APPENDIX A.1

Current Boring Logs

GROUP SYMBOLS AND NAMES

Graphic / Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly graded SAND Poorly graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic / Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY elastic ELASTIC SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435-04)
CAI	Cerchar Abrasivity Index
CL	Collapse Potential (ASTM D 5333-03)
CR	Corrosion, Sulfates, Chlorides (CTM 643 - 99; CTM 417 - 06; CTM 422 - 06)
CU	Consolidated Undrained Triaxial (ASTM D 4767-02)
DS	Direct Shear (ASTM D 3080-04)
EI	Expansion Index (ASTM D 4829-03)
EM	Elastic Model with Compressive Strength (ASTM D 7102)
M	Moisture Content (ASTM D 2216-05)
OC	Organic Content (ASTM D 2974-07)
P	Permeability (CTM 220 - 05)
PA	Particle Size Analysis (ASTM D 422-63 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89-02, AASHTO T 90-00)
PL	Point Load Index (ASTM D 5731-05)
PM	Pressure Meter
PP	Pocket Penetrometer
PTS	Petrographic Thin Section
R	R-Value (CTM 301 - 00)
SG	Specific Gravity (AASHTO T 100-06)
SD	Slake Durability Index (ASTH D 4645)
SL	Shrinkage Limit (ASTM D 427-04)
SW	Swell Potential (ASTM D 4546-03)
UC	Unconfined Compression - Soil (ASTM D 2166-06) Unconfined Compression - Rock (ASTM D 2938-95)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850-03)
UW	Unit Weight (ASTM D 4767-04)
VS	Vane Shear (AASHTO T 223-96 [2004])

SAMPLER GRAPHIC SYMBOLS

- Standard Penetration Test (SPT)
- Standard California Sampler
- Modified California Sampler
- Shelby Tube
- Piston Sampler
- NX Rock Core
- HQ Rock Core
- Bulk Sample
- Other (see remarks)

DRILLING METHOD SYMBOLS

- Auger Drilling
- Rotary Drilling
- Dynamic Cone or Hand Driven
- Diamond Core

WATER LEVEL SYMBOLS

- First Water Level Reading (during drilling)
- Static Water Level Reading (short-term)
- Static Water Level Reading (long-term)

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REPORT TITLE				
BORING RECORD LEGEND				
DIST. **7**	COUNTY **L.A.**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER **NA**	PREPARED BY	DATE	PLATE NO.	

CONSISTENCY OF COHESIVE SOILS

Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2

APPARENT DENSITY OF COHESIONLESS SOILS

Descriptor	SPT N_{60} - Value (blows / foot)
Very Loose	0 - 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

MOISTURE

Descriptor	Criteria
Dry	No descernable moisture
Moist	Moisture present but no visible water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS

Descriptor	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size (in.)
Boulder		Greater than 12
Cobble		3 - 12
Gravel	Coarse	3/4 - 3
	Fine	1/5 - 3/4
Sand	Coarse	1/16 - 1/5
	Medium	1/64 - 1/16
	Fine	1/300 - 1/64
Silt and Clay		Less than 1/300

CEMENTATION

Descriptor	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

NOTE: This legend sheet provides descriptors and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

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REPORT TITLE				
BORING RECORD LEGEND				
DIST. 7	COUNTY L.A.	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME SR 710 North Study				
BRIDGE NUMBER NA	PREPARED BY		DATE	PLATE NO.

ROCK GRAPHIC SYMBOLS

IGNEOUS ROCK

SEDIMENTARY ROCK

METAMORPHIC ROCK

BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 10 ft
Very Thickly Bedded	3 ft - 10 ft
Thickly Bedded	1 ft - 3 ft
Moderately Bedded	4 in. - 1 ft
Thinly Bedded	1 in. - 4 in.
Very Thinly Bedded	1/4 in. - 1 in.
Laminated	Less than 1/4 in.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic Features					General Characteristics
	Chemical Weathering-Discoloration and/or Oxidation		Mechanical Weathering-Grain Boundary Conditions (Disaggregation) Primarily for Granitics and Some Coarse-Grained Sediments	Texture and Leaching		
	Body of Rock	Fracture Surfaces		Texture	Leaching	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change	No leaching	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved	Minor leaching of some soluble minerals.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

CORE RECOVERY (REC) (%)

$$\frac{\Sigma \text{ Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100$$

ROCK QUALITY DESIGNATION (RQD) (%)

$$\frac{\Sigma \text{ Length of intact core pieces} \geq 4 \text{ in.}}{\text{Total length of core run (in.)}} \times 100$$

ROCK HARDNESS

Description	Criteria
Extremely Hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows.
Very Hard	Cannot be scratched with a pocketknife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with a pocketknife or sharp pick with difficulty (heavy pressure). Breaks with heavy hammer blows.
Moderately Hard	Can be scratched with pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows.
Moderately Soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily by a pocketknife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Can be readily indented, grooved or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very Slightly Fractured	Core lengths greater than 3 ft.
Slightly Fractured	Core lengths mostly from 1 to 3 ft.
Moderately Fractured	Core lengths mostly from 4 in. to 1 ft.
Intensely Fractured	Core lengths mostly from 1 to 4 in.
Very Intensely Fractured	Mostly chips and fragments.

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REPORT TITLE				
BORING RECORD LEGEND				
DIST. 7	COUNTY L.A.	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME SR 710 North Study				
BRIDGE NUMBER NA	PREPARED BY	DATE	PLATE NO.	

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
J. Culotta	3-18-13	3-19-13	34° 2' 47.97224" / -118° 9' 57.31965" NAD83	A-13-001
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Jet Drilling, Inc				344.1 ft NAVD88
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Hollow-Stem Auger			CME-75	8 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
SPT (1.4"), Cal (2.5")			140 lb. Auto Hammer, 30" Drop	72%
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS DURING DRILLING / AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING
Cement and Bentonite Grout			NE	105.4 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (2").												
	1	AGGREGATE BASE (12").												
342.10	2	Lean CLAY (CL); dark yellowish brown; moist; medium plasticity; homogeneous; (ARTIFICIAL FILL).												
	3			B01										
340.10	4	Lean CLAY with SAND (CL); dark yellowish brown; moist; mostly medium to low plasticity fines; some fine SAND; trace fine GRAVEL; homogeneous.												
	5			S02	4 8 11	19	100		18	107				CR, M, UW
338.10	6													
	7													
336.10	8													
	9													
334.10	10	Olive gray.		S03	3 6 7	13	100							
	11													
332.10	12													
	13													
330.10	14													
	15	Very stiff.		S04	4 6 10	16	100		26	98	UU =1.06			M, PI, UU, UW
328.10	16													
	17													
326.10	18													
	19													
324.10	20	Trace gypsum and sandstone fragments.		S05	4 7 10	17	100							
	21													
322.10	22													
	23													
320.10	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				A-13-001
DIST.	COUNTY	ROUTE	POSTMILE	EA
07	LA	710		07-187900
PROJECT OR BRIDGE NAME				
SR 710 North Study				
BRIDGE NUMBER	PREPARED BY	DATE	SHEET	
	D. Jankly	4-18-13	1 of 4	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	Lean CLAY with SAND (CL) *(continued)*. Hard; brown; trace brick fragments.		S06	7 11 13	24	100		17	115	UU =2.07			M, PI, UU, UW
318.10	26													
	27													
316.10	28	SILTY SAND (SM); dense; yellowish brown; moist; mostly coarse to fine SAND; little fines; few fine GRAVEL; stratified; weak cementation; (ALLUVIUM).												
	29													
314.10	30			S07	17 17 17	34	100							
	31													
312.10	32													
	33													
310.10	34													
	35	Brown.		S08	32 29 18	47	100		18	106				DS, M, PA, UW
308.10	36													
	37													
306.10	38	Lean CLAY (CL); brown; moist; mostly low plasticity fines; few coarse to fine SAND; homogeneous.												
	39													
304.10	40			S09	7 11 18	29	100		17					M, PA, PI
	41													
302.10	42													
	43	SANDY SILT (ML); strong brown; moist; mostly non-plastic fines; some coarse to fine SAND; trace fine GRAVEL; homogeneous.												
300.10	44													
	45			S10	15 27 39	66	100		14	122				M, PA, UW
298.10	46													
	47													
296.10	48													
	49													
294.10	50			S11	14 13 27	40	72							
	51													
292.10	52													
	53	SILTY SAND (SM); light yellowish brown; moist; mostly medium and fine SAND; some fines; stratified; weak cementation.												
290.10	54													
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-001**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **2 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55	SILTY SAND (SM) *(continued)*.		S12	37 50-4"		100		4	100				DS, M, UW
288.10	56													
	57													
286.10	58	Poorly graded SAND with SILT (SP-SM); very dense; light yellowish brown; moist; mostly coarse to fine SAND; little coarse to fine GRAVEL; few fines; homogeneous; weak cementation.												
	59													
284.10	60			S13	71 100-5"		50							PA
	61													
282.10	62													
	63													
280.10	64													
	65	Dark yellowish brown; mostly medium and fine SAND; few fine GRAVEL.		S14	28 60		100		6	130				M, UW
278.10	66													
	67													
276.10	68	Well-graded SAND with SILT (SW-SM); very dense; yellowish brown; moist; mostly coarse to fine SAND; few fines; trace fine GRAVEL; stratified; weak cementation.												
	69													
274.10	70			S15	25 28 28	56	100		3					M, PA
	71													
272.10	72													
	73	SILTY SAND (SM); light olive brown; moist; mostly medium and fine SAND; some fines; trace fine GRAVEL; stratified; weak cementation.												
270.10	74													
	75			S16	25 50		100		10	106				M, PA, UW
268.10	76													
	77													
266.10	78													
	79													
264.10	80	Very dense; yellowish brown; trace organic flecks.		S17	21 34 34	68	100							
	81													
262.10	82													
	83													
260.10	84													
	85													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-001**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **3 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85	SEDIMENTARY ROCK (CLAYSTONE AND SANDSTONE); decomposed.		S18	17 43 50-5"		100		16	117				DS, M, PA, UW
258.10	86	Lean CLAY (CL); brown; moist; mostly low to medium plasticity fines; few fine SAND; homogeneous; (FERNANDO FORMATION).												
	87													
256.10	88													
	89													
254.10	90			S19	10 19 23	42	100							
	91													
252.10	92													
	93	SANDY lean CLAY (CL); brown; moist; mostly low to medium plasticity fines; some coarse to fine SAND; few fine GRAVEL; homogeneous.												
250.10	94													
	95			S20	23 83		100		10	129				M, PI, UW
248.10	96													
	97													
246.10	98	Poorly graded SAND (SP); very dense; yellowish brown; moist; mostly coarse to fine SAND: few fine GRAVEL; stratified; weak cementation.												
	99													
244.10	100			S21	60 67		92							
	101													
242.10	102													
	103	CLAYEY SAND with GRAVEL (SC); brown; moist; mostly coarse to fine SAND; some low to medium plasticity fines; little fine GRAVEL; stratified; weak cementation.												
240.10	104													
	105			S22	160-5"		100							
238.10	106	Bottom of borehole at 105.4 ft bgs Boring terminated at a planned depth.												
	107													
236.10	108													
	109													
234.10	110													
	111													
232.10	112													
	113													
230.10	114													
	115													

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-001**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **4 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
J. Lee/D. Jankly	3-11-13	3-12-13	34° 3' 24.91488" / -118° 9' 54.02971" NAD83	RC-13-002
DRILLING CONTRACTOR: Jet Drilling, Inc			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 349.2 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger to 45'; Rotary Wire-Line to TD			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8" to 45'; 3.8" to TD
SAMPLER TYPE(S) AND SIZE(S) (ID): SPT (1.4"), Cal (2.5"), HQ (2.5"), NQ (2")			SPT HAMMER TYPE: 140 lb. Auto Hammer, 30" Drop	HAMMER EFFICIENCY, ERi: 72%
BOREHOLE BACKFILL AND COMPLETION: Cement and Bentonite Grout			GROUNDWATER READINGS: DURING DRILLING 32.0 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 85.1 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	SANDY fat CLAY (CH); dark brown; moist; high plasticity; (ARTIFICIAL FILL).		B01										
	1													CR
347.20	2													
	3													
345.20	4													
	5			S02	3 5 7	12	78							PI
343.20	6													
	7													
341.20	8													
	9	CLAYEY SAND (SC); greenish gray; moist; mostly coarse to fine SAND; some medium plasticity fines; few fine GRAVEL; homogeneous; weak cementation.												
339.20	10			S03	5 6 8	14	78		18	112	UU =0.6			M, PA, UU, UW
	11													
337.20	12													
	13													
335.20	14													
	15			S04	4 6 8	14	72							PI
333.20	16	Medium dense; brick fragment observed.												
	17													
331.20	18	SANDY lean CLAY (CL); dark brown; moist; mostly medium to high plasticity fines; some coarse to fine SAND; trace fine GRAVEL; (ALLUVIUM).												
	19													
329.20	20			S05	4 7 9	16	89		20	109				M, PA, PI, UW
	21													
327.20	22													
	23													
325.20	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				RC-13-002
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY D. Jankly	DATE 4-18-13	SHEET 1 of 4	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	SANDY lean CLAY (CL) *(continued)*.		S06	4 4 6	10	100							PI
323.20	26													
	27													
321.20	28													
	29													
319.20	30	Dark gray.		S07	6 9 11	20	80		21	106	UU =1.09			M, PI, UU, UW
	31													
317.20	32													
	33	SILTY SAND (SM); dense to very dense; brown; wet; coarse to fine grained.												
315.20	34													
	35			S08	36 50		100							
313.20	36	Cobble or boulder encountered.												
	37													
311.20	38													
	39	SEDIMENTARY ROCK, (CLAYSTONE); massive; dark greenish gray; fresh; soft to moderately soft; slightly fractured, randomly oriented, tight; locally abundant bioturbation structures and soft sediment deformation features; (FERNANDO FORMATION).												
309.20	40			S09	16 38 50-4"		100		26	98	UU =3.35			M, PI, UU, UW
	41													
307.20	42													
	43													
305.20	44													
	45			S10	18 38 50-5"		100							
303.20	46													
	47			C11			40	40						
301.20	48													
	49													
299.20	50			C12			70	70						
	51													
297.20	52								15	114				M, PA, PI, UC=465psi, UW
	53													
295.20	54													
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-002**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **2 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		SEDIMENTARY ROCK *(continued)*.		C13			0	0						
293.20	56														
	57		At Elev 292.2', observed abundant bioturbation structures dipping 20 to 30 degrees, possibly indicative of bedding dip.												
291.20	58														
	59														
289.20	60				C14			92	92						
	61														
287.20	62														
	63														
285.20	64														
	65				C15			93	80						
283.20	66		At Elev 283.2', observed fault, dipping 40°, 1/16" thick lean CLAY lining, striated.												
	67		At Elev 282.2', observed abundant bioturbation structures dipping 20 to 30 degrees, possibly indicative of bedding dip.							18	114	UU =0.99			UU
281.20	68														
	69														
279.20	70				C16			100	100						
	71														
277.20	72		At Elev 277.2', observed random fracture, dipping 40°, tight.												
	73														
275.20	74														
	75				C17			97	97						
273.20	76														
	77		At Elev 272.2', observed abundant bioturbation structures dipping 20 to 30 degrees, possibly indicative of bedding dip.							13	115				PI, UC=482psi
271.20	78														
	79														
269.20	80				C18			0	0						
	81														
267.20	82														
	83														
265.20	84														
	85														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-002**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **3 of 4**

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		Bottom of borehole at 85.1 ft bgs												
263.20	86		Boring terminated at a planned depth.												
	87		RQD values provided on the boring logs are based on intact core pieces obtained between two natural discontinuities. The majority of core obtained from this boring is typically very weak to weak and does not meet the "sound core" definition provided in the standard test method for RQD (ASTM D 6032). These RQD values should not be used to evaluate rock mass quality.												
261.20	88														
	89														
259.20	90														
	91														
257.20	92														
	93														
255.20	94														
	95														
253.20	96														
	97														
251.20	98														
	99														
249.20	100														
	101														
247.20	102														
	103														
245.20	104														
	105														
243.20	106														
	107														
241.20	108														
	109														
239.20	110														
	111														
237.20	112														
	113														
235.20	114														
	115														

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-002**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **4 of 4**

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
J. Lee/D. Jankly	3-13-13	3-14-13	34° 4' 8.476249" / -118° 9' 44.95765" NAD83	RC-13-003
DRILLING CONTRACTOR: Jet Drilling, Inc			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 388.8 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger to 27'; Rotary Wash to TD			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8" to 27'; 3.8" to TD
SAMPLER TYPE(S) AND SIZE(S) (ID): SPT (1.4"), Cal (2.5"), HQ (2.5")			SPT HAMMER TYPE: 140 lb. Auto Hammer, 30" Drop	HAMMER EFFICIENCY, ERi: 72%
BOREHOLE BACKFILL AND COMPLETION: Cement and Bentonite Grout			GROUNDWATER READINGS: DURING DRILLING 17.0 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 100.5 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		SILTY SAND with GRAVEL (SM); gray; moist; coarse to fine SAND; coarse to fine GRAVEL; (ARTIFICIAL FILL).		B01										
386.80	2		SEDIMENTARY ROCK, (CLAYEY SILTSTONE) very thinly bedded with fine SANDSTONE; light olive brown and strong brown; moderately weathered; very soft to soft; moderately fractured; (PUENTE FORMATION).												
384.80	4														
	5				S02	18 40 41	81	100		25	93				DS, M, PI, UW
382.80	6														
380.80	8														
378.80	10				S03	12 18 21	39	100		26					CR, M
376.80	12		SEDIMENTARY ROCK, (Poorly Indurated SILTY SANDSTONE); medium to fine grained; massive to very thickly bedded; pale yellow with strong brown oxidation; moderately weathered; (SILTY SAND (SM); moist; mostly fine SAND; some fines; weak cementation).												
374.80	14														
	15		At Elev 373.8', observed bedding joint, dipping 90 to 85°.		S04	19 32 47	79	100		22	105	UU =2.15			M, PA, UU, UW
372.80	16														
	17														
370.80	18														
368.80	20		Dense.		S05	12 19 27	46	100							
366.80	22														
364.80	24														
	25														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				RC-13-003
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY D. Jankly	DATE 4-18-13	SHEET 1 of 4	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		SEDIMENTARY ROCK *(continued)*. Mostly medium to fine SAND.		S06	21 36 50	86	100		22	105				DS, PA
362.80	26														
	27				C07			0	0						
360.80	28														
	29														
358.80	30				C08			10	10						
	31														
356.80	32														
	33														
354.80	34														
	35				C09			23	0						
352.80	36														
	37														
350.80	38														
	39														
348.80	40				C10			0	0						
	41														
346.80	42														
	43														
344.80	44														
	45		Very dense.		S11	50-5"		100							PA
342.80	46				C12			0	0						
	47														
340.80	48														
	49														
338.80	50				C13			0	0						
	51														
336.80	52														
	53														
334.80	54														
	55														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-003**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **2 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55				S14	50-3"		100							PA
332.80	56				C15			0	0						
	57														
330.80	58														
	59														
328.80	60				C16			0	0						
	61														
326.80	62														
	63														
324.80	64														
	65				S17	17 23 37	60	100		21					M, PA
322.80	66		Mostly fine SAND.												
	67				C18			50	0						
320.80	68														
	69														
318.80	70		At Elev 318.8', becomes pale olive to olive with strong brown oxidized zones.		C19			50	0						
	71														
316.80	72														
	73														
314.80	74														
	75				C20			15	0						
312.80	76														
	77														
310.80	78														
	79														
308.80	80				S21	31 34 35	69	100		23					M
	81														
306.80	82				C22			0	0						
	83														
304.80	84														
	85														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-003**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **3 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85				S23	70-4"		100							
302.80	86														
	87														
300.80	88														
	89														
298.80	90				S24	37		100							
	91					50-4"									
296.80	92														
	93														
294.80	94														
	95				S25	100-6"		100		23	104				DS, M, PA, UW
292.80	96														
	97														
290.80	98														
	99														
288.80	100				S26	66-6"		100							
	101		Bottom of borehole at 100.5 ft bgs Boring terminated at a planned depth. RQD values provided on the boring logs are based on intact core pieces obtained between two natural discontinuities. The majority of core obtained from this boring is typically very weak to weak and does not meet the "sound core" definition provided in the standard test method for RQD (ASTM D 6032). These RQD values should not be used to evaluate rock mass quality.											
286.80	102														
	103														
284.80	104														
	105														
282.80	106														
	107														
280.80	108														
	109														
278.80	110														
	111														
276.80	112														
	113														
274.80	114														
	115														

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-003**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **4 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
D. Jankly	3-27-13	3-29-13	34° 4' 20.38198" / -118° 9' 39.77389" NAD83	RC-13-004
DRILLING CONTRACTOR: Cascade Drilling, LP			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 393.4 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger to 44'; Rotary Wire-line to TD			DRILL RIG: Guspech Brut 22R	BOREHOLE DIAMETER: 8" to 44'; 3.8" to TD
SAMPLER TYPE(S) AND SIZE(S) (ID): SPT (1.4"), Cal (2.5"), HQ (2.5")			SPT HAMMER TYPE: 140 lb. Auto Hammer, 30" Drop	HAMMER EFFICIENCY, ERi: 78%
BOREHOLE BACKFILL AND COMPLETION: Piezometer Installed on Completion			GROUNDWATER READINGS: DURING DRILLING 9.5 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 109.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	CLAYEY SAND (SC); brown; moist; mostly coarse to fine SAND; some medium plasticity fines; few fine GRAVEL; homogeneous; weak cementation (ALLUVIUM).		B01										CR, M
	1								17					
391.40	2													
	3													
389.40	4													
	5	Loose.		S02	2 2 3	5	100							PA, PI
387.40	6													
	7													
385.40	8	SILTY, CLAYEY SAND (SC-SM); brown; moist to wet; mostly coarse to fine SAND; some medium plasticity fines; few fine GRAVEL; homogeneous; weak cementation.												
	9													
383.40	10			S03	5 8 14	22	67		12	125				M, DS, PA, PI, UW
	11													
381.40	12													
	13													
379.40	14													
	15	Medium dense; Lacks GRAVEL.		S04	4 7 9	16	44							
377.40	16													
	17													
375.40	18													
	19													
373.40	20	Brown; mostly medium to fine SAND.		S05	4 5 8	13	56		20	106				M, DS, PA, UW
	21													
371.40	22													
	23													
369.40	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				RC-13-004
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY D. Jankly	DATE 4-18-13	SHEET 1 of 4	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	Grayish brown. SILTY, CLAYEY SAND (SC-SM) *(continued)*.		S06	5 10 13	23	28							CR
367.40	26													
	27													
365.40	28													
	29													
363.40	30	Mostly medium to fine SAND.		S07	6 11 15	26	67		20	111				M, DS, PA, UW
	31													
361.40	32													
	33													
359.40	34													
	35	Wet; little fines.		S08	5 6 7	13	100							
357.40	36													
	37													
355.40	38													
	39	SEDIMENTARY ROCK, (fine SANDY SILTSTONE); gray (unoxidized) and yellowish red (oxidized); moderately weathered; very soft to soft; slightly to very slightly fractured; very weak; (PUENTE FORMATION).												
353.40	40			S09	42 44 50-5"		100		24	94				M, DS, PA, UW
	41													
351.40	42													
	43													
349.40	44	SEDIMENTARY ROCK, (SILTY SANDSTONE); fine grained; massive to very thickly bedded; gray (unoxidized) and yellowish red (oxidized); moderately weathered; very soft to soft; poorly to moderately indurated; slightly to very slightly fractured.		C10			13	0						
	45													
347.40	46													
	47													
345.40	48													
	49	At Elev 344.9', observed fracture zone, dipping 90 to 80°, tight. At Elev 344.4', becomes slightly weathered.		C11			80	0						
343.40	50													
	51	At Elev 342.6', observed bedding joint, dipping 20 to 10°, 10" thick sequence, laminated to very thinly bedded.							14					M, PA
341.40	52													
	53													
339.40	54			C12			47	0						
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-004**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **2 of 4**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		SEDIMENTARY ROCK *(continued)*.		C12			47	0						
337.40	56														
	57		At Elev 336.4', observed bedding joint, dipping 20 to 10°, 2.6' thick sequence; CLAYSTONE, (gray); very thinly bedded with thin fine SANDSTONE, (yellowish red); moderately weathered; soft; slaking along bedding planes; beds are undulatory.												
335.40	58														
	59				C13			48	0						
333.40	60		At Elev 333.8', observed random fracture, dipping 70°, tight, iron oxide stained.							19	111				M, PA, UC=102psi, UW
	61		At Elev 332.4', observed CLAYSTONE bed fragments, disturbed by drilling.												
331.40	62														
	63														
329.40	64				C14			0	0						
	65														
327.40	66														
	67														
325.40	68														
	69				C15			87	0						
323.40	70		At Elev 324.4', observed bedding joint, dipping 30°, 1.3' sequence of coarse to fine SANDSTONE; gray with iron oxide staining along fractures. At Elev 323.4', observed fracture zone, dipping 70 to 60°, tight; iron oxide stained.							7					M, PA
	71														
321.40	72		At Elev 321.8', observed bedding joint, dipping 30 to 20°, laminations within very thickly bedded SANDSTONE.												
	73														
319.40	74		At Elev 319.9', observed bedding joint, dipping 30 to 20°, 1.5" thick laminated SANDSTONE bed with 1/4" thick gray CLAYSTONE bed in center.		C16			20	0						
	75		At Elev 319.8', observed fracture zone, dipping 90 to 70°, tight; iron oxide stained.												
317.40	76		At Elev 319.4', becomes medium to fine grained; with dusky red lining along fracture and bedding surfaces.												
	77														
315.40	78		At Elev 315.6', observed fracture zone, dipping 90 to 70°, tight; iron oxide stained.												
	79		At Elev 314.8', observed bedding joint, dipping 20 to 10°, 1/4" thick CLAYSTONE bed, gray.		C17			97	0						
313.40	80		At Elev 314.5', observed bedding joint, dipping 5 to 0°, 1/4" thick CLAYSTONE bed, gray. At Elev 314.4', observed 12" thick; coarse to fine grained SANDSTONE.												
	81		At Elev 313.4', observed bedding joint, dipping 10 to 0°, 1/2" thick CLAYSTONE bed, gray.							5	154				EM, M, UC=2,158psi, UW
311.40	82		At Elev 313.3', observed bedding joint, dipping 10 to 0°, 1/2" thick CLAYSTONE bed, gray.												PL
	83		At Elev 313.2', observed 12" thick; coarse to fine grained SANDSTONE. At Elev 313.0', observed random fracture, dipping 70°, tight; iron oxide stained.												
309.40	84		At Elev 312.2', observed 1.7' thick zone; strong brown; moderately hard; moderately to well indurated.		C18			100	0						
	85														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-004**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **3 of 4**

