

**GEOTECHNICAL ENGINEERING  
SERVICES REPORT  
NO. 1-21006**

**PASEO DEL SOL EXTENSION & LOOP ROAD**

**SANTA FE, NEW MEXICO**

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**PREPARED FOR:**

**TIERRA CONTENTA CORPORATION**

April 17, 2023  
Job No. 1-21006

**Tierra Contenta Corporation  
1111 Agua Fria Street  
Santa Fe, New Mexico 87501**

**ATTN: Kurt Krahn, Board Member**

**RE: Geotechnical Engineering Services Report  
Paseo Del Sol Extension & Loop Road  
Santa Fe, New Mexico**

Dear Mr. Krahn:

Submitted herein is the Geotechnical Engineering Services report for the above referenced project. The report contains the results of our field investigation, laboratory testing, and recommendations for pavement section design as well as criteria for site grading.

It has been a pleasure to serve you on this project. If you should have any questions, please contact this office.

Respectfully submitted:

Reviewed by:

**GEO-TEST, INC.**



Timothy Matson, Staff Engineer



Patrick R. Whorton, PE

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## **INTRODUCTION**

This report presents the results of a geotechnical investigation performed by this firm for the proposed extension of Paseo Del Sol and construction of Loop Road in Santa Fe, New Mexico.

The objective of this investigation is to:

- 1) Evaluate the nature and engineering properties of the subsurface soils underlying the proposed roadway.
- 2) To provide recommendations for new pavement design as well as criteria for site grading.

The investigation includes subsurface exploration, selected soil sampling, laboratory testing of the samples, performing an engineering analysis and preparation of this report.

## **PROPOSED CONSTRUCTION & TRAFFIC LOADS**

It is understood that the project consists of the construction of new roadway, extending 5,810 linear feet of Paseo Del Sol between Jaguar Drive and Herrera Drive. New pavement construction will also consist of the construction of about 5,500 linear feet of Loop Road.

Traffic data was supplied by Walker Engineering. This data indicates that Paseo Del Sol will be subjected to a maximum daily traffic (ADT) of 7,000 vehicles per day, South Loop Road 4,500 and North Loop Road 1,900. It is assumed that this data accounts for growth rate and that a majority, 97 to 98 percent of the traffic will consist of cars and light trucks while 1 percent will consist of buses and 1 to 2 percent single unit trucks.

Axle load equivalency factors of 0.0008, 0.6808 and 0.189 were used for cars/light trucks, buses and single unit trucks, respectively, resulting in a 20-year design Equivalent Single 18-kip Axle Load (ESAL) of 580,700 for Paseo Del Sol, 311,484 for the South Loop Road and 131,515 for the North Loop Road. The calculation of the ESALS is as follows:

$$\text{ESAL} = \text{ADT} * 365 * \text{Design Years} * [(\% \text{Auto} * \text{Equivalency Factor Auto}) + (\% \text{SUT} * \text{Equivalency Factor SUT}) + (\% \text{Buses} * \text{Equivalency Factor Buses})]$$

### **Paseo Del Sol**

$$\text{ESAL} = 7,000 * 365 * 20 [(0.97 * 0.0008) + (0.01 * 0.189) + (0.02 * 0.6808)] = 580,700.$$

**South Loop**

ESAL = 4,500 \* 365 \* 20 [(0.98 \* 0.0008) +(0.01 \* 0.189) +(0.01 \* 0.6808)] = 311,484.

**North Loop**

ESAL = 1,900 \* 365 \* 20 [(0.98 \* 0.0008) +(0.01 \* 0.189) +(0.01 \* 0.6808)] = 131,515.

Should traffic data or other project details vary significantly from those outlined above, this firm should be notified for review and possible revision of recommendations contained herein.

**FIELD EXPLORATION**

Eight (8) exploratory borings were drilled to depths of approximately 5½ feet below existing site grades. The approximate locations of the borings are shown on the Boring Location Map, Figure 1. The soils encountered in the borings were continuously examined, visually classified and logged during the drilling operation by the field engineer. The boring logs are presented in a following section of this report. Drilling was accomplished using a truck mounted drill rig equipped with 2.25-inch inside diameter continuous flight hollow stem auger. Subsurface materials were sampled at five-foot intervals or less utilizing an open tube split barrel sampler driven by a standard penetration test hammer. Composite bulk samples were also collected from the auger cuttings from some of the borings.

**LABORATORY TESTING**

Selected samples were tested in the laboratory to determine certain engineering properties of the soils. Moisture contents were determined to evaluate the various soil deposits with depth. The results of these tests are shown on the boring logs.

