NORDIC INDUSTRIES, INC.

MAGNUS Pacific

DATE:	October 3, 2013
TO:	SBFCA C/O Parsons Brinkeroff Mr. Mark Martin 2329 Gateway Oaks Drive, Suite 200 Sacramento, CA 95833-4231 mamartin@pbworld.com
cc	
Pages:	72

TRANSMITTAL #	**SUB 67**
FROM:	Nordic / Magnus Pacific JV Sean L. Rhodes Project Manager srhodes@magnuspacific.com 1437 Furneaux Road Olivehurst,CA 95961 TEL: 530-742-7124 FAX: 530-742-3707

We are sending you:

- ☐ Specifications
- ☐ Plans
- ☐ Drawings
- ☐ Submittal
- ☐ RFI
- ☐ Letter
- ☐ Change Order
- ☐ Field Instruction
- ☐ Other: See Below

Specification Section: **31 62 43**

Item No.	Date	Copies	Pages	Description
1	10/3/13	1	72	Impermeable Layer Verification Logs

Remarks: As discussed attached our the missing impermable layer verification drill logs that were completed between Aug 3 - Aug 15 plus the final complete boring 35B. This should conclude all logs for the Impermeable Layer Verification for the DMM operation.

I certify that the above submitted items had been reviewed in detail and are correct and in strict conformance with contract drawings and specifications except as otherwise stated.

Sean L. Rhodes

Digitally signed by: Sean L. Rhodes
DN: CN = Sean L. Rhodes C = US O = Magnus Pacific OU = Operations Manager
Date: 2013.10.03 10:52:17 -07'00'

Sean L. Rhodes

Copy to: File

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
Ben Crawford	8-3-13	8-3-13		13_86025_16B
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Geo-Ex, Driller Name: Tom Scott			0.00' Rt Sta 860+25 Reach 13	80.5 ft
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Rotary Wash			CME 75	
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
Std Cal (2.5"), HQ Core, SPT (1.4")			Automatic Trip, 140 lb, 30 inch	
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS: DURING DRILLING	AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING
Cement Grout			N/A	N/A	130.0 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														
	1														7:00am begin drilling 10:15 BDC on site
78.50	2														
	3														
76.50	4														
	5														
74.50	6														
	7														
72.50	8														
	9														
70.50	10														
	11														
68.50	12														
	13														
66.50	14														
	15														
64.50	16														
	17														
62.50	18														
	19														
	20														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				13_86025_16B
DIST.	COUNTY	ROUTE	POSTMILE	EA
03	YUB		D	03-13-120.1
PROJECT OR BRIDGE NAME				
SBFCA				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
	David Castro			1 of 6

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
John Wright	9-16-13	9-17-13		13_87900_35B
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Geo-Ex, Driller Name: Ryan			0.00' Rt Sta 879+00 Reach 13	69.0 ft
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Rotary Wash			CME 850	4 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
HQ Core			Automatic Trip, 140 lb, 30 inch	
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS: DURING DRILLING	AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING
Cement Grout			N/A	N/A	116.5 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														
	1														
67.00	2														
	3														
65.00	4														
	5														
63.00	6														
	7														
61.00	8														
	9														
59.00	10														
	11														
57.00	12														
	13														
55.00	14														
	15														
53.00	16														
	17														
51.00	18														
	19														
	20														

(continued)

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Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				13_87900_35B
DIST.	COUNTY	ROUTE	POSTMILE	EA
03	YUB		D	03-13-120.1
PROJECT OR BRIDGE NAME				
SBFCA				
BRIDGE NUMBER	PREPARED BY	DATE	SHEET	
	John Wright		1 of 6	

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
	20														
	21														
47.00	22														
	23														
45.00	24														
	25														
43.00	26														
	27														
41.00	28														
	29														
39.00	30														
	31														
37.00	32														
	33														
35.00	34														
	35														
33.00	36														
	37														
31.00	38														
	39														
29.00	40														
	41														
27.00	42														
	43														
	44														

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Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87900_35B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **John Wright**		DATE	SHEET **2 of 6**

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
	44														
	45														
23.00	46														
	47														
21.00	48														
	49														
19.00	50														
	51														
17.00	52														
	53														
15.00	54														
	55														gravel layer
13.00	56														
	57														
11.00	58														
	59														
9.00	60														
	61														
7.00	62														
	63														
5.00	64														
	65														
3.00	66														
	67														
	68														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87900_35B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **John Wright**		DATE	SHEET **3 of 6**

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
	68														
	69														
-1.00	70														
	71														
-3.00	72														
	73														
-5.00	74														
	75														
-7.00	76														
	77														
-9.00	78														
	79														
-11.00	80														
	81														
-13.00	82														
	83														
-15.00	84														
	85														
-17.00	86														
	87														
-19.00	88														
	89														
-21.00	90														
	91														
	92														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87900_35B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **John Wright**		DATE	SHEET **4 of 6**

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
	92														
	93														
-25.00	94														
	95														
-27.00	96														
	97														end of gravel layer. Lost ~300 gal of fluid.
-29.00	98														
	99														
-31.00	100		CLAYEY SAND (SC); very stiff; gray; moist to wet; about 85% coarse to medium SAND; about 15% low to medium plasticity fines.		1			100							
	101		Lean CLAY (CL); greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines; slightly blocky.									PP = 3.25			
-33.00	102				2			100				PP = 3.25			
	103		Hard.									PP = 4.25			
-35.00	104		About 10% fine SAND; about 90% medium plasticity fines.									PP = >4.5			
	105		Very stiff.									PP = 3.75			
-37.00	106		Poorly graded SAND with SILT (SP-SM); dartk gray; wet; about 90% coarse to fine SAND; about 10% nonplastic to low plasticity fines. 1/2" lenses of Silty SAND.									PP = 2.5			
	107				3			85							
-39.00	108														
	109		Lean CLAY (CL); very stiff; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines; slightly blocky.												
-41.00	110											PP = 2.5			
	111		About 10% medium to fine SAND; about 90% medium plasticity fines.												
-43.00	112		Poorly graded SAND (SP); dark gray; wet; about 95% coarse to fine SAND; about 5% nonplastic fines.		4			95							
	113		Poorly graded SAND with SILT (SP-SM); dark gray; wet; about 90% coarse to fine SAND; about 10% nonplastic fines.									PP = 2.5			
-45.00	114		Lean CLAY (CL); very stiff; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines; blocky.									PP = 3.5			
	115		Hard.									PP = >4.5			
	116														