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		At Elev 309.9', observed random fracture, dipping 50°, tight; iron oxide stained.		C18			100	0						
307.40	86		At Elev 307.9', observed 4" thick fine SANDSTONE bed, micaceous.												
	87		SEDIMENTARY ROCK, (CLAYEY SANDSTONE) fine to medium grained; light greenish gray; slightly weathered; very soft; poorly indurated: slightly fractured.												
305.40	88		At Elev 305.6', observed random fracture, dipping 70°, tight; iron oxide stained.												
	89				C19			30	0						
303.40	90														
	91														
301.40	92														
	93		SEDIMENTARY ROCK, (SILTSTONE) very thinly bedded with thin fine (SANDSTONE) beds; dark gray to strong brown; slightly to moderately weathered; very soft to soft; some minor shears with up to 1/4" offsets.												
299.40	94				C20			83	0						
	95		At Elev 300.4', observed bedding joint, dipping 20 to 10°. At Elev 298.4', observed bedding joint, dipping 20 to 10°, . Unit is 95% unoxidized; SANDSTONE (light gray to very dark gray) beds are locally laminated. SILTSTONE (very dark greenish gray to dark gray) beds are polished and striated with local slaking.												
297.40	96														
	97														
295.40	98														
	99		At Elev 294.4', observed bedding joint, dipping 25 to 15°.		C21			97	0						
293.40	100		At Elev 293.4', observed random fracture, dipping 55°, smooth to slightly rough.												
	101		At Elev 292.6', observed random fracture, dipping 55°, smooth to slightly rough.							15					SD
291.40	102		At Elev 291.4', observed 5" thick, hard, moderately to well indurated zone.												
	103														
289.40	104		SEDIMENTARY ROCK, (SANDSTONE); fine to medium grained; laminated to thinly bedded with thin interbeds of SILTSTONE; brown to very dark greenish gray; slightly weathered; very soft to soft; poorly indurated; slightly to moderately fractured.		C22			92	0						
	105		Siltstone beds are locally polished and striated and slaking.												
287.40	106		At Elev 288.4', observed bedding joint, dipping 25 to 15°.												
	107		At Elev 286.8', observed fault, dipping 55°, smooth, minor offsets of SILTSTONE beds.												
285.40	108														
	109		Bottom of borehole at 109.0 ft bgs												
283.40	110		Boring terminated at a planned depth.												
	111		Piezometer Sensor Installed at 36.7' (El. 356.7')												
281.40	112		RQD values provided on the boring logs are based on intact core pieces obtained between two natural discontinuities. The majority of core obtained from this boring is typically very weak to weak and does not meet the "sound core" definition provided in the standard test method for RQD (ASTM D 6032). These RQD values should not be used to evaluate rock mass quality.												
	113														
279.40	114														
	115														

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-004**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **4 of 4**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
D. Jankly	2-25-13	3-5-13	34° 4' 28.73972" / -118° 9' 39.96954" NAD83	RC-13-005
DRILLING CONTRACTOR: Cascade Drilling, LP			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 425.0 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger to 81.5'; Rotary Wire-line to TD			DRILL RIG: Guspech Brut 22R	BOREHOLE DIAMETER: 8" to 81.5'; 3.8" to TD
SAMPLER TYPE(S) AND SIZE(S) (ID): SPT (1.4"), Cal (2.5"), HQ (2.5")			SPT HAMMER TYPE: 140 lb. Auto Hammer, 30" Drop	HAMMER EFFICIENCY, ERi: 78%
BOREHOLE BACKFILL AND COMPLETION: Piezometer Installed on Completion			GROUNDWATER READINGS: DURING DRILLING 52.5 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 225.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (4").												
	1	AGGREGATE BASE (6").												
423.00	2	SANDY fat CLAY (CH); yellowish brown; moist; mostly medium plasticity fines; little coarse to fine SAND; few fine GRAVEL; blocky; (ARTIFICIAL FILL).												
	3			B01										
421.00	4													
	5			S02	4 5 6	11	67							PA, PI
419.00	6													
	7													
417.00	8													
	9													
415.00	10	With some Puente Formation derived gravel. Gravel is generally very stiff to hard.		S03	3 5 10	15	67		28	89				M, PI, UW
	11													
413.00	12													
	13													
411.00	14													
	15	Few fine SAND; few gravel as 10'.		S04	2 3 5	8	89		26					M, PA
409.00	16													
	17													
407.00	18													
	19													
405.00	20	With trace asphaltic concrete debris.		S05	4 12 14	26	78		13	112				M, UW
	21													
403.00	22													
	23	Concrete layer encountered.												
401.00	24	CLAYEY SAND (SC); medium dense; dark yellowish brown; moist; mostly medium to fine SAND; some fines; trace fine GRAVEL; homogeneous; weak cementation; (ALLUVIUM).												
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				RC-13-005
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY D. Jankly	DATE 4-18-13	SHEET 1 of 8	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	CLAYEY SAND (SC) *(continued)*.		S06	7 8 5	13	33							PA
399.00	26													
	27													
397.00	28	Poorly graded SAND with SILT and GRAVEL (SP-SM); dark yellowish brown; moist; some coarse to fine SAND; some coarse to fine GRAVEL; few fines; homogeneous; moderate cementation.												
	29													
395.00	30			S07	13 26 29	55	78		6	118				M, DS, PA, UW
	31													
393.00	32													
	33	SILTY SAND (SM); medium dense; dark yellowish brown; moist to wet; mostly coarse to fine SAND; some fines; trace fine GRAVEL; homogeneous; weak cementation; micaceous.												
391.00	34													
	35			S08	6 5 4	9	89							PA
389.00	36													
	37													
387.00	38	Moist; mostly fine SAND.												
	39													
385.00	40			S09	2 12 16	28	78		13	95				M, PA, UW
	41													
383.00	42													
	43	SANDY fat CLAY (CH); light olive brown; moist; mostly medium plasticity fines; little fine SAND; homogeneous.												
381.00	44													
	45			S10	6 9 11	20	100		21					CR, M, PI
379.00	46													
	47													
377.00	48	Light yellowish brown; mostly fine SAND; some fines; micaceous.												
	49													
375.00	50			S11	2 9 19	28	89		19	107				M, DS, PA, UW
	51													
373.00	52													
	53													
371.00	54													
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-005**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **2 of 8**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55	SANDY fat CLAY (CH) *(continued)*. Wet; trace fine GRAVEL.		S12	14 18 36	54	67							
369.00	56													
	57													
367.00	58	Lean CLAY with SAND (CL); light olive brown; moist; mostly medium plasticity fines; little fine SAND; homogeneous.												
	59													
365.00	60	Hard.		S13	9 15 28	43	89		20	110	UU =2.31			M, PI, UU, UW
	61													
363.00	62													
	63	Yellowish brown; moist to wet.												
361.00	64													
	65			S14	9 13 20	33	100							
359.00	66													
	67													
357.00	68													
	69													
355.00	70			S15	7 16 30	46	89		20	110				M, DS, PA, PI, UW
	71													
353.00	72													
	73	Strong brown; little medium to fine SAND; iron oxide and manganese staining.												
351.00	74													
	75			S16	6 10 15	25	78							PA, PI
349.00	76													
	77													
347.00	78													
	79	SEDIMENTARY ROCK, (SILTSTONE and CLAYSTONE); thinly to very thinly bedded with thin interbeds of fine SANDSTONE: white to dark grayish brown; moderately weathered; very soft; moderately to intensely fractured; iron oxide stained: (PUENTE FORMATION).												
345.00	80			S17	7 15 25	40	67		26	99	UU =2.01			M, PI, UU, UW
	81													
343.00	82			C18			40	0						
	83													
341.00	84													
	85													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-005**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **3 of 8**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85	SEDIMENTARY ROCK *(continued)*.		C19			72	30						
339.00	86	Bedding joint dipping 70°, slightly rough.												
	87													
337.00	88													
	89													
335.00	90	At Elev 335.0', becomes soft.		C20			83	28						
	91	At Elev 334.0', observed fracture zone, dipping 90 to 40°, 1/16" thick manganese and iron oxide staining; rough.												
333.00	92	At Elev 333.0', observed bedding joint, dipping 80°, slightly rough.												
	93			C21			83	27						
331.00	94	At Elev 331.0', becomes siliceous; light gray to gray.							2	158				M, PL, UW
	95	At Elev 330.5', observed fracture zone, dipping 40 to 0°, 1/16"-1/4" thick CLAYEY SAND infill; slightly rough.												
329.00	96	At Elev 329.0', observed bedding joint, dipping 80 to 70°.												
	97	At Elev 328.6', observed random fracture, dipping 90 to 40°, 1/8" thick lean CLAY lining; slightly rough.												
327.00	98	At Elev 328.0', observed 1' thick zone, very soft.		C22			82	0						
	99													
325.00	100	At Elev 325.0', becomes grayish brown to strong brown (where oxidized); moderately to slightly weathered;.												CR
	101	At Elev 324.0', observed bedding joint, dipping 70 to 60°.												
323.00	102													
	103			C23			62	0						
321.00	104													
	105	At Elev 320.0', becomes moderately weathered; parting surfaces are generally moderately rough.												
319.00	106	At Elev 319.5', observed 6" thick very intensely fractured zone.												
	107	12" thick very intensely fractured zone.												
317.00	108			C24			93	17						
	109	At Elev 316.0', observed bedding joint, dipping 90°, tight.												
315.00	110	Gray to strong brown (where oxidized).												
	111	At Elev 313.8', observed fault, dipping 65°, 1/16" thick, lean CLAY lining; polished and striated.												
313.00	112	At Elev 313.0', observed random fracture, dipping 20°, tight.												
	113	At Elev 312.7', observed random fracture, dipping 20°, tight.		C25			47	0						
311.00	114													
	115													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-005**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **4 of 8**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	115		At Elev 310.0', observed bedding joint, dipping 70 to 60°, tight. Few iron oxide stained beds.		C25			47	0						
309.00	116														
	117		At Elev 308.4', observed fracture zone, dipping 90 to 60°, tight; moderately rough.												
307.00	118				C26			90	0						
	119														
305.00	120		At Elev 305.0', observed bedding joint, dipping 90°, 1" thick SANDSTONE bed.												
	121														
303.00	122		At Elev 303.0', observed bedding joint, dipping 90 to 70°, overturned bedding. Local lean CLAY lining along beds and random fractures.												
	123		At Elev 302.0', observed fracture zone, dipping 60°, 1/16" thick lean CLAY lining, tight.		C27			87	20						
301.00	124		At Elev 301.0', observed little fine SANDSTONE beds up to 1.5" thick. Numerous minor, tight shears with up to 1/16" thick lean CLAY lining.												
	125		At Elev 300.0', observed bedding joint, dipping 80°.												
299.00	126														
	127														
297.00	128				C28			97	33						
	129		At Elev 296.7', observed fracture zone, dipping 65°, tight. At Elev 296.0', observed bedding joint, dipping 90°.												
295.00	130		At Elev 295.0', becomes dark olive gray to very dark grayish brown; slightly weathered; locally slaking, polished and striated bedding planes.												
	131		At Elev 294.9', observed bedding joint, dipping 90 to 70°.							30					EM, M, SD, UC=137psi
293.00	132		At Elev 293.0', observed random fracture, dipping 65 to 55°, 1/16" thick lean CLAY lining; slightly rough.												
	133				C29			97	53						
291.00	134														
	135														
289.00	136		At Elev 289.0', observed bedding joint, dipping 80°, tight. Scarce iron oxide staining along SANDSTONE beds; slight slaking along SILTSTONE bedding planes.												
	137														
287.00	138		At Elev 287.0', observed random fracture, dipping 30 to 70°, tight.		C30			100	100	29					M, PL, SD
	139														
285.00	140		At Elev 285.0', becomes slightly weathered to fresh; dark greenish gray (SANDSTONE) to very dark greenish gray (SILTSTONE).												
	141														
283.00	142		PTS: Feldspathic wacke; 50% biotite, 20% quartz; 15% muscovite; 15% plagioclase.							27	102				M, PL, PTS, SD, UW
	143				C31			80	10						
281.00	144														
	145														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-005**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **5 of 8**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	145														
			At Elev 279.7', observed bedding joint, dipping 80°, 2-3" thick fine SANDSTONE bed, dark greenish gray, very intensely fractured.		C31			80	10						
279.00	146														
	147														
277.00	148				C32			70	20						
	149														
275.00	150		At Elev 275.0', observed abundant, randomly oriented, polished and striated, fracture and bedding plane surfaces. Offsets up to 1".												
	151		At Elev 274.0', observed bedding joint, dipping 75 to 65°, 12" thick medium to fine grained SANDSTONE bed with faint internal SILTSTONE laminations.												
273.00	152		At Elev 273.0', becomes fresh.												
	153				C33			78	0						
271.00	154														
	155		At Elev 270.2', observed random fracture, dipping 70°, polished.												
269.00	156		At Elev 270.0', observed bedding joint, dipping 55 to 45°.												
	157		At Elev 268.6', observed random fracture, dipping 70°, polished.												
267.00	158		At Elev 268.0', observed bedding joint, dipping 55°, 1/2" thick, lean CLAY lined, sheared bed.		C34			60	0						
	159														
265.00	160		At Elev 266.0', observed bedding joint, dipping 65°, tight.												
	161														
263.00	162		At Elev 263.2', observed random fracture, dipping 40°, tight.												
	163		At Elev 263.1', observed fault, dipping 80°, 1/16" thick, lean CLAY lining; smooth; 1" reverse offset.		C35			48	10						
261.00	164														
	165		At Elev 260.0', observed bedding joint, dipping 70 to 60°, tight. Numerous polished and striated beds.												
259.00	166														
	167														
257.00	168		At Elev 257.4', observed bedding joint, dipping 70°, 5" thick fine SANDSTONE bed.		C36			79	0						
	169		At Elev 256.0', observed bedding joint, dipping 90 to 70°, tight, continuing polished and striated bedding planes.												
255.00	170				C37			0	0						
	171														
253.00	172				C38			60	0						
	173		At Elev 252.0', observed bedding joint, dipping 80 to 60°, tight.												
251.00	174				C39			100	50						
	175														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-005**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **6 of 8**

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	175			C39			100	50						
249.00	176	At Elev 249.0', observed bedding joint, dipping 90 to 60°, tight, locally overturned beds with abundant internal polished surfaces, offsets up to 1/2". Rock is siliceous to 182' (El.: 243').		C40			100	57						
	177													
247.00	178													
	179								11	114				EM, M, SD, UC=316psi, UW
245.00	180													
	181			C41			98	53						
243.00	182	At Elev 243.8', observed random fracture, dipping 55°, tight, polished. At Elev 243.6', observed random fracture, dipping 55°, tight, polished.												
	183													
241.00	184								7	116				M, PA, PL, SD, UW
	185	At Elev 241.0', observed bedding joint, dipping 85°, abundant internal polished surfaces, offsets up to 1/4". Some slaking along bedding planes. At Elev 240.1', observed random fracture, dipping 50°, tight, polished.												
239.00	186	At Elev 239.7', observed random fracture, dipping 35°, tight, polished.		C42			97	58						
	187	At Elev 238.0', observed bedding joint, dipping 80°, tight.												
237.00	188	PTS: Feldspathic wacke; 50% biotite, 20% quartz; 15% muscovite; 15% plagioclase.												
	189													PTS
235.00	190	SEDIMENTARY ROCK, (SANDSTONE); fine grained; very thickly bedded with thin interbeds of SILTSTONE: dark greenish gray (SANDSTONE) and very dark greenish gray (SILTSTONE); fresh; soft; moderately to intensely fractured.												
	191			C43			70	20						
233.00	192	At Elev 235.5', observed 6" thick SANDSTONE bed with internally sheared SILTSTONE rip-up clasts up to 2" dia. Continues to 192.8' (El.: 232.2').												
	193	At Elev 232.2', observed bedding joint, dipping 85 to 75°, 2' thick SILTSTONE sequence; beds have up to 1/16" thick lean CLAY lining; polished.												
231.00	194													
	195	At Elev 230.0', observed 12" thick SANDSTONE bed with internally sheared SILTSTONE rip-up clasts up to 2" dia..												
229.00	196			C44			83	50						
	197													
227.00	198	At Elev 227.0', observed bedding joint, dipping 75 to 60°, tight. Unit is 80%SANDSTONE; 20%SILTSTONE. SILTSTONE beds are sheared and polished with up to 1/16" thick lean CLAY lining.												
	199													
225.00	200													
	201	SEDIMENTARY ROCK, (SILTY SANDSTONE) medium to fine grained; massive to very thickly bedded; dark bluish gray; fresh; moderately soft to moderately hard; poorly to moderately indurated; moderately fractured, up to 1/8" thick lean CLAY lining.		C45			83	80						
223.00	202													
	203	At Elev 223.0', observed shear/fault zone, dipping 90 to 70°, 1/8" thick lean CLAY lining; tight.												
221.00	204	At Elev 222.0', observed fault, dipping 70°, 1/8" thick lean CLAY lining; tight.												
	205													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-005**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **7 of 8**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	205	SEDIMENTARY ROCK *(continued)*.		C45			83	80						
219.00	206			C46			100	100	11	118				M, PA, UW
	207													
217.00	208													
	209													
215.00	210													
	211	At Elev 214.0', becomes coarse to fine SAND to 212.5' (El.: 212.5').		C47			100	100						
213.00	212													
	213	At Elev 212.5', observed fault, dipping 85 to 60°, 1/8" thick lean CLAY lining; tight. At Elev 212.4', becomes medium to fine grained.												
211.00	214	At Elev 211.2', observed fault, dipping 70°, 1/8" thick lean CLAY lining; tight.												
	215	At Elev 211.1', observed bedding joint, dipping 50°, 12" zone, thinly bedded with very thin to thin SILTSTONE. At Elev 209.5', observed fault, dipping 90 to 80°, 1/16" thick lean CLAY lining; tight.												
209.00	216			C48			93	52	14	113				M, UW
	217	At Elev 208.5', observed fault, dipping 80°, 1/16" thick lean CLAY lining; tight. Offsets local SILTSTONE beds..												
207.00	218													
	219	At Elev 206.7', observed fault, dipping 60°, 1/16" thick lean CLAY lining; tight. Truncates local SILTSTONE beds.. At Elev 206.5', observed bedding joint, dipping 50°, tight.												
205.00	220	At Elev 206.0', observed fault, dipping 70°, 1/16" thick lean CLAY lining; tight. Truncates local SILTSTONE beds. Rock becomes soft.												
	221			C49			54	25						
203.00	222													
	223													
201.00	224	At Elev 201.0', observed fracture zone, tight, with up to 1/8" thick lean CLAY lining.												
	225	Bottom of borehole at 225.0 ft bgs												
199.00	226	Boring terminated at a planned depth.												
	227	Piezometer Sensor Installed at 124.5' (El. 300.5')												
197.00	228	RQD values provided on the boring logs are based on intact core pieces obtained between two natural discontinuities. The majority of core obtained from this boring is typically very weak to weak and does not meet the "sound core" definition provided in the standard test method for RQD (ASTM D 6032). These RQD values should not be used to evaluate rock mass quality.												
	229													
195.00	230													
	231													
193.00	232													
	233													
191.00	234													
	235													

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-005**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **8 of 8**

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
J. Culotta	3-20-13	3-22-13	34° 5' 23.94852" / -118° 9' 11.19711" NAD83	R-13-006
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Jet Drilling, Inc				505.6 ft NAVD88
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Hollow-Stem Auger to 60'; Rotary Wash to TD			CME-75	8" to 60'; 3.8" to TD
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
SPT (1.4"), Cal (2.5"), HQ (2.5")			140 lb. Auto Hammer, 30" Drop	72%
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS DURING DRILLING / AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING
Cement and Bentonite Grout			NE	120.8 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (2").												
		AGGREGATE BASE (3").												
	1	SANDY SILTY CLAY (CL-ML); brown; moist; mostly low plasticity fines; some fine SAND; trace fine GRAVEL; homogeneous; (ALLUVIUM).												
503.60	2			B01										
	3													
501.60	4													
	5													
499.60	6			S02	12 24 29	53	100		12	125				M, PA, UW
	7													
497.60	8													
	9													
495.60	10			S03	9 11 10	21	100							
	11													
493.60	12													
	13													
491.60	14													
	15			S04	11 13 19	32	100		15	120				M, DS, PA, PI, UW
489.60	16													
	17													
487.60	18													
	19													
485.60	20			S05	10 12 12	24	100							
	21													
483.60	22													
	23													
481.60	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				R-13-006
DIST.	COUNTY	ROUTE	POSTMILE	EA
07	LA	710		07-187900
PROJECT OR BRIDGE NAME				
SR 710 North Study				
BRIDGE NUMBER	PREPARED BY	DATE	SHEET	
	D. Jankly	4-18-13	1 of 5	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	SANDY SILTY CLAY (CL-ML) *(continued)*.												
479.60	26			S06	11 15 19	34	89							
	27													
477.60	28													
	29													
475.60	30			S07	12 14 14	28	78		9					M, PA, PI
	31													
473.60	32													
	33	Light olive brown; few fine SAND; stratified.												
471.60	34													
	35			S08	13 19 27	46	72							PA
469.60	36													
	37													
467.60	38	Lean CLAY (CL); light olive brown; moist; mostly medium plasticity fines; few fine SAND; homogeneous.												
	39													
465.60	40			S09	5 9 13	22	89							PA, PI
	41													
463.60	42													
	43	SANDY SILT (ML); dark yellowish brown; moist; mostly fines; some fine SAND; homogeneous.												
461.60	44													
	45			S10	18 41 50	91	72		11	118				DS, M, PA, UW
459.60	46													
	47													
457.60	48													
	49	CLAYEY SAND (SC); very dense; dark brown; moist; mostly coarse and fine SAND; little low to medium plasticity fines; homogeneous; moderate cementation.												
455.60	50			S11	33 39 50	89	100							PA, PI
	51													
453.60	52													
	53	Well-graded SAND with SILT (SW-SM); strong brown; moist; mostly coarse to fine SAND; few fines; trace fine GRAVEL; homogeneous; weak cementation, some iron oxide staining.												
451.60	54													
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-13-006**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **2 of 5**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55	Well-graded SAND with SILT (SW-SM) *(continued)*.		S12	100 100-5"		100		3	123				M, PA, UW
449.60	56													
	57													
447.60	58													
	59													
445.60	60	Very dense.		S13	43 100-5"		50							
	61													
443.60	62													
	63	SEDIMENTARY ROCK, (SILTSTONE); thinly bedded with thin (CLAYSTONE) interbeds; olive and brownish yellow; moderately weathered; very soft to soft; (PUENTE FORMATION).												
441.60	64													
	65	At Elev 440.6', observed bedding joint, dipping 70 to 60°, iron oxide stained, slaking.		S14	18 34 50-5"		100		27	97				M, PA, PI, UC=41.5psi, UW
439.60	66													
	67													
437.60	68													
	69													
435.60	70			S15	15 24 27	51	100							CR
	71													
433.60	72													
	73													
431.60	74													
	75	At Elev 430.6', becomes grayish brown and yellowish brown.		S16	40 100		100		22	104	UU =2.63			PA, PI, SD, UU
429.60	76			C17			17	0						
	77													
427.60	78													
	79													
425.60	80			C18			12	0						
	81													
423.60	82													
	83													
421.60	84													
	85													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-13-006**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **3 of 5**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85	SEDIMENTARY ROCK *(continued)*.												
419.60	86													
	87													
417.60	88													
	89													
415.60	90	At Elev 415.6', with few fine SANDSTONE beds.		S19	25 40 50-5"		88		29	95				CR, M, PA, PI, UC=35.6psi, UW
	91													
413.60	92													
	93													
411.60	94													
	95	At Elev 410.6', observed bedding joint, dipping 90 to 80°, dark yellowish brown with gray laminations.		S20	22 41 50-4"		88		26	99				EM, M, UC= 73.5psi, UW
409.60	96													
	97													
407.60	98													
	99													
405.60	100	At Elev 405.6', becomes predominantly SILTSTONE; laminated; dark yellowish brown and yellowish red.		S21	21 27 43	70	100		29	94				M, SD, UW
	101													
403.60	102													
	103													
401.60	104													
	105	At Elev 400.6', observed bedding joint, dipping 80 to 70°, iron oxide stained beds, slaking.		S22	22 43 50-4"		100		28	97	UU =1.83			M, PA, PI, UU, UW
399.60	106													
	107													
397.60	108													
	109													
395.60	110			S23	12 22 36	58	100							
	111													
393.60	112													
	113													
391.60	114													
	115													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**R-13-006**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **4 of 5**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	115		At Elev 390.6', becomes slightly weathered. At Elev 390.5', observed bedding joint, dipping 20°, slaking.		S24	43 100-5"		91		24	103				M, PA, PI, UW
389.60	116														
	117														
387.60	118														
	119														
385.60	120		At Elev 385.6', becomes slightly weathered to fresh; very dark gray with greenish gray laminations; soft.		S25	70 100-4"		100							
	121		Bottom of borehole at 120.8 ft bgs												
383.60	122		Boring terminated at a planned depth.												
	123														
381.60	124														
	125														
379.60	126														
	127														
377.60	128														
	129														
375.60	130														
	131														
373.60	132														
	133														
371.60	134														
	135														
369.60	136														
	137														
367.60	138														
	139														
365.60	140														
	141														
363.60	142														
	143														
361.60	144														
	145														