Sieve analysis and Atterberg limits tests were performed to aid in soil classification. The results of these tests are presented in the Summary of Laboratory Results and on the individual test reports presented in a following section of this report. In addition, a moisture density relationship (proctor) test was performed on a composite bulk sample to determine the maximum dry density and optimum moisture content of the near surface soils.

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## **SUBSURFACE SOIL CONDITIONS**

As indicated by the exploratory borings, the native soils encountered along the proposed roadway alignments consist primarily of interbedded layers of sandy clay and clayey sand with varying degrees of cementation (caliche) which were encountered at the surface and extended to the full depth explored. These soils ranged from low to medium plasticity with relative consistencies ranging from soft to firm. Man-made fill soils consisting of clayey sands with various amounts of gravel were encountered in Boring 2 and extended to full depth explored. It appears that these soils were placed during grading of the development of the nearby subdivision and fire station in anticipation of a future extension of Paseo Del Sol West. This area also contains an underground sewer line with associated fills. Gravel with various amounts of sand and silt was encountered in Boring 5. The gravel was found to be non-plastic, dense, extended to full depth explored and was not encountered in other areas of the site. Detailed lithological descriptions are presented on the attached boring logs.

According to the Unified Soil Classification System (USCS), most of the existing near surface subgrade soils located at the boring locations generally consist of Clayey Sand (SC) and Sandy Clay (CL). These soils classify as A-2-6, A-7-6, A-4 & A-6, according to the American Association of State Highway and Transportation Officials (AASHTO) soil classification system. According to the NMDOT, these soils have correlated R-values ranging from 6 to 27 and are considered poor to fair subgrade soils for pavements. Detailed lithological descriptions are presented on the attached boring logs.

Groundwater was not encountered in any of the borings and soil moisture contents were generally low with occasional horizons with a moderate moisture content.

## **PAVEMENT SECTION DESIGN**

Pavement design and analysis was performed in general conformance the procedures outlined in the latest edition of the "Guidelines of Design of Pavement Structures" by the American Association of State Highway and Transportation and the "Structural Design Guide for Flexible Pavements", Bulletin 102, by the New Mexico Department of Transportation. A 20-year Pavement Design Life was used in the analysis.

Pavement design was performed using the WinPAS software. The software performs pavement section thickness design based on the 1993 AASHTO Guide for Design of Pavements Structures.

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Structural Numbers were calculated, based on the input of design ESALS, Reliability (80%), Overall Deviation (0.45), Soil Resilient Modulus (10,035 psi, correlated from R-Value of 16 using the equation  $M_R = 1,155 + 555 \cdot R$ ), Initial Serviceability of 4.2, and Terminal Serviceability of 2.0. Using a layer coefficient of 0.44 for Hot Mix Asphalt (HMA) and 0.11 for aggregate base course and a drainage coefficient of 1, the following pavement sections were determined.

Location	Design ESALS	Hot Mix Asphalt (inch)	Aggregate Base Course (inch)
Paseo Del Sol	580,700	4.0	8.0
South Loop	311,484	4.0	6.0
North Loop	131,515	3.0	7.0

The WinPAS design charts for flexible pavements are attached to this report, Appendix A.

The aggregate base course used in the pavement section should meet NMDOT Type I Base Course specifications and should be placed and compacted according to the method outlined within the Site Grading section of this report.

All paving materials, quality and construction, should conform to the current New Mexico Department of Transportation Standard Specifications for Road and Bridge Construction. The HMA should be SPIII or SPIV, compacted to a target density of 94.5 percent, with a minimum compaction of 92 and a maximum compaction of 97 percent of the theoretical maximum density. The Performance Grade (PG) asphalt binder used should be based on the NMDOT’s Pavement Type Selection and Design Guideline.

**SITE-GRADING**

The following general guidelines should be included in the project construction specifications to provide a basis for quality control during site grading. It is recommended that all structural fill and backfill be placed and compacted under full-time engineering observation and in accordance with the following:

- 1) After site clearing and grubbing and making any required excavations, the exposed soils throughout the roadway areas should be densified prior to placement of subgrade fill, if necessary, or base course.

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- 2) Densification of the exposed native soils should consist of scarifying to a depth of 8 inches, moisture conditioning to -1 percent to +2 percent of the optimum moisture content and compacting the area to a minimum of 95 percent of maximum dry density as determined in accordance with ASTM D-698. The surface should be firm and non-yielding to the heavy compaction equipment.
- 3) Should fill be required to bring the roadways to finish subgrade elevations, the fill should be placed in maximum 8-inch loose lifts and compacted with approved compaction equipment. The subgrade fill should have an correlated R-Value of at least 16. All compaction of subgrade fill should be accomplished to a minimum of 95 percent of the maximum dry density, and within 1 percent below to 2 percent above the optimum moisture content, as determined in accordance with D-1557.
- 4) Base course shall be placed in 8-inch loose lifts and compacted with approved compaction equipment. Loose lifts should be reduced to 4 inches if handheld compaction equipment is used. Compaction of base course shall be accomplished to a minimum of 95 percent of the maximum dry density as determined in accordance with ASTM D-1557. The moisture content of the base course during compaction should be within 2 percent of the optimum moisture content.
- 5) Tests for degree of compaction shall be determined by the ASTM D-1556 method or ASTM D-6938. Observation and field tests shall be carried out during fill and backfill placement by the geotechnical engineer to assist the contractor in obtaining the required degree of compaction. If less than 95 percent is indicated, additional compaction effort shall be made with adjustment of the moisture content as necessary until a minimum of 95 percent compaction is obtained.