(continued)

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REPORT TITLE				HOLE ID
BORING RECORD				**13_87900_35B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **John Wright**		DATE	SHEET **5 of 6**

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
	116		Lean CLAY (CL) *(continued)*.		4			95				PP = >4.5			
			Bottom of borehole at 116.5 ft bgs												
	117														
-49.00	118														
	119														
-51.00	120														
	121														
-53.00	122														
	123														
-55.00	124														
	125														
-57.00	126														
	127														
-59.00	128														
	129														
-61.00	130														
	131														
-63.00	132														
	133														
-65.00	134														
	135														
-67.00	136														
	137														
-69.00	138														
	139														
	140														

FINAL LOG:
The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our final logs represent our interpretation of the field logs and general knowledge of the site and geological conditions.

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87900_35B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **John Wright**	DATE	SHEET **6 of 6**	

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
	20														
	21														
58.50	22														
	23														
56.50	24														
	25														
54.50	26														
	27														
52.50	28														
	29														
50.50	30														
	31														
48.50	32														
	33														
46.50	34														
	35														
44.50	36														
	37														
42.50	38														
	39														
40.50	40														
	41														
38.50	42														
	43														
	44														

(continued)

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
	44														
	45														
34.50	46														
	47														
32.50	48														
	49														
30.50	50														
	51														
28.50	52														
	53														
26.50	54														
	55														
24.50	56														
	57														
22.50	58														
	59														
20.50	60														
	61														
18.50	62														
	63														
16.50	64														encountered gravel layer
	65														
14.50	66														
	67														
	68														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_86025_16B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **3 of 6**

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
	68														
	69														
10.50	70														
	71														
8.50	72														
	73														
6.50	74														
	75														
4.50	76														
	77														end gravel layer
2.50	78														encountered gravel layer
	79														
0.50	80														
	81														
-1.50	82														
	83														
-3.50	84														
	85														
-5.50	86														
	87														
-7.50	88														end gravel layer
	89														
-9.50	90														
	91														
	92														

(continued)

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
	92														
	93														
-13.50	94														
	95														
-15.50	96														
	97														
-17.50	98														
	99														encountered gravel layer
-19.50	100														
	101														
-21.50	102														
	103														
-23.50	104														
	105														10:47am driller indicates end of gravel layer
-25.50	106														
	107		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% low to medium plasticity fines; some SILT also present.		1	27 22 30	52	80				PP = >4.5			
-27.50	108				2			83							
	109				3			100							
-29.50	110														
	111														
-31.50	112				4			67							
	113														sample stuck in cone barrel
-33.50	114														
	115														
	116														

(continued)

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Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_86025_16B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **5 of 6**

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
	116		Lean CLAY (CL) *(continued)*. *(continued)*.		4			67							
	117				5			93							1:30pm
-37.50	118		SANDY SILT (ML); hard; greenish gray; moist; about 50% fine SAND; about 50% low to medium plasticity fines.												
	119		SILTY SAND (SM); dense to very dense; greenish gray; moist; about 55% fine SAND; about 45% medium plasticity fines.		6			87							
-39.50	120		SILT with SAND (ML); hard; greenish gray; moist; about 15% SAND; about 85% medium plasticity fines.												
	121		Poorly graded SAND (SP); medium dense; dark gray; moist; about 95% medium to fine SAND; about 5% low plasticity fines.												2:04pm
-41.50	122		No Sample.		7			0							
	123														
-43.50	124				8	16 29 63	92	89							2:21pm
	125		SILTY CLAY to CLAYEY SILT (CL/ML); very stiff to hard; greenish gray; moist; about 5% fine SAND; about 95% low to medium plasticity fines.												
-45.50	126		Poorly graded SAND (SP); dense; dark gray; moist; about 5% low plasticity fines.		9	28 40 47	87	100							
	127		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; low to medium plasticity fines.												
-47.50	128				10			87							
	129		SILTY SAND (SM); greenish gray; moist; about 50% fine SAND; about 50% low plasticity fines; to Sandy SILT.												
-49.50	130		Bottom of borehole at 130.0 ft bgs												4:14pm
	131		FINAL LOG: The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our final logs represent our interpretation of the field logs and general knowledge of the site and geological conditions.												
-51.50	132														
	133														
-53.50	134														
	135														
-55.50	136														
	137														
-57.50	138														
	139														
	140														

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_86025_16B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **6 of 6**

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
John Wright	8-6-13	8-12-13		13_87725_33B
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Geo-Ex, Driller Name: Tom Scott			0.00' Rt Sta 877+25 Reach 13	81.0 ft
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Rotary Wash			CME 75	5 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
Std Cal (2.5"), SPT (1.4")			Automatic Trip, 140 lb, 30 inch	
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS: DURING DRILLING	AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING
Cement Grout			N/A	N/A	128.0 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														
	1														
79.00	2														
	3														
77.00	4														
	5														
75.00	6														
	7														
73.00	8														
	9														
71.00	10														
	11														
69.00	12														
	13														
67.00	14														
	15														
65.00	16														
	17														
63.00	18														
	19														
	20														

(continued)

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Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				13_87725_33B
DIST.	COUNTY	ROUTE	POSTMILE	EA
03	YUB		D	03-13-120.1
PROJECT OR BRIDGE NAME				
SBFCA				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
	David Castro			1 of 6

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
	20														
	21														
59.00	22														
	23														
57.00	24														
	25														
55.00	26														
	27														
53.00	28														
	29														
51.00	30														
	31														
49.00	32														
	33														
47.00	34														
	35														
45.00	36														
	37														
43.00	38														
	39														
41.00	40														add 30 gal of water
	41														
39.00	42														
	43														
	44														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87725_33B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **2 of 6**