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REPORT TITLE				HOLE ID
BORING RECORD				**R-13-006**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **5 of 5**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
D. Jankly	3-7-13	3-18-13	34° 5' 16.55525" / -118° 9' 41.26998" NAD83	RC-13-007
DRILLING CONTRACTOR: Cascade Drilling, LP			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 493.1 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger to 87'; Rotary Wire-line to TD			DRILL RIG: IR-8400 to 53'; CME-85 to TD	BOREHOLE DIAMETER: 8" to 87'; 3.8" to TD
SAMPLER TYPE(S) AND SIZE(S) (ID): SPT (1.4"), Cal (2.5"), HQ (2.5")			SPT HAMMER TYPE: 140 lb. Auto Hammer, 30" Drop	HAMMER EFFICIENCY, ERi: 78%
BOREHOLE BACKFILL AND COMPLETION: Piezometer Installed on Completion			GROUNDWATER READINGS: DURING DRILLING 45.0 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 271.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (3.5").												
		AGGREGATE BASE (3").												
	1	SILTY SAND (SM); very dense; dark yellowish brown; moist; mostly coarse to fine SAND; some low plasticity fines; few fine GRAVEL; homogeneous, weak to moderate cementation; (ALLUVIUM).		B01										
491.10	2													
	3													
489.10	4													
	5			S02	19 50 50-4"		75							
487.10	6													
	7													
485.10	8													
	9													
483.10	10			S03	13 16 28	44	78							PA
	11													
481.10	12													
	13													
479.10	14													
	15	Dense; strong brown; mostly medium to fine SAND; weak cementation.		S04	13 13 20	33	94							PA
477.10	16													
	17													
475.10	18													
	19													
473.10	20	Brown; dry; mostly fine SAND.		S05	8 19 19	38	67		5	103				M, PA, UW
	21	SANDY SILT (ML); brown; moist; mostly low plasticity fines; some medium to fine SAND; homogeneous.												
471.10	22													
	23													
469.10	24	Poorly graded SAND with SILT (SP-SM); medium dense; strong brown; moist; mostly medium to fine SAND; few to												
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				RC-13-007
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY D. Jankly	DATE 4-18-13	SHEET 1 of 10	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	little low plasticity fines; homogeneous; weak cementation.												
467.10	26	Poorly graded SAND with SILT (SP-SM) *(continued)*.		S06	8 11 14	25	78							
	27													
465.10	28	SANDY SILTY CLAY (CL-ML); reddish brown; moist; mostly low plasticity fines; some medium to fine SAND; trace fine GRAVEL; homogeneous; <5% porosity to 1/16".												
	29													
463.10	30			S07	8 13 20	33	67							PA, PI
	31													
461.10	32													
	33	SILTY SAND (SM); dense; strong brown; moist; mostly coarse to fine SAND; some low plasticity fines; little fine GRAVEL; homogeneous; weak to moderate cementation.												
459.10	34													
	35			S08	10 15 24	39	94							PA
457.10	36													
	37													
455.10	38													
	39													
453.10	40	Moist to wet; lacks GRAVEL.		S09	4 8 24	32	100		16	113				M, UW
	41													
451.10	42													
	43	Well-graded SAND with SILT (SW-SM); very dense; brown; wet; mostly coarse to fine SAND; few low plasticity fines; few fine GRAVEL; homogeneous; weak cementation.												
449.10	44													
	45			S10	8 26 47	73	78							PA
447.10	46													
	47													
445.10	48													
	49	Poorly graded SAND with GRAVEL (SP); yellowish brown; wet; mostly coarse to medium SAND; little coarse to fine GRAVEL; homogenous; weak cementation.												
443.10	50			S11	11 40 30	70	33		16	112				M, UW
	51													
441.10	52													
	53	SILTY SAND (SM); medium dense; brown; wet; mostly fine SAND; some low plasticity fines; homogeneous; weak cementation.												
439.10	54													
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-007**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **2 of 10**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55	SILTY SAND (SM) *(continued)*.		S12	8 11 16	27	89							
437.10	56													
	57													
435.10	58													
	59													
433.10	60	SILTY SAND (SM); dark yellowish brown; wet; mostly medium to fine SAND; little low plasticity fines; trace fine GRAVEL; homogeneous; weak cementation.		S13	50-6"		0							
	61													
431.10	62													
	63													
429.10	64													
	65	Very dense.		S14	20 24 18	42	89		21					M, PA
427.10	66													
	67	SEDIMENTARY ROCK, (CLAYSTONE); massive; strong brown; decomposed; (SANDY fat CLAY (CH); strong brown; moist; mostly medium to high plasticity fines; trace fine SAND; homogeneous; (FERNANDO FORMATION)).												
425.10	68													
	69													
423.10	70			S15	12 27 45	72	100							
	71													
421.10	72													
	73													
419.10	74													
	75			S16	8 12 19	31	78							PA, PI
417.10	76													
	77													
415.10	78													
	79													
413.10	80	SEDIMENTARY ROCK, (CLAYSTONE); massive; light grayish brown to brown; moderately weathered; very soft; very slightly fractured, randomly oriented, tight; locally abundant bioturbation structures, possibly indicative of bedding. Local soft sediment deformation.		S17	21 45 50-4"		75		26	99	UU =3.34			M, PA, PI, UU, UW
	81													
411.10	82													
	83													
409.10	84													
	85													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-007**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **3 of 10**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85	SEDIMENTARY ROCK *(continued)*.		S18	15 16 26	42	67							
407.10	86													
	87			C19			100	88						
405.10	88													
	89													
403.10	90													
	91	At Elev 402.1', observed							19					M, PI
401.10	92	At Elev 401.1', observed numerous tight, randomly oriented shears and fractures, polished and clay lined up to 1/16" thick.		C20			100	100						
	93													
399.10	94													
	95													
397.10	96													
	97	At Elev 396.1', becomes grayish brown to yellowish red, slightly fractured.		C21			97	97						
395.10	98													
	99													
393.10	100													
	101								29	93				EM, M, UW, UC=134psi
391.10	102			C22			100	50						
	103													
389.10	104													
	105	At Elev 388.3', observed fault, dipping 80°, 1/16" thick lean CLAY lining; tight.												
387.10	106	At Elev 387.3', observed fault, dipping 85°, 1/8" thick lean CLAY lining; tight.												
	107			C23			0	0						
385.10	108													
	109													
383.10	110													
	111													
381.10	112	At Elev 381.1', observed abundant bioturbation structures, elongated, 1/2" to 3" long and 1/8" to 1/2" thick.		C24			100	67						
	113													
379.10	114	At Elev 379.3', observed random fracture, dipping 70°, tight; smooth.												
	115	At Elev 378.7', observed random fracture, dipping 80°,												

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-007**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **4 of 10**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	115		tight; rough.		C24			100	67						
377.10	116									25	99	UU =4.34			PA, PI, UU
	117				C25			80	70						
375.10	118														
	119														
373.10	120		Thinly to very thinly bedded with few thin interbeds of fine SANDSTONE: gray and strong brown; slightly weathered; very soft; slightly fractured; some slaking along bedding planes.												
	121		At Elev 373.1', observed bedding joint, dipping 20 to 10°.												
371.10	122				C26			70	63						
	123														
369.10	124														
	125									21					M, PA, PI, SD
367.10	126														
	127		At Elev 366.1', observed bedding joint, dipping 30 to 20°, tight. Rock becomes very soft to soft.		C27			100	90						
365.10	128														
	129														
363.10	130		At Elev 363.1', observed bedding joint, dipping 30°, tight. CLAYSTONE is very dark gray.												
	131		At Elev 361.9', observed fault, dipping 80°, 1/16" thick lean CLAY lining, smooth.												
361.10	132				C28			90	90						
	133														
359.10	134		At Elev 359.6', observed contact, dipping 60 degrees, likely soft sediment deformation feature, material change below.												
	135		Massive; very dark gray; slightly weathered to fresh; moderately soft to soft; very slightly fractured; locally abundant bioturbation structures (light bluish gray) and soft sediment deformation features.												
357.10	136		At Elev 357.7', observed SANDSTONE bed; strong brown; subhorizontal; majority has been washed out due to drilling.							20	108				EM, M, UW, UC=420psi
	137				C29			100	100						
355.10	138		At Elev 356.9', observed SANDSTONE bed; strong brown; subhorizontal; majority has been washed out due to drilling.							13	108				M, PA, SD, UW
	139		At Elev 355.1', becomes very dark bluish gray, fresh. At Elev 354.3', observed random fracture, dipping 30°, tight, smooth to slightly rough.												
353.10	140		At Elev 354.1', observed random fracture, dipping 50°, tight, smooth to slightly rough.												
	141														
351.10	142				C30			70	60						
	143														
349.10	144		At Elev 349.1', observed fault, dipping 60°, 1/16" thick lean CLAY lining, smooth to slightly rough.												
	145														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-007**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **5 of 10**

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Number	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Remarks
	145		C30	70	60	21	107	EM, M, PL, UW, UC=274psi
347.10	146							
	147		C31	90	80			
345.10	148	At Elev 345.4', observed bedding joint, dipping 20 to 0°, 3" thick cemented SILTSTONE bed; moderately hard to hard.						
	149	At Elev 345.1', becomes dark greenish gray with greenish gray bioturbation structures, unfractured.						
343.10	150							
	151							
341.10	152	At Elev 341.3', observed bedding joint, dipping 20 to 10°, undulatory SILTSTONE lamination.	C32	100	100			
	153					22	105	M, PA, PI, PL, SD, UW
339.10	154							
	155							
337.10	156							
	157		C33	0	0			CR
335.10	158							
	159	At Elev 334.1', observed abundant bioturbation structures dipping less than 10 degrees.	C34	100	100			
333.10	160					23	104	EM, M, UW, UC=148psi
	161							
331.10	162							PA, PI
	163							
329.10	164		C35	100	100			
	165							
327.10	166	PTS: Laminated siltstone; 68% biotite; 15% muscovite; 10% plagioclase; 7% quartz. At Elev 327.1', becomes greenish black.						PTS
	167		C36	100	100	24	100	EM, M, UW, UC=383psi
325.10	168							
	169							
323.10	170		C37	100	100			
	171	At Elev 322.1', observed abundant bioturbation structures dipping 10 to 20 degrees.						
321.10	172							
	173					15	105	M, PA, PI, SD, UW
319.10	174							
	175							

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-007**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **6 of 10**

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	175				C38			100	100						
317.10	176														
	177														
315.10	178									23	103				EM, M, PL, UW, UC=74psi
	179														
313.10	180				C39			0	0						
	181				C40			100	100						
311.10	182														
	183									23	105				EM, M, PL, SD, UW, UC=254psi
309.10	184														
	185														PA
307.10	186				C41			100	100						
	187														
305.10	188														
	189														
303.10	190														
	191														
301.10	192		At Elev 301.6', observed bedding joint, dipping 20 to 10°, some very fine SANDSTONE beds up to 1/4" thick, continues to 194' (El.: 231').		C42			100	100						
	193		At Elev 300.4', observed fault, dipping 20°, 1/16" thick lean CLAY lining, tight.							22	100				CR, PA, PI, UC=397psi
299.10	194		Bedding joint dipping 25 to 30°, 12" thick zone of very thinly bedded to laminated SILTSTONE, slaking along bedding planes, smooth.												
	195														
297.10	196														
	197				C43			100	100						
295.10	198									20					EM, M, SD, UC=428psi
	199				C44			100	100						
293.10	200														
	201														
291.10	202														
	203														
289.10	204				C45			100	100						
	205														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-007**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **7 of 10**

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	205				C45			100	100	22					PA, PI, SD
287.10	206				C46			91	91						
	207		PTS: Laminated siltstone; 65% biotite; 15% muscovite; 10% plagioclase; 10% quartz.							23	103				EM, M, UW, UC=439psi
285.10	208														PTS
	209														
283.10	210														
	211		At Elev 282.1', observed abundant bioturbation structures dipping 15 to 20 degrees.												
281.10	212				C47			82	82						
	213														
279.10	214		At Elev 279.1', observed few shell fragments.												
	215														PA
277.10	216		At Elev 277.1', observed bedding joint, dipping 20 to 10°, 2" thick very fine SANDSTONE bed, greenish gray.												
	217				C48			100	100						
275.10	218														
	219														
273.10	220														
	221														
271.10	222				C49			100	100						
	223		At Elev 270.3', observed random fracture, dipping 60°, tight, slightly rough.												
269.10	224		At Elev 269.6', observed bedding joint, dipping 25 to 15°, 1.5' thick, thinly bedded to laminated SILTSTONE sequence; with 2-3" thick SANDSTONE bed, very dark bluish gray, at 224.3' (El.: 200.7').		C50			91	91						
	225														
267.10	226									19	109				M, SD, UW
	227														
265.10	228														
	229		SEDIMENTARY ROCK, (Fine SANDY SILTSTONE); massive; very dark greenish gray; fresh; very soft; poorly indurated; unfractured; with locally abundant bioturbation structures (light bluish gray) and soft sediment deformation features.		C51			100	100						
263.10	230														
	231		At Elev 263.9', observed bedding joint, dipping 30 to 20°, 1" to 3" thick moderately indurated, moderately hard bed, dark grayish brown.												
261.10	232		At Elev 261.6', observed bedding joint, dipping 30 to 20°, 1" to 3" thick moderately indurated, moderately hard bed, dark grayish brown.												
	233														
259.10	234				C52			100	100						
	235														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-007**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **8 of 10**

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	235		SEDIMENTARY ROCK *(continued)*.		C52			100	100						
257.10	236		At Elev 257.8', observed bedding joint, dipping 20 to 10°, 2-3" thick SANDSTONE bed, very dark bluish gray.												
	237														
255.10	238														
	239														
253.10	240				C53			100	100						
	241														PA
251.10	242														
	243														
249.10	244														
	245				C54			100	100						
247.10	246														
	247														
245.10	248														
	249		At Elev 244.9', observed bedding joint, dipping 30 to 20°, 1" to 3" thick moderately indurated, moderately hard bed, dark grayish gray.							17	117				EM, M, UW, UC=285psi
243.10	250														
	251				C55			100	100						
241.10	252														
	253														
239.10	254				C56			100	100						
	255														
237.10	256														
	257														
235.10	258									18	112				PA, UC=363psi
	259				C57			100	100						
233.10	260		SEDIMENTARY ROCK, (SILTSTONE); massive; very dark greenish gray; fresh; soft; unfractured; locally abundant bioturbation structures (dark greenish gray) and soft sediment deformation features.												
	261														
231.10	262		At Elev 231.1', observed bedding joint, dipping 20 to 10°, 2-3" thick thinly bedded SILTSTONE.		C58			100	100						
	263														
229.10	264														
	265														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-007**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **9 of 10**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	265		SEDIMENTARY ROCK *(continued)*.		C58			100	100						
227.10	266									20	107				PA, SD, UC=533psi
	267				C59			100	100						
225.10	268		Abundant bioturbation structures dipping 20 degrees.												
	269														
223.10	270														
	271		Bottom of borehole at 271.0 ft bgs												
221.10	272		Boring terminated at a planned depth.												
	273		Piezometer Sensors Installed at 52' and 200' (El. 493.1', and 293.1')												
219.10	274		RQD values provided on the boring logs are based on intact core pieces obtained between two natural discontinuities. The majority of core obtained from this boring is typically very weak to weak and does not meet the "sound core" definition provided in the standard test method for RQD (ASTM D 6032). These RQD values should not be used to evaluate rock mass quality.												
	275														
217.10	276														
	277														
215.10	278														
	279														
213.10	280														
	281														
211.10	282														
	283														
209.10	284														
	285														
207.10	286														
	287														
205.10	288														
	289														
203.10	290														
	291														
201.10	292														
	293														
199.10	294														
	295														

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-007**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **10 of 10**

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
J. Culotta	3-25-13	3-25-13	34° 6' 39.83764" / -118° 9' 3.307107" NAD83	A-13-008
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Jet Drilling, Inc				615.5 ft NAVD88
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Hollow-Stem Auger			CME-75	8 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
SPT (1.4"), Cal (2.5")			140 lb. Auto Hammer, 30" Drop	72%
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS DURING DRILLING / AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING
Cement and Bentonite Grout			NE	96.5 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (3").												
		AGGREGATE BASE (9").												
	1	SILTY SAND (SM); yellowish brown; moist; mostly coarse to fine SAND; little fines; few fine GRAVEL; homogeneous; weak cementation (ALLUVIUM).		B01										
613.50	2													
	3													
611.50	4													
	5			S02	5 7 8	15	100		10	114				M, PI, UW
609.50	6													
	7													
607.50	8													
	9													
605.50	10	Loose.		S03	4 4 4	8	100							PA
	11													
603.50	12													
	13													
601.50	14													
	15	Light olive brown; mostly medium to fine SAND.		S04	8 18 28	46	100		4	115				DS, PA
599.50	16													
	17													
597.50	18													
	19													
595.50	20	Very dense; trace GRAVEL, stratified.		S05	22 38 43	81	100							
	21													
593.50	22													
	23													
591.50	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				A-13-008
DIST.	COUNTY	ROUTE	POSTMILE	EA
07	LA	710		07-187900
PROJECT OR BRIDGE NAME				
SR 710 North Study				
BRIDGE NUMBER	PREPARED BY	DATE	SHEET	
	D. Jankly	4-18-13	1 of 4	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	SILTY SAND (SM) *(continued)*. Some fine SAND; few fine GRAVEL.		S06	22 38 50-5"		100		10	119				M, PA, UW
589.50	26													
	27													
587.50	28													
	29													
585.50	30	Very dense; mostly coarse to fine SAND; little fine GRAVEL; little fines; stratified.		S07	18 20 25	45	78							PA
	31													
583.50	32													
	33													
581.50	34													
	35			S08	32 95		17							
579.50	36													
	37													
577.50	38													
	39													
575.50	40			S09	19 29 34	63	100							
	41													
573.50	42													
	43													
571.50	44													
	45	Mostly fine SAND; some fines.		S10	11 16 32	48	100		13	111				DS, PA
569.50	46													
	47													
567.50	48	Poorly graded SAND with SILT (SP-SM); very dense; yellowish brown; moist; mostly coarse to fine SAND; little fine GRAVEL; few fines; stratified; weak cementation.												
	49													
565.50	50			S11	32 28 33	61	100							PA
	51													
563.50	52													
	53													
561.50	54													
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-008**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **2 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		Poorly graded SAND with SILT (SP-SM) *(continued)*.		S12	45 50-5"		73		3	114				M, PA, UW
559.50	56														
	57														
557.50	58		Well-graded SAND with SILT (SW-SM); very dense; yellowish brown; moist; mostly medium to fine SAND; few fines; trace fine GRAVEL; homogeneous; weak cementation.												
	59														
555.50	60				S13	18 20 26	46	100							PA
	61														
553.50	62														
	63														
551.50	64														
	65		Mostly coarse to fine SAND; little fine GRAVEL; few fines.		S14	70 100		83		2	108				M, DS, PA, UW
549.50	66														
	67														
547.50	68		SILTY SAND (SM); very dense; yellowish brown; moist; mostly coarse to fine SAND; little fines; trace GRAVEL; homogeneous; weak cementation.												
	69														
545.50	70				S15	35 69		100		2					CR, M
	71														
543.50	72														
	73		Well-graded SAND with SILT (SW-SM); yellowish brown; moist; mostly coarse to fine SAND; little coarse to fine GRAVEL; few fines; homogeneous; weak cementation.												
541.50	74														
	75				S16	79 92		67		2	105				DS, M, PA, UW
539.50	76														
	77														
537.50	78														
	79														
535.50	80		Very dense; few GRAVEL, stratified.		S17	30 71		50							
	81														
533.50	82														
	83														
531.50	84														
	85														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-008**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **3 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		Well-graded SAND with SILT (SW-SM) *(continued)*.		S18	100-2"		0							
529.50	86														
	87														
527.50	88		SILTY SAND (SM); dense; dark yellowish brown; moist; mostly fine SAND; some fines; homogeneous; weak cementation.												
	89														
525.50	90				S19	14 16 18	34	100							
	91														
523.50	92														
	93														
521.50	94														
	95				S20	20 35 50-5"		67		9	118				M, PA, UW
519.50	96														
	97		Bottom of borehole at 96.5 ft bgs Boring terminated at a planned depth.												
517.50	98														
	99														
515.50	100														
	101														
513.50	102														
	103														
511.50	104														
	105														
509.50	106														
	107														
507.50	108														
	109														
505.50	110														
	111														
503.50	112														
	113														
501.50	114														
	115														

CH2MHILL®

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-008**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **4 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
D. Jankly	3-18-13	3-26-13	34° 6' 44.52444" / -118° 9' 26.03744" NAD83	RC-13-009
DRILLING CONTRACTOR: Cascade Drilling, LP			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 650.9 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger to 147'; Rotary Wire-line to TD			DRILL RIG: CME-95 to 120'; CME-85 to TD	BOREHOLE DIAMETER: 8" to 147'; 3.8" to TD
SAMPLER TYPE(S) AND SIZE(S) (ID): SPT (1.4"), Cal (2.5"), HQ (2.5")			SPT HAMMER TYPE: 140 lb. Auto Hammer, 30" Drop	HAMMER EFFICIENCY, ERi: 78%
BOREHOLE BACKFILL AND COMPLETION: Piezometer Installed on Completion			GROUNDWATER READINGS: DURING DRILLING 92.0 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 267.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (5").												
	1	SILTY SAND (SM); loose; yellowish red; moist; mostly medium to fine SAND; some fines; few fine GRAVEL; homogeneous; weak cementation; (ALLUVIUM).												
648.90	2			B01										
	3													
646.90	4													
	5			S02	2 2 3	5	100		10					M, PA
644.90	6													
	7													
642.90	8	Poorly graded SAND (SP); yellowish brown; moist; mostly medium to fine SAND; few fines; homogeneous; weak cementation.												
	9													
640.90	10			S03	3 6 9	15	67		11	102				M, UW
	11													
638.90	12													
	13	Well-graded SAND with SILT and GRAVEL (SW-SM); dense; yellowish brown; moist; mostly coarse to fine SAND; little fine GRAVEL; few fines; homogeneous; weak cementation.												
636.90	14													
	15			S04	11 12 16	28	100							
634.90	16													
	17													
632.90	18													
	19													
630.90	20			S05	28 40 48	88	89		4	119				M, PA, UW
	21													
628.90	22													
	23													
626.90	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				RC-13-009
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY D. Jankly	DATE 4-18-13	SHEET 1 of 10	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	Well-graded SAND with SILT and GRAVEL (SW-SM) *(continued)*. Very dense.		S06	30 50		100							
624.90	26													
	27													
622.90	28													
	29													
620.90	30	Few fine GRAVEL.		S07	26 26 27	53	67		3	105				DS, PA
	31													
618.90	32													
	33	SANDY SILT (ML); strong brown; moist; mostly non-plastic fines; some fine SAND; homogeneous.												
616.90	34													
	35			S08	13 17 28	45	100							PI
614.90	36													
	37													
612.90	38													
	39													
610.90	40	Yellowish brown.		S09	15 22 28	50	67		9	98				M, PA, UW
	41													
608.90	42													
	43													
606.90	44													
	45			S10	13 11 15	26	100							
604.90	46													
	47													
602.90	48	SILTY SAND (SM); brown; moist; mostly fine SAND; some non plastic fines; homogeneous; weak cementation.												
	49													
600.90	50			S11	16 17 39	56	94		3	101				DS, PA, PI
	51													
598.90	52													
	53													
596.90	54													
	55													

(continued)

CH2MHILL®

REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-009**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **2 of 10**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		SILTY SAND (SM) *(continued)*. Dense; moist to wet; Minor free water.		S12	12 16 20	36	100							
594.90	56														
	57														
592.90	58														
	59														
590.90	60				S13	24 29 35	64	89							
	61														
588.90	62														
	63		Moist.												
586.90	64														
	65				S14	17 19 19	38	94							
584.90	66														
	67														
582.90	68														
	69														
580.90	70				S15	23 44 50-4"		75		4	113				M, PA, UW
	71														
578.90	72														
	73														
576.90	74														
	75		Very dense.		S16	20 24 26	50	100							
574.90	76														
	77														
572.90	78		SANDY SILT (ML); brown; moist; mostly non-plastic fines; some fine SAND; homogeneous.												
	79														
570.90	80				S17	29 30 50	80	67		12	110				DS, PA
	81														
568.90	82														
	83														
566.90	84														
	85														

(continued)

