Figure No. 1

LEGEND

Approximate Boring Location

N

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

BORING LOCATION PLAN

CANYON DRIVE AREA RAODWAY RECONSTRUCTION
SPANISH FORK, UTAH

SPANISH FORK CITY

Project Mngr: RLC	Terracon	Project No.	61085021
Designed By:	12217 S. Lone Peak Pkwy. Ste. 100 Draper, Utah 84020 801.545.8500 Fax: 801.545.8600	Scale:	NOT TO SCALE
Checked By: JWG		Date:	3/24/08
Approved By: CJT		Drawn By:	RLC (61)
File Name: N:\Projects\2008\61085021\Boring Plan.doc		Figure No.	–

LOG OF BORING NO. B-01

CLIENT: **Spanish Fork City**

SITE: **Spanish Fork, Utah**

PROJECT: **Spanish Fork City Canyon**

Boring Location: 950 East Sterling Drive

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS Soil Symbol	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES PENETRATION RESISTANCE BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WEIGHT, PCF	TESTS LIQUID LIMIT	TESTS PLASTICITY INDEX	TESTS % PASSING NO. 200 SIEVE	TESTS OTHER
	ASPHALT: four inches thick (0.33)												
	FILL: gravel, brown, four inches thick (0.66) **CLAY:** medium stiff to very stiff, orange to brown	1											
		2	CL	1	SS	12	16	18		29	12		
		3											
		4	CL	2	SS	10	4	17					
		5											
	(5.5)												
	BOTTOM OF BORING AT APPROXIMATELY 5.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▼		▼
WL			

Terracon

BORING STARTED	2-29-08		
BORING COMPLETED	2-29-08		
RIG	ATV	FOREMAN	CJ
LOGGED	CJ	JOB #	61085021

BOREHOLE 99 61085021.GPJ TERRACON.GDT 3/25/08

LOG OF BORING NO. B-02

CLIENT: **Spanish Fork City**

SITE: **Spanish Fork, Utah**

PROJECT: **Spanish Fork City Canyon**

Boring Location: 1003 East Sterling Circle

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS Soil Symbol	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES PENETRATION RESISTANCE BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WEIGHT, PCF	TESTS LIQUID LIMIT	TESTS PLASTICITY INDEX	TESTS % PASSING NO. 200 SIEVE	OTHER
	ASPHALT: five inches thick												
	0.42												
	0.58 **FILL:** gravel, brown, two inches thick												
	CLAY: very soft to soft, orange to brown	1											
		2	CL	1	SS	8	3	22		22	6		
		3											
		4		2	SS	1	1	9					
		5											
	5.5												
	BOTTOM OF BORING AT APPROXIMATELY 5.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▼		▼
WL			

Terracon

BORING STARTED	2-29-08		
BORING COMPLETED	2-29-08		
RIG	ATV	FOREMAN	CJ
LOGGED	CJ	JOB #	61085021

BOREHOLE 99 61085021.GPJ TERRACON.GDT 3/25/08

LOG OF BORING NO. B-03

CLIENT
Spanish Fork City

SITE
Spanish Fork, Utah

PROJECT
Spanish Fork City Canyon

Boring Location: 1111 East Sterling Drive

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS Soil Symbol	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES PENETRATION RESISTANCE BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WEIGHT, PCF	TESTS LIQUID LIMIT	TESTS PLASTICITY INDEX	TESTS % PASSING NO. 200 SIEVE	OTHER
	0.25 **ASPHALT:** three inches thick												
	0.67 **FILL:** gravel, brown, five inches thick												
	CLAY: stiff, orange to brown	1											
		2	CL	1	SS	18	10	21		30	9		
		3											
		4		2	SS		9	26					
		5											
	5.5												
	BOTTOM OF BORING AT APPROXIMATELY 5.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▼		▼
WL			