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
	44														
	45														
35.00	46														
	47														
33.00	48														
	49														
31.00	50														
	51														
29.00	52														
	53														
27.00	54														
	55														
25.00	56														
	57														
23.00	58														
	59														
21.00	60														
	61														
19.00	62														gravel layer
	63														
17.00	64														
	65														
15.00	66														
	67														
	68														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87725_33B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **3 of 6**

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
	68														
	69														
11.00	70														used 300 gal of water
	71														
9.00	72														
	73														
7.00	74														
	75														
5.00	76														
	77														
3.00	78														
	79														
1.00	80														
	81														
-1.00	82														
	83														
-3.00	84														
	85														
-5.00	86														
	87														
-7.00	88														
	89														
-9.00	90														
	91														
	92														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87725_33B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **4 of 6**

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
	92														
	93														
-13.00	94														
	95														
-15.00	96														
	97														
-17.00	98														
	99														
-19.00	100														
	101														
-21.00	102														
	103														
-23.00	104														
	105														
-25.00	106														
	107														
-27.00	108														
	109														
-29.00	110		Poorly graded SAND (SP); dense; dark gray; wet; about 95% SAND; about 5% nonplastic fines.		1	18 21 23	44	83							end of gravel layer
	111														
-31.00	112														
	113				2	14 15 15	30	58							
-33.00	114														
	115		SILTY SAND (SM); dense; dark gray; wet; about 75% fine SAND; about 25% nonplastic to low plasticity fines.		3		36	75							8-7-13 8:45am
	116														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87725_33B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **5 of 6**

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
	116		SILTY SAND (SM) *(continued)*.		3	14 17 19	36	75							
	117														
-37.00	118		SANDY SILT (ML); very stiff to hard; gray; moist; about 35 to 40% fine SAND; about 65 to 60% low plasticity fines; interbedded layer of poorly graded SAND with silt.		4	12 14 23	37	71							10:20am
	119														
-39.00	120		SANDY CLAYEY SILT (ML/CL); medium stiff to stiff; gray; moist; about 35% fine SAND; about 65% low to medium plasticity fines.		5	6 8 9	17	54				PP = 3.5			
	121														
-41.00	122		Lean to fat CLAY (CL/CH); hard; greenish gray; moist; about 5% fine SAND; about 95% medium to high plasticity fines.		6	21 28 36	64	33				PP = 1.25 PP = 3.5			
	123														add 50 gal of water
					7	56/6	REF	0							
-43.00	124				8	42 54 70	124	33				PP = >4.5			
	125														
-45.00	126		CLAYEY SAND (SC); very dense; gray; moist; about 65% medium to fine SAND; about 35% low to medium plasticity fines.		9	21 36 44	80	79							
	127		Poorly graded SAND (SP); very dense; dark gray; wet; about 95% coarse SAND; about 5% nonplastic fines; Interbedded layers of silty SAND (dark gray, 40% fines, low plasticity).												
-47.00	128		Bottom of borehole at 128.0 ft bgs												
	129														
-49.00	130														
	131														
-51.00	132														
	133														
-53.00	134														
	135														
-55.00	136														
	137														
-57.00	138														
	139														
	140														

FINAL LOG:
The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our final logs represent our interpretation of the field logs and general knowledge of the site and geological conditions.

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87725_33B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **6 of 6**

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
John Wright	8-5-13	8-6-13		13_87825_34B
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Geo-Ex, Driller Name: Tom Scott			0.00' Rt Sta 878+25 Reach 13	81.0 ft
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Rotary Wash			CME 75	
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
Mod Cal (2"), SPT (1.4")			Automatic Trip, 140 lb, 30 inch	
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS: DURING DRILLING N/A; AFTER DRILLING (DATE) N/A	TOTAL DEPTH OF BORING
Cement Grout				129.5 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														
	1														Top of Levee (Asphalt) graded (~1 ft)
79.00	2														
	3														
77.00	4														
	5														
75.00	6														
	7														
73.00	8														
	9														
71.00	10														
	11														
69.00	12														
	13														
67.00	14														
	15														
65.00	16														
	17														
63.00	18														
	19														
	20														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				13_87825_34B
DIST.	COUNTY	ROUTE	POSTMILE	EA
03	YUB		D	03-13-120.1
PROJECT OR BRIDGE NAME				
SBFCA				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
	David Castro			1 of 6

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
	20														
	21														
59.00	22														
	23														
57.00	24														
	25														
55.00	26														
	27														
53.00	28														
	29														
51.00	30														
	31														
49.00	32														
	33														
47.00	34														
	35														
45.00	36														
	37														
43.00	38														
	39														
41.00	40														
	41														
39.00	42														
	43														
	44														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87825_34B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **2 of 6**

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
	44														
	45														
35.00	46														
	47														
33.00	48														
	49														
31.00	50														
	51														
29.00	52														
	53														
27.00	54														
	55														
25.00	56														
	57														
23.00	58														
	59														
21.00	60														
	61														
19.00	62														
	63														
17.00	64														
	65														
15.00	66														slight drill rig chatter
	67														
	68														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87825_34B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **3 of 6**

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
	68														
	69														
11.00	70														heavy drill rig chatter, indicating gravel layer
	71														
9.00	72														
	73														
7.00	74														
	75														
5.00	76														
	77														
3.00	78														
	79														
1.00	80														
	81														
-1.00	82														
	83														
-3.00	84														
	85														
-5.00	86														
	87														
-7.00	88														
	89														
-9.00	90														
	91														about 160 gal of water used
	92														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87825_34B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **4 of 6**