CH2MHILL®

REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-009**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **3 of 10**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85	SANDY SILT (ML) *(continued)*.		S18	18 18 26	44	89							PI
564.90	86													
	87													
562.90	88													
	89													
560.90	90	Some medium to fine SAND.		S19	19 27 50	77	67							
	91													
558.90	92													
	93													
556.90	94													
	95	Trace fine GRAVEL.		S20	22 30 45	75	100							
554.90	96													
	97													
552.90	98	SILTY SAND (SM); yellowish brown; wet; mostly coarse to fine SAND; little fines; trace fine GRAVEL; homogeneous; weak cementation.												
	99													
550.90	100			S21	18 36 50-2"		79		15	118				M, PA, UW
	101													
548.90	102													
	103													
546.90	104													
	105	Very dense; Locally stratified with two - 1" to 2" thick SILT lenses, low plasticity.		S22	30 44 50-5"		71							
544.90	106													
	107													
542.90	108	SANDY SILTY CLAY (CL-ML); dark yellowish brown; moist to wet; mostly low plasticity fines; some coarse to fine SAND; few fine GRAVEL; homogenous.												
	109													
540.90	110			S23	50-4"		100		12	126				M, PA, UW
	111													
538.90	112													
	113													
536.90	114													
	115													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-009**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **4 of 10**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	115	SANDY SILTY CLAY (CL-ML) *(continued)*.		S24	26 50		58		14					M, PA, PI
534.90	116													
	117													
532.90	118													
	119													
530.90	120			S25	50		33							
	121													
528.90	122													
	123	SILTY SAND (SM); olive; wet; mostly fine SAND; some low plasticity fines; stratified with faintly darker horizons; weak cementation.												
526.90	124													
	125			S26	50-3"		0							Flowing sands encountered
524.90	126													
	127													
522.90	128													
	129													
520.90	130	Very dense.		S27	47 45 50-5"		12							
	131													
518.90	132			S28	62 50 45	95	100		21					M, PA
	133													
516.90	134													
	135													
514.90	136													
	137			S29	67 39-3"		78		21	110				Sampler bouncing M, PA, UW
512.90	138													
	139													
510.90	140	IGNEOUS ROCK, (QUARTZ DIORITE); medium grained; strong brown; decomposed to intensely weathered; (CLAYEY SAND (SC); very dense; moist; mostly coarse to medium SAND; some medium plasticity fines; moderate cementation); (Wilson Quartz Diorite).												
	141													
508.90	142			S30	60 50-3"		44		12					CR, M
	143													
506.90	144													
	145													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-009**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **5 of 10**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	145		IGNEOUS ROCK *(continued)*.												
504.90	146														
	147		IGNEOUS ROCK, (QUARTZ DIORITE); medium grained; phaneritic; strong brown; moderately weathered; moderately hard; intensely fractured; unit has abundant totally healed fractures, up to 1/8" thick.		C32			86	0						
502.90	148		At Elev 502.4', observed fracture zone, dipping 60 to 40°, 1/8" thick lean CLAY lining; tight; slightly rough.												
	149														
500.90	150														
	151														
498.90	152		At Elev 498.9', observed fracture zone, dipping 70 to 40°, 1/16" thick lean CLAY and manganese lining; tight; slightly rough, locally slickensided.		C33			64	0						
	153														
496.90	154														
	155														
494.90	156		At Elev 495.4', observed fault, dipping 60 to 35°, 1/16" thick lean CLAY lining; tight; slightly rough.												
	157		At Elev 493.9', observed fracture zone, dipping 50 to 30°, manganese stained; tight; moderately rough to rough.		C34			92	0						
492.90	158		At Elev 492.9', observed foliation joint, dipping 90 to 70°, 1/4" wide felsic vein; brownish yellow; moderately soft; tight; undulatory.												
	159														
490.90	160														
	161		At Elev 489.9', observed foliation joint, dipping 80°, 3/8" wide felsic vein; brownish yellow; moderately soft; tight; undulatory.												
488.90	162		At Elev 488.9', observed fracture zone, dipping 50 to 30°, manganese stained; tight; moderately rough to rough.		C35			94	20						
	163														
486.90	164														
	165		At Elev 485.9', becomes moderately to intensely fractured.							5	141				M, PL, UW
484.90	166														
	167		At Elev 484.2', observed foliation joint, dipping 70°, 1/8" to 2" wide felsic vein; yellow; moderately soft; tight; undulatory; continues to178.7' (El.: 472.2').		C36			100	40	6	139				EM, M, UC=436psi, UW
482.90	168		At Elev 483.9', becomes slightly weathered.												
	169		At Elev 483.4', observed fracture zone, dipping 30 to 0°, numerous subhorizontal; manganese stained; tight fractures; moderately rough to rough.												
480.90	170														
	171														
478.90	172				C37			100	0						
	173														
476.90	174		At Elev 477.4', observed 1' thick; soft; easily friable zone.												
	175														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-009**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **6 of 10**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	175	IGNEOUS ROCK *(continued)*.		C37			100	0						
474.90	176	At Elev 475.3', observed random fracture, dipping 60°, 0 to 1/16" thick; lean CLAY and manganese lining; tight; moderately rough to rough.							2	139				M, PL, UW
	177	At Elev 473.9', becomes slightly to moderately weathered.		C38			100	30						
472.90	178													
	179	At Elev 471.9', observed random fracture, dipping 40°, manganese lined; tight; moderately rough.												
470.90	180	At Elev 470.9', observed random fracture, dipping 50°, manganese lined; tight; moderately rough.												
	181	At Elev 470.4', observed shear/fault zone, dipping 70°, 1.5' thick gouge zone; rock is pulverized; shear plane in center is moderately rough, lined with 1/8" thick, black SANDY SILT; gouge zone varies, strong brown to black to white.												
468.90	182	At Elev 468.9', becomes intensely fractured.		C39			100	0						
	183	At Elev 468.8', observed foliation joint, dipping 90 to 80°, 1/8" to 3/8" wide felsic vein; 2' long; yellow; moderately hard; tight.												
466.90	184	At Elev 467.9', observed fracture zone, dipping 70 to 30°, manganese lined; tight; moderately rough.												
	185													
464.90	186													
	187	At Elev 463.9', becomes hard, moderately fractured.		C40			100	60	2					CR, M
462.90	188	At Elev 463.8', observed fracture zone, dipping 55 to 40°, manganese lined; tight; moderately rough; continues to 191' (El.: 459.9).												PTS
	189	At Elev 462.9', observed fault, dipping 50°, 1/2" thick SANDY lean CLAY lining; stepped and smooth; white.												
460.90	190	PTS: Sheared quartz diorite; 71% plagioclase; 15% biotite; 14% quartz.												
	191	At Elev 459.7', observed fault, dipping 30°, 1/8" thick; lean CLAY and manganese lining; tight; smooth to slightly rough.							4	147				EM, M, UC=281psi, UW
458.90	192	At Elev 459.1', observed fault, dipping 0°, 1/8" thick; lean CLAY and manganese lining; tight; moderately rough.		C41			100	0						
	193	At Elev 458.9', becomes intensely fractured; typically tight and well healed, local manganese staining.												
456.90	194	At Elev 456.5', observed fault, dipping 10 to 0°, 1/2" thick SANDY lean CLAY gouge; stepped and smooth; white.												
	195	At Elev 455.9', observed fault, dipping 80 to 60°, 1/16" to 3/8" thick black lean CLAY gouge; stepped and smooth.												
454.90	196	At Elev 455.1', observed fault, dipping 20°, 1/8" thick; lean CLAY and manganese lining; tight; smooth; rock is pulverized between faults at 195.8' and 196'.		C42			100	0						
	197	At Elev 454.9', observed fault, dipping 60°, 1/8" thick; lean CLAY and manganese lining; tight; moderately rough.												
452.90	198	At Elev 453.9', becomes very intensely fractured to 207'; fractures are typically manganese lined and tight.												
	199	At Elev 453.8', observed fracture zone, dipping 70 to 10°, manganese lined; tight; moderately rough; continues to 207' (El.: 443.9').												
450.90	200													
	201													
448.90	202			C43			96	0						
	203													
446.90	204													
	205													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-009**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **7 of 10**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	205		At Elev 446.3', observed fault, dipping 65°, 1/8" thick; lean CLAY and manganese lining; tight; smooth to slightly rough.		C43			96	0						
444.90	206														
	207		At Elev 443.9', becomes slightly weathered; hard; moderately to intensely fractured.		C44			100	66	2	148				EM, M, PL, UC=892psi, UW
442.90	208		At Elev 442.6', observed fault, dipping 60 to 50°, 1"to 2" thick lean CLAY gouge and manganese lining; tight; smooth to slightly rough.												
	209		At Elev 441.6', observed random fracture, dipping 0°, manganese lined; tight; moderately rough.												
440.90	210		At Elev 440.9', observed random fracture, dipping 0°, manganese lined; tight; moderately rough.							1	151				CAI, M, PL, UW
	211		At Elev 439.7', observed random fracture, dipping 60°, manganese lined; tight; moderately rough.												PL
438.90	212		At Elev 438.9', becomes moderately hard.		C45			100	40						
	213		At Elev 437.8', observed fault, dipping 30 to 20°, 1/8" thick; lean CLAY lining; tight; smooth to slightly rough.												
436.90	214		At Elev 437.4', observed fault, dipping 30°, 1/8" thick; lean CLAY lining; tight; smooth to slightly rough.												
	215		At Elev 437.3', observed fault, dipping 50°, 1/8" thick; lean CLAY lining; tight; smooth to slightly rough.												
434.90	216		At Elev 436.5', observed fracture zone, dipping 50 to 10°, manganese lined; tight; moderately rough; continues to 217' (El.: 433.9').												
	217		At Elev 433.9', becomes hard.		C46			100	40						
432.90	218		At Elev 433.8', observed fracture zone, dipping 40 to 20°, manganese lined; tight; moderately rough; continues to 222' (El.: 428.9').												
	219														
430.90	220														
	221														
428.90	222				C47			100	46						
	223		At Elev 428.6', observed fracture zone, dipping 70 to 10°, manganese lined; tight; moderately rough; continues to 227' (El.: 423.9').							3	149				M, PL, UW
426.90	224														
	225														
424.90	226														
	227		At Elev 424.7', observed fault, dipping 40 to 20°, manganese lined; tight; moderately rough.		C48			100	72						PTS
422.90	228		At Elev 423.9', observed fracture zone, dipping 50 to 0°, spaced every 2" to 6"; manganese lined; tight; moderately rough; continues to 257.8' (El.: 393.1'). PTS: Sheared quartz diorite; 75% plagioclase; 13% quartz; 12% biotite.												
	229		At Elev 421.7', observed fault, dipping 60°, 1/8" thick SANDY lean CLAY lining; tight; smooth to slightly rough,.							2	149				M, PL, UW
420.90	230														
	231		At Elev 419.9', observed fault, dipping 60°, 1/8" thick lean CLAY lining; tight; smooth to slightly rough.												
418.90	232				C49			100	30						
	233									3	147				EM, M, UC=294psi, UW
416.90	234														
	235														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-009**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **8 of 10**

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	235				C49			100	30						
414.90	236														
	237				C50			96	0						
412.90	238		At Elev 413.2', observed fault, dipping 20°, 1/8" thick SANDY lean CLAY lining; tight; smooth to slightly rough. At Elev 412.7', observed fault, dipping 20°, 1/16" thick SANDY lean CLAY lining; tight; smooth to slightly rough.												
	239														
410.90	240														
	241														
408.90	242				C51			100	30						
	243														
406.90	244														
	245														PL
404.90	246									2					M, PL
	247		At Elev 404.4', observed fault, dipping 20°, 1/2" thick SANDY lean CLAY lining; tight; smooth to slightly rough.		C52			100	60						
402.90	248														EM, M, PL, UC=1593psi, UW
	249									2	153				
400.90	250														
	251														
398.90	252				C53			36	36						
	253														
396.90	254		At Elev 396.9', observed fault, dipping 60 to 30°, 1/4" thick SANDY lean CLAY lining; tight; smooth to slightly rough. CLAY gouge to 255' (EL.: 395.9').												
	255		At Elev 396.3', observed fault, dipping 50°, 3/8" thick SANDY lean CLAY lining; tight; smooth to slightly rough.												
394.90	256		Main splay between 254' and 255'.							2	149				EM, M, PL, UC=506psi, UW
	257		At Elev 396.1', observed fault, dipping 30°, 1/16" thick lean CLAY lining; tight; smooth to slightly rough.		C54			100	40						
392.90	258		At Elev 393.3', observed fracture zone, dipping 20 to 0°, manganese lined; tight; moderately rough. At Elev 393.1', observed fault, dipping 30°, 1/8" thick SANDY lean CLAY lining; tight; smooth to slightly rough.												
	259		At Elev 393.0', observed fault, dipping 50°, 3/4" thick SANDY lean CLAY lining; tight; smooth to slightly rough.												
390.90	260														
	261														
388.90	262		At Elev 389.5', observed fracture zone, dipping 60 to 0°, spaced every 2" to 6"; manganese lined; tight; moderately rough to rough; continues to 267' (El.: 383.9').		C55			100	30						
	263														
386.90	264														
	265														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-009**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **9 of 10**

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	265				C55			100	30						
384.90	266		PTS: Sheared tonalite; 67% plagioclase; 21% quartz; 12% biotite.												PTS
	267		Bottom of borehole at 267.0 ft bgs												
382.90	268		Boring terminated at a planned depth.												
	269		Piezometer Sensors Installed at 100' and 199.5' (El. 550.4', and 451.4')												
380.90	270														
	271														
378.90	272														
	273														
376.90	274														
	275														
374.90	276														
	277														
372.90	278														
	279														
370.90	280														
	281														
368.90	282														
	283														
366.90	284														
	285														
364.90	286														
	287														
362.90	288														
	289														
360.90	290														
	291														
358.90	292														
	293														
356.90	294														
	295														

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REPORT TITLE				HOLE ID
BORING RECORD				**RC-13-009**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**		DATE **4-18-13**	SHEET **10 of 10**

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
M. Herzberg	3-4-13	3-8-13	34° 7' 3.973722" / -118° 9' 22.46405" NAD83	O-13-010
DRILLING CONTRACTOR: Boart Longyear Company			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 693.5 ft NAVD88
DRILLING METHOD: Sonic			DRILL RIG: 600 T Roto Sonic	BOREHOLE DIAMETER: 4 in
SAMPLER TYPE(S) AND SIZE(S) (ID): 3.5" ID polytube; polybag			SPT HAMMER TYPE: N/A	HAMMER EFFICIENCY, ERi: N/A
BOREHOLE BACKFILL AND COMPLETION: Piezometer Installed on Completion			GROUNDWATER READINGS: DURING DRILLING 151.0 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 272.0 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		ASPHALT (8.5").												Hand Auger to 5'
	1		Poorly graded SAND (SP); dark yellowish brown; moist; few fine, subangular GRAVEL; mostly medium to fine SAND; few nonplastic fines; weak cementation; soil development: A-horizon grading to Bk soil horizon. [ALLUVIUM].		O01			100							
691.46	2														
	3														
689.46	4														
	5				O02			100							
687.46	6														
	7														
685.46	8														
	9														
683.46	10		SILTY SAND with GRAVEL and COBBLES (SM); dark yellowish brown; moist; little fine, subangular GRAVEL; mostly medium to fine SAND; little nonplastic fines; micaceous; %5 COBBLES, GRANITE, very intensely weathered, soft, disturbed due to drilling.		O03			100							
	11														
681.46	12														
	13														
679.46	14														
	15				O04			100							
677.46	16														
	17														
675.46	18														
	19		Coarse to fine SAND.		O05			100							
673.46	20									2					PA, M
	21														
671.46	22														
	23														
669.46	24				O06			100							
	25														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				O-13-010
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY M. Strane	DATE	SHEET 1 of 10	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		*(continued)*.		O06			100							
667.46	26														
	27														
665.46	28		Increased fines.												
	29		SILT with SAND and COBBLES (ML); dark yellowish brown; moist; trace angular GRAVEL; little medium to fine SAND; mostly low to medium plasticity, medium dry strength fines; COBBLES, GRANITE, moderately weathered, hard, ~3-4" diameter.		O07			100							
663.46	30														
	31														
661.46	32														
	33		Poorly graded SAND (SP); dark yellowish brown; moist; trace angular GRAVEL; mostly fine SAND; trace nonplastic fines; weak cementation.		O08			100							
659.46	34														
	35														
657.46	36		Poorly graded SAND (SP) thinly bedded with thin interbeds of SILT (ML) Poorly graded SAND(SP); brown; moist; mostly coarse to fine SAND; trace fines; some subangular GRAVEL; weak cementation. SILT (ML); light gray; moist; low plasticity; rapid dilatancy.											
	37				O09			100							
655.46	38		SILTY CLAY with GRAVEL (CL-ML); dark yellowish brown; moist; little fine, angular GRAVEL; trace fine SAND; mostly low plasticity fines.												
	39		SILTY CLAY (CL-ML); pale yellow; moist; trace coarse, angular GRAVEL; few fine SAND; mostly low plasticity fines.												
653.46	40		SILTY SAND (SM); yellowish brown; moist; mostly fine SAND; some nonplastic to low plasticity fines; few coarse to fine GRAVEL; slightly micaceous; moderate cementation.							7					PA, M
	41				O10			100							
651.46	42														
	43														
649.46	44														
	45		SILT (ML); dark yellowish brown; moist; few fine SAND; mostly low plasticity fines; micaceous.		O11			100							
647.46	46														
	47														
645.46	48														
	49														
643.46	50				O12			100							
	51														
641.46	52														
	53														
639.46	54				O13			100							
	55														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**O-13-010**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **2 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		SILTY CLAY (CL-ML); yellowish brown; moist; mostly low plasticity fines.		O13			100							
637.46	56														
	57		Poorly graded SAND with SILT (SP-SM); dark yellowish brown; moist; mostly coarse to fine SAND; few nonplastic fines; weak cementation.												
635.46	58		SILT (ML); dark yellowish brown; moist; few fine SAND; mostly low plasticity fines.		O14			100							
	59		Poorly graded SAND with SILT and COBBLES (SP-SM); brown; moist; mostly coarse to fine SAND; few nonplastic fines; weak cementation; 15% COBBLES, GRANITE, moderately soft to moderately hard, 3-4" diameter.												
633.46	60									2					PA, M
	61		Poorly graded SAND with SILT, GRAVEL, and COBBLES (SP-SM); brown; moist; little, fine, subangular GRAVEL; mostly coarse to fine SAND; few nonplastic fines; weak cementation; 15% COBBLES, GRANITE, moderately weathered, hard, ~3-4" diameter.		O15			100						
631.46	62														
	63														
629.46	64														
	65				O16			100							
627.46	66														
	67		SILT with SAND (ML); dark yellowish brown; moist; little fine SAND; mostly low plasticity fines.												
625.46	68														
	69				O17			100							
623.46	70		Poorly graded SAND with GRAVEL (SP); brown; some fine, subangular GRAVEL; mostly coarse to fine SAND; few nonplastic fines; weak cementation.												
	71														
621.46	72														
	73				O18			100							
619.46	74														
	75		SILT with SAND (ML); brown; moist; mostly nonplastic, low dry strength fines; micaceous.												
617.46	76				O19			100							
	77		Poorly graded SAND with SILT (SP-SM); dark yellowish brown; moist; few GRAVEL; mostly coarse to fine SAND; few nonplastic fines; weak cementation.												
615.46	78														
	79														
613.46	80		SILTY SAND (SM); dark yellowish brown; moist; trace coarse to fine GRAVEL; mostly coarse to fine SAND; some low plasticity fines; weak cementation.		O20			100							
	81		Well-graded SAND with SILT and GRAVEL (SW-SM); yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; few nonplastic fines; weak cementation; slightly micaceous.												
611.46	82														
	83				O21			100							
609.46	84														
	85														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**O-13-010**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **3 of 10**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		Well-graded SAND with SILT and GRAVEL (SW-SM) *(continued)*.		O21			100		2					PA, M
607.46	86		SANDY SILT (ML); light yellowish brown; moist; few GRAVEL; some medium to fine SAND; mostly low plasticity fines.		O22			100							
	87		Poorly graded SAND with SILT (SP-SM); yellowish brown; moist; trace GRAVEL; mostly medium to fine SAND; few nonplastic fines; weak cementation; slightly micaceous.												
605.46	88				O23			100							
	89														
603.46	90														
	91														
601.46	92														
	93		SILT (ML); brown; moist; trace fine SAND; mostly nonplastic, low dry strength fines; fines downward.		O24			50							
599.46	94		SILTY SAND (SM); pale brown; moist; trace GRAVEL; mostly medium to fine SAND; little nonplastic fines; weak cementation; slightly micaceous; fines upward to SAND with SILT.												
	95														
597.46	96				O25			100							
	97														
595.46	98		SILT (ML); brown; moist; trace fine SAND; mostly nonplastic, low dry strength fines; fines increase with depth, micaceous.												
	99				O26			50							
593.46	100		SILTY SAND (SM); yellowish brown; moist; trace fine GRAVEL; mostly medium to fine SAND; some nonplastic fines; weak cementation; micaceous.												
	101				O27			100		7					PA, M
591.46	102		SILT with SAND (ML); dark yellowish brown; moist; little fine SAND; mostly nonplastic fines; micaceous.												
	103		Poorly graded SAND (SP); yellowish brown; moist; trace GRAVEL; mostly coarse to fine SAND; few fines; weak cementation.		O28			100							
589.46	104														
	105		Fine SAND; trace nonplastic fines.												
587.46	106		SILTY CLAY (CL-ML); brown; moist; trace GRAVEL; few fine SAND; mostly low plasticity, high dry strength fines; fines downward.												
	107														
585.46	108		Poorly graded SAND with SILT (SP-SM); brown; moist; trace GRAVEL; mostly fine SAND; few nonplastic fines; weak cementation.												
	109		At Elev 584.5', observed ~2" thick SILTY SAND (SM) bed.												
583.46	110		SILTY SAND (SM); brown; moist; trace GRAVEL; mostly coarse to fine SAND; some low plasticity fines; weak cementation.		O29			100							
	111		Poorly graded SAND (SP); brown; moist; trace GRAVEL; mostly coarse to fine SAND; few nonplastic fines; weak cementation.												
581.46	112														
	113		At Elev 580.5', observed 2 inch thick fine SAND bed at the bottom of unit.												
579.46	114		SILTY SAND (SM) thickly bedded with thick interbeds of SILTY CLAY (CL-ML). SILTY SAND; brown; moist;												
	115														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**O-13-010**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **4 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	115		mostly coarse to fine SAND; some fines; few fine GRAVEL; weak cementation. SILTY CLAY; dark yellowish brown to brown; moist; mostly non to low plasticity fines; few fine SAND; slow to rapid dilatancy.. *(continued)*.		O29			100							
577.46	116														
	117				O30			100		8					PA, PI, M
575.46	118														
	119														
573.46	120				O31			100							
	121														
571.46	122														
	123														
569.46	124		SILTY CLAY (CL-ML); dark yellowish brown; moist; few fine SAND; mostly medium plasticity, low dry strength fines.												
	125														
567.46	126														
	127				O32			100							
565.46	128														
	129														
563.46	130		Lean CLAY (CL) thickly bedded with thick interbeds of SILTY SAND (SM); Lean CLAY; dark yellowish brown; moist; little medium to fine SAND; trace coarse to fine GRAVEL; low plasticity; slow to rapid dilatancy. SILTY SAND; moist; brown; mostly medium to fine SAND; some fines; few fine GRAVEL.		O33			100						PA, PI
	131														
561.46	132														PA
	133														
559.46	134														
	135														
557.46	136														
	137														
555.46	138														
	139														
553.46	140														
	141				O34			100		8					PA, M
551.46	142														
	143									19					PA, PI, M, CR
549.46	144														
	145														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**O-13-010**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **5 of 10**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	145		*(continued).*		O34			100		8					
547.46	146														
	147														
545.46	148														
	149														
543.46	150				O35			100							PA
	151														
541.46	152														
	153														
539.46	154														
	155														
537.46	156														
	157				O36			100							
535.46	158														
	159				O37			100							
533.46	160									10					PA, M
	161														
531.46	162														
	163														
529.46	164														
	165														
527.46	166														PA, PI
	167														
525.46	168														
	169														
523.46	170														
	171		Fat CLAY (CH); yellowish brown; moist; mostly high plasticity fines.												
521.46	172		SILTY SAND (SM) thickly interbedded with thick interbeds of SILT(ML); SILTY SAND; yellowish brown; moist; mostly fine SAND; some low plasticity fines; weak cementation; slightly micaceous. SILT; yellowish brown; moist; mostly fines; little fine SAND; low plasticity; rapid dilatancy; slightly micaceous.		O38			100							
	173														PA
519.46	174														
	175														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**O-13-010**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **6 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	175		*(continued)*.		O38			100							
517.46	176														
	177				O39			100							
515.46	178														
	179		SANDY SILT (ML); yellowish brown; moist; trace fine GRAVEL; some fine SAND; mostly nonplastic fines; slightly micaceous.												
513.46	180									20					PA, M
	181														
511.46	182														
	183														
509.46	184														
	185														
507.46	186														
	187				O40			100							
505.46	188														
	189														
503.46	190		SANDY lean CLAY (CL); reddish brown; moist; some medium to fine SAND; mostly low plasticity, medium dry strength fines; some pedogenic soil development.												
	191														PA, PI
501.46	192														
	193														
499.46	194														
	195		SANDY SILT (ML); yellowish brown; moist; some fine SAND; mostly nonplastic fines.		O41			100							
497.46	196														
	197														
495.46	198		SILTY SAND (SM); reddish brown; moist; trace fine GRAVEL; mostly medium to fine SAND; some nonplastic to low plasticity fines; moderate cementation; micaceous, some pedogenic soil development.							7					PA, PI, M, CR
	199														
493.46	200														
	201		Fat CLAY (CH); dark yellowish brown; moist; few fine SAND; mostly high plasticity, very high dry strength fines; slightly micaceous, parent material to pedogenic soil development in SILTY SAND (SM) above.												
491.46	202														
	203		CLAYEY SAND (SC); brown; moist; trace fine GRAVEL; mostly coarse to fine SAND; little low plasticity fines; moderate cementation.												
489.46	204		Poorly graded SAND (SP); dark yellowish brown; moist; few fine GRAVEL; mostly coarse to fine SAND; few												
	205														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**O-13-010**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **7 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	205		fines; moderate cementation; slightly micaceous.		O41			100							
487.46	206		SILTY CLAY (CL-ML); brown; moist; little fine SAND; mostly high plasticity fines; micaceous.												
	207		SANDY SILT (ML); dark yellowish brown; moist; some fine SAND; mostly low plasticity fines; micaceous.		O42			100							
485.46	208		Poorly graded SAND with SILT (SP-SM); dark yellowish brown; moist; mostly fine SAND; little nonplastic fines; weak cementation; fines upward.												
	209		SILTY CLAY (CL-ML); brown; moist; little fine SAND; mostly high plasticity, high dry strength fines; micaceous.												
483.46	210		SANDY lean CLAY (CL); brown; moist; some medium to fine SAND; mostly low to medium plasticity, medium dry strength fines.												PA, PI
	211		At Elev 483.5', observed trace SAND.												
481.46	212		At Elev 482.6', observed coarse GRAVEL and possible decomposed cobble (IGNEOUS).												
	213														
479.46	214		SILTY SAND (SM); brown; moist; trace fine GRAVEL; mostly medium to fine SAND; some low plasticity fines; weak cementation; pedogenic soil development (Bt Horizon) with visible fine to coarse GRAVEL, white clay to silt coating ped surfaces, very pale brown.												
	215														
477.46	216														
	217		Color to grayish green, clay staining ped surfaces.		O43			100							
475.46	218									10					PA, M
	219		Increased GRAVEL.												
473.46	220		CLAYEY SAND (SC); brown; moist; mostly fine SAND; some low to medium plasticity fines; fines downward.		O44			100							
	221														PA, PI
471.46	222		At Elev 471.2', becomes reddish brown.												
	223														
469.46	224														
	225														
467.46	226		SILTY SAND (SM); yellowish brown; moist; few coarse to fine GRAVEL; mostly coarse to fine SAND; little fines.												
	227														PA
465.46	228														
	229														
463.46	230		Silty SAND with GRAVEL and COBBLES (SM); brown; moist; mostly coarse to fine SAND; little fines; little fine GRAVEL; micaceous; weak cementation; 5% COBBLES, GRANITE, intensely weathered, hard, broken due to drilling; fines downward.		O45			100							
	231														
461.46	232														
	233		At Elev 460.5', contains trace fine GRAVEL, fines downward.												
459.46	234														PA
	235														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**O-13-010**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **8 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	235		*(continued)*.		O45			100							
457.46	236														
	237				O46			100							
455.46	238		SANDY SILT (ML); brown; moist; trace GRAVEL; some medium to fine SAND; mostly medium plasticity, low dry strength fines. At Elev 455.2', observed increased clay content, color transitions to brown.												
	239														
453.46	240		Lean CLAY (CL) moderately bedded with thin beds of Poorly graded SAND (SP); Lean CLAY; brown; moist; low to medium plasticity; very slow dilatancy. Poorly graded SAND; brown; moist; mostly medium to fine SAND; few fines; weak cementation.												
	241														
451.46	242														
	243				O47			100		13					PA, Pl, M
449.46	244		Bedding fines downward.												
	245														
447.46	246														
	247														
445.46	248														
	249														
443.46	250				O48			100							
	251														
441.46	252		SILTY SAND (SM); brown; moist; mostly medium to fine SAND; some fines; moderate cementation.												
	253		CLAYEY SAND (SC); brown; moist; trace GRAVEL; mostly medium to fine SAND; some fines; moderate cementation; fines upwards.		O49			100							
439.46	254														
	255														
437.46	256														
	257														
435.46	258														
	259														
433.46	260														
	261														
431.46	262														
	263				O50			100							
429.46	264														
	265														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**O-13-010**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **9 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	265		CLAYEY SAND (SC) *(continued)*.		O50			100							
427.46	266														
	267														
425.46	268		Poorly graded SAND with CLAY (SP-SC); dark yellowish brown; moist; mostly coarse to fine SAND; few low plasticity, low dry strength fines; weak cementation.												
	269														
423.46	270														
	271														
421.46	272		Borehole Terminated at Planned Depth												
	273		Piezometer Sensor Installed at 196' (El. 497.5'). Bottom of borehole at 272.0 ft bgs												
419.46	274														
	275														
417.46	276														
	277														
415.46	278														
	279														
413.46	280														
	281														
411.46	282														
	283														
409.46	284														
	285														
407.46	286														
	287														
405.46	288														
	289														
403.46	290														
	291														
401.46	292														
	293														
399.46	294														
	295														