### **CONSTRUCTION EXCAVATIONS**

The results of this investigation indicate that the excavations into the native soils encountered in the borings can be readily excavated using normal earth moving equipment, however, areas of strongly cemented caliche and dense gravel will require additional effort. Excavated slopes should be designed and constructed in accordance with 29 CFR 1926, Subpart P, and any applicable state or local regulations. Temporary cut slopes should not exceed 1.5 to 1 (horizontal to vertical). Permanent cut and/or fill slopes should not exceed 2 to 1. All surface waters should be routed so that water does not flow down the face of the excavation slopes. Shoring, bracing or benching should be performed by the contractor in accordance with the strictest governing safety standards.

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In areas where fill is placed on slopes, it is recommended that the new fill be benched into the existing slope with maximum 1.5-foot vertical cuts where the existing slope is steeper than 5:1 (horizontal to vertical). The width of the cut will depend on the inclination of the existing slope. No benching is considered necessary where the existing slope is less than 5:1.

### **MOISTURE PROTECTION**

Increases in the subgrade moisture content can weaken the subgrade soils, thereby shortening pavement life and causing localized failure. Therefore, all paved areas should be graded to drain and not allow any ponding on or within 10 feet paved areas. Positive drainage should be provided away from the perimeter of all paved areas for a distance of at least 10 feet. It is recommended that the pavement be graded with a 2 percent crown or slope to facilitate drainage.

The foregoing recommendations should only be considered minimum requirements for overall site development. It is recommended that a civil/drainage engineer be consulted for more detailed grading and drainage recommendations.

### **FOUNDATION REVIEW AND INSPECTION**

This report has been prepared to aid in the evaluation of this site and to assist in the design of this project. It is recommended that the geotechnical engineer be provided the opportunity to review the final design drawings and specifications in order to determine whether the recommendations in this report are applicable to the final design. Review of the final design drawings and specifications should be noted in writing by the geotechnical engineer.

In order to permit correlation between the conditions encountered during construction and to confirm recommendations presented herein, it is recommended that the geotechnical engineer be retained to perform continuous observations and testing during the earthwork portion of this project.

### **CLOSURE**

Our conclusions, recommendations and opinions presented herein are:

- 1) Based upon our evaluation and interpretation of the findings of the field and laboratory program.

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- 2) Based upon an interpolation of soil conditions between and beyond the explorations.
- 3) Subject to confirmation of the conditions encountered during construction.
- 4) Based upon the assumption that sufficient observation will be provided during construction.
- 5) Prepared in accordance with generally accepted professional geotechnical engineering principles and practice.

This report has been prepared for the sole use of Tierra Contenta Corporation, specifically to aid in the design of the proposed extension of Paseo Del Sol and Loop Road located in Santa Fe, New Mexico, and not for use by any third parties.

We make no other warranty, either express or implied. Any person using this report for bidding or construction purposes should perform such independent investigation as he deems necessary to satisfy himself as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project. If conditions encountered during construction appear to be different than indicated by this report, this office should be notified.