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
	92														
	93														
-13.00	94														
	95														mixed more mud (drilling fluid), 50 gal. total water 210 gal.
-15.00	96														
	97														
-17.00	98														
	99														
-19.00	100														
	101														
-21.00	102														heavy drill rig rattle for about 1 ft
	103														
-23.00	104														
	105														
-25.00	106														
	107														
-27.00	108														
	109														
-29.00	110														out of gravel layer
	111		Lean CLAY (CL); very stiff to hard; gray; moist; about 5% fine SAND; medium plasticity fines.		1	13	36	46				PP = 4.0			12:00pm 260 gal of total water used
-31.00	112					18									
	113					18									
-33.00	114		SANDY SILT (ML); very stiff to hard; dark gray; moist; about 40 to 45% fine SAND; low plasticity fines.		2	10	36	92							
	115					14									
	116					22									

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87825_34B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **5 of 6**

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
	116	SANDY SILT (ML) *(continued)*.		3	14 20 32	52	83							
	117	SILTY SAND (SM); dense; dark gray; moist; fine SAND; about 35% low to medium plasticity fines.												1:45pm
-37.00	118													
	119	Poorly graded SAND (SP); dense; dark gray; moist; medium to fine SAND; about 5% nonplastic fines; Interbedded layers of sandy silt.		4	12 18 26	44	92				PP = 3.75			
-39.00	120	SILTY CLAY to CLAYEY SILT (CL/ML); very stiff to hard; greenish gray; moist; about 4% fine SAND; low to medium plasticity fines.												2:30pm
	121			5	13 19 32	51	63							
-41.00	122	SANDY SILT (ML); hard; gray; moist; about 40% fine SAND; low plasticity fines.												3:15pm
	123													
-43.00	124			6	13 18 24	42	83							
	125	SILTY SAND (SM); dense; dark gray; moist; fine SAND; about 15% nonplastic fines.												
														end drilling for 8/5/13
-45.00	126	Lean CLAY (CL); hard; greenish gray; moist; about 4 to 15% fine SAND; medium plasticity fines; blocky.		7	14 47 61	108	100				PP = >4.5			resume sampling at 8:00am 8/6/13
	127													
-47.00	128	SILTY SAND (SM); very dense; dark gray; wet; fine SAND; about 20% nonplastic to low plasticity fines; Interbedded layers of SP (dark gray, wet, 4% fine to medium sand).		8	28 41 54	95	88							
	129	SANDY SILT (ML); very loose; dark gray; moist; about 35% fine SAND; nonplastic to low plasticity fines.												
-49.00	130	Bottom of borehole at 129.5 ft bgs												
	131	FINAL LOG: The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our final logs represent our interpretation of the field logs and general knowledge of the site and geological conditions.												
-51.00	132													
	133													
-53.00	134													
	135													
-55.00	136													
	137													
-57.00	138													
	139													
	140													

Material Graphics

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_87825_34B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **6 of 6**

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
John Wright	8-6-13	8-7-13		13_88025_36B
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Geo-Ex, Driller Name: Ryan			0.00' Rt Sta 880+25 Reach 13	81.0 ft
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Rotary Wash			CME 850	4 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
HQ Core, SPT (1.4")			Automatic Trip, 140 lb, 30 inch	
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS: DURING DRILLING N/A; AFTER DRILLING (DATE) N/A	TOTAL DEPTH OF BORING
Cement Grout				130.0 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														
	1														
79.00	2														
	3														
77.00	4														
	5														
75.00	6														
	7														
73.00	8														
	9														
71.00	10														
	11														
69.00	12														
	13														
67.00	14														
	15														
65.00	16														
	17														
63.00	18														
	19														
	20														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				13_88025_36B
DIST.	COUNTY	ROUTE	POSTMILE	EA
03	YUB		D	03-13-120.1
PROJECT OR BRIDGE NAME				
SBFCA				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
	David Castro			1 of 6

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
	20														
	21														
59.00	22														
	23														
57.00	24														
	25														
55.00	26														
	27														
53.00	28														
	29														
51.00	30														
	31														
49.00	32														
	33														
47.00	34														
	35														
45.00	36														
	37														
43.00	38														
	39														
41.00	40														
	41														
39.00	42														
	43														
	44														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88025_36B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **2 of 6**

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
	44														
	45														
35.00	46														
	47														
33.00	48														
	49														
31.00	50														
	51														
29.00	52														
	53														
27.00	54														
	55														
25.00	56														
	57														
23.00	58														
	59														
21.00	60														
	61														
19.00	62														
	63														
17.00	64														
	65														
15.00	66														
	67														
	68														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88025_36B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **3 of 6**

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
	68														drill rig rattle
	69														
11.00	70														
	71														
9.00	72														
	73														
7.00	74														
	75														
5.00	76														
	77														
3.00	78														
	79														
1.00	80														
	81														
-1.00	82														
	83														heavy drill rig chatter, indicating gravel layer
-3.00	84														
	85														
-5.00	86														
	87														
-7.00	88														
	89														
-9.00	90														mixed two tanks, 200 gal of water
	91														
	92														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88025_36B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **4 of 6**

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
	92														
	93														
-13.00	94														
	95														
-15.00	96														
	97														
-17.00	98														7:55am add another tank of mud, 300 gal of water
	99														
-19.00	100														8:20am, another tank of mud, 400 gal of water
	101														
-21.00	102														8:30am no circulation
	103														
-23.00	104														
	105														
-25.00	106														8:45am add another tank of mud, 500 gal of water 9:30am add another tank of mud, 600 gal of water out of gravel layer at 106 ft
	107														
-27.00	108														
	109		SILTY CLAY with SAND (CL-ML); hard; gray to greenish gray; moist; about 10 to 25% medium to fine SAND; about 90 to 85% low to medium plasticity fines; interbedded layers of SP-SM (dark gray, wet, 10% fines non-plastic).		1	25 37 60	97	75							11:00am
-29.00	110														
	111				2			100							12:30pm
-31.00	112														
	113				3			97							
-33.00	114											PP = 3.5			
	115		Lean CLAY (CL); very stiff to hard; greenish gray; moist; about 10% fine SAND; about 90% medium plasticity fines.									PP = 1.5			
	116		CLAYEY SILT with SAND (ML/CL); very stiff; greenish		4			90							

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88025_36B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **5 of 6**

