

Geotechnical Report

US 181

From Station 550+82 to 745+00

Prepared for:



Under TxDOT Contract 36-7IDP5008 (WA#1)

Gregory, San Patricio, Texas

CSJ Number 0101-04-097

ETTL Project Number T612-17

Prepared By:



**ETTL Engineers &
Consultants Inc.**

Rev.	Date	Reason for Revision	By	Check	P.E.
00	4-6-18	Draft	RMD	RWG	CBQ
01	4/18/2018	Sign Additions	RMD	RMD	CBQ
02	6/25/2018	Signed Report	RMD	RMD	CBQ

Three of the bridge borings were converted to piezometers. Borings B-3, B-6 and B-11 were used to install temporary piezometers PZ-3, PZ-6 and PZ-11. Water readings in the piezometers ranged from elevation 19.5 to 20 msl.

It should be noted, however, that seasonal groundwater conditions might vary throughout the year depending upon prevailing climatic conditions. This magnitude of variance will be largely dependent upon the duration and intensity of precipitation, surface drainage characteristics of the surrounding area, and significant changes in site topography.

4.5 Pavement Sections

The pavement section was measured in each of the pavement borings and is typically around 15 to 16 inches of total thickness. The actual measurements of the pavement section are given in **Table 4.4** below.

Table 4.5 Existing Pavement Sections			
Boring	HMAC Thickness (in.)	Flexible Base Thickness (in.)	Total Thickness (in.)
PC-1 (NBFR)	9.0	6.0	15
PC-2 (NBML)	10.0	6.0	16
PC-3 (SBML)	9.0	6.0	15
PC-4 (SBFR)	7.0	9.0	16

4.5.1 Pavement Subgrade

New ramps are proposed in several locations as well as new main lane paving that will connect the new main lane bridges to the current main lanes. The design of the pavement section was outside the scope of this work, but borings were taken to determine the subgrade soils that will be encountered. Of the 25 borings, the majority (16 borings) have a fat clay (CH) subgrade soils. The PI's of the subgrade in these borings ranged from 38 to 68. Six of the borings have a lean clay (CL) at the surface with PI's ranging from 21 to 31. The three remaining borings have a clayey sand (SC) at the surface with a PI of approximately 21.

The soils should be treated with lime in accordance with Item 260, "Lime Treatment (Road Mixed)". The amount of lime should be determined using test method Tex-121-E.