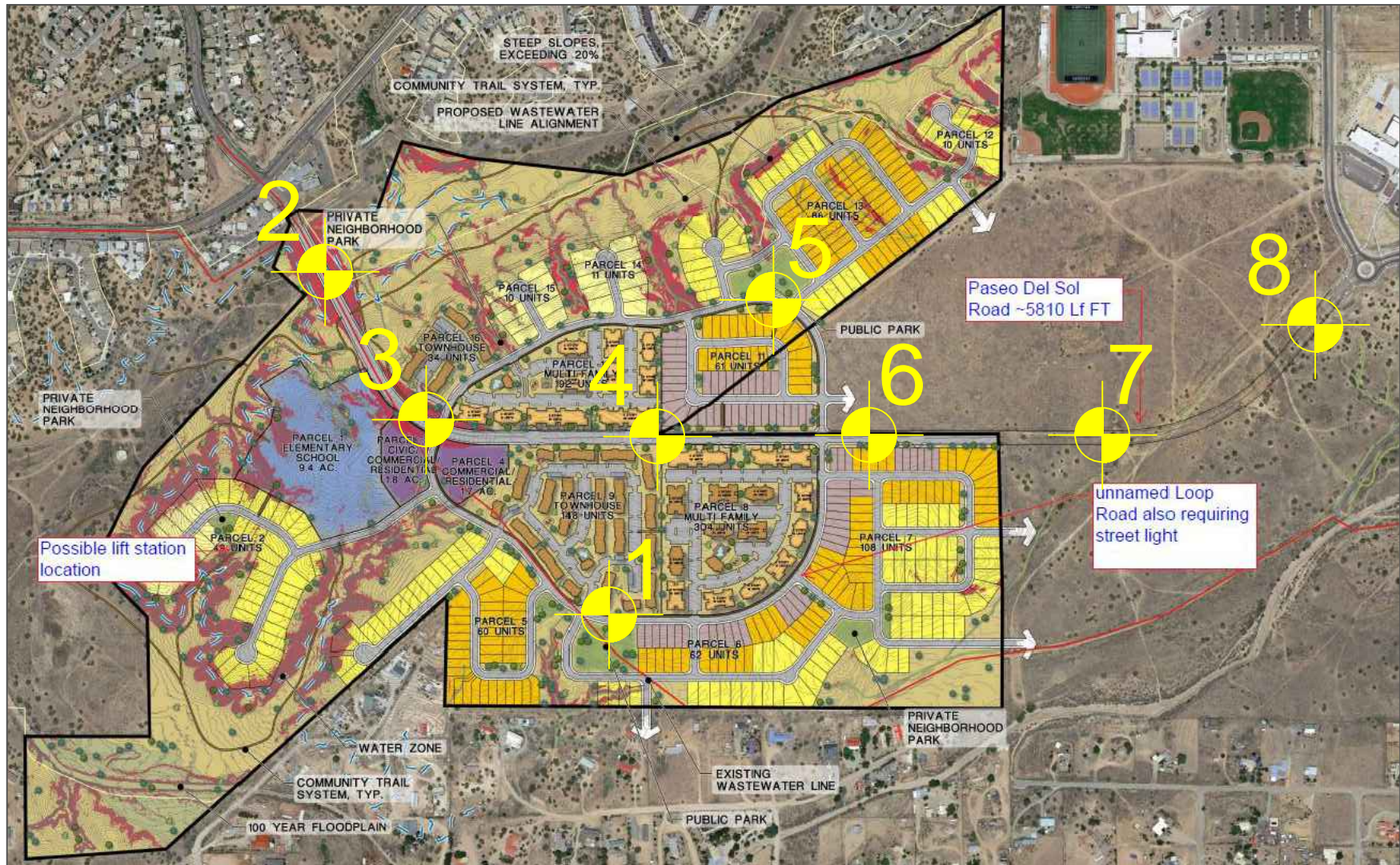
All soil samples will be discarded 30 days after the date of this report unless we receive a specific request to retain the samples for a longer period of time.

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# BORING LOCATION MAP



Paseo Del Sol Extension & Loop Road  
Santa Fe, New Mexico  
Job No. 1-01002

Figure 1



**GEO-TEST**  
GEOTECHNICAL ENGINEERING  
AND MATERIAL TESTING



Project: Paseo Del Sol Extension & Loop Road  
 Date: 03/01/2023 Project No: 1-21006  
 Elevation: Type: 2.25" I.D. HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 1

During Drilling: NONE

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE						
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80					
5								CL	SANDY CLAY, medium plasticity, very firm to firm, strongly to weakly cemented, dry, tan/light brown/white					
		6-6-5 11	SS	9										
		4-5-7 12	SS	9										
		STOPPED AUGER AT 4' STOPPED SAMPELR AT 5.5'												

LOG OF TEST BORING 1-21006-TIERRA CONTENTA.GPJ GEO TEST.GDT 4/12/23

LEGEND

- SS - Split Spoon
- AMSL - Above Mean Sea Level
- AC - Auger Cuttings
- CS - Continuous Sampler
- UD/SL - Undisturbed Sleeve
- UD - Undisturbed
- ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.