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
	116		blue gray; moist; about 15% SAND; about 85% low to medium plasticity fines; interbedded layers of poorly graded SAND (dark gray, 5% fines, fine to medium sand).		4			90				PP = 3.5			1:40pm
	117														
-37.00	118		Poorly graded SAND (SP); dense; dark gray; wet; about 95% medium to fine SAND; about 5% fines.		5										
	119														
-39.00	120		SILTY SAND (SM); dense; dark gray; wet; about 80% SAND; about 20% nonplastic fines.												
	121		Poorly graded SAND with SILT (SP-SM); dense; dark gray; wet; about 90% SAND; about 10% nonplastic fines; 4 inch silty SAND layer from 19 to 23 inches from tip (dark gray, wet, 15% fines, fine sand).		6			97							2:30pm
-41.00	122														
	123		Lean CLAY (CL); very stiff to hard; greenish blue gray; moist; about 5% fine SAND; about 95% medium plasticity fines; interbedded layers of SILT (greenish blue gray, moist, low plasticity).		7			97							
-43.00	124														
	125														
-45.00	126				8			83							End drilling for 8/6/13 Resume drilling on 8/7/13
	127														
			SILTY SAND (SM); dense; gray; wet; about 80% fine SAND; about 20% nonplastic fines.												
-47.00	128		Poorly graded SAND with SILT (SP-SM); dense; dark gray; wet; about 90% fine SAND; about 10% nonplastic fines.		9			88							
	129		SILTY SAND (SM); dense; gray; wet; about 80 to 75% fine SAND; about 20 to 25% nonplastic to low plasticity fines; interbedded layers of sandy SILT (gray, moist, low plasticity, 45% fine sand, 1 inch layers).												
-49.00	130		Poorly graded SAND with SILT (SP-SM); dense; dark gray; wet; about 90% medium to fine SAND; about 10% nonplastic fines.												
	131		Bottom of borehole at 130.0 ft bgs												
-51.00	132		FINAL LOG: The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our final logs represent our interpretation of the field logs and general knowledge of the site and geological conditions.												
	133														
-53.00	134														
	135														
-55.00	136														
	137														
-57.00	138														
	139														
	140														

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88025_36B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **6 of 6**

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
John Wright	8-8-13	8-9-13		13_88125_37B
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Geo-Ex, Driller Name: Ryan			0.00' Rt Sta 881+25 Reach 13	81.0 ft
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Rotary Wash			CME 850	4 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
Mod Cal (2"), HQ Core, SPT (1.4")			Automatic Trip, 140 lb, 30 inch	
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS: DURING DRILLING N/A; AFTER DRILLING (DATE) N/A	TOTAL DEPTH OF BORING
Cement Grout				129.0 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														
	1														
79.00	2														
	3														
77.00	4														
	5														
75.00	6														
	7														
73.00	8														
	9														
71.00	10														
	11														
69.00	12														
	13														
67.00	14														
	15														
65.00	16														
	17														
63.00	18														
	19														
	20														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				13_88125_37B
DIST.	COUNTY	ROUTE	POSTMILE	EA
03	YUB		D	03-13-120.1
PROJECT OR BRIDGE NAME				
SBFCA				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
	David Castro			1 of 6

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
	20														
	21														
59.00	22														
	23														
57.00	24														
	25														
55.00	26														
	27														
53.00	28														
	29														
51.00	30														
	31														
49.00	32														
	33														
47.00	34														
	35														
45.00	36														
	37														
43.00	38														
	39														
41.00	40														
	41														
39.00	42														
	43														
	44														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88125_37B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **2 of 6**

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
	44														
	45														
35.00	46														
	47														
33.00	48														
	49														
31.00	50														
	51														
29.00	52														
	53														
27.00	54														
	55														
25.00	56														
	57														
23.00	58														
	59														
21.00	60														
	61														
19.00	62														
	63														
17.00	64														
	65														
15.00	66														
	67														2:50pm drill rig chatter, indicating start of gravel layer
	68														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88125_37B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **3 of 6**

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
	68														
	69														end drill rig chatter
11.00	70														
	71														
9.00	72														drill rig chatter
	73														
7.00	74														
	75														lost circulation
5.00	76														
	77														
3.00	78														regain mud circulation
	79														
1.00	80														
	81														
-1.00	82														
	83														
-3.00	84														
	85														
-5.00	86														
	87														
-7.00	88														
	89														
-9.00	90														
	91														
	92														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88125_37B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **4 of 6**

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
	92														
	93														
-13.00	94														
	95														
-15.00	96														
	97														
-17.00	98														7:15am 8/9/13, losing circulation, add 100 gal to mud tank
	99														
-19.00	100														end drill rig chatter
	101														drill rig chatter again
-21.00	102														
	103														
-23.00	104														
	105														
-25.00	106														end drill rig chatter
	107														
-27.00	108		No Sample.		1	25	53	0							7:55am old 3" piece of wood in sampler.
	109					27 26									
-29.00	110														
	111		CLAYEY SAND (SC); dense; gray; moist; about 65% SAND; about 35% low plasticity fines. Fat CLAY (CH); hard; greenish gray; moist; about 5% fine SAND; about 95% high plasticity fines.		2	14 15 18	33	50				PP = >4.5			8:35am
-31.00	112											PP = 1.5			
	113		SANDY SILT (ML); hard; gray; moist; about 40 to 50% fine SAND; about 50% nonplastic to low plasticity fines.		3			92							
-33.00	114														
	115														
	116				4			92							

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88125_37B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **5 of 6**