Terracon

BORING STARTED	2-29-08		
BORING COMPLETED	2-29-08		
RIG	ATV	FOREMAN	CJ
LOGGED	CJ	JOB #	61085021

BOREHOLE 99 61085021.GPJ TERRACON.GDT 3/25/08

LOG OF BORING NO. B-04

CLIENT: **Spanish Fork City**

SITE: **Spanish Fork, Utah**

PROJECT: **Spanish Fork City Canyon**

Boring Location: 495 South Nebo Street

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS Soil Symbol	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES PENETRATION RESISTANCE BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WEIGHT, PCF	TESTS LIQUID LIMIT	TESTS PLASTICITY INDEX	TESTS % PASSING NO. 200 SIEVE	OTHER
	0.25 **ASPHALT:** three inches thick												
	0.58 **FILL:** gravel, brown, four inches thick												
	CLAY: stiff, orange to brown	1											
			CL	1	SS	16	8	17		24	8		
		2											
		3											
				2	SS	18	11	19					
		4											
	5 **SILTY SAND:** medium dense, orange-brown	5											
	5.5 BOTTOM OF BORING AT APPROXIMATELY 5.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▼		▼
WL			

Terracon

BORING STARTED	2-29-08		
BORING COMPLETED	2-29-08		
RIG	ATV	FOREMAN	CJ
LOGGED	CJ	JOB #	61085021

BOREHOLE 99 61085021.GPJ TERRACON.GDT 3/25/08

LOG OF BORING NO. B-05

CLIENT
Spanish Fork City

SITE
Spanish Fork, Utah

PROJECT
Spanish Fork City Canyon

Boring Location: 1135 East 410 South

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS Soil Symbol	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES PENETRATION RESISTANCE BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WEIGHT, PCF	TESTS LIQUID LIMIT	TESTS PLASTICITY INDEX	TESTS % PASSING NO. 200 SIEVE	OTHER
	0.33 **ASPHALT:** four inches thick												
	0.75 **FILL:** gravel, brown, two to five inches thick												
	CLAY: very stiff, brown to orange, with silty sand layers	1	CL	1	SS	18	14	19		31	14		
		2											
		3		2	SS	18	23	16					
		4											
	5.5	5											
	BOTTOM OF BORING AT APPROXIMATELY 5.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▼		▼
WL			

Terracon

BORING STARTED			2-29-08
BORING COMPLETED			2-29-08
RIG	ATV	FOREMAN	CJ
LOGGED	CJ	JOB #	61085021

BOREHOLE 99 61085021.GPJ TERRACON.GDT 3/25/08

LOG OF BORING NO. B-06

CLIENT: **Spanish Fork City**

SITE: **Spanish Fork, Utah**

PROJECT: **Spanish Fork City Canyon**

Boring Location: 1035 East Canyon Drive

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS Soil Symbol	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES PENETRATION RESISTANCE BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WEIGHT, PCF	TESTS LIQUID LIMIT	TESTS PLASTICITY INDEX	TESTS % PASSING NO. 200 SIEVE	OTHER
	0.33 **ASPHALT:** four inches thick												
	0.58 **FILL:** gravel, brown, three inches thick **CLAY:** stiff to very stiff, brown to orange	1											
		2	CL	1	SS	18	18	19		26	10		
		3											
		4		2	SS	18	9	17					
		5											
	5.5 BOTTOM OF BORING AT APPROXIMATELY 5.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▼		▼
WL			

Terracon

BORING STARTED	2-29-08		
BORING COMPLETED	2-29-08		
RIG	ATV	FOREMAN	CJ
LOGGED	CJ	JOB #	61085021

BOREHOLE 99 61085021.GPJ TERRACON.GDT 3/25/08

LOG OF BORING NO. B-07

CLIENT
Spanish Fork City

SITE
Spanish Fork, Utah

PROJECT
Spanish Fork City Canyon

Boring Location: 914 East Canyon Drive

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS Soil Symbol	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES PENETRATION RESISTANCE BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WEIGHT, PCF	TESTS LIQUID LIMIT	TESTS PLASTICITY INDEX	TESTS % PASSING NO. 200 SIEVE	OTHER
	ASPHALT: four inches thick (0.33)												
	FILL: gravel, brown, four inches thick (0.66)												
	SILTY SAND: very loose to loose, brown	1											
		2		1	SS	4	4	12				17	
		3											
		4		2	SS	14	3	13					
		5											
	5.5												
	BOTTOM OF BORING AT APPROXIMATELY 5.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	NE	WD	
WL			
WL			