Project: Paseo Del Sol Extension & Loop Road  
 Date: 03/01/2023 Project No: 1-21006  
 Elevation: Type: 2.25" I.D. HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 2

During Drilling: NONE

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft
									20 40 60 80
5									
			SS	6-8-10 18	6		FILL	CLAYEY SAND with GRAVEL (SC), fine to coarse grained, low plasticity, medium dense, moist, brown	18
			SS	9-12-12 24	7				24
								STOPPED AUGER AT 4' STOPPED SAMPLER AT 5.5'	

LOG OF TEST BORING 1-21006-TIERRA CONTENTA.GPJ GEO TEST.GDT 4/12/23

LEGEND

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 Elevation: Type: 2.25" I.D. HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 3

During Drilling: NONE

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE											
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80										
									CL	SANDY CLAY, low to medium plasticity, firm, slightly moist to moist, brown									
			SS	10-10-19 29	15														
5			SS	14-17-20 37	6				SM	SILTY SAND with GRAVEL, fine to medium grained, some coarse sand, non-plastic, dense, slightly moist, reddish/brown									
										STOPPED AUGER AT 4' STOPPED SAMPLER AT 5.5'									

LOG OF TEST BORING 1-21006-TIERRA CONTENTA.GPJ GEO TEST.GDT 4/12/23

LEGEND

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Project: Paseo Del Sol Extension & Loop Road  
 Date: 03/01/2023 Project No: 1-21006  
 Elevation: Type: 2.25" I.D. HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 4

During Drilling: NONE

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE				
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80			
5		8-5-3 8	SS	8-5-3 8	11		SC	CLAYEY SAND, fine grained, low plasticity, soft to firm, weakly cemented, slightly moist to dry, tan/light brown/white				
		6-11-16 27	SS	6-11-16 27	9							
								STOPPED AUGER AT 4' STOPPED SAMPLER AT 5.5'				

LOG OF TEST BORING 1-21006-TIERRA CONTENTA GPJ GEO TEST. GDT 4/12/23

LEGEND

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 Elevation: Type: 2.25" I.D. HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 5

During Drilling: NONE

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE				
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80			
5		19-14-19	SS	33	2		GW-GM	GRAVEL with SILT and SAND, fine to coarse grained, non-plastic, dense, dry, brown/light brown *difficult drilling				
		16-22-36	SS	58	2							
								STOPPED AUGER AT 4' STOPPED SAMPLER AT 5.5'				

LOG OF TEST BORING 1-21006-TIERRA CONTENTA.GPJ GEO TEST.GDT 4/12/23

LEGEND

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 Elevation: Type: 2.25" I.D. HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 6

During Drilling: NONE

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE		
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80	
5		4-4-6	SS	10	14		CL	CLAY with SAND, low plasticity, soft to moderately firm, slightly moist to moist, brown		
		8-9-10	SS	19	10		SC			CLAYEY SAND, fine grained, low to medium plasticity, firm, weakly cemented, slightly moist to dry, tan/white to tan/light brown with white inclusions
		8-8-9	SS	17	9			STOPPED AUGER AT 4' STOPPED SAMPLER AT 5.5'		

LOG OF TEST BORING 1-21006-TIERRA CONTENTA GPJ GEO TEST.GDT 4/12/23

LEGEND

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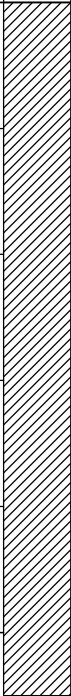
LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 7

During Drilling: NONE

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE											
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80										
5																			
			SS	9-9-8 17	5		CL	CLAY with SAND, low plasticity, firm to moderately firm, slightly moist to dry, tan/light brown											
			SS	8-5-5 10	5														
								STOPPED AUGER AT 4' STOPPED SAMPLER AT 5.5'											

LOG OF TEST BORING 1-21006-TIERRA CONTENTA.GPJ GEO TEST.GDT 4/12/23

LEGEND

- SS - Split Spoon
- AMSL - Above Mean Sea Level
- AC - Auger Cuttings
- CS - Continuous Sampler
- UD/SL - Undisturbed Sleeve
- UD - Undisturbed
- ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.



# SUMMARY OF LABORATORY RESULTS

TEST HOLE	DEPTH (FEET)	UNIFIED CLASS	(% MOIST)	LL	PI	SIEVE ANALYSIS PERCENT PASSING											
						NO 200	NO 100	NO 40	NO 10	NO 4	3/8"	1/2"	3/4"	1"	1 1/2"	2"	4"
1	3.0		8.9														
1	5.0	CL	8.6	41	23	50	67	81	93	98	99	100					
2	3.0	SC	6.2	30	15	22	29	40	57	71	87	95	100				
2	5.0		6.5														
3	3.0	CL	15.0	36	18	58	72	83	95	98	99	100					
3	5.0		6.1														
4	3.0		10.6														
4	5.0	SC	8.8	31	13	50	70	85	97	99	100						
5	3.0	GW-GM	1.7	NP	NP	7	10	16	29	42	57	65	76	84	99		
5	5.0		2.2														
6	1.0	CL	14.4	25	8	72	85	92	99	100							
6	3.0		10.0														
6	5.0	SC	8.9	38	19	37	54	68	90	97	100						
7	3.0	CL	5.2	29	14	60	75	83	93	97	99	99	100				
7	5.0		4.9														
8	3.0	SC	7.8	45	25	39	57	73	92	97	99	100					
8	5.0		7.3														
Bulk	0.0 - 5.0	SC	3.0	33	15	46	61	72	90	100							