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
	116		SANDY SILT (ML) *(continued)*.		4			92							
	117		Lean CLAY (CL); hard; greenish gray; moist; about 5 to 10% fine SAND; about 95 to 90% medium plasticity fines; blocky, mottled oxidation.												
-37.00	118														
	119				5			90							
-39.00	120														
	121														
-41.00	122		SILTY SAND (SM); hard; dark gray; wet; about 85% fine SAND; about 15% nonplastic fines; interbedded layers of poorly graded SAND (gray, 4% fines, fine to medium sand, wet).		6			100							
	123		Lean CLAY (CL); hard; greenish gray; moist; about 5 to 15% fine SAND; about 95 to 85% fines; blocky.												
-43.00	124														
	125		SILTY SAND (SM); dense; gray; moist; about 20 to 50% fine SAND; about 80 to 50% fines; interbedded layers of poorly graded SAND.		7			100							
-45.00	126		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines; blocky.												
	127														10:40am
-47.00	128				8										
	129														11:10am
			Bottom of borehole at 129.3 ft bgs												
-49.00	130		FINAL LOG: The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our final logs represent our interpretation of the field logs and general knowledge of the site and geological conditions.												
	131														
-51.00	132														
	133														
-53.00	134														
	135														
-55.00	136														
	137														
-57.00	138														
	139														
	140														

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88125_37B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**	DATE	SHEET **6 of 6**	

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
John Wright	8-8-13	8-10-13		13_88225_38B
DRILLING CONTRACTOR: Gulf Shore, Driller Name: Carlos			BOREHOLE LOCATION (Offset, Station, Line): 0.00' Rt Sta 882+25 Reach 13	SURFACE ELEVATION: 81.0 ft
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME 75	BOREHOLE DIAMETER: 8 in
SAMPLER TYPE(S) AND SIZE(S) (ID): Mod Cal (2"), SPT (1.4")			SPT HAMMER TYPE: Automatic Trip, 140 lb, 30 inch	HAMMER EFFICIENCY, ERi
BOREHOLE BACKFILL AND COMPLETION: Cement Grout			GROUNDWATER READINGS: DURING DRILLING N/A; AFTER DRILLING (DATE) N/A	TOTAL DEPTH OF BORING: 130.5 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														
	1														used hollow stem auger as casing to 34 ft
79.00	2														
	3														
77.00	4														
	5														
75.00	6														
	7														
73.00	8														
	9														
71.00	10														
	11														
69.00	12														
	13														
67.00	14														
	15														
65.00	16														
	17														
63.00	18														
	19														
	20														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				13_88225_38B
DIST. 03	COUNTY YUB	ROUTE	POSTMILE D	EA 03-13-120.1
PROJECT OR BRIDGE NAME: SBFCA				
BRIDGE NUMBER	PREPARED BY: David Castro		DATE	SHEET 1 of 6

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
	20														
	21														
59.00	22														
	23														
57.00	24														
	25														
55.00	26														
	27														
53.00	28														
	29														
51.00	30														
	31														
49.00	32														
	33														
47.00	34														
	35														
45.00	36														
	37														
43.00	38														
	39														
41.00	40														
	41														
39.00	42														
	43														
	44														

(continued)

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
	44														
	45														
35.00	46														
	47														
33.00	48														
	49														
31.00	50														
	51														
29.00	52														
	53														
27.00	54														
	55														
25.00	56														
	57														
23.00	58														
	59														
21.00	60														
	61														
19.00	62														
	63														
17.00	64														
	65														
15.00	66														
	67														
	68														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88225_38B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **3 of 6**

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
	68														
	69														2:45pm drill rig chatter indicating gravel layer
11.00	70														
	71														
9.00	72														
	73														
7.00	74														
	75														
5.00	76														
	77														7:20am losing mud circulation. added 30 gal
3.00	78														
	79														
1.00	80														Hole will not stay open. losing circulation. Switched to HSA and drilled to 99 ft
	81														
-1.00	82														
	83														
-3.00	84														
	85														
-5.00	86														
	87														
-7.00	88														
	89														
-9.00	90														
	91														
	92														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88225_38B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **4 of 6**

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
	92														
	93														
-13.00	94														
	95														
-15.00	96														
	97														
-17.00	98														
	99														
-19.00	100														
	101														
-21.00	102														
	103														
-23.00	104														
	105														Drilled to 105 ft with hollow stem auger due to loose material and loss of mud fluids
-25.00	106														
	107														
-27.00	108														
	109		Fat CLAY (CH); very stiff; greenish blue gray; moist; about 5% fine SAND; about 95% medium to high plasticity fines.		1	12 14 16	30	83				PP = 4.0			
-29.00	110														3:15pm
	111		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines.		2	9 24 37	61	100							
-31.00	112														
	113				3	9 24 37	61	100							
-33.00	114				4	12 25 29	54	100							
	115														4:40pm End day 8:00am Resume drilling on 8/10/13
	116														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88225_38B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **5 of 6**

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
	116		Lean CLAY (CL) *(continued)*.		5	11 15 38	53	100				PP = 3.5			
	117														
-37.00	118		Medium to high plasticity fines; Lean to Fat CLAY.		6	14 28 42	70	78				PP = 2.5			
	119														
-39.00	120				7	9 26 50/5	76/11	100							
	121		SANDY lean CLAY (CL); hard; greenish gray; moist; about 10 to 30% medium to fine SAND; about 90 to 70% medium plasticity fines; interbedded layers of poorly graded SAND with fine to medium SAND.		8	12 22 35	57	100							
-41.00	122		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% medium to high plasticity fines; Lean to Fat CLAY, blocky.												
	123				9	40 50/3	50/3	100							
-43.00	124		No Sample.		10 11	50/3 26 47	REF 97/9	0 100							9:50am
	125		SANDY SILT (ML); hard; dark gray; moist; about 35% fine SAND; about 65% low plasticity fines.												
-45.00	126		Lean CLAY (CL); hard; dark greenish gray; moist; about 5 to 40% fine SAND; about 95 to 60% medium plasticity fines; to sandy lean CLAY, blocky.		12	50/3 20 36 50	86	100				PP = 4.0			
	127														
-47.00	128				13	25 46 50/4	96/10	100				PP = 3.25			
	129		SANDY SILT (ML); hard; dark gray; moist; about 40% fine SAND; about 60% low plasticity fines.												
-49.00	130		Lean CLAY with SAND (CL); hard; dark gray; moist; about 15% fine SAND; about 85% medium plasticity fines.		14	12 25 50	75	100							
	131		Bottom of borehole at 130.5 ft bgs												
-51.00	132		FINAL LOG: The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our final logs represent our interpretation of the field logs and general knowledge of the site and geological conditions.												
-53.00	134														
	135														
-55.00	136														
	137														
-57.00	138														
	139														
	140														