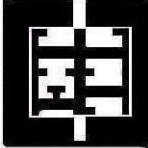
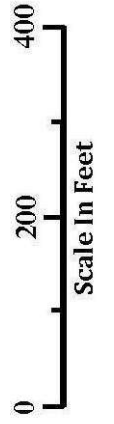
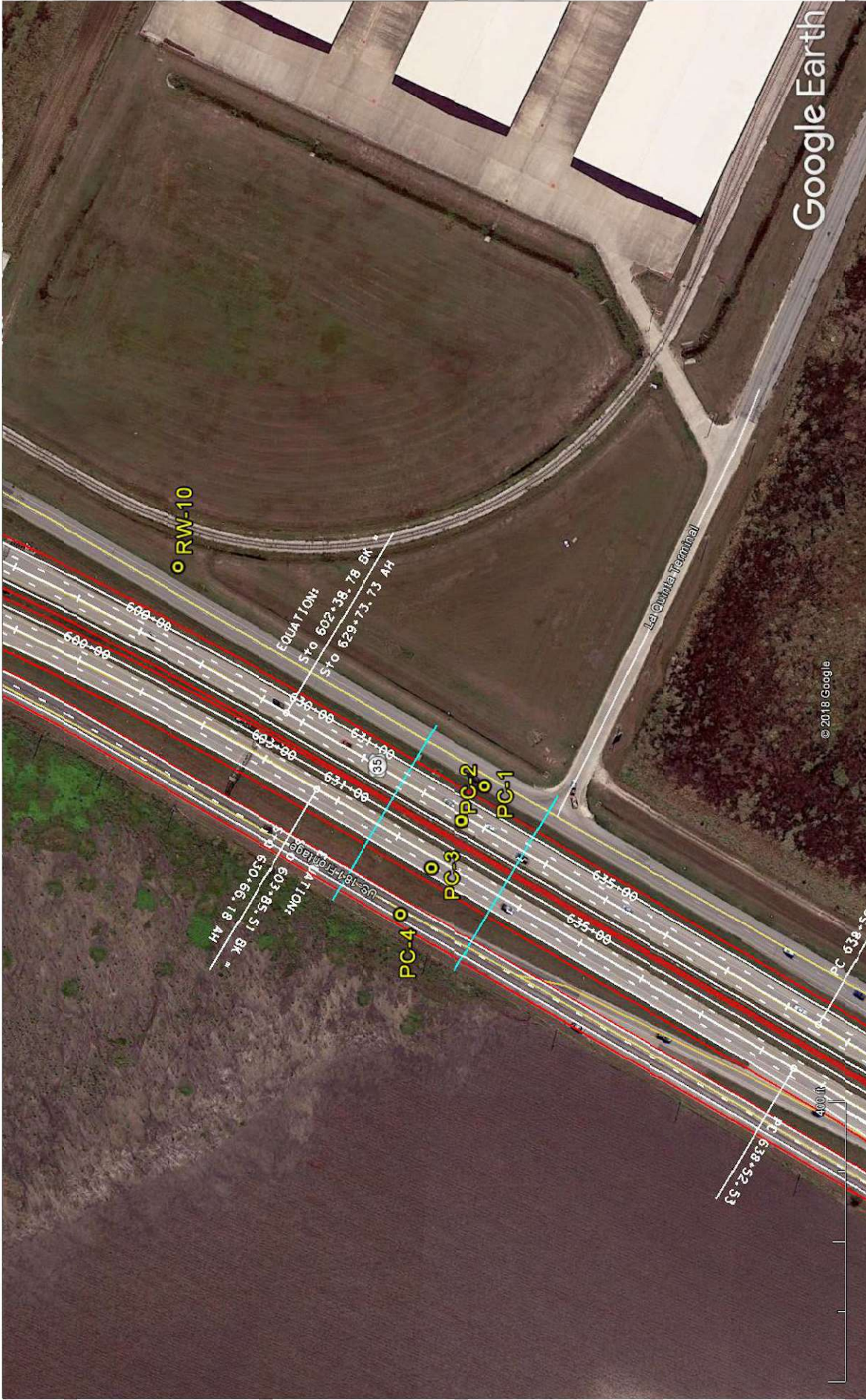
4.6 Heavy Haul Road

The heavy haul road will be a section of the project from near the intersection with LaQuinta Terminal and to the north approximate 200 feet. This section will have very thick concrete paving for the main lanes and the frontage roads to allow heavy equipment crossing of the highway. The existing pavement section will be removed. The thicknesses of the pavement are listed in **Table 4.4** above.

5.0 BRIDGE FOUNDATION RECOMMENDATIONS

Only two bridges will be constructed for this project. Bridges are identified as the US 181 South Bound Overpass at Sunset Road and SH 35 and US 181 North Bound Overpass at Sunset Road and SH 35. Fifteen borings were drilled collectively with respect to the US 181 Overpass Bridges at Sunset Road and SH 35.





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CSJ: 0101-04-097
 US 181
 PORTLAND TO GREGORY
 SAN PATRICIO CO., TEXAS

PLATE 1 - PLAN OF BORINGS
 SHEET 5
 JOB NO.: T612-17
 DATE: FEB. 2018
 SCALE: AS SHOWN

APPROVED BY:
 DRAWN BY:
 A.K.B.