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**O-13-010**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **10 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
M. Herzberg	3-8-13	3-8-13	34° 7' 37.06099" / 118° 9' 16.22499" NAD83	A-13-015
DRILLING CONTRACTOR: Martini Drilling Corporation			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 778.3 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8.5 in
SAMPLER TYPE(S) AND SIZE(S) (ID): 5-foot long split barrel; 3" dia			SPT HAMMER TYPE: N/A	HAMMER EFFICIENCY, ERi: N/A
BOREHOLE BACKFILL AND COMPLETION: Grout Well Cement, Portland Cement			GROUNDWATER READINGS: DURING DRILLING 67.8 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 103.6 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (6").												Hand Auger to 5'
	1	AGGREGATE BASE (12").												
776.26	2	SILTY SAND (SM); dark yellowish brown; trace coarse to fine, subangular GRAVEL; coarse to fine SAND; little fines; weak cementation [ALLUVIUM].												
	3													
774.26	4													
	5	SANDY lean CLAY (CL) dark yellowish brown; moist; trace fine subangular GRAVEL; some coarse to fine SAND; mostly low plasticity low to medium dry strength fines. At Elev 773.2', contains A-B horizon soil development. At Elev 773.0', contains moderate to strong Bt soil horizon development Moderately thick clay films on ped faces and thick clay films on clasts.		O01			100							PA, PI
772.26	6													
	7													
770.26	8													
	9													
768.26	10			O02			90							
	11	SILTY CLAY with COBBLES (CL-ML); yellowish brown; moist; few fine SAND; mostly medium plasticity, low dry strength fines. 10% COBBLES, GRANITE, slightly weathered, moderately hard, broken due to drilling. At Elev 765.3', observed increase in CLAY content.												
766.26	12													
	13													
764.26	14													
	15	SILTY SAND (SM); yellowish brown; moist; few fine GRAVEL; mostly coarse to fine SAND; little fines; weak cementation.		O03			90							PA
762.26	16	Poorly graded SAND with CLAY and GRAVEL (SP-SC); strong brown; moist; some coarse to fine GRAVEL; mostly coarse to fine SAND; little fines; moderate cementation; Bt horizon soil development.												
	17													
760.26	18													
	19													
758.26	20	Poorly graded SAND (SP); dark yellowish brown; moist; few coarse to fine, subrounded GRAVEL; mostly coarse to fine SAND; few fines; weak cementation. At Elev 758.2', becomes oxidized, yellowish red.		O04			100							
	21													
756.26	22													
	23													
754.26	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				A-13-015
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY: M. Strane	DATE	SHEET 1 of 4	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		*(continued).*		O05			96							
752.26	26														
	27														
750.26	28														
	29														
748.26	30				O06			80							
	31														
746.26	32														
	33														
744.26	34														
	35		Well-graded SAND with SILT and GRAVEL (SW-SM) yellowish brown; moist; little fine subangular GRAVEL; mostly coarse to fine SAND; few fines; weak cementation.		O07			84							PA
742.26	36														
	37														
740.26	38														
	39														
738.26	40		Poorly graded SAND with GRAVEL (SP); yellowish brown; moist; little coarse to fine subangular GRAVEL, mostly coarse to fine SAND; few fines; weak cementation.		O08			100							
	41														
736.26	42														
	43		Poorly graded SAND (SP); yellowish brown; moist; mostly medium to fine SAND; few fines; weak cementation.												
734.26	44		Poorly graded SAND with GRAVEL(SP); dark yellowish brown; moist; little coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; increasing GRAVEL with depth.												
	45				O09			30							
732.26	46														
	47														
730.26	48														
	49														
728.26	50		Poorly graded SAND (SP); yellowish brown; moist; few coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; GRAVEL decreasing with depth.		O10			88							
	51														
726.26	52		Poorly graded SAND with SILT (SP-SM); yellowish brown; moist; mostly coarse to fine SAND; little nonplastic to low plasticity, low dry strength fines; moderate cementation.												
	53														
724.26	54		Poorly graded SAND (SP); yellowish brown; moist; few coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; fines												
	55														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-015**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **2 of 4**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		\increasing with depth.		O11			76							PA
722.26	56		Poorly graded SAND with SILT and COBBLES (SP-SM); yellowish brown; moist; few fine GRAVEL; mostly coarse to fine SAND; few fines; weak cementation; 10% COBBLES, GRANITE, slightly weathered, moderately hard, 3" dia; fines upward.												
	57														
720.26	58		Poorly graded SAND (SP); yellowish brown; moist; few coarse to fine, subrounded GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; fines upward.		O12			100							
	59														
718.26	60				O13			92							
	61														
716.26	62														
	63														
714.26	64		SILTY CLAY (CL-ML); yellowish brown; few fine SAND; mostly low to medium plasticity, low dry strength fines.												
	65		Poorly graded SAND (SP); yellowish brown; mostly fine SAND; few fines; moderate cementation; oxidized.												
712.26	66		Poorly graded SAND with SILT (SP-SM); yellowish brown; moist; mostly fine SAND; little fines; moderate cementation.		O14			94							
	67														
710.26	68		Poorly graded SAND (SP); pale brown; moist; few coarse to fine GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation.												
	69														
708.26	70		Poorly graded SAND (SP) moderately bedded with thin interbeds of SILTY CLAY (CL-ML) and thin to moderate interbeds of Poorly graded SAND with GRAVEL (SP); Poorly graded SAND; yellowish brown; moist; mostly fine SAND; few fines; weak cementation. SILTY CLAY; stiff; light brownish gray; moist; trace fine SAND; mostly low to medium plasticity, low dry strength fines; rapid dilatancy. Poorly graded SAND with GRAVEL, yellowish brown; moist, mostly coarse to fine SAND; little coarse to fine subrounded GRAVEL; few fines; weak cementation; larger GRAVEL are decomposed.		O15			94							
	71														
706.26	72														
	73														
704.26	74														
	75		SILTY SAND with GRAVEL (SM); yellowish brown; moist; little fine GRAVEL; mostly coarse to fine SAND; \little fines.		O16			78							PA, PI
702.26	76		Fat CLAY (CH); brown; moist; few medium to fine SAND; mostly high plasticity, high dry strength fines. At Elev 702.2', observed strong Bt horizon, brown.												
	77														
700.26	78														
	79														
698.26	80		Poorly graded SAND (SP); dark yellowish brown; moist; mostly coarse to fine SAND; few fines; weak cementation; fines upward. At Elev 697.0', observed possible bioturbated zone, observed Bt soil horizon fragments 2" in dimension.		O17			92							
	81														
696.26	82														
	83		At Elev 695.9', contains strong Bt soil development. SANDY SILTY CLAY (CL-ML); brown; moist; little medium to fine SAND; mostly medium plasticity, low dry strength fines; fines downward. At Elev 694.3', contains 1" clay lens.												
694.26	84														
	85														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-015**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **3 of 4**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85	Poorly graded SAND (SP); yellowish brown; moist; mostly medium to fine SAND; few fines.		O18			36							
692.26	86	SILTY CLAY (CL-ML); dark yellowish brown; moist; few fine SAND; mostly low to medium plasticity, low dry strength fines; coarsens downward.												
	87													
690.26	88													
	89													
688.26	90	SEDIMENTARY ROCK (SANDSTONE), fine sand to medium sand, thinly bedded, dark yellowish orange, very intensely weathered, very soft, (SILTY SAND (SP); mostly SAND; few GRAVEL; little fines) [TOPANGA FORMATION].		O19			84							
	91													
686.26	92	Random fracture (clay, totally healed), dipping 40 to 50°.												
	93	Random fracture (black clay, totally healed), dipping 30 to 40°.												
684.26	94	Random fracture (clay, totally healed), dipping 30 to 40°. Joint (gray clay, totally healed), dipping 40 to 50°.												
	95	Random fracture (gray clay, totally healed), dipping 30 to 40°.		O20			100							PA
682.26	96													
	97													
680.26	98													
	99													
678.26	100			O021			100							
	101													
676.26	102													
	103	Random fracture (totally healed), dipping 40 to 50°, 1/10" wide fracture with thin clay films.												
674.26	104	Borehole Terminated at Planned Depth. Bottom of borehole at 103.6 ft bgs												
	105													
672.26	106													
	107													
670.26	108													
	109													
668.26	110													
	111													
666.26	112													
	113													
664.26	114													
	115													

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-015**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **4 of 4**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
M. Herzberg	3-6-13	3-6-13	34° 7' 43.99556" / -118° 9' 16.8569" NAD83	A-13-016
DRILLING CONTRACTOR: Martini Drilling Corporation			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 785.4 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8.5 in
SAMPLER TYPE(S) AND SIZE(S) (ID): 5-foot long split barrel; 3" dia			SPT HAMMER TYPE: N/A	HAMMER EFFICIENCY, ERi: N/A
BOREHOLE BACKFILL AND COMPLETION: Grout, Portland Cement			GROUNDWATER READINGS: DURING DRILLING: Not Encountered; AFTER DRILLING (DATE):	TOTAL DEPTH OF BORING: 65.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (8.5").												Hand Auger to 5'
	1	AGGREGATE BASE (6").												
783.38	2	SANDY lean CLAY (CL); brown; moist; few fine SAND; mostly medium plasticity fines [ALLUVIUM].												
	3													
781.38	4													
	5			O01			96							PI
779.38	6	SILTY SAND (SM); brown; moist; trace fine GRAVEL; mostly fine SAND; some fines; moderate cementation.												
	7													
777.38	8													
	9													
775.38	10	SILTY CLAY with SAND (CL-ML); yellowish brown; moist; little fine SAND; mostly medium plasticity fines; oxidized.		O02			68							
	11													
773.38	12													
	13													
771.38	14	SILTY SAND (SM); yellowish brown; moist; few coarse, angular GRAVEL; mostly medium to fine SAND; little fines; moderate cementation; oxidized.												
	15			O03			100							PA
769.38	16	SILTY CLAY with SAND (CL-ML); yellowish brown; moist; some fine SAND; mostly medium plasticity fines; oxidized.												
	17													
767.38	18	Poorly graded SAND (SP); strong brown; moist; trace fine, angular GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; oxidized.												
	19	Poorly graded SAND (SP) moderately bedded with thin interbeds of Poorly graded SAND with GRAVEL(SP) and COBBLES; Poorly graded SAND; brownish yellow; dry to moist; mostly fine to coarse SAND; trace fine GRAVEL; trace fines, weak cementation; oxidized; Poorly graded SAND with GRAVEL, strong brown; dry; mostly fine to coarse SAND; little fine to coarse GRAVEL; weak cementation; oxidized. < 5% COBBLES, GRANITE, very soft, 4" diameter.												
765.38	20			O04			86							
	21													
763.38	22													
	23	Poorly graded SAND with SILT (SP-SM); light yellowish brown; moist; mostly SAND; little fines; weak cementation; oxidized.												
761.38	24	Poorly graded SAND with GRAVEL and COBBLES (SP); light yellowish brown; dry; little subangular GRAVEL; mostly coarse to fine SAND; trace fines;												
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				A-13-016
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY: M. Strane	DATE	SHEET 1 of 3	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		weak cementation; 10% COBBLES, GRANITE, very hard, 3" diameter. *(continued)*.		O05			84							
759.38	26														
	27														
757.38	28		SILTY SAND (SM); yellowish brown; moist; mostly fine SAND; some fines; weak cementation; micaceous.		O06			100							
	29		Poorly graded SAND (SP); light yellowish brown; moist; trace GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation.												
755.38	30		SILT (ML); yellowish brown; moist; few fine SAND; mostly fines; laminated; oxidized; micaceous.		O07			90							
	31														
753.38	32		Poorly graded SAND (SP) thickly bedded with moderate beds of Poorly graded GRAVEL with SAND (GP) and COBBLES. Poorly graded SAND; brown; moist; mostly SAND; few fine GRAVEL; trace fines; weak cementation; Poorly graded GRAVEL with SAND; brown; moist; mostly GRAVEL; little fine to medium SAND; trace fines; weak cementation. < 5% IGNEOUS COBBLES; GRANITE; very soft; ~ 4" diameter.											
	33				O08			100							
751.38	34														
	35				O09			60							PA
749.38	36														
	37														
747.38	38														Drill rig chatter
	39														
745.38	40				O10			100							
	41														
743.38	42														
	43				O11			100							
741.38	44														
	45				O12			100							
739.38	46														
	47														
737.38	48				O13			60							hard drilling
	49														
735.38	50				O14			80							
	51		SEDIMENTARY ROCK (SANDSTONE), fine sand to coarse sand, grayish orange, intensely weathered, (SILTY SAND (SM) moist; little fines, strong cementation) [TOPANGA FORMATION].												
733.38	52														
	53				O15			100							
731.38	54														
	55														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-016**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **2 of 3**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		SEDIMENTARY ROCK (Sandstone) *(continued)*.		O16			84							PA
729.38	56														
	57														
727.38	58				O17			100							
	59														
725.38	60				O18			100							
	61														
723.38	62														
	63				O19			100							
721.38	64														
	65		Borehole Terminated at Planned Depth. Bottom of borehole at 65.0 ft bgs												
719.38	66														
	67														
717.38	68														
	69														
715.38	70														
	71														
713.38	72														
	73														
711.38	74														
	75														
709.38	76														
	77														
707.38	78														
	79														
705.38	80														
	81														
703.38	82														
	83														
701.38	84														
	85														

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-016**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **3 of 3**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
C. Madden	3-4-13	3-4-13	34° 7' 46.87144" / -118° 9' 16.92348" NAD83	A-13-017
DRILLING CONTRACTOR: Martini Drilling Corporation			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 788.7 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8.5 in
SAMPLER TYPE(S) AND SIZE(S) (ID): 5-foot long split barrel; 3" dia			SPT HAMMER TYPE: N/A	HAMMER EFFICIENCY, ERi: N/A
BOREHOLE BACKFILL AND COMPLETION: Grout, Portland Cement			GROUNDWATER READINGS: DURING DRILLING / AFTER DRILLING (DATE): Not Encountered	TOTAL DEPTH OF BORING: 100.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (8.5").												Hand Auger to 5'
	1	AGGREGATE BASE (12").												
786.70	2	SILTY SAND (SM); yellowish brown; moist; few coarse to fine GRAVEL; mostly fine SAND; little fines; weak cementation [ALLUVIUM].												
	3													
784.70	4													
	5	Poorly graded SAND with SILT and GRAVEL (SP-SM); light yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; few fines; weak cementation; thickly laminated.		O01			100							
782.70	6													
	7													
780.70	8													
	9													
778.70	10			O02			84							
	11													
776.70	12													
	13													
774.70	14													
	15			O03			100							PA
772.70	16													
	17	Poorly graded SAND with SILT and COBBLES (SP-SM) very thickly bedded with moderate beds of poorly graded SAND with SILT (SP-SM). Poorly graded SAND with SILT and COBBLES; light yellowish brown; moist; mostly coarse to fine SAND; few fines; trace GRAVEL; weak cementation; locally oxidized; 5% COBBLES, GRANITE, 3-4" diameter, very hard. Poorly graded SAND with SILT; yellowish brown; moist; mostly coarse to fine SAND; few fines; trace GRAVEL; weak cementation.												
770.70	18													
	19													
768.70	20			O04			82							
	21													
766.70	22													
	23													
764.70	24													
	25													

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				A-13-017
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY: M. Strane	DATE	SHEET 1 of 4	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	*(continued)*.		O05			90							
762.70	26													
	27													
760.70	28													
	29													
758.70	30			O06			107							
	31													
756.70	32	Poorly graded SAND (SP); light yellowish brown; moist; mostly fine SAND; few fines; weak cementation; micaceous.												
	33	Poorly graded SAND with SILT (SP-SM) moderately bedded with thin interbeds of poorly graded GRAVEL with SAND (GP). Poorly graded SAND with SILT; brownish yellow; moist; mostly coarse to fine SAND; few fines; trace GRAVEL; weak cementation. Poorly graded GRAVEL with SAND (GP); brownish yellow; moist; mostly fine GRAVEL; few coarse to fine SAND; few fines; weak cementation.												
754.70	34													
	35			O07			80							PA
752.70	36	Poorly graded SAND (SP) with COBBLES moderately bedded with moderate beds of poorly graded SAND with GRAVEL(SP). Poorly graded SAND with COBBLES: yellowish brown; moist; mostly coarse to fine SAND; trace fines; little coarse to fine GRAVEL; 5% COBBLES, GRANITE, soft to hard, 3-9" diameter. Poorly graded SAND with GRAVEL; yellowish brown; moist; mostly coarse to fine SAND; little coarse to fine GRAVEL; trace fines.												
	37													
750.70	38													
	39													
748.70	40			O08			70							
	41													
746.70	42													
	43													
744.70	44													
	45			O09			90							
742.70	46													
	47													
740.70	48													
	49													
738.70	50			O10			34							
	51	Poorly graded SAND with SILT (SP-SM); light yellowish brown; moist; trace fine GRAVEL; mostly medium to fine SAND; few fines; weak cementation; locally oxidized to brownish yellow.												
736.70	52													
	53													
734.70	54													
	55													

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-017**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **2 of 4**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		Poorly graded SAND with SILT (SP-SM) *(continued)*.		O11			82							PA
732.70	56														
	57														
730.70	58		COBBLES moderately bedded with moderate beds of poorly graded GRAVEL with SAND (GP). COBBLES; 100% IGNEOUS COBBLES, GRANITE; 3-4" dia; soft to hard. Poorly graded GRAVEL with SAND; pale brown; moist; mostly GRAVEL; little coarse to fine SAND; trace fines; weak cementation.											
	59														
728.70	60				O12			54							
	61														
726.70	62														
	63														
724.70	64														
	65				O13			24							
722.70	66														
	67														
720.70	68														
	69														
718.70	70		Poorly graded SAND (SP); light yellowish brown; moist; trace coarse to fine GRAVEL; mostly medium to fine SAND; slight soil development at 70-72', oxidized, brown.		O14			40							
	71														
716.70	72														
	73														
714.70	74														
	75		SILTY SAND (SM); light yellowish brown; moist; few fine GRAVEL; mostly medium to fine SAND; little fines; moderate cementation; micaceous.		O15			92							PA
712.70	76		Poorly graded SAND with GRAVEL (SP) moderately bedded with moderate beds of poorly graded GRAVEL with SAND (GP). Poorly graded SAND with GRAVEL; pale brown; moist; mostly coarse to fine SAND; some GRAVEL; trace fines; weak cementation. Poorly graded GRAVEL with SAND; pale brown; moist; mostly fine GRAVEL; some medium to fine SAND; trace fines; weak cementation.											
	77														
710.70	78														
	79														
708.70	80				O16			85							
	81														
706.70	82														
	83														
704.70	84														
	85														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-017**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **3 of 4**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		*(continued)*.		O17			94							
702.70	86														
	87														
700.70	88														
	89														
698.70	90				O18			94							
	91														
696.70	92														
	93														
694.70	94														
	95		SEDIMENTARY ROCK (SANDSTONE), medium-grained, dark yellowish brown, decomposed, moderate cementation (Well graded SAND with GRAVEL (SW); mostly coarse to fine SAND; some coarse to fine GRAVEL; trace fines) [TOPANGA FORMATION].		O19			100							PA
692.70	96														
	97														
690.70	98														
	99														
688.70	100		Borehole Terminated at Planned Depth. Bottom of borehole at 100.0 ft bgs												
	101														
686.70	102														
	103														
684.70	104														
	105														
682.70	106														
	107														
680.70	108														
	109														
678.70	110														
	111														
676.70	112														
	113														
674.70	114														
	115														