Terracon

BORING STARTED	2-29-08		
BORING COMPLETED	2-29-08		
RIG	ATV	FOREMAN	CJ
LOGGED	CJ	JOB #	61085021

BOREHOLE 99 61085021.GPJ TERRACON.GDT 3/25/08

LOG OF BORING NO. B-08

CLIENT: **Spanish Fork City**

SITE: **Spanish Fork, Utah**

PROJECT: **Spanish Fork City Canyon**

Boring Location: 945 East Flonette Avenue

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS Soil Symbol	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES PENETRATION RESISTANCE BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WEIGHT, PCF	TESTS LIQUID LIMIT	TESTS PLASTICITY INDEX	TESTS % PASSING NO. 200 SIEVE	OTHER
	ASPHALT: four inches thick (0.33)												
	FILL: gravel, brown, three inches thick (0.58)												
	CLAY: very stiff, brown to orange	1											
		2	CL	1	SS	18	14	20		24	6		
		3											
		4		2	SS	16	20	20					
		5											
	5.5												
	BOTTOM OF BORING AT APPROXIMATELY 5.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▼		▼
WL			

Terracon

BORING STARTED	2-29-08		
BORING COMPLETED	2-29-08		
RIG	ATV	FOREMAN	CJ
LOGGED	CJ	JOB #	61085021

BOREHOLE 99 61085021.GPJ TERRACON.GDT 3/25/08

LOG OF BORING NO. B-09

CLIENT
Spanish Fork City

SITE
Spanish Fork, Utah

PROJECT
Spanish Fork City Canyon

Boring Location: 1023 East 300 South

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS Soil Symbol	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES PENETRATION RESISTANCE BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WEIGHT, PCF	TESTS LIQUID LIMIT	TESTS PLASTICITY INDEX	TESTS % PASSING NO. 200 SIEVE	OTHER
	0.25 **ASPHALT:** three inches thick												
	FILL: gravel, brown, 1 inches thick												
	1 **CLAY:** medium stiff to very stiff, brown to orange	1											
		2	CL	1	SS	2	18	13		25	7	43	
		3											
		4		2	SS	18	6						
	5.5	5											
	BOTTOM OF BORING AT APPROXIMATELY 5.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▼		▼
WL			

Terracon

BORING STARTED	2-29-08		
BORING COMPLETED	2-29-08		
RIG	ATV	FOREMAN	CJ
LOGGED	CJ	JOB #	61085021

BOREHOLE 99 61085021.GPJ TERRACON.GDT 3/25/08

LOG OF BORING NO. B-10

CLIENT
Spanish Fork City

SITE
Spanish Fork, Utah

PROJECT
Spanish Fork City Canyon

Boring Location: 428 South Nebo Street

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS Soil Symbol	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES PENETRATION RESISTANCE BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WEIGHT, PCF	TESTS LIQUID LIMIT	TESTS PLASTICITY INDEX	TESTS % PASSING NO. 200 SIEVE	OTHER
	ASPHALT: four inches thick (0.33)												
	FILL: gravel, brown, four inches thick (0.66)												
	SILTY CLAY: stiff, brown to orange	1											
		2	CL ML	1	SS	18	9			24	4		
		3											
		4		2	SS		7						
		5											
	5.5												
	BOTTOM OF BORING AT APPROXIMATELY 5.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▼		▼
WL			

Terracon

BORING STARTED	2-29-08		
BORING COMPLETED	2-29-08		
RIG	ATV	FOREMAN	CJ
LOGGED	CJ	JOB #	61085021

BOREHOLE 99 61085021.GPJ TERRACON.GDT 3/25/08

LOG OF BORING NO. B-11

CLIENT: **Spanish Fork City**

SITE: **Spanish Fork, Utah**

PROJECT: **Spanish Fork City Canyon**

Boring Location: 342 South 900 East

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS Soil Symbol	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES PENETRATION RESISTANCE BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WEIGHT, PCF	TESTS LIQUID LIMIT	TESTS PLASTICITY INDEX	TESTS % PASSING NO. 200 SIEVE	OTHER
	0.17 **ASPHALT:** two inches thick												
	FILL: sandy gravel, brown	1											
		2		1	SS	4	35	6				18	
		3											
	3.5 **SILTY SAND:** medium dense, brown	4		2	SS		21						
	5.5	5											
	BOTTOM OF BORING AT APPROXIMATELY 5.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▼		▼
WL			