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88225_38B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **6 of 6**

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
John Wright	8-7-13	8-8-13		13_88325_39B
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Geo-Ex, Driller Name: Ryan			0.00' Rt Sta 883+25 Reach 13	81.0 ft
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Rotary Wash			CME 850	4 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
Mod Cal (2"), HQ Core, SPT (1.4")			Automatic Trip, 140 lb, 30 inch	
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS: DURING DRILLING N/A; AFTER DRILLING (DATE) N/A	TOTAL DEPTH OF BORING
Cement Grout				130.0 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														
	1														
79.00	2														
	3														
77.00	4														
	5														
75.00	6														
	7														
73.00	8														
	9														
71.00	10														
	11														
69.00	12														
	13														
67.00	14														
	15														
65.00	16														
	17														
63.00	18														
	19														
	20														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				13_88325_39B
DIST.	COUNTY	ROUTE	POSTMILE	EA
03	YUB		D	03-13-120.1
PROJECT OR BRIDGE NAME				
SBFCA				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
	David Castro			1 of 6

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
	20														
	21														
59.00	22														
	23														
57.00	24														
	25														
55.00	26														
	27														
53.00	28														
	29														
51.00	30														switch from solid stem auger to mud rotary
	31														
49.00	32														
	33														
47.00	34														
	35														
45.00	36														
	37														
43.00	38														
	39														
41.00	40														
	41														
39.00	42														
	43														
	44														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88325_39B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **2 of 6**

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
	44														
	45														
35.00	46														
	47														
33.00	48														
	49														
31.00	50														
	51														
29.00	52														
	53														
27.00	54														
	55														
25.00	56														
	57														
23.00	58														
	59														
21.00	60														
	61														
19.00	62														
	63														
17.00	64														
	65														
15.00	66														
	67														
	68														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88325_39B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **3 of 6**

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
	68														
	69														
11.00	70														drill rig chatter indicating gravel layer
	71														
9.00	72														
	73														
7.00	74														
	75														
5.00	76														
	77														
3.00	78														
	79														
1.00	80														
	81														
-1.00	82														
	83														
-3.00	84														
	85														drill rig chatter stopped, smoother drilling indicating end of gravel layer
-5.00	86														
	87														
-7.00	88														
	89														
-9.00	90														
	91														
	92														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88325_39B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **4 of 6**

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
	92														
	93														
-13.00	94														
	95														
-15.00	96														
	97														
-17.00	98														
	99														
-19.00	100														drill rig chatter indicating gravel layer
	101														
-21.00	102														
	103														
-23.00	104														
	105														
-25.00	106														1:30pm end of gravel layer
	107														
-27.00	108		Lean CLAY (CL); very stiff; greenish gray; moist; about 4% fine SAND; about 96% medium plasticity fines; blocky.		1	25 18 15	33	67				PP = 4.0			
	109														
-29.00	110		No Sample.		2			0							
	111														
-31.00	112				3	31 31 36	67	0							
	113														4:05pm
-33.00	114		Fat CLAY (CH); hard; greenish gray; moist; about 5% fine SAND; about 95% high plasticity fines; blocky.		4	19 17 26	43	89				PP = >4.5			8/7/13 end drilling. 8/8/13 resume drilling at 6:45am
	115														
	116				5			100							

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88325_39B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **5 of 6**

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
	116		Fat CLAY (CH) *(continued)*.		5			100				PP = >4.5			
	117		Lean to fat CLAY (CL/CH); hard; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines.												
-37.00	118				6			100				PP = >4.5			
	119														
-39.00	120														
	121				7			100				PP = >4.5			
-41.00	122														
	123		6" interval of interbedded clayey SAND (gray, 30% to 40% fine sand, low plasticity).												
-43.00	124		Blocky.		8			100				PP = 3.75			
	125		Lean CLAY with SAND (CL); hard; gray; about 25 to 30% fine SAND; about 75 to 70% low to medium plasticity fines.												
-45.00	126		Lean to fat CLAY (CL/CH); hard; greenish gray; moist; about 5% fine SAND; about 95% fines; blocky.												
	127				9			100				PP = >4.5			
-47.00	128														8:30am
	129		SANDY SILT (ML); hard; dark gray; moist; about 45% fine SAND; about 55% nonplastic to low plasticity fines.												
-49.00	130		Bottom of borehole at 130.0 ft bgs												
	131		FINAL LOG: The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our final logs represent our interpretation of the field logs and general knowledge of the site and geological conditions.												
-51.00	132														
	133														
-53.00	134														
	135														
-55.00	136														
	137														
-57.00	138														
	139														
	140														

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88325_39B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **6 of 6**

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
John Wright	8-13-13	8-15-13		13_88425_40B
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Geo-Ex, Driller Name: Tom Scott			0.00' Rt Sta 884+25 Reach 13	81.0 ft
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Rotary Wash			CME 75	4 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
Mod Cal (2"), SPT (1.4")			Automatic Trip, 140 lb, 30 inch	
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS: DURING DRILLING N/A; AFTER DRILLING (DATE) N/A	TOTAL DEPTH OF BORING
Cement Grout				129.0 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														
	1														11:30am DPC on-site
79.00	2														
	3														
77.00	4														
	5														
75.00	6														
	7														
73.00	8														
	9														
71.00	10														
	11														
69.00	12														
	13														
67.00	14														
	15														
65.00	16														
	17														
63.00	18														
	19														
	20														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				13_88425_40B
DIST.	COUNTY	ROUTE	POSTMILE	EA
03	YUB		D	03-13-120.1
PROJECT OR BRIDGE NAME				
SBFCA				
BRIDGE NUMBER	PREPARED BY	DATE	SHEET	
	David Castro		1 of 6	

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
	20														
	21														
59.00	22														
	23														
57.00	24														
	25														
55.00	26														
	27														
53.00	28														
	29														
51.00	30														
	31														
49.00	32														
	33														
47.00	34														
	35														
45.00	36														
	37														
43.00	38														
	39														
41.00	40														
	41														
39.00	42														
	43														
	44														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88425_40B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **2 of 6**