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-017**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **4 of 4**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
D. Jankly	3-26-13	3-28-13	34° 8' 27.62903" / -118° 9' 18.02278" NAD83	A-13-020
DRILLING CONTRACTOR: Cascade Drilling, LP			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 799.9 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME-95	BOREHOLE DIAMETER: 8 in
SAMPLER TYPE(S) AND SIZE(S) (ID): SPT (1.4"), Cal (2.5")			SPT HAMMER TYPE: 140 lb. Auto Hammer, 30" Drop	HAMMER EFFICIENCY, ERi: 78%
BOREHOLE BACKFILL AND COMPLETION: Piezometer Installed on Completion			GROUNDWATER READINGS: DURING DRILLING 124.0 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 149.8 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	AGGREGATE BASE (4").												
	1	SILTY SAND (SM); dense; strong brown; moist; mostly coarse to fine SAND; some low plasticity fines; few coarse to fine GRAVEL; homogeneous; weak cementation; (ALLUVIUM).		B01										
797.90	2													
	3													
795.90	4													
	5			S02	6 11 26	37	78							Rock clast encountered during sampling PA
793.90	6													
	7													
791.90	8													
	9													
789.90	10	Mostly fine SAND; lacks GRAVEL.		S03	6 11 19	30	89		15	99				DS, M, UW
	11													
787.90	12													
	13	SANDY SILT (ML); strong brown; moist; mostly low plasticity fines; some medium to fine SAND; homogeneous.												
785.90	14													
	15			S04	7 11 18	29	94		19					CR, M, PA
783.90	16													
	17													
781.90	18													
	19	SILTY SAND (SM); strong brown; moist; mostly fine SAND; some low plasticity fines; homogeneous; weak cementation.												
779.90	20			S05	12 22 36	58	100		7	100				M, DS, PA, UW
	21													
777.90	22													
	23													
775.90	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				A-13-020
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY: D. Jankly	DATE: 4-18-13	SHEET: 1 of 6	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	SILTY SAND (SM) *(continued)*. Very dense; Trace fine GRAVEL.		S06	12 34 50-3"		100							
773.90	26													
	27													
771.90	28	Poorly graded SAND with SILT (SP-SM); yellowish brown; moist; mostly coarse to fine SAND; little fine GRAVEL; few fines; homogeneous; weak cementation.												
	29													
769.90	30			S07	70-6"		100		5	111				Rock clast encountered during sampling M, PA, UW
	31													
767.90	32													
	33													
765.90	34													
	35	Very dense.		S08	9 21 50-5"		100							
763.90	36													
	37													
761.90	38													
	39	SILTY SAND (SM); yellowish brown; moist; mostly fine SAND; some low plasticity fines; homogeneous; weak cementation.												
759.90	40			S09	19 23 35	58	100		14	104				M, PA, DS, UW
	41													
757.90	42													
	43													
755.90	44													
	45	Very dense.		S10	14 23 41	64	100		12					CR, M
753.90	46													
	47													
751.90	48													
	49	Poorly graded SAND (SP); yellowish brown; moist; mostly fine SAND; homogeneous; weak cementation.												
749.90	50			S11	18 29 40	69	100		6	101				M, UW
	51													
747.90	52													
	53													
745.90	54	SANDY SILT (ML); yellowish brown; moist; mostly non-plastic fines; some fine SAND; stratified.												
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-020**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **2 of 6**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55	SANDY SILT (ML) *(continued)*.		S12	13 29 44	73	100		17					M, PA, PI
743.90	56													
	57													
741.90	58	Poorly graded SAND with SILT (SP-SM); yellowish brown; moist; mostly coarse to fine SAND; few low plasticity fines; homogeneous; weak cementation.												
	59													
739.90	60			S13	42 50-2"		100							Rock clast encountered during sampling
	61													
737.90	62													
	63													
735.90	64													
	65	Very dense; little fine GRAVEL.		S14	41 50-5"		100							Rock clast encountered during sampling PA
733.90	66													
	67													
731.90	68													
	69													
729.90	70	Lacks GRAVEL.		S15	34 50		58		8	108				M, DS, UW
	71													
727.90	72													
	73													
725.90	74													
	75	Trace coarse to fine GRAVEL.		S16	48 50-3"		100							Rock clast encountered during sampling
723.90	76													
	77													
721.90	78													
	79													
719.90	80			S17	50-3"		0							
	81													
717.90	82													
	83													
715.90	84													
	85													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-020**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **3 of 6**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		Poorly graded SAND with SILT (SP-SM) *(continued)*. Few coarse to fine GRAVEL.		S18	50 50		67							Rock clast encountered during sampling
713.90	86														
	87														
711.90	88		Well-graded SAND with SILT (SW-SM); very dense; yellowish brown; moist; mostly coarse to fine SAND; little fine GRAVEL; few fines; homogeneous; weak cementation.												
	89														
709.90	90				S19	32 43 47	90	89							PA
	91														
707.90	92														
	93														
705.90	94														
	95				S20	22 50		83		10	104				M, UW
703.90	96														
	97		SILTY SAND (SM); very dense; yellowish brown; moist; mostly medium to fine SAND; some low plasticity fines; few fine GRAVEL; homogeneous; weak cementation.												
701.90	98														
	99														
699.90	100				S21	15 29 33	62	100							PA
	101														
697.90	102														
	103		Poorly graded SAND with GRAVEL (SP); dark yellowish brown; moist; mostly medium to fine SAND; little coarse to fine GRAVEL; homogeneous; weak cementation.												
695.90	104														
	105				S22	50-5"		20							Rock clast encountered during sampling
693.90	106														
	107														
691.90	108														
	109														
689.90	110		Very dense.		S23	50 50/3"	50/3	100							
	111														
687.90	112														
	113														
685.90	114														
	115														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-020**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **4 of 6**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	115		Poorly graded SAND with GRAVEL (SP) *(continued)*.		S24	50		100							
683.90	116														
	117														
681.90	118														
	119														
679.90	120				S25	50-3"		100		5					M
	121														
677.90	122		SILTY SAND (SM); very dense; dark yellowish brown; moist; mostly coarse to fine SAND; little fine GRAVEL; little fines; homogeneous; weak cementation.												
	123														
675.90	124														
	125				S26	50-3"		33		10					M, PA
673.90	126				S27	42 50-3"		78							
	127														
671.90	128														
	129														
669.90	130				S28	50-4"		50							
	131														
667.90	132														
	133		Lean CLAY with SAND (CL); dark yellowish brown; moist; mostly medium plasticity fines; little medium to fine SAND.												
665.90	134														
	135				S29	12 29 23	52	100							
663.90	136														
	137		Hard.		S30	12 28 50-4"		75		23	104	UU =2.93			M, PA, PI, UU, UW
661.90	138		SANDY lean CLAY (CL); yellowish brown; moist; mostly low plasticity fines; some medium to fine SAND; stratified.												
	139														
659.90	140				S31	9 18 37	55	44		21					M, PA, PI
	141														
657.90	142														
	143														
655.90	144														
	145														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-020**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **5 of 6**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	145		Poorly graded SAND with GRAVEL (SP); very dense; dark yellowish brown; moist; mostly medium to fine SAND; little coarse to fine GRAVEL; homogeneous; weak cementation.		S32	50-4"		0							
653.90	146														
	147														
651.90	148														
	149				S33	47 50-3"		0							
649.90	150		Bottom of borehole at 149.8 ft bgs												
	151		Boring terminated at a planned depth.												
			Piezometer Sensor Installed at 147' (El. 652.9')												
647.90	152														
	153														
645.90	154														
	155														
643.90	156														
	157														
641.90	158														
	159														
639.90	160														
	161														
637.90	162														
	163														
635.90	164														
	165														
633.90	166														
	167														
631.90	168														
	169														
629.90	170														
	171														
627.90	172														
	173														
625.90	174														
	175														

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-020**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **6 of 6**	

5 BR - STANDARD SR710N_CH_CASCADE.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
J. Culotta/ J. Lee	3-26-13	3-27-13	34° 6' 8.040517" / -118° 9' 4.076669" NAD83	A-13-021
DRILLING CONTRACTOR: Jet Drilling, Inc			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 577.9 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8 in
SAMPLER TYPE(S) AND SIZE(S) (ID): SPT (1.4"), Cal (2.5")			SPT HAMMER TYPE: 140 lb. Auto Hammer, 30" Drop	HAMMER EFFICIENCY, ERi: 72%
BOREHOLE BACKFILL AND COMPLETION: Cement and Bentonite Grout			GROUNDWATER READINGS: DURING DRILLING NE; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 110.8 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (2").												
		AGGREGATE BASE (2").												
	1	Fat CLAY (CH); dark brown; moist; mostly medium to high plasticity fines; few fine SAND; homogeneous; (TOPSOIL).		B01										
575.90	2													
	3	SEDIMENTARY ROCK, (SILTSTONE); thinly bedded; yellowish brown; intensely weathered; very soft. (TOPANGA FORMATION).												
573.90	4													
	5			S02	9 13 17	30	100							
571.90	6													
	7													
569.90	8													
	9													
567.90	10	At Elev 567.9', becomes soft; caliche along bedding surfaces.		S03	20 42 50-5"		100							
	11	At Elev 567.4', observed bedding joint, dipping 20°.												
565.90	12													
	13													
563.90	14													
	15	At Elev 562.9', observed bedding joint, dipping 30°, iron oxide and manganese stained beds.		S04	10 15 29	44	89							
561.90	16													
	17													
559.90	18													
	19													
557.90	20	At Elev 557.9', with some CLAYSTONE beds. Becomes grayish brown with yellowish brown oxidation; moderately weathered.		S05	24 72		67		21	99				M, PA, PI, UC=54psi, UW
	21	At Elev 557.4', observed bedding joint, dipping 20°.												
555.90	22													
	23													
553.90	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				A-13-021
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY: D. Jankly	DATE: 4-18-13	SHEET: 1 of 4	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	At Elev 552.9', becomes laminated to thinly bedded. SEDIMENTARY ROCK *(continued)*.		S06	21 24 34	58	67							
551.90	26													
	27													
549.90	28	SEDIMENTARY ROCK, (SANDY SILTSTONE); very thinly bedded; grayish brown to yellowish brown (where oxidized); intensely weathered; soft; intensely to moderately fractured.												
	29													
547.90	30			S07	40 100-3"		100		27	91				M, UW
	31													
545.90	32													
	33	SEDIMENTARY ROCK, (CLAYSTONE); massive; yellowish brown; intensely weathered; very soft; iron oxide and manganese staining, trace caliche.												
543.90	34													
	35			S08	4 7 16	23	78							
541.90	36													
	37													
539.90	38													
	39													
537.90	40	At Elev 538.1', with some coarse to fine grained SANDSTONE beds. At Elev 537.9', observed bedding joint, dipping 20 to 15°.		S09	34 40 50-4"		100		28	84	UU =3.53			M, PA, PI, UU, UW
	41													
535.90	42	SEDIMENTARY ROCK, (SILTSTONE); very thinly bedded; dark grayish brown to yellowish brown (where oxidized); moderately weathered; soft to moderately hard; intensely fractured; iron oxide and manganese staining.												
	43													
533.90	44													
	45			S10	34 28 28	56	100							
531.90	46													
	47													
529.90	48													
	49													
527.90	50			S11	74 100-3"		100							
	51													
525.90	52													
	53													
523.90	54													
	55													

(continued)

CH2MHILL®

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-021**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **2 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55	SEDIMENTARY ROCK *(continued)*.		S12	34 74		100							
521.90	56													
	57													
519.90	58													
	59													
517.90	60	At Elev 517.9', observed bedding joint, dipping 35°, few 1/8" to 1/4" thick, hard, slightly rough bedding planes.		S13	25 100-4"		75		22	92				M, PA, UC=13psi, UW
	61													
515.90	62													
	63													
513.90	64													
	65	At Elev 512.9', becomes soft; trace caliche.		S14	42 100-4"		100		22					M, CR
511.90	66													
	67													
509.90	68													
	69													
507.90	70	At Elev 507.9', with some CLAYSTONE beds. Becomes strong brown and dark gray.		S15	25 50		100		30	86				M, PI, SD, UW
	71													
505.90	72													
	73													
503.90	74													
	75	At Elev 502.9', observed bedding joint, dipping 30°.		S16	34 43 50-4"		100		22					M, PA
501.90	76													
	77													
499.90	78													
	79													
497.90	80			S17	105 100-2"		100		20	92				EM, M, UC=38.6psi, UW
	81													
495.90	82													
	83													
493.90	84													
	85													

(continued)

CH2MHILL®

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-021**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **3 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85	At Elev 492.9', observed bedding joint, dipping 35 to 25°, few caliche lined joints.		S18	14 17 29	46	100		22					CR, M
491.90	86													
	87													
489.90	88													
	89													
487.90	90			S19	55 100-4"		100		24	91				M, PA, PI, SD, UC=20psi, UW
	91													
485.90	92													
	93													
483.90	94													
	95			S20	100-5"		80							
481.90	96													
	97													
479.90	98													
	99													
477.90	100	At Elev 477.9', with some coarse to fine grained SANDSTONE beds.		S21	40 100-3"		100		23	97				M, PA, UW
	101													
475.90	102													
	103													
473.90	104													
	105			S22	100-5"		100							
471.90	106													
	107													
469.90	108													
	109													
467.90	110			S23	40 100-3"		100		30	91				M, UW
	111	Bottom of borehole at 110.8 ft bgs												
465.90	112	Boring terminated at a planned depth.												
	113													
463.90	114													
	115													

Material Graphics

CH2MHILL®

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-021**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **D. Jankly**	DATE **4-18-13**	SHEET **4 of 4**	

5 BR - STANDARD SR710N_CH_JET.GPJ CALTRANS LIBRARY DEC09-W CH LOGO.GLB 6/9/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
M. Herzberg	3-18-13	3-18-13	34° 7' 5.807651" / -118° 9' 25.39573" NAD83	A-13-022
DRILLING CONTRACTOR: Martini Drilling Corporation			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 696.3 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8.5 in
SAMPLER TYPE(S) AND SIZE(S) (ID): 5-foot long split barrel; 3" dia			SPT HAMMER TYPE: N/A	HAMMER EFFICIENCY, ERi: N/A
BOREHOLE BACKFILL AND COMPLETION: Grout, Portland Cement			GROUNDWATER READINGS: DURING DRILLING: Not Encountered; AFTER DRILLING (DATE):	TOTAL DEPTH OF BORING: 110.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (6").												Hand Auger to 5'
	1	AGGREGATE BASE (12").												
694.34	2	SANDY SILT (ML); brown; moist; some fine SAND; mostly nonplastic fines; pedogenic soil development (A-horizon) at top of unit, dark brown [ALLUVIUM].												
	3													
692.34	4													
	5			O01			100							PA
690.34	6	At Elev 690.9', observed soil development (laminated Bt) , variegated light yellowish brown and yellowish brown.												
	7													
688.34	8													
	9													
686.34	10			O02			70							
	11													
684.34	12	Poorly graded SAND with COBBLES (SP); dark yellowish brown; moist; few fine GRAVEL; mostly coarse to fine SAND; few nonplastic fines; 20% COBBLES, GRANITE, hard, broken due to drilling.												
	13	SILTY SAND (SM); brown; moist; mostly fine SAND; little fines; weak cementation; slightly micaceous, coarsens downward.												
682.34	14													
	15	Poorly graded SAND with SILT (SP-SM); brown; moist; mostly fine SAND; few fines; weak cementation.		O03			100							
680.34	16													
	17													
678.34	18	GRAVEL lens, 2" diameter.												
	19	Poorly graded SAND with COBBLES (SP); dark yellowish brown; moist; few coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; few nonplastic fines; micaceous, fines increase downward; COBBLES, GRANITE, decomposed, broken due to drilling.												
676.34	20			O04			68							
	21													
674.34	22													
	23													
672.34	24													
	25													

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				A-13-022
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY: M. Strane	DATE	SHEET 1 of 4	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		Poorly graded SAND with SILT and GRAVEL (SP-SM); dark yellowish brown; moist; some coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; few fines; weak cementation.		O05			84							PA
670.34	26														
	27														
668.34	28														
	29														
666.34	30		Poorly graded SAND with COBBLES (SP); dark yellowish brown; moist; few coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; trace non plastic fines; micaceous, fines increase downward; COBBLES, GRANITE; decomposed, broken due to drilling.		O06			90							
	31														
664.34	32														
	33		Poorly graded SAND (SP); brown; moist; mostly fine SAND; few fines; weak cementation; micaceous.												
662.34	34		Poorly graded SAND with SILT (SP-SM); dark brown; moist; trace GRAVEL; mostly coarse to fine SAND; few fines; moderate cementation.												
	35		Poorly graded SAND with SILT, GRAVEL and COBBLES (SP-SM); dark yellowish brown; moist; little coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; few nonplastic fines; weak cementation; micaceous, fines increase downward; 5% COBBLES, GRANITE, decomposed, disturbed due to drilling.		O07			90							
660.34	36														
	37														
658.34	38														
	39														
656.34	40				O08			84							
	41														
654.34	42														
	43														
652.34	44														
	45				O09			90							PA
650.34	46														
	47														
648.34	48														
	49														
646.34	50				O10			88							
	51														
644.34	52														
	53														
642.34	54														
	55														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-022**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **2 of 4**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		*(continued)*.		O11			90							
640.34	56														
	57														
638.34	58														
	59														
636.34	60				O12			100							
	61														
634.34	62		Poorly graded SAND with SILT (SP-SM); dark bluish gray; moist; trace GRAVEL; mostly coarse to fine SAND; few fines; fines upward.												
	63														
632.34	64														
	65		SILTY SAND with COBBLES (SM); dark yellowish brown; moist; mostly coarse to fine SAND; little nonplastic fines; weak cementation; 5% COBBLES, decomposed, soft, disturbed due to drilling.		O13			80							
630.34	66														
	67														
628.34	68														
	69														
626.34	70		Poorly graded SAND (SP); dark yellowish brown; moist; few coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation.		O14			84							
	71														
624.34	72														
	73														
622.34	74														
	75		SILTY SAND (SM); dark yellowish brown; moist; mostly medium to fine SAND; some fines; moderate cementation; micaceous.		O15			96							PA
620.34	76														
	77		Poorly graded SAND (SP); dark yellowish brown; moist; few coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; fines upward.												
618.34	78														
	79														
616.34	80				O16			76							
	81														
614.34	82														
	83														
612.34	84		Increased coarse GRAVEL.												
	85														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-022**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **3 of 4**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		Poorly graded SAND (SP) *(continued)*.		O17			84							
610.34	86														
	87														
608.34	88														
	89														
606.34	90				O18			88							
	91														
604.34	92														
	93		SANDY lean CLAY (CL) moderately bedded with moderate beds of Poorly graded SAND with SILT and GRAVEL (SP-SM). SANDY lean CLAY; yellowish brown; moist; some coarse to fine SAND; mostly low to medium plasticity, medium dry strength, slow dilatancy fines; micaceous. Poorly graded SAND with SILT and GRAVEL: yellowish brown; moist; mostly fine to coarse SAND; little fine to coarse GRAVEL; few fines; weak cementation; possible decomposed COBBLES at bedding contacts, disturbed by drilling.											
602.34	94														
	95				O19			100							PA
600.34	96														
	97														
598.34	98														
	99														
596.34	100				O20			100							
	101														
594.34	102														
	103														
592.34	104														
	105				O021			100							
590.34	106														
	107														
588.34	108														
	109														
586.34	110		Borehole Terminated at Planned Depth. Bottom of borehole at 110.0 ft bgs												
	111														
584.34	112														
	113														
582.34	114														
	115														

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-022**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **4 of 4**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
M. Herzberg	3-11-13	3-14-13	34° 7' 6.682608" / -118° 9' 25.34212" NAD83	O-13-023
DRILLING CONTRACTOR: Boart Longyear Company			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 698.1 ft NAVD88
DRILLING METHOD: Sonic			DRILL RIG: 600 T Roto Sonic	BOREHOLE DIAMETER: 4 in
SAMPLER TYPE(S) AND SIZE(S) (ID): 3.5" ID polytube; polybag			SPT HAMMER TYPE: N/A	HAMMER EFFICIENCY, ERi: N/A
BOREHOLE BACKFILL AND COMPLETION: Grout, Portland Cement			GROUNDWATER READINGS: DURING DRILLING 161.0 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 270.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (8.5").												Hand Auger to 5', first run is re-drill of hand augered soil
	1	AGGREGATE BASE (13").												
696.11	2	Poorly graded SAND with SILT (SP-SM); yellowish brown; moist; few coarse to fine, subangular GRAVEL; mostly medium to fine SAND; few nonplastic fines; slight calcium carbonate coating on clasts [ALLUVIUM].		O01			100							
	3													
694.11	4													
	5			O02			100							
692.11	6													
	7	SILTY CLAY with SAND (CL-ML); yellowish brown; moist; little fine SAND; mostly low plasticity fines.												
690.11	8	Poorly graded SAND with SILT and GRAVEL (SP-SM); yellowish brown; moist; mostly fine SAND; little coarse to fine GRAVEL; few nonplastic fines; weak cementation.												
	9													
688.11	10	Poorly graded SAND with SILT (SP-SM); yellowish brown; moist; trace coarse to fine, subrounded GRAVEL; mostly medium to fine SAND; few nonplastic fines; weak cementation; micaceous.		O03			100							
	11													
686.11	12													
	13	SILTY CLAY (CL-ML); dark yellowish brown; moist; few fine SAND; mostly low plasticity fines; slightly oxidized.												
684.11	14	Poorly graded SAND (SP); dark yellowish brown; moist; trace coarse to fine, subrounded GRAVEL; mostly medium to fine SAND; trace nonplastic fines.		O04			100							
	15	SILTY SAND (SM); yellowish brown; moist; mostly fine SAND; little nonplastic fines.												
682.11	16													
	17	SILT with SAND (ML); yellowish brown; moist; little fine SAND; mostly nonplastic fines; slightly micaceous.												
680.11	18	SILTY CLAY (CL-ML); dark yellowish brown; moist; few fine SAND; mostly medium plasticity, low dry strength fines.												
	19			O05			100							
678.11	20	Well-graded SAND with SILT and GRAVEL (SW-SM); yellowish brown; moist; little fine, subangular GRAVEL; mostly coarse to fine SAND; few nonplastic fines; GRAVEL concentrated at top and bottom of unit Becomes coarser with depth, faint fining upward sequence.							2					PA, M
	21													
676.11	22			O06			100							
	23													
674.11	24													
	25													