SUMMARY OF LABORATORY RESULTS: 1-21006-TIERRA CONTENIDA.GPJ GEO TEST.GDT 4/12/23



LL = LIQUID LIMIT  
PI = PLASTICITY INDEX  
NP = NON PLASTIC or NO VALUE

Project: Paseo Del Sol Extension & Loop Road  
Location: Santa Fe, New Mexico  
Number: 1-21006

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Classification	Water Content (%)	Dry Density (pcf)	AASHTO CLASS	Corr. R-Value
1	5.0	41	18	23	12.5	50	CL	8.6		A-7-6	6
2	3.0	30	15	15	19	22	SC	6.2		A-2-6	27
3	3.0	36	18	18	12.5	58	CL	15.0		A-6	10
4	5.0	31	18	13	9.5	50	SC	8.8		A-6	11
5	3.0	NP	NP	NP	38	7	GW-GM	1.7		A-1-a	72
6	1.0	25	17	8	4.75	72	CL	14.4		A-4	26
6	5.0	38	19	19	9.5	37	SC	8.9		A-6	9
7	3.0	29	15	14	19	60	CL	5.2		A-6	10
8	3.0	45	20	25	12.5	39	SC	7.8		A-7-6	7
Bulk	2.5	33	18	15	4.75	46	SC	3.0		A-6	10