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
	44														
	45														
35.00	46														
	47														
33.00	48														
	49														
31.00	50														
	51														
29.00	52														
	53														
27.00	54														
	55														
25.00	56														
	57														
23.00	58														
	59														
21.00	60														
	61														
19.00	62														
	63														gravel layer
17.00	64														
	65														
15.00	66														
	67														
	68														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88425_40B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **3 of 6**

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
	68														
	69														
11.00	70														add 40 gal of water
	71														
9.00	72														
	73														
7.00	74														
	75														
5.00	76														
	77														gravel layer
3.00	78														
	79														
1.00	80														
	81														
-1.00	82														
	83														
-3.00	84														
	85														
-5.00	86														100 gal of water total
	87														
-7.00	88														
	89														
-9.00	90														
	91														
	92														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88425_40B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **4 of 6**

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
	92														
	93														gravel layer
-13.00	94														
	95														
-15.00	96														
	97														
-17.00	98														
	99														
-19.00	100														
	101														180 gal of water total
-21.00	102														
	103														
-23.00	104														
	105														
-25.00	106														
	107														gravel layer
-27.00	108														
	109														pumps broke. DPC to 898+00 at 12:30pm
-29.00	110														210 gal of water total 2:30pm End day, driller needs HQ bit, boring has loose sands and gravels, will not stay open end gravel layer
	111		Lean CLAY (CL); very stiff to hard; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines.		1	12 14 23	37	100				PP = 3.25			
-31.00	112														
	113														
-33.00	114				2	19 27 29	56	100				PP = >4.5			
	115														
	116														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88425_40B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **5 of 6**

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
	116	Lean CLAY (CL) *(continued)*.												
	117	SILT (ML); very stiff; gray; moist; about 15% fine SAND; about 85% low plasticity fines.		3	12 18 20	38	100							
-37.00	118	SANDY SILT (ML); very stiff; gray; moist; about 50% fine SAND; about 50% fines.												
	119	Lean to fat CLAY (CL/CH); hard; greenish gray; moist; about 5% fine SAND; about 95% medium to high plasticity fines.		4	18 30 50	80	92				PP = >4.5			
-39.00	120	SILTY CLAY with SAND (CL-ML); hard; greenish gray; moist; about 15% fine SAND; about 85% medium plasticity fines.												
	121			5	18 29 50	79	100							
-41.00	122	Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines; interbedded layer of silty SAND (dark gray, 20% fines).									PP = 2.0			
	123			6	29 50/5"	50/5	100				PP = 3.0 PP = 3.25			
-43.00	124			7	16 27 94	121	100				PP = >4.5 PP = 1.75			
	125													
-45.00	126			8	12 28 51	79	100				PP = 4.5 PP = >4.5			
	127	SILTY SAND (SM); very dense; dark gray; moist; about 60% SAND; about 40% nonplastic fines.												
-47.00	128			9	14 19 23	42	89							
	129	Bottom of borehole at 129.0 ft bgs												
-49.00	130	FINAL LOG: The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our final logs represent our interpretation of the field logs and general knowledge of the site and geological conditions.												
	131													
-51.00	132													
	133													
-53.00	134													
	135													
-55.00	136													
	137													
-57.00	138													
	139													
	140													

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88425_40B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **6 of 6**

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
John Wright	8-9-13	8-10-13		13_88525_41B
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Geo-Ex, Driller Name: Ryan			0.00' Rt Sta 885+25 Reach 13	81.0 ft
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Rotary Wash			CME 850	4 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
Mod Cal (2"), HQ Core, SPT (1.4")			Automatic Trip, 140 lb, 30 inch	
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS: DURING DRILLING N/A; AFTER DRILLING (DATE) N/A	TOTAL DEPTH OF BORING
Cement Grout				129.0 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														
	1														
79.00	2														
	3														
77.00	4														
	5														
75.00	6														
	7														
73.00	8														
	9														
71.00	10														
	11														
69.00	12														
	13														
67.00	14														
	15														
65.00	16														
	17														
63.00	18														
	19														
	20														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				13_88525_41B
DIST.	COUNTY	ROUTE	POSTMILE	EA
03	YUB		D	03-13-120.1
PROJECT OR BRIDGE NAME				
SBFCA				
BRIDGE NUMBER	PREPARED BY	DATE	SHEET	
	David Castro		1 of 6	

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
	20														
	21														
59.00	22														
	23														
57.00	24														
	25														
55.00	26														
	27														
53.00	28														
	29														
51.00	30														
	31														
49.00	32														
	33														
47.00	34														
	35														
45.00	36														
	37														
43.00	38														
	39														
41.00	40														
	41														
39.00	42														
	43														
	44														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88525_41B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **2 of 6**

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
	44														
	45														
35.00	46														
	47														
33.00	48														
	49														
31.00	50														
	51														
29.00	52														
	53														
27.00	54														
	55														
25.00	56														
	57														
23.00	58														
	59														
21.00	60														
	61														
19.00	62														
	63														
17.00	64														
	65														
15.00	66														
	67														
	68														

(continued)

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
	68														drill rig chatter
	69														
11.00	70														
	71														
9.00	72														
	73														
7.00	74														
	75														
5.00	76														
	77														
3.00	78														
	79														
1.00	80														
	81														
-1.00	82														
	83														
-3.00	84														
	85														end drill rig chatter
-5.00	86														
	87														
-7.00	88														
	89														
-9.00	90														
	91														
	92														

(continued)

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
	92														
	93														
-13.00	94														
	95														
-15.00	96														
	97														
-17.00	98														
	99														
-19.00	100														
	101														drill rig chatter
-21.00	102														
	103														
-23.00	104														
	105														
-25.00	106														
	107														
-27.00	108		Lean CLAY (CL); hard; gray; moist; about 5% fine SAND; about 95% fines.		1			71				PP = 3.5			end drill rig chatter
	109														
-29.00	110		Lean to fat CLAY (