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				O-13-023
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY M. Strane	DATE	SHEET 1 of 10	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		Well-graded SAND with SILT and GRAVEL (SW-SM) *(continued)*.		O06			100							
672.11	26		6 ft thick pedogenic soil development, moderately developed A horizon; dark brown; increased silt.		O07			100							
	27														
670.11	28														
	29														
668.11	30														
	31				O08			100							
666.11	32		At Elev 666.1', becomes dark yellowish brown.												
	33														
664.11	34		Poorly graded SAND (SP); light olive brown; moist; trace fine GRAVEL; mostly fine SAND; few fines; weak cementation.		O09			100							
	35		Poorly graded SAND with GRAVEL (SP); yellowish brown; moist; little coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation.												
662.11	36														
	37		Poorly graded SAND with SILT (SP-SM); dark yellowish brown; moist; few fine GRAVEL; mostly coarse to fine SAND; few fines; weak cementation; oxidized possible soil development.		O10			100							
660.11	38														
	39		Poorly graded SAND with GRAVEL (SP); yellowish brown; moist; little GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation.												
658.11	40		Poorly graded SAND with SILT (SP-SM); dark yellowish brown; moist; few coarse to fine GRAVEL; mostly medium to fine SAND; few fines; weak cementation.		O11			100							
	41		Poorly graded SAND with GRAVEL (SP); dark yellowish brown; moist; little GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation.												
656.11	42									4					PA, M
	43		SILTY SAND with GRAVEL (SM); yellowish brown; moist; little fine GRAVEL; mostly coarse to fine SAND; little fines; weak cementation.												
654.11	44				O12			100							
	45														
652.11	46														
	47				O13			100							
650.11	48														
	49														
648.11	50														
	51				O14			100							
646.11	52														
	53		At Elev 645.7', observed COBBLE; METAMORPHIC; ~3-4" diameter; gneissic texture; decomposed. At base of fining upward sequence.												
644.11	54		Poorly graded SAND with SILT and GRAVEL (SP-SM); pale brown; moist; little coarse to fine, subangular GRAVEL; mostly medium to fine SAND; few fines;												
	55														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**O-13-023**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **2 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		weak cementation.		O14			100							
642.11	56		Poorly graded SAND (SP); dark yellowish brown; moist; few coarse to fine GRAVEL; mostly medium to fine SAND; few fines; weak cementation.		O15			100							
	57		SILTY SAND (SM); dark yellowish brown; moist; trace GRAVEL; mostly fine SAND; some fines; weak cementation; micaceous.												
640.11	58		SILTY SAND (SM) *(continued)*.												
	59		Poorly graded SAND with SILT (SP-SM); dark yellowish brown; moist; trace GRAVEL; mostly medium to fine SAND; few nonplastic fines; weak cementation; micaceous.		O16			100							
638.11	60		Poorly graded SAND with GRAVEL and COBBLES (SP); dark yellowish brown; moist; little fine, subangular GRAVEL; mostly coarse to fine SAND; weak cementation; 5% COBBLES, DIORITE, decomposed, soft, disturbed due to drilling.												
	61														
636.11	62		At Elev 639.2', becomes yellowish brown.							4					PA, M
	63				O17			100							
634.11	64														
	65														
632.11	66														
	67				O18			100							
630.11	68														
	69														
628.11	70														
	71		SILTY SAND with COBBLES (SM), light olive brown, few fine GRAVEL; mostly fine to medium SAND; little fines; weak cementation; 5% COBBLES, DIORITE, decomposed, soft, disturbed due to drilling.		O19			100							
626.11	72														
	73														
624.11	74														
	75		Poorly graded SAND with COBBLES (SP); dark yellowish brown; moist; few GRAVEL; mostly medium to fine SAND; few nonplastic fines; weak cementation; 5% COBBLES, GRANITE, fresh, hard, 3" diameter.		O20			100							
622.11	76														
	77														
620.11	78														
	79		SILTY SAND with COBBLES (SM); light gray; moist; trace GRAVEL; mostly medium to fine SAND; little fines; moderate cementation; 10% COBBLES, GRANITE, decomposed, hard, ~3-4" diameter.		O21			100							
618.11	80														
	81		SILTY SAND with GRAVEL and COBBLES (SM); yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; little fines; moderate cementation; fines upward; 5% COBBLES, GRANITE, decomposed, disturbed due to drilling.												
616.11	82														
	83				O22			100							
614.11	84														
	85														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**O-13-023**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **3 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		*(continued).*		O22			100		5					PA, M
612.11	86		SILTY SAND with GRAVEL (SM); dark yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; little fines; weak cementation; micaceous.												
	87				O23			100							
610.11	88														
	89														
608.11	90		At Elev 608.2', becomes increasing coarse.												
	91				O24			100							
606.11	92														
	93		Poorly graded SAND (SP); dark yellowish brown; moist; few GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; fining upward.												
604.11	94														
	95		Poorly graded SAND (SP); moderately bedded with thin interbeds of SILTY SAND (SM). Poorly graded SAND; yellowish brown; moist; mostly fine to coarse SAND; few fines; trace GRAVEL; weak cementation; micaceous. SILTY SAND; dark yellowish brown; moist; mostly fine SAND; little nonplastic fines; weak cementation; slightly micaceous.		O25			100						
602.11	96														
	97														
600.11	98														
	99		SANDY SILTY CLAY (CL-ML); dark yellowish brown; moist; few fine GRAVEL; some medium to fine SAND; mostly low plasticity fines; micaceous.							16					PA, PI, M
598.11	100														
	101		Poorly graded SAND (SP); dark yellowish brown; moist; few fine GRAVEL; mostly medium to fine SAND; trace fines; weak cementation; coarsens upwards.												
596.11	102														Switch from polytube sampling to polybag sampling
	103		SILTY SAND (SM); brown; moist; trace fine GRAVEL; mostly medium to fine SAND; little fines; weak cementation.		O26			100							
594.11	104														
	105		Poorly graded SAND (SP); yellowish brown; moist; few fine GRAVEL; mostly coarse to fine SAND; few fines; weak cementation.												
592.11	106														
	107		SILTY SAND (SM); yellowish brown; moist; mostly coarse to fine SAND; little fines; weak cementation.		O27			100							
590.11	108														
	109		Lean CLAY (CL); dark yellowish brown; moist; some fine SAND; mostly low plasticity, low dry strength fines; coarsens downward.												
588.11	110														
	111														
586.11	112														
	113		Poorly graded SAND with SILT (SP-SM); dark yellowish brown; moist; mostly fine SAND; few fines; weak cementation.												
584.11	114		Brown; few GRAVEL; medium to fine SAND.												
	115														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**O-13-023**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **4 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	115		Poorly graded SAND with SILT (SP-SM) *(continued)*. Yellowish brown.		O28			100							
582.11	116		Brown; little GRAVEL; fines upward.												
	117		SANDY SILTY CLAY (CL-ML); brown; moist; some fine SAND; mostly low plasticity fines; micaceous.		O29			100							
580.11	118		SILTY SAND (SM); dark yellowish brown; moist; trace GRAVEL; mostly medium to fine SAND; some fines; moderate cementation.												
	119		SANDY SILTY CLAY (CL-ML); dark yellowish brown; moist; some fine SAND; mostly low plasticity fines; micaceous.												
578.11	120														
	121		Lean CLAY (CL); dark yellowish brown; moist; trace SAND; mostly low plasticity fines.												
576.11	122														
	123		SILTY SAND (SM); brown; moist; few fine GRAVEL; mostly medium to fine SAND; some fines.												
574.11	124		At Elev 573.6', observed thin bed with slight soil development, dark yellowish brown.												
	125														
572.11	126														
	127		Poorly graded SAND with SILT (SP-SM); dark yellowish brown; moist; few fine GRAVEL; mostly medium to fine SAND; few fines; weak cementation.		O30			100							
570.11	128														
	129														
568.11	130														
	131														
566.11	132				O31			100							
	133														
564.11	134														
	135				O32			100							
562.11	136														
	137														
560.11	138														
	139														
558.11	140														
	141		Poorly graded SAND (SP); brown; moist; mostly fine SAND; trace fines; weak cementation; coarsens upward.												
556.11	142									21					PA, PI, M, CR water added to facilitate drilling
	143		SILT with SAND (ML); brown; moist; trace fine GRAVEL; little fine SAND; mostly nonplastic fines; micaceous.												
554.11	144														
	145														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**O-13-023**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **5 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	145		SANDY SILT (ML); brown; moist; some medium to fine SAND; mostly nonplastic fines.		O33			100							
552.11	146														
	147		Poorly graded SAND (SP); brown; moist; mostly fine SAND; few fines; weak cementation; coarsens upwards.												
550.11	148		SILTY SAND (SM); dark yellowish brown; moist; mostly medium to fine SAND; some fines; moderate cementation.		O34			100							
	149		SILT with SAND (ML); dark yellowish brown; moist; little fine SAND; mostly nonplastic fines.												
548.11	150		Well-graded SAND with SILT and GRAVEL (SW-SM); dark yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; few fines; weak cementation; fining downward with localized areas of increased GRAVEL.												
	151														
546.11	152														
	153														
544.11	154														
	155														
542.11	156														
	157				O35			100							
540.11	158														
	159														
538.11	160									9					PA, M
	161														
536.11	162														
	163														
534.11	164														
	165														
532.11	166														
	167				O36			100							
530.11	168														
	169				O37			100							
528.11	170														
	171														
526.11	172														
	173														
524.11	174														
	175														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**O-13-023**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **6 of 10**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	175		Well-graded SAND with SILT and GRAVEL (SW-SM) *(continued)*.		O37			100							
522.11	176														
	177														
520.11	178														
	179		At Elev 519.1', contains increased coarse GRAVEL.												
518.11	180		SILTY SAND (SM) moderately bedded with moderate beds of Poorly graded SAND with SILT (SP-SM). SILTY SAND; mottled olive brown and dark yellowish brown; moist; mostly medium to fine SAND; some fines; micaceous; weak cementation. Poorly graded SAND with SILT; dark yellowish brown; moist; mostly medium to fine SAND; few fine GRAVEL; few fines; weak cementation; micaceous.							10					PA, M
	181														
516.11	182														
	183														
514.11	184				O38			100							
	185														
512.11	186														
	187														
510.11	188														
	189														
508.11	190														
	191		Poorly graded SAND (SP); dark yellowish brown; moist; few fine GRAVEL; mostly medium to fine SAND; few fines; weak cementation; slightly micaceous. At Elev 506.7', observed local clay rich zones.												
506.11	192														
	193														
504.11	194														
	195														
502.11	196														
	197		Fat CLAY (CH); dark reddish brown; moist; mostly high plasticity, very high dry strength fines; strong pedogenic soil development.		O39			100							
500.11	198														
	199		Lean CLAY with SAND (CL); brown; moist; little fine SAND; mostly low to medium plasticity, medium dry strength fines; little pedogenic soil development but same parent material as above.												
498.11	200									15					PA, PI, M, CR
	201		SILTY CLAY with SAND (CL-ML); dark yellowish brown; moist; little fine SAND; mostly medium plasticity fines; possible parent material to above soils, micaceous.												
496.11	202														
	203		Fat CLAY with SAND (CH); dark reddish brown; moist; trace fine GRAVEL; little SAND; mostly high plasticity, very high dry strength fines; some soil development, slightly micaceous. At Elev 494.1', contains decreasing soil development , brown.												
494.11	204														
	205														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**O-13-023**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **7 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	205		Fat CLAY with SAND (CH) *(continued)*.		O39			100							
492.11	206		At Elev 492.1', contains decreasing soil development, dark yellowish brown.												
	207														
490.11	208														
	209														
488.11	210														
	211		SANDY fat CLAY (CH); light olive brown; moist; some fine SAND; mostly high plasticity, very high dry strength fines.												
486.11	212														
	213		Fat CLAY (CH); reddish brown; moist; few coarse to fine SAND; mostly high plasticity, very high dry strength fines; some manganese accumulation.												
484.11	214														
	215		CLAYEY SAND (SC); reddish brown; moist; mostly medium to fine SAND; some low to medium plasticity fines; moderate cementation; strong soil pedogenic development.		O40			100							
482.11	216														
	217														
480.11	218		Becomes strong brown; coarsens downward.							11					PA, Pl, M
	219														
478.11	220														
	221		Fat CLAY with SAND (CH); brown; moist; trace GRAVEL; mostly high plasticity, high dry strength fines; some pedogenic soil development.		O41			100							
476.11	222														
	223														
474.11	224														
	225		At Elev 473.1', becomes reddish brown.												
472.11	226														
	227														
470.11	228														
	229														
468.11	230				O42			100							
	231														
466.11	232														
	233														
464.11	234														
	235														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**O-13-023**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **8 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	235		Fat CLAY with SAND (CH) *(continued)*.		O42			100							
462.11	236		CLAYEY SAND (SC); reddish brown; moist; mostly medium to fine SAND; some low to medium plasticity fines; moderate cementation; some SAND grains visible in soil development.												
	237														
460.11	238														
	239														
458.11	240		At Elev 458.1', becomes mottled with light olive brown.		O43			100		13					PA, PI, M
	241														
456.11	242														
	243														
454.11	244														
	245		SILTY CLAY (CL-ML); brown; moist; mostly low plasticity fines; locally light olive brown.												
452.11	246														
	247														
450.11	248														
	249														
448.11	250		IGNEOUS ROCK, (QUARTZ DIORITE), dark yellowish brown, decomposed, (Lean CLAY with SAND (CL); moist; mostly fines; some coarse to fine SAND; very soft to soft) [WILSON QUARTZ DIORITE].		O44			100							
	251														
446.11	252				O45			100							
	253														
444.11	254		Grayish black, horizontal, Lean CLAY lens.												
	255														
442.11	256														
	257														
440.11	258														
	259														
438.11	260		IGNEOUS ROCK, (QUARTZ DIORITE), very light gray, slightly weathered, moderately hard.												
	261														
436.11	262				O46			100							
	263														
434.11	264														
	265														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**O-13-023**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **9 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	265		IGNEOUS ROCK *(continued)*.		O46			100							
432.11	266														
	267														
430.11	268														
	269														
428.11	270														
	271		Borehole Terminated at Planned Depth. Bottom of borehole at 270.0 ft bgs												
426.11	272														
	273														
424.11	274														
	275														
422.11	276														
	277														
420.11	278														
	279														
418.11	280														
	281														
416.11	282														
	283														
414.11	284														
	285														
412.11	286														
	287														
410.11	288														
	289														
408.11	290														
	291														
406.11	292														
	293														
404.11	294														
	295														

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REPORT TITLE				HOLE ID
BORING RECORD				**O-13-023**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **10 of 10**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
M. Herzberg	3-19-13	3-19-13	34° 7' 11.04237" / -118° 9' 25.31084" NAD83	A-13-024
DRILLING CONTRACTOR: Martini Drilling Corporation			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 715.6 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8.5 in
SAMPLER TYPE(S) AND SIZE(S) (ID): 5-foot long split barrel; 3" dia			SPT HAMMER TYPE: N/A	HAMMER EFFICIENCY, ERi: N/A
BOREHOLE BACKFILL AND COMPLETION: Grout, Portland Cement			GROUNDWATER READINGS: DURING DRILLING / AFTER DRILLING (DATE): Not Encountered	TOTAL DEPTH OF BORING: 125.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (6").												Hand Auger to 5'
	1	AGGREGATE BASE (12").												
713.59	2	SILTY SAND (SM); dark yellowish brown; moist; mostly fine SAND; little fines; moderate cementation; soil development (A-horizon) in top 1.5' of unit, very dark grayish brown: [ALLUVIUM].												
	3													
711.59	4													
	5			O01			62							
709.59	6													
	7													
707.59	8													
	9													
705.59	10	SILTY CLAY (CL-ML); dark yellowish brown; moist; trace fine GRAVEL; few coarse to fine SAND; mostly low to medium plasticity fines; micaceous; some soil development (A-horizon).		O02			54							
	11													
703.59	12													
	13													
701.59	14													
	15	SILTY SAND (SM); dark yellowish brown; moist; trace fine GRAVEL; mostly medium to fine SAND; some fines; weak cementation; micaceous.		O03			100							PA
699.59	16													
	17													
697.59	18													
	19													
695.59	20			O04			18							
	21													
693.59	22													
	23													
691.59	24													
	25													

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				A-13-024
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY: M. Strane	DATE	SHEET 1 of 5	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		Mostly coarse to fine SAND; little fines; moderate cementation; micaceous. SILTY SAND (SM) *(continued)*.		O05			80							
689.59	26														
	27														
687.59	28		Few coarse to fine, subangular GRAVEL.		O06			100							
	29		Poorly graded SAND with SILT and GRAVEL (SP-SM); yellowish brown; moist; little coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; few fines; weak cementation; fines downward.												
685.59	30				O07			64							
	31														
683.59	32														
	33														
681.59	34														
	35				O08			27							PA
679.59	36														
	37														
677.59	38				O09			100							
	39														
675.59	40				O10			64							
	41														
673.59	42														
	43				O11			100							
671.59	44		Poorly graded SAND (SP); dark yellowish brown; moist; trace fine GRAVEL; mostly medium to fine SAND; few fines; weak cementation; micaceous.												
	45		Poorly graded SAND with GRAVEL (SP); yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; few fines; weak cementation.		O12			68							
669.59	46		SILTY SAND (SM); dark yellowish brown; moist; mostly medium to fine SAND; little fines; weak cementation; micaceous.												
	47														
667.59	48				O13			100							
	49		Trace coarse to fine, subangular GRAVEL; coarse to fine SAND.												
665.59	50				O14			82							
	51														
663.59	52														
	53														
661.59	54														
	55														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-024**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **2 of 5**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		SANDY SILT (ML); dark yellowish brown; moist; some medium to fine SAND; mostly nonplastic fines.		O15			80							PA
659.59	56														
	57		At Elev 659.0', contains SILT lens; trace SAND; brown.												
657.59	58		Poorly graded SAND with GRAVEL and COBBLES (SP); yellowish brown; moist; little coarse to fine, subangular GRAVEL; mostly medium to fine SAND; trace nonplastic fines; weak cementation; fines upward; 5% COBBLES, GRANITE, moderately soft to moderately hard, broken due to drilling.												
	59														
655.59	60				O16			64							
	61														
653.59	62														
	63														
651.59	64														
	65				O17			80							
649.59	66														
	67														
647.59	68														
	69														
645.59	70				O18			40							
	71														
643.59	72														
	73		SILTY SAND with GRAVEL (SM); dark yellowish brown; moist; little coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; little fines; weak cementation.		O19			100							
641.59	74		SANDY SILT with GRAVEL (ML); yellowish brown; moist; little GRAVEL; some medium to fine SAND; mostly low plasticity fines; slightly micaceous.												
	75				O20			100							PA
639.59	76		Poorly graded SAND with GRAVEL (SP); dark yellowish brown; moist; little coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; trace nonplastic fines. At Elev 640.6', becomes oxidized, yellowish red.												
	77														
637.59	78				O21			84							
	79														
635.59	80		Poorly graded SAND (SP); dark yellowish brown; moist; few coarse to fine GRAVEL; mostly medium to fine SAND; few fines; weak cementation.		O022			42							
	81		SILTY SAND (SM); dark yellowish brown; moist; mostly fine SAND; little fines; weak cementation; micaceous.												
633.59	82		Poorly graded SAND with COBBLES (SP); dark yellowish brown; moist; few coarse to fine GRAVEL; mostly medium to fine SAND; few nonplastic fines; 5% COBBLES, GRANITE, soft, 3-4" diameter. At Elev 632.2', contains fine grained lens.												
	83														
631.59	84														
	85														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-024**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **3 of 5**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		Well-graded SAND with SILT, GRAVEL, and COBBLES (SW-SM); dark yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; few nonplastic fines; 30% COBBLES, GRANITE, soft to moderately soft, 3-4" diameter.		O23			168							PA
629.59	86														
	87														
627.59	88				O24			60							
	89														
625.59	90				O25			14							
	91														
623.59	92														
	93														
621.59	94														
	95		SILTY SAND (SM); yellowish brown; moist; mostly fine SAND; little fines; weak cementation; slightly micaceous.		O26			100							
619.59	96		Poorly graded SAND (SP); dark yellowish brown; moist; few coarse to fine GRAVEL; mostly coarse to fine SAND; weak cementation.												
	97														
617.59	98		SILTY SAND (SM); dark yellowish brown; moist; mostly fine SAND; little fines; weak cementation; micaceous.		O27			40							
	99														
615.59	100				O28			100							
	101		Poorly graded SAND (SP); dark yellowish brown; moist; few coarse to fine GRAVEL; mostly coarse to fine SAND; few fines; weak cementation.												
613.59	102														
	103														
611.59	104		SILTY SAND (SM); dark yellowish brown; moist; trace fine GRAVEL; mostly medium to fine SAND; some low plasticity fines; moderate cementation; micaceous.												
	105				O29			86							PA
609.59	106														
	107														
607.59	108		Poorly graded SAND with GRAVEL (SP); dark yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; few fines; weak cementation.												
	109														
605.59	110				O30			94							
	111		SILTY SAND (SM); dark yellowish brown; moist; mostly fine SAND; little fines; moderate cementation.												
603.59	112														
	113		Poorly graded SAND with GRAVEL and COBBLES (SP); dark yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; few fines; 30% COBBLES, GRANITE, moderately hard, 4-7" intersected length.												
601.59	114														
	115														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-024**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **4 of 5**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	115		*(continued)*.		O31			50							
599.59	116														
	117														
597.59	118														
	119														
595.59	120		Poorly graded SAND (SP); dark yellowish brown; moist; few fine GRAVEL; mostly medium to fine SAND; trace fines; weak cementation.		O32			20							
	121		SILTY SAND (SM); dark yellowish brown; moist; mostly fine SAND; little fines; moderate cementation; micaceous.												
593.59	122														
	123														
591.59	124														
	125		Borehole Terminated at Planned Depth. Bottom of borehole at 125.0 ft bgs												
589.59	126														
	127														
587.59	128														
	129														
585.59	130														
	131														
583.59	132														
	133														
581.59	134														
	135														
579.59	136														
	137														
577.59	138														
	139														
575.59	140														
	141														
573.59	142														
	143														
571.59	144														
	145														

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-024**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **5 of 5**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
M. Herzberg	3-20-13	3-20-13	34° 7' 11.69519" / -118° 9' 25.30382" NAD83	A-13-025
DRILLING CONTRACTOR: Martini Drilling Corporation			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 720.9 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8.5 in
SAMPLER TYPE(S) AND SIZE(S) (ID): 5-foot long split barrel; 3" dia			SPT HAMMER TYPE: N/A	HAMMER EFFICIENCY, ERi: N/A
BOREHOLE BACKFILL AND COMPLETION: Grout, Portland Cement			GROUNDWATER READINGS: DURING DRILLING: Not Encountered; AFTER DRILLING (DATE):	TOTAL DEPTH OF BORING: 125.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (6").												Hand Auger to 5'
	1	AGGREGATE BASE (12").												
718.94	2	SILTY SAND (SM); dark brown; moist; few fine, subangular to subrounded GRAVEL; mostly coarse to fine SAND; some fines; moderate cementation; A-horizon soil development; fines downward [ALLUVIUM].												
	3													
716.94	4													
	5			O01			74							PA
714.94	6													
	7													
712.94	8													
	9													
710.94	10			O02			90							
	11	Dark yellowish brown.												
708.94	12													
	13													
706.94	14													
	15			O03			100							
704.94	16													
	17													
702.94	18													
	19													
700.94	20	Brown; lacks GRAVEL; A/B horizon pedogenic soil development; trace thin clay films.		O04			84							
	21													
698.94	22	SILTY CLAY with SAND (CL-ML); dark yellowish brown; moist; little medium to fine SAND; mostly low plasticity, medium dry strength fines; A/B soil horizon development, very few thin clay films on clasts; fines downward.												
	23													
696.94	24													
	25													

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				A-13-025
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY: M. Strane	DATE	SHEET 1 of 5	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	SANDY SILTY CLAY (CL-ML); dark brown; moist; trace fine, subangular GRAVEL; some medium to fine SAND; mostly low plasticity, low dry strength fines; some laminar Bt soil horizon development.		O05			100							PA, PI
694.94	26													
	27													
692.94	28													
	29	Dark yellowish brown; some fine SAND; Bt soil horizon development; micaceous.												
690.94	30			O06			100							
	31													
688.94	32	Poorly graded SAND with SILT (SP-SM); dark yellowish brown; moist; mostly fine SAND; few fines; weak cementation.												
	33	SILTY SAND (SM); dark yellowish brown; moist; mostly fine SAND; little fines; moderate cementation.												
686.94	34													
	35	SANDY SILTY CLAY (CL-ML); dark yellowish brown; moist; little fine SAND; mostly low plasticity, low dry strength fines.		O07			100							PA, PI
684.94	36	SILTY SAND (SM); dark yellowish brown; moist; mostly fine SAND; some nonplastic fines; moderate cementation.												
	37	At Elev 685.3', contains fine SAND lens. At Elev 685.1', contains fine SAND lens.												
682.94	38													
	39													
680.94	40			O08			100							
	41													
678.94	42													
	43	Poorly graded SAND (SP); yellowish brown; moist; trace coarse to fine GRAVEL; mostly medium to fine SAND; few fines; weak cementation; bottom contact is angular, possible FAULT; some pedogenic soil development (A-horizon).												
676.94	44	At Elev 677.6', contains coarse decomposed IGNEOUS GRAVEL.												
	45	SILTY CLAY with SAND (CL-ML); yellowish brown; moist; little fine SAND; mostly low plasticity, low dry strength fines.		O09			100							PA
674.94	46	Well-graded SAND with GRAVEL (SW); dark yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; fines upward.												
	47													
672.94	48	At Elev 674.9', becomes oxidized, brown.												
	49													
670.94	50	Poorly graded SAND with GRAVEL and COBBLES (SP); yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; trace nonplastic fines; 5% COBBLES, GRANITE PORPHYRY, decomposed, soft, disturbed due to drilling.		O10			100							
	51													
668.94	52													
	53													
666.94	54													
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-025**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **2 of 5**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Number	Recovery (%)	Remarks
	55	*(continued).*	O11	100	
664.94	56	SILTY SAND (SM); dark yellowish brown; moist; mostly fine SAND; little fines; weak cementation; fines downward.			
	57				
662.94	58				
	59				
660.94	60		O12	100	
	61				
658.94	62				
	63	Poorly graded SAND (SP); yellowish brown; moist; trace coarse to fine GRAVEL; mostly medium to fine SAND; few fines; weak cementation; fines downward.			
656.94	64				
	65	SILTY CLAY (CL-ML); dark yellowish brown; moist; few fine SAND; mostly low plasticity, low dry strength fines.	O13	100	PA
654.94	66	SILTY SAND (SM); yellowish brown; moist; mostly fine SAND; little fines; weak cementation; fines downward.			
	67				
652.94	68				
	69				
650.94	70	At Elev 650.7', observed coarse GRAVEL bed.	O14	100	
	71	Poorly graded SAND (SP); yellowish brown; moist; trace coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; few fines; weak cementation; fines downward.			
648.94	72	At Elev 649.6', becomes oxidized, brown.			
	73				
646.94	74				
	75		O15	100	
644.94	76	At Elev 644.9', becomes dark yellowish brown.			
	77				
642.94	78				
	79	At Elev 641.9', becomes oxidized, strong brown, 1-2" thick.			
640.94	80	At Elev 641.3', becomes oxidized, strong brown, 1-2" thick.	O16	84	
	81	COBBLES, GRANITE; decomposed; soft; 3-4" diameter.			
638.94	82	Poorly graded SAND with SILT (SP-SM); yellowish brown; moist; mostly fine SAND; little fines; moderate cementation; fines downward.			
	83				
636.94	84				
	85				

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-025**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **3 of 5**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		Poorly graded SAND with SILT and GRAVEL (SP-SM); yellowish brown; moist; little coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; few fines; weak cementation.		O17			100							PA
634.94	86														
	87														
632.94	88														
	89														
630.94	90				O18			82							
	91														
628.94	92														
	93		Poorly graded SAND with GRAVEL (SP); dark yellowish brown; moist; little coarse to fine, subrounded GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation.												
626.94	94														
	95		At Elev 625.9', becomes dark yellowish brown.		O19			100							
624.94	96		SILTY SAND (SM) thinly to moderately bedded with thin to moderate beds of Poorly graded SAND (SP). SILTY SAND: dark yellowish brown; moist; mostly medium to fine SAND; some fines; weak cementation; micaceous. Poorly graded SAND; dark yellowish brown; moist; mostly medium to fine SAND; few fines; trace coarse to fine subrounded GRAVEL; weak cementation.												
	97														
622.94	98														
	99														
620.94	100				O20			100							
	101														
618.94	102														
	103														
616.94	104														
	105				O21			100							PA
614.94	106														
	107														
612.94	108		Poorly graded SAND (SP); dark yellowish brown; moist; few coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation.												
	109														
610.94	110				O22			70							
	111														
608.94	112														
	113		SANDY SILTY CLAY (CL-ML); yellowish brown; moist; some fine SAND; mostly low plasticity, low dry strength fines.												
606.94	114														
	115														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-025**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **4 of 5**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	115		Poorly graded SAND (SP); dark yellowish brown; moist; trace coarse to fine, subangular GRAVEL; mostly medium to fine SAND; few fines; weak cementation; coarsens upward.		O23			100							
604.94	116														
	117		SANDY SILTY CLAY (CL-ML) moderately interbedded with moderate interbeds of Poorly Graded SAND (SP) and SILTY SAND (SM). SANDY SILTY CLAY; dark yellowish brown; moist; mostly fines, low plasticity, low dry strength; some fine SAND. Poorly Graded SAND; yellowish brown; moist; mostly medium to fine SAND; few fines; micaceous. SILTY SAND; dark yellowish brown; mostly medium to fine SAND; little fines; weak cementation.											
602.94	118														
	119														
600.94	120				O24			100							
	121														
598.94	122		Poorly graded SAND with SILT (SP-SM); dark yellowish brown; moist; few fine GRAVEL; mostly coarse to fine SAND; little fines; weak cementation.												
	123														
596.94	124														
	125		Borehole Terminated at Planned Depth. Bottom of borehole at 125.0 ft bgs												
594.94	126														
	127														
592.94	128														
	129														
590.94	130														
	131														
588.94	132														
	133														
586.94	134														
	135														
584.94	136														
	137														
582.94	138														
	139														
580.94	140														
	141														
578.94	142														
	143														
576.94	144														
	145														