SUMMARY AASHTO 1-21006-TIERRA CONTENTA.GPJ GEO-TEST.GDT 4/12/23



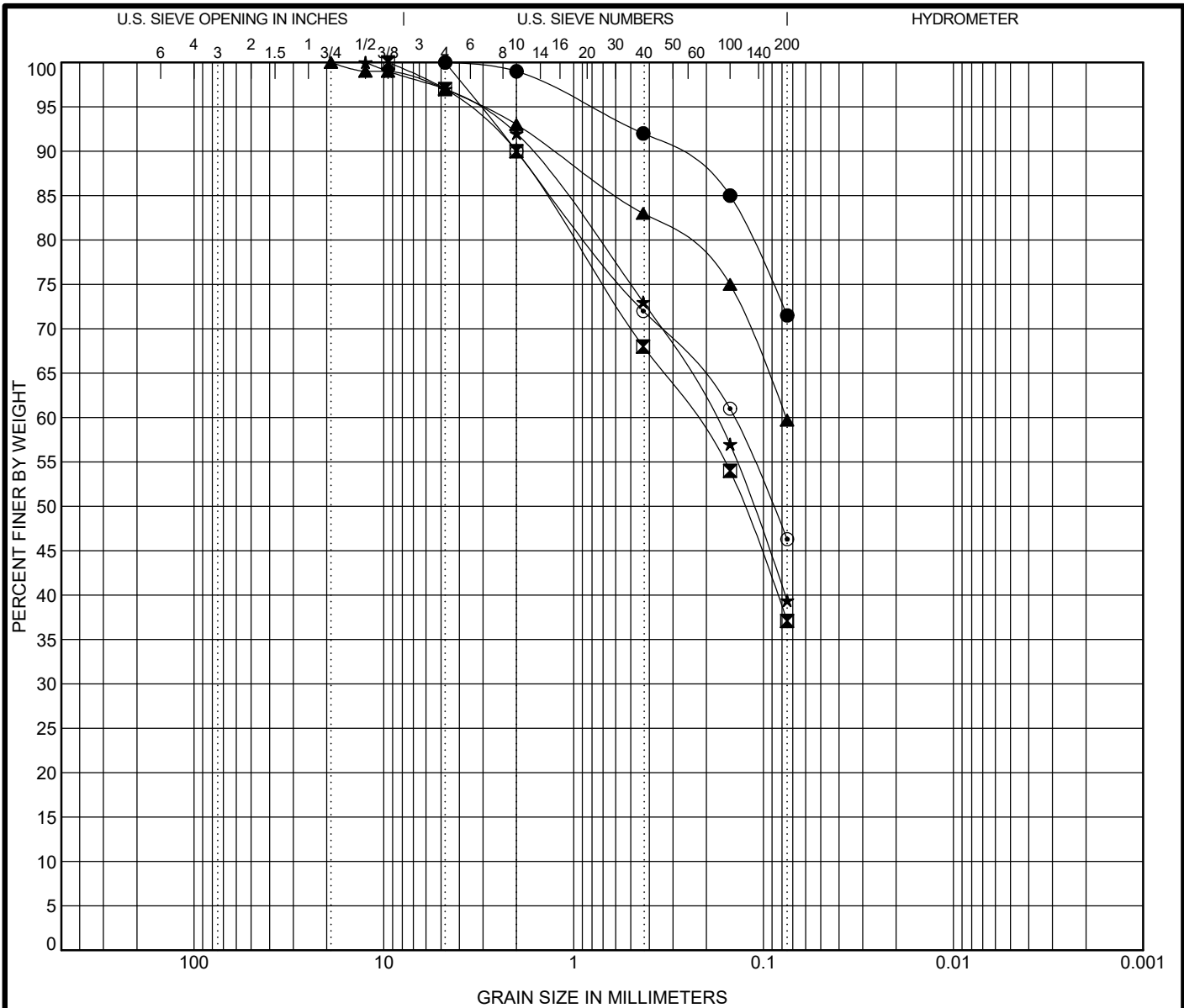
**Summary of Laboratory Results**

Project: Paseo Del Sol Extension & Loop Road

Location: Santa Fe, New Mexico

Number: 1-21006





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification				LL	PL	PI	Cc	Cu
●	6 1.0	LEAN CLAY with SAND(CL)				25	17	8		
☒	6 5.0	CLAYEY SAND(SC)				38	19	19		
▲	7 3.0	SANDY LEAN CLAY(CL)				29	15	14		
★	8 3.0	CLAYEY SAND(SC)				45	20	25		
◎	Bulk 0.0 - 5.0	CLAYEY SAND(SC)				33	18	15		

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	6 1.0	4.75				0.0	28.5	71.5	
☒	6 5.0	9.5	0.236			3.0	59.9	37.1	
▲	7 3.0	19	0.076			3.0	37.3	59.7	
★	8 3.0	12.5	0.183			3.0	57.6	39.4	
◎	Bulk 0.0 - 5.0	4.75	0.143			0.0	53.7	46.3	