Terracon

BORING STARTED	2-29-08		
BORING COMPLETED	2-29-08		
RIG	ATV	FOREMAN	CJ
LOGGED	CJ	JOB #	61085021

BOREHOLE 99 61085021.GPJ TERRACON.GDT 3/25/08

LOG OF BORING NO. B-12

CLIENT: **Spanish Fork City**

SITE: **Spanish Fork, Utah**

PROJECT: **Spanish Fork City Canyon**

Boring Location: 436 South 900 East

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS Soil Symbol	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES PENETRATION RESISTANCE BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WEIGHT, PCF	TESTS LIQUID LIMIT	TESTS PLASTICITY INDEX	TESTS % PASSING NO. 200 SIEVE	OTHER
	ASPHALT: four inches thick (0.33)	1											
	SILTY SAND: loose, brown, with some gravel	2		1	SS	10	9	14				29	
		3											
		4		2	SS	15	7						
		5											
	5.5												
	BOTTOM OF BORING AT APPROXIMATELY 5.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▼		▼
WL			

Terracon

BORING STARTED	2-29-08		
BORING COMPLETED	2-29-08		
RIG	ATV	FOREMAN	CJ
LOGGED	CJ	JOB #	61085021

BOREHOLE 99 61085021.GPJ TERRACON.GDT 3/25/08

FLEXIBLE PAVEMENT DESIGN

PROJECT: **Canyon Drive Area Roadway Reconstruction** PROJECT NO.: 61085021
Spanish Fork, Utah

CALCULATIONS BY: Rick L. Chesnut, P.E.

SEGMENT: **Low-Volume Interior Streets** DATE: 3/24/2008

DESIGN PARAMETERS

Proposed Paving Year	2008
Initial Serviceability Index	4.5
Terminal Serviceability Index	2.5
Traffic Analysis Period (years)	20
Reliability Factor (%)	90
Overall Deviation	0.45
Dynamic C.B.R. of Subgrade Soils (%)	4.0
Modulus of Subgrade Reaction (psi)	6,000
Drainage Coefficient, C_d	1.0
Frost Depth, inches	20
Required Structural Number	1.74

DESIGN TRAFFIC

Base Year AADT	
Final Year AADT	
Total Design Lane ESALs	10,000
Design Lane ESALs/Day	27

PAVEMENT DESIGN

	Thickness (in)	Layer Coefficient
Granular Borrow	0	0.08
Untreated Base	8	0.10
Asphalt Concrete Pavement	3	0.40

********** RECOMMENDED PAVEMENT SECTION **********

	Thickness (in)	Structural Number
Asphaltic Concrete pavement	**3.0**	1.20
Untreated Base	**8**	0.80
Granular Borrow		
TOTAL	11.0	2.00

Terracon

FLEXIBLE PAVEMENT DESIGN

PROJECT: **Canyon Drive Area Roadway Reconstruction** PROJECT NO.: 61085021
Spanish Fork, Utah

CALCULATIONS BY: Rick L. Chesnut, P.E.

SEGMENT: **900 East Street** DATE: 3/24/2008

DESIGN PARAMETERS

Proposed Paving Year	2008
Initial Serviceability Index	4.5
Terminal Serviceability Index	2.5
Traffic Analysis Period (years)	20
Reliability Factor (%)	90
Overall Deviation	0.45
Dynamic C.B.R. of Subgrade Soils (%)	4.0
Modulus of Subgrade Reaction (psi)	6,000
Drainage Coefficient, C_d	1.0
Frost Depth, inches	20
Required Structural Number	2.55

DESIGN TRAFFIC

Base Year AADT	
Final Year AADT	
Total Design Lane ESALs	100,000
Design Lane ESALs/Day	274

PAVEMENT DESIGN

	Thickness (in)	Layer Coefficient
Granular Borrow	6	0.08
Untreated Base	6	0.10
Asphalt Concrete Pavement	4	0.40

********** RECOMMENDED PAVEMENT SECTION **********

	Thickness (in)	Structural Number
Asphaltic Concrete pavement	**4.0**	1.60
Untreated Base	**6**	0.60
Granular Borrow	**6**	0.48
TOTAL	16.0	2.68

Terracon