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-025**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **5 of 5**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
M. Herzberg	3-21-13	3-21-13	34° 7' 13.23076" / -118° 9' 25.28736" NAD83	A-13-026
DRILLING CONTRACTOR: Martini Drilling Corporation			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 736.1 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8.5 in
SAMPLER TYPE(S) AND SIZE(S) (ID): 5-foot long split barrel; 3" dia			SPT HAMMER TYPE: N/A	HAMMER EFFICIENCY, ERi: N/A
BOREHOLE BACKFILL AND COMPLETION: Grout, Portland Cement			GROUNDWATER READINGS: DURING DRILLING 40.0 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 110.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (6").												Hand Auger to 5'
	1	AGGREGATE BASE (12").												
734.07	2	Poorly graded SAND (SP); yellowish brown; moist; trace fine GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation [ALLUVIUM].												
	3													
732.07	4													
	5	Poorly graded SAND with COBBLES (SP); yellowish brown; moist; trace coarse to fine GRAVEL; mostly coarse SAND; trace fines; weak cementation; 20% COBBLES, GRANITE, moderately weathered, moderately hard, 3-4" diameter.		O01			16							
730.07	6													
	7													
728.07	8													
	9													
726.07	10	SILTY CLAY (CL-ML); yellowish brown; moist; few fine SAND; mostly low plasticity, low dry strength fines.		O02			100							
	11													
724.07	12	Poorly graded SAND with SILT and GRAVEL (SP-SM); yellowish brown; moist; some coarse to fine GRAVEL; mostly coarse to fine SAND; few fines; weak cementation. At Elev 722.8', observed decreasing GRAVEL.												
	13													
722.07	14													
	15			O03			100							PA
720.07	16													
	17													
718.07	18	At Elev 718.6', contains fine SAND lens, 3" thick.												
	19	At Elev 717.1', becomes pale brown.												
716.07	20	Poorly graded SAND (SP); yellowish brown; moist; few coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation. At Elev 715.5', contains increased coarse GRAVEL.		O04			24							
	21													
714.07	22													
	23													
712.07	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				A-13-026
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY: M. Strane	DATE	SHEET 1 of 4	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		Poorly graded SAND (SP) *(continued)*.		O05			32							
710.07	26		At Elev 710.1', contains increased coarse GRAVEL.												
	27														
708.07	28														
	29														
706.07	30		Poorly graded SAND (SP); dark yellowish brown; moist; few coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; few fines; weak cementation.		O06			90							
	31														
704.07	32														
	33														
702.07	34														
	35		SILTY SAND (SM); dark yellowish brown; moist; mostly fine SAND; little fines; moderate cementation.		O07			86							PA
700.07	36		At Elev 700.9', contains SILTY CLAY (CL-ML); dark yellowish brown; weak to moderate soil development.												
	37		SILTY SAND with COBBLES (SM); dark yellowish brown; moist; mostly medium to fine SAND; little fines; weak cementation; 10% COBBLES, DIORITE, decomposed, very soft, disturbed due to drilling.												
698.07	38														
	39														
696.07	40		Poorly graded SAND with GRAVEL (SP); yellowish brown; moist; little coarse to fine, subangular to subrounded GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; coarsens downward.		O08			86							Water encountered between 40-43'
	41														
694.07	42		SILTY CLAY (CL-ML); dark yellowish brown; moist; few medium to fine SAND; mostly low plasticity, low dry strength fines; coarsens downward.												
	43														
692.07	44														
	45		Poorly graded SAND (SP); dark yellowish brown; moist; mostly fine SAND; trace fines; weak cementation.		O09			100							
690.07	46		Fat CLAY (CH); dark yellowish brown; moist; mostly high plasticity, medium dry strength fines.												
	47		Poorly graded SAND with SILT and COBBLES (SP-SM); dark yellowish brown; moist; trace fine GRAVEL; mostly medium to fine SAND; little fines; weak cementation; 10% COBBLES, GRANITE, decomposed, soft, disturbed due to drilling; coarsens downward.												
688.07	48														
	49		At Elev 689.4', contains few coarse to fine GRAVEL.												
686.07	50		SILTY SAND (SM); dark yellowish brown; moist; mostly fine SAND; little fines; weak cementation.		O10			40							
	51		Poorly graded SAND (SP); dark yellowish brown; moist; mostly fine SAND; few fines; weak cementation.												
684.07	52		Poorly graded SAND (SP); dark yellowish brown; mostly medium to fine SAND; trace fines; weak cementation.												
	53		At Elev 684.2', contains SILTY SAND lens, 2" thick.												
682.07	54														
	55														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-026**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **2 of 4**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		Poorly graded SAND with SILT (SP-SM); dark yellowish brown; moist; mostly medium to fine SAND; few fines; weak cementation. At Elev 680.9', grades to fine SAND.		O11			86							PA
680.07	56														
	57														
678.07	58		Poorly graded SAND (SP); dark yellowish brown; moist; trace coarse to fine GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation. At Elev 677.3', contains increased fine GRAVEL in top of unit.												
	59														
676.07	60		At Elev 675.8', consists of fine to medium SAND.		O12			82							Borehole heaving between 60-65'
	61														
674.07	62														
	63														
672.07	64		Poorly graded SAND with SILT (SP-SM); dark yellowish brown; moist; trace coarse to fine GRAVEL; mostly coarse to fine SAND; few fines; weak cementation.												
	65		Poorly graded SAND (SP); yellowish brown; moist; trace fine, subangular GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; fines upward.		O13			76							
670.07	66														
	67														
668.07	68														
	69		At Elev 667.4', contains increased silt.												
666.07	70				O14			72							
	71		SILTY SAND (SM); brown; moist; mostly fine SAND; little fines; moderate cementation.												
664.07	72		SILT with SAND (ML); dark yellowish brown; moist; trace fine GRAVEL; little medium to fine SAND; mostly nonplastic, low dry strength fines. At Elev 662.9', with with few coarse to fine GRAVEL and increase in fines.												
	73														
662.07	74														
	75		Poorly graded SAND with SILT (SP-SM); yellowish brown; moist; trace fine GRAVEL; mostly medium to fine SAND; few fines; weak cementation.		O15			26							PA
660.07	76														
	77														
658.07	78														
	79														
656.07	80		SILTY CLAY (CL-ML); yellowish brown; moist; few fine SAND; mostly low plasticity, low dry strength fines. At Elev 655.8', contains poorly graded SAND lens, 4" thick. At Elev 655.1', contains poorly graded SAND with SILT.		O16			24							
	81														
654.07	82														
	83														
652.07	84														
	85														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-026**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **3 of 4**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		Poorly graded SAND (SP); yellowish brown; moist; mostly coarse to fine SAND; trace fines; weak cementation; fines upward.		O17			72							
650.07	86		SILT with SAND (ML); dark yellowish brown; moist; little fine SAND; mostly low plasticity, low dry strength fines.												
	87														
648.07	88		Poorly graded SAND (SP); yellowish brown; moist; mostly coarse to fine SAND; trace fines; weak cementation; fines upward to fine SAND with SILT.		O18			100							
	89														
646.07	90		SANDY SILTY CLAY (CL-ML); yellowish brown; moist; some fine SAND; mostly low plasticity, low dry strength fines.		O19			72							
	91		SILTY CLAY (CL-ML); yellowish brown; moist; few fine SAND; mostly low plasticity, low dry strength fines.												
644.07	92														
	93		Fat CLAY with SAND (CH); strong brown; moist; little medium to fine SAND; mostly high plasticity, medium dry strength fines; strong Bt soil horizon development [DECOMPOSED BEDROCK]. At Elev 642.8', observed leached lens, light yellowish brown, ~1" thick.		O20			100							
642.07	94														
	95		At Elev 642.5', observed leached lens, light yellowish brown, ~1" thick.		O21			100							PA, PI
640.07	96		SANDY lean CLAY (CL); dark brown; moist; some medium to fine SAND; mostly low to medium plasticity, low to medium dry strength fines; coarsens upward.. At Elev 639.4', observed light yellowish brown, ~1" thick.												
	97														
638.07	98														
	99														
636.07	100				O22			100							
	101														
634.07	102														
	103														
632.07	104		SEDIMENTARY ROCK (SILTSTONE), moderate yellowish brown, intensely weathered, soft, (SILT (ML); yellowish brown; moist; mostly nonplastic fines; few fine SAND) [TOPANGA FORMATION].												
	105				O23			100							
630.07	106														
	107														
628.07	108														
	109														
626.07	110		Borehole Terminated at Planned Depth. Bottom of borehole at 110.0 ft bgs												
	111														
624.07	112														
	113														
622.07	114														
	115														

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-026**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **4 of 4**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
M. Herzberg	3-22-13	3-22-13	34° 7' 15.90845" / -118° 9' 25.36406" NAD83	A-13-027
DRILLING CONTRACTOR: Martini Drilling Corporation			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 751.9 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8.5 in
SAMPLER TYPE(S) AND SIZE(S) (ID): 5-foot long split barrel; 3" dia			SPT HAMMER TYPE: N/A	HAMMER EFFICIENCY, ERi: N/A
BOREHOLE BACKFILL AND COMPLETION: Grout, Portland Cement			GROUNDWATER READINGS: DURING DRILLING 55.0 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 100.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (6").												Hand Auger to 5'
	1	AGGREGATE BASE (12").												
749.89	2	Well-graded SAND with SILT, GRAVEL and COBBLES (SW-SM); yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; little fines; 5% COBBLES GRANITE, decomposed, micaceous, disturbed due to drilling [ALLUVIUM].												
	3													
747.89	4													
	5			O01			100							PA
745.89	6													
	7													
743.89	8													
	9													
741.89	10			O02			78							
	11	Decreased GRAVEL and increased fines.												
739.89	12	SANDY SILTY CLAY (CL-ML); pale brown; moist; some fine SAND; mostly low plasticity fines.												
	13	Poorly graded SAND (SP); yellowish brown; moist; few coarse to fine GRAVEL; mostly coarse to fine SAND; few fines.												
737.89	14													
	15			O03			88							
735.89	16													
	17													
733.89	18	SANDY SILTY CLAY (CL-ML); dark yellowish brown; moist; some fine SAND; mostly low plasticity fines.												
	19	Poorly graded SAND with GRAVEL (SP); yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; few fines.												
731.89	20			O04			90							
	21													
729.89	22	COBBLES, ~60 to 100%, GRANITE, disturbed due to drilling; yellowish brown; with coarse to fine, angular GRAVEL and fine SAND.												
	23	Poorly graded SAND with GRAVEL(SP), thinly interbedded with thin beds of SILTY SAND (SM). Poorly graded SAND with GRAVEL; dark yellowish brown; mostly fine to coarse SAND; little fine to coarse GRAVEL; weak cementation. SILTY SAND; yellowish												
727.89	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				A-13-027
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY: M. Strane	DATE	SHEET 1 of 4	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		brown, mostly fine SAND; little fines; weak cementation.		O05			50							PA
725.89	26		Poorly graded SAND with SILT, GRAVEL, and COBBLES (SP-SM); dark yellowish brown; moist; some coarse to fine GRAVEL; mostly coarse to fine SAND; few fines; 15% COBBLES, GRANITE, intensely weathered, soft to moderately soft, ~3-4" diameter.											
	27														
723.89	28														
	29														
721.89	30		Poorly graded SAND; (SP); dark yellowish brown; moist; few coarse to fine GRAVEL; mostly coarse to fine SAND; few fines.		O06			90							
	31														
719.89	32														
	33														
717.89	34														
	35				O07			80							
715.89	36														
	37														
713.89	38														
	39		At Elev 713.4', observed increased coarse GRAVEL.												
711.89	40		Poorly graded SAND (SP); yellowish brown; moist; trace GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation.		O08			88							
	41														
709.89	42														
	43														
707.89	44														
	45		SILTY SAND with GRAVEL (SM); dark yellowish brown; moist, little coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; little fines.		O09			34							PA
705.89	46														
	47														
703.89	48														
	49														
701.89	50		Poorly graded SAND with COBBLES (SP); yellowish brown; moist; trace fine, angular GRAVEL; mostly medium to fine SAND; few nonplastic fines; 5% COBBLES, GRANITE, decomposed, soft, disturbed due to drilling.		O10			88							
	51														
699.89	52														
	53														
697.89	54		At Elev 697.8', becomes fine grained, increasing SILT.												
	55														

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-027**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **2 of 4**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		Poorly graded SAND (SP); yellowish brown; moist; trace GRAVEL; mostly coarse to fine SAND; few fines; weak cementation; fines upward.		O11			58							
695.89	56		SILTY CLAY with SAND (CL-ML); dark yellowish brown; moist; little medium to fine SAND; mostly low plasticity, low to medium dry strength fines.												
	57		At Elev 694.9', contains slight soil development (A-horizon), dark yellowish brown.												
693.89	58		Poorly graded SAND (SP); yellowish brown; moist; mostly medium to fine SAND; few fines; weak cementation; micaceous.												
	59														
691.89	60		Fat CLAY (CH); yellowish brown; moist; mostly high plasticity, high dry strength fines; micaceous.		O12			100							
	61		SILTY SAND (SM); yellowish brown; moist; mostly medium to fine SAND; little fines; soil development (A-horizon?), color grades to dark brown to brown; micaceous.												
689.89	62														
	63		Poorly graded SAND (SP); yellowish brown; moist; trace fine GRAVEL; mostly medium to fine SAND; few fines; weak cementation. At Elev 688.0', observed GRAVEL, coarse to fine.												
687.89	64														
	65		At Elev 687.1', observed SILTY SAND (SM) lens, mostly fine SAND; little SILT.		O13			74							PA
685.89	66		SILTY SAND (SM); dark yellowish brown; moist; mostly fine SAND; little fines; moderate cementation; micaceous, coarsens downward.												
	67														
683.89	68		At Elev 684.1', contains few coarse SAND and trace fine GRAVEL.												
	69		SANDY SILT (ML); brown; moist; some fine SAND; mostly low plasticity fines; micaceous.												
681.89	70		Lean CLAY with SAND (CL); yellowish brown; moist; some fine SAND; mostly low to medium plasticity, low to medium dry strength fines; micaceous. At Elev 681.6', becomes dark brown. At Elev 680.9', becomes brown.		O14			100							
	71														
679.89	72														
	73														
677.89	74														
	75				O15			100							PA, PI
675.89	76														
	77														
673.89	78		At Elev 673.9', becomes dark brown. At Elev 673.6', becomes brown.												
	79														
671.89	80		At Elev 671.9', becomes dark brown.		O16			100							
	81														
669.89	82														
	83														
667.89	84														
	85														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-027**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **3 of 4**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	85		Increasing SAND. Lean CLAY with SAND (CL) *(continued)*.		O17			100							
665.89	86														
	87														
663.89	88														
	89														
661.89	90				O18			100							
	91														
659.89	92		CLAYEY SAND (SC); dark yellowish brown; moist; mostly medium to fine SAND; some fines; moderate cementation.												
	93														
657.89	94														
	95				O19			100							PA, PI
655.89	96		SEDIMENTARY ROCK (SILTSTONE), grayish orange variegated with orange; decomposed; soft; (SANDY Lean CLAY (CL); moist; some medium to fine SAND; mostly low to medium plasticity fines) [TOPANGA FORMATION].												
	97														
653.89	98														
	99														
651.89	100		Boring Terminated at Planned Depth. Bottom of borehole at 100.0 ft bgs												
	101														
649.89	102														
	103														
647.89	104														
	105														
645.89	106														
	107														
643.89	108														
	109														
641.89	110														
	111														
639.89	112														
	113														
637.89	114														
	115														

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-027**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **4 of 4**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
M. Herzberg	3-7-13	3-7-13	34° 7' 42.57908" / -118° 9' 16.73893" NAD83	A-13-034
DRILLING CONTRACTOR: Martini Drilling Corporation			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 783.7 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8.5 in
SAMPLER TYPE(S) AND SIZE(S) (ID): 5-foot long split barrel; 3" dia			SPT HAMMER TYPE: N/A	HAMMER EFFICIENCY, ERi: N/A
BOREHOLE BACKFILL AND COMPLETION: Grout, Portland Cement			GROUNDWATER READINGS: DURING DRILLING 82.5 ft; AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING: 85.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (6").												Hand Auger to 5'
	1	AGGREGATE BASE(12").												
781.71	2	CLAYEY SAND with GRAVEL (SC); dark yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; some fines; moderate cementation [ALLUVIUM].												
	3													
779.71	4													
	5	SANDY lean CLAY with GRAVEL (CL); brown; moist; few coarse to fine GRAVEL; some medium to fine SAND; mostly low plasticity, medium dry strength fines.		O01			95							PA, PI
777.71	6	At Elev 778.5', observed A-horizon soil development', brown, medium dry strength.												
	7	CLAYEY SAND with GRAVEL (SC); dark yellowish brown; moist; little coarse to fine, subangular GRAVEL; mostly coarse to fine SAND; some fines; strong cementation; coarse GRAVEL are intensely weathered.												
775.71	8													
	9	CLAYEY SAND (SC); brown; moist; few coarse to fine GRAVEL; mostly coarse to fine SAND; little fines; moderate cementation; coarsens downward.												
773.71	10	At Elev 776.6', contains weak B-horizon soil development. At Elev 775.2', with little GRAVEL.		O02			100							
	11	Poorly graded SAND with GRAVEL and COBBLES (SP); dark yellowish brown to brown; moist; little fine, subangular GRAVEL; mostly medium to fine SAND; few fines; weak cementation; fine GRAVEL appears to be crushed COBBLE; 5% COBBLES, GRANITE, intensely weathered, moderately soft, ~3-4" diameter.												
771.71	12													
	13			O03			100							
769.71	14													
	15	Coarse GRAVEL are intensely weathered.		O04			100							
767.71	16													
	17													
765.71	18	At Elev 765.9', contains Bt soil development.		O05			100							
	19													
763.71	20	Well-graded SAND with SILT, GRAVEL, and COBBLES (SW-SM); dark yellowish brown; moist; some coarse to fine, subrounded GRAVEL; mostly coarse to fine SAND; few fines; weak cementation; 10% COBBLES, DIORITE, intensely to moderately weathered, moderately soft, disturbed by drilling.		O06			100							
	21													
761.71	22													
	23			O07			100							
759.71	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				A-13-034
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY: M. Strane	DATE	SHEET 1 of 4	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		*(continued).*		O08			60							PA
757.71	26														
	27														
755.71	28		Poorly graded SAND with COBBLES (SP); yellowish brown; moist; little coarse to fine, subrounded GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; 20% COBBLES, DIORITE, intensely to moderately weathered, moderately soft to moderately hard, broken due to drilling.		O09			100						
	29														
753.71	30				O10			100							
	31		SILTY CLAY (CL-ML); yellowish brown; moist; trace fine GRAVEL; few fine SAND; mostly low to medium plasticity, low dry strength fines. At Elev 751.8', contains increased oxidation.												local soft drilling
751.71	32														
	33		Poorly graded SAND (SP); yellowish brown; few coarse to fine, subrounded GRAVEL; mostly coarse to fine SAND; few fines; weak cementation; coarsens upwards. At Elev 750.7', contains increased GRAVEL. At Elev 750.2', observed increasing silt.		O11			100						
749.71	34														
	35		Poorly graded SAND with COBBLES (SP); yellowish brown; few coarse to fine, subrounded GRAVEL; mostly coarse to fine SAND; little fines; GRAVEL increases downward; weak cementation. 5% COBBLES, GRANITE, moderately weathered, moderately soft; 5% COBBLES, DIORITE, decomposed, very soft. COBBLES disturbed due to drilling.		O12			88						
747.71	36														
	37														
745.71	38														
	39		At Elev 744.8', becomes light yellowish brown.												
743.71	40				O13			90							
	41		At Elev 743.1', contains increased GRAVEL.												
741.71	42		At Elev 741.6', contains increased GRAVEL.												
	43														
739.71	44														
	45		SILTY SAND with GRAVEL (SM); yellowish brown; moist; little coarse to fine GRAVEL; mostly coarse to fine SAND; little fines; weak cementation.		O14			68							PA local hard drillling
737.71	46														
	47														
735.71	48		Poorly graded SAND with GRAVEL (SP); yellowish brown; little coarse to fine, subrounded GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation.		O15			48						
	49														
733.71	50		Poorly graded SAND (SP); yellowish brown; moist; trace fine GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation.		O16			100							50-54' very soft drilling
	51														
731.71	52														
	53		At Elev 730.5', contains decreased GRAVEL.												
729.71	54														local hard drilling
	55														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-034**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **2 of 4**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55	At Elev 728.7', contains decreased GRAVEL. Poorly graded SAND (SP) *(continued)*.		O17			100							
727.71	56													
	57	At Elev 726.5', contains decreased GRAVEL.												
725.71	58													
	59	CLAYEY SAND (SC); dark yellowish brown; moist; few coarse to fine, angular GRAVEL; mostly medium to fine SAND; some low to medium plasticity, low dry strength fines; Has strong Bt soil horizon development [COLLUVIUM].												
723.71	60			O18			100							
	61													
721.71	62													
	63													
719.71	64													
	65			O19			100							PA, PI
717.71	66													
	67	At Elev 716.9', contains moderate Bt soil horizon development.												
715.71	68													
	69	At Elev 715.3', becomes slightly oxidized, yellowish brown to bottom of unit.												
713.71	70	Moderate B-horizon soil development in decomposed bedrock.		O20			100							
	71													
711.71	72													
	73													
709.71	74	SEDIMENTARY ROCK (CONGLOMERATE), fine sand to coarse sand, light gray, very intensely weathered, very soft, (Well graded SAND with GRAVEL and SILT (SW-SM), mostly SAND; little coarse to fine GRAVEL; few fines). [TOPANGA FORMATION].												
	75			O21			92							PA Drill chatter, hard drilling
707.71	76													
	77													
705.71	78													
	79													
703.71	80	Very pale orange, intensely weathered, soft.		O22			100							
	81													
701.71	82													
	83			O23			44							
699.71	84													
	85	Practical Refusal at 84.5'.												

(continued)

Earth Consultants International

REPORT TITLE				HOLE ID
BORING RECORD				**A-13-034**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **3 of 4**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks
	85		Bottom of borehole at 85.0 ft bgs											
697.71	86													
	87													
695.71	88													
	89													
693.71	90													
	91													
691.71	92													
	93													
689.71	94													
	95													
687.71	96													
	97													
685.71	98													
	99													
683.71	100													
	101													
681.71	102													
	103													
679.71	104													
	105													
677.71	106													
	107													
675.71	108													
	109													
673.71	110													
	111													
671.71	112													
	113													
669.71	114													
	115													

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-034**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **4 of 4**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
M. Herzberg	3-5-13	3-5-13	34° 7' 45.53762" / -118° 9' 16.92735" NAD83	A-13-035
DRILLING CONTRACTOR: Martini Drilling Corporation			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION: 787.2 ft NAVD88
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME-75	BOREHOLE DIAMETER: 8.5 in
SAMPLER TYPE(S) AND SIZE(S) (ID): 5-foot long split barrel; 3" dia			SPT HAMMER TYPE: N/A	HAMMER EFFICIENCY, ERi: N/A
BOREHOLE BACKFILL AND COMPLETION: Grout, Portland Cement			GROUNDWATER READINGS: DURING DRILLING: Not Encountered; AFTER DRILLING (DATE):	TOTAL DEPTH OF BORING: 73.0 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT (6.5").												Hand Auger to 5'
	1	AGGREGATE BASE (13").												
785.19	2	SILTY CLAY (CL-ML); yellowish brown; moist; few fine SAND; mostly low plasticity fines; micaceous [ALLUVIUM].												
	3													
783.19	4													
	5	A-horizon soil development.		O01			100							PI
781.19	6													
	7													
779.19	8													
	9	Trace SAND; Laminar Bt soil development.												
777.19	10			O02			100							
	11													
775.19	12													
	13													
773.19	14													
	15			O03			100							PA
771.19	16	SILTY SAND with GRAVEL (SM); light yellowish brown; moist; little fine GRAVEL; mostly coarse to fine SAND; little fines; weak cementation; micaceous.												
	17	SILT with SAND (ML); brown; moist; little fine SAND; mostly fines; micaceous.												
769.19	18	Poorly graded SAND (SP); black; moist; trace fine GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; laminated.												
	19	Poorly graded SAND with GRAVEL (SP); dark yellowish brown; moist; little fine GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; micaceous.												
767.19	20			O04			35							
	21													
765.19	22													
	23													
763.19	24													
	25													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				A-13-035
DIST. 07	COUNTY LA	ROUTE 710	POSTMILE	EA 07-187900
PROJECT OR BRIDGE NAME: SR 710 North Study				
BRIDGE NUMBER	PREPARED BY: M. Strane	DATE	SHEET 1 of 3	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25	Poorly graded SAND with COBBLES (SP); dark yellowish brown; moist; few GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; slightly micaceous, slight oxidization at top of unit; 10% COBBLES, GRANITE, decomposed, soft to very soft, disturbed due to drilling.		O05			100							
761.19	26													
	27													
759.19	28	SILT with SAND (ML); dark yellowish brown; moist; little fine SAND; mostly fines; micaceous.		O06			100							
	29													
757.19	30			O07			100							
	31	At Elev 756.0', becomes oxidized, dark yellowish brown and very pale brown.												
755.19	32	Poorly graded SAND with GRAVEL (SP); dark yellowish brown; moist; some coarse to fine GRAVEL; mostly coarse to fine SAND; trace fines; weak cementation; fines upward.												
	33													
753.19	34	At Elev 754.1', becomes oxidized.												
	35	At Elev 752.2', becomes strong brown.		O08			100							PA
751.19	36													
	37													
749.19	38	At Elev 749.4', observed dark yellowish brown, <5% IGNEOUS COBBLES, intensely weathered, 3-4" diameter.		O09			44							
	39													
747.19	40	Poorly graded SAND (SP); dark yellowish brown; moist; few fine GRAVEL; mostly coarse to fine SAND; few fines; weak cementation.		O10			100							
	41													
745.19	42	At Elev 745.5', observed SILT lens, brown.												
	43	At Elev 744.8', becomes dark yellowish brown. At Elev 744.2', observed <5% IGNEOUS COBBLES, GRANITE, decomposed, very soft, ~6" diameter.		O11			40							
743.19	44													
	45			O12			100							
741.19	46													
	47													
739.19	48			O13			100							
	49	SEDIMENTARY ROCK (SANDSTONE), coarse sand to fine sand, very pale orange, very intensely weathered, soft, (SILTY SAND (SM), brown; moist; trace fine GRAVEL; mostly coarse to fine SAND; some fines; strong cementation) [TOPANGA FORMATION].												
737.19	50			O14			100							
	51													
735.19	52													
	53			O15			84							
733.19	54													
	55													

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-035**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**		DATE	SHEET **2 of 3**

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	55		SEDIMENTARY ROCK (Sandstone) *(continued)*.		O16			100							
731.19	56														
	57														
729.19	58		Becomes decomposed; (Poorly graded SAND with SILT (SP-SM); brown; friable).		O17			68							
	59														
727.19	60				O18			34							
	61														
725.19	62														
	63														
723.19	64														
	65		(SANDSTONE), intensely weathered, soft, (SILTY SAND with GRAVEL (SM), mostly coarse to fine SAND; some coarse to fine GRAVEL; little fines).		O19			48							PA very hard drilling
721.19	66														
	67														
719.19	68				O20			40							
	69														very hard drilling
717.19	70		Decomposed, grayish brown.		O21			64							
	71														
715.19	72														
	73		Dark yellowish orange, intensely weathered, oxidized.		O22			100							
			Practical Refusal at 73 ft. Bottom of borehole at 73.0 ft bgs												Refusal
713.19	74														
	75														
711.19	76														
	77														
709.19	78														
	79														
707.19	80														
	81														
705.19	82														
	83														
703.19	84														
	85														

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REPORT TITLE				HOLE ID
BORING RECORD				**A-13-035**
DIST. **07**	COUNTY **LA**	ROUTE **710**	POSTMILE	EA **07-187900**
PROJECT OR BRIDGE NAME **SR 710 North Study**				
BRIDGE NUMBER	PREPARED BY **M. Strane**	DATE	SHEET **3 of 3**	

5 BR - STANDARD SR710N_ECILOGS_REVBYCH2M.GPJ CALTRANS LIBRARY DEC09-W_ECI_LOGO.GLB 1/15/14