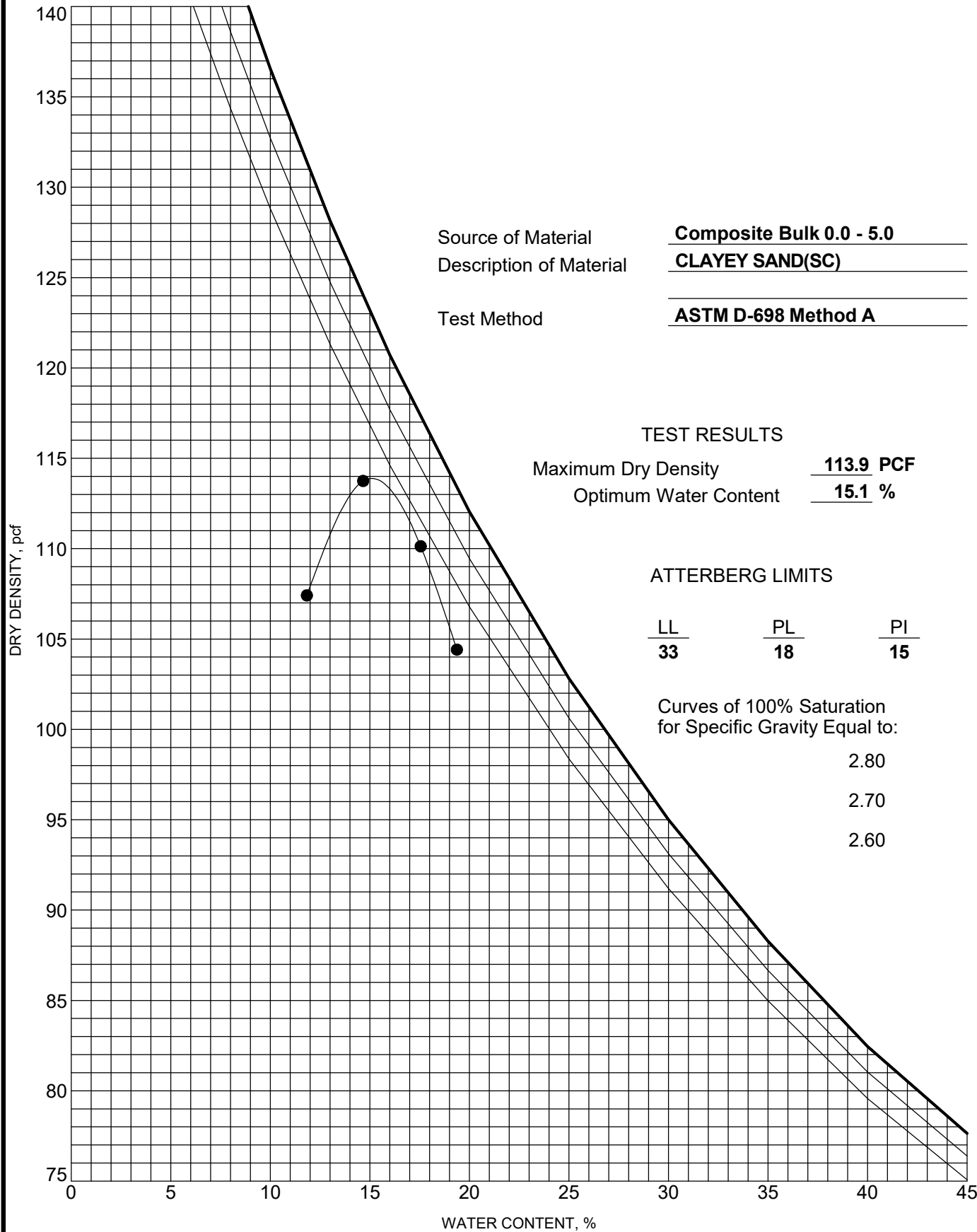


**GRAIN SIZE DISTRIBUTION**

Project: Paseo Del Sol Extension & Loop Road  
 Location: Santa Fe, New Mexico  
 Number: 1-21006

U.S. GRAIN SIZE 1-21006-TIERRA CONTENTA.GPJ GEO TEST.GDT 4/12/23

US COMPACTION 1-21006-TIERRA CONTENTA.GPJ GEO TEST.GDT 4/12/23



### MOISTURE-DENSITY RELATIONSHIP

Project: Paseo Del Sol Extension & Loop Road

Location: Santa Fe, New Mexico

Number: 1-21006

# APPENDIX A

# WinPAS

Pavement Thickness Design According to  
**1993 AASHTO Guide for Design of Pavements Structures**  
American Concrete Pavement Association

## Flexible Design Inputs

Project Name: Paseo Del Sol Extension  
Route: Paseo Del Sol  
Location: Santa Fe, New Mexico

## Flexible Pavement Design/Evaluation

<b>Structural Number</b>	2.63	<b>Subgrade Resilient Modulus</b>	10,035.00 psi
<b>Total Flexible ESALs</b>	580,700	<b>Initial Serviceability</b>	4.20
<b>Reliability</b>	80.00 percent	<b>Terminal Serviceability</b>	2.50
<b>Overall Standard Deviation</b>	0.45		

## Layer Pavement Design/Evaluation

Layer Material	Layer Coefficient	Drainage Coefficient	Layer Thickness	Layer SN
Asphalt Cement Concrete	0.44	1.00	4.00	1.76
Graded Stone Base	0.11	1.00	8.00	0.88
			$\Sigma$ SN	2.64

# WinPAS

Pavement Thickness Design According to  
**1993 AASHTO Guide for Design of Pavements Structures**  
American Concrete Pavement Association

## Flexible Design Inputs

Project Name: Paseo Del Sol Extension  
Route: Paseo Del Sol  
Location: Santa Fe, New Mexico

## Flexible Pavement Design/Evaluation

<b>Structural Number</b>	2.37	<b>Subgrade Resilient Modulus</b>	10,035.00 psi
<b>Total Flexible ESALs</b>	311,484	<b>Initial Serviceability</b>	4.20
<b>Reliability</b>	80.00 percent	<b>Terminal Serviceability</b>	2.50
<b>Overall Standard Deviation</b>	0.45		

## Layer Pavement Design/Evaluation

Layer Material	Layer Coefficient	Drainage Coefficient	Layer Thickness	Layer SN
Asphalt Cement Concrete	0.44	1.00	4.00	1.76
Graded Stone Base	0.11	1.00	6.00	0.66
			$\Sigma$ SN	2.42

# WinPAS

Pavement Thickness Design According to  
**1993 AASHTO Guide for Design of Pavements Structures**  
American Concrete Pavement Association

## Flexible Design Inputs

Project Name: Paseo Del Sol Extension  
Route: North Loop  
Location: Santa Fe, New Mexico

## Flexible Pavement Design/Evaluation

<b>Structural Number</b>	2.05	<b>Subgrade Resilient Modulus</b>	10,035.00 psi
<b>Total Flexible ESALs</b>	131,515	<b>Initial Serviceability</b>	4.20
<b>Reliability</b>	80.00 percent	<b>Terminal Serviceability</b>	2.50
<b>Overall Standard Deviation</b>	0.45		

## Layer Pavement Design/Evaluation

Layer Material	Layer Coefficient	Drainage Coefficient	Layer Thickness	Layer SN
Asphalt Cement Concrete	0.44	1.00	3.00	1.32
Graded Stone Base	0.11	1.00	7.00	0.77
			$\Sigma$ SN	2.09