DRILLING LOG

WinCore
Version 3.1

County San Patricio Co.
Highway US 181
CSJ 0101-04-097

Hole PC-1
Structure NBUS181
Station 632+69.59
Offset 74.72' LT

District Corpus Christi
Date 2/20/18
Grnd. Elev. 32.19 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks	
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)		
30.7			9" HMAC / 6" BASE							Hand Penetrometer =2.5 (tsf)	
			SAND, Clayey; dense; light gray; moist; fill (SC)								
29.2			CLAY, Fat; hard becoming stiff @ 5'; dark brown; moist (CH)			31	68	43			Hand Penetrometer =4.5 (tsf) Minus #200 Sieve =86% +40 Sieve =0%, +4 Sieve =0%
5			CLAY, Lean; very soft; light brown; moist; with gypsum lenses and organic material (CL)			25	48	33			Hand Penetrometer =2.75 (tsf) Hand Penetrometer =1.0 (tsf) Minus #200 Sieve =91% +40 Sieve =0%, +4 Sieve =0%
24.2											
22.2											

Remarks: GPS Coordinates: N27.906967°, W97.300504°.

The ground water elevation was not determined during the course of this boring.

Driller: Rich Herman

Logger: Eric Rodriguez

Organization: E TTL



DRILLING LOG

WinCore
Version 3.1

County San Patricio Co.
Highway US 181
CSJ 0101-04-097

Hole PC-2
Structure NBUS181
Station 632+69.82
Offset 11.02' LT

District Corpus Christi
Date 2/20/18
Grnd. Elev. 32.47 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
31.			10" HMAC / 6" BASE							SPT Data =18 (Blows/Ft.)
			CLAY, Fat; with Sand; soft becoming stiff 5'; dark brown; dry becoming moist @ 3' (CH)			28	64	45		Hand Penetrometer =1.75 (tsf) Minus #200 Sieve =82% +40 Sieve =0%, +4 Sieve =0%
5						27	65	48		Hand Penetrometer =3.0 (tsf) Minus #200 Sieve =83% +40 Sieve =0%, +4 Sieve =0%
24.5				CLAY, Lean; stiff; light brown; moist (CL)						
22.5	10									

Remarks: GPS Coordinates: N27.907057°, W97.300656°.

The ground water elevation was not determined during the course of this boring.

Driller: Rich Herman

Logger: Eric Rodriguez

Organization: E TTL



DRILLING LOG

WinCore
Version 3.1

County San Patricio Co.
Highway US 181
CSJ 0101-04-097

Hole PC-3
Structure Pavement
Station 632+69.50
Offset 11.69' RT

District Corpus Christi
Date 2/20/18
Grnd. Elev. 32.35 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
30.9			9" HMAC / 6" BASE							SPT Data =19 (Blows/Ft.)
			CLAY, Fat; with Sand; soft becoming very soft @ 5'; brown; dry becoming moist @ 3' (CH)			33	65	43		Hand Penetrometer =2.0 (tsf) Minus #200 Sieve =84% +40 Sieve =1%, +4 Sieve =0%
5			CLAY, Fat; stiff; light brown; moist (CH)			28	68	44		Hand Penetrometer =1.0 (tsf) Hand Penetrometer =3.0 (tsf) Minus #200 Sieve =95% +40 Sieve =0%, +4 Sieve =0%
24.4										
22.4	10									

Remarks: GPS Coordinates: N27.907176°, W97.300865°.

The ground water elevation was not determined during the course of this boring.

Driller: Rich Herman

Logger: Eric Rodriguez

Organization: E TTL



DRILLING LOG

WinCore
Version 3.1

County San Patricio Co.
Highway US 181
CSJ 0101-04-097

Hole PC-4
Structure Pavement
Station 632+64.66
Offset 96.24' RT

District Corpus Christi
Date 2/20/18
Grnd. Elev. 30.38 ft
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
28.9			7" HMAC / 9" BASE							SPT Data =36 (Blows/Ft.)
			CLAY, Lean; stiff; brown; dry; fill (CL)							
27.4			CLAY, Fat; with Sand; soft becoming stiff @ 8'; light brown; moist (CH)			26	58	40		
5						26	50	34		Hand Penetrometer =1.5 (tsf) Minus #200 Sieve =83% +40 Sieve =0%, +4 Sieve =0%
20.4										Hand Penetrometer =3.0 (tsf)

Remarks: GPS Coordinates: N27.907296°, W97.301070°.

The ground water elevation was not determined during the course of this boring.

Driller: Rich Herman

Logger: Eric Rodriguez

Organization: E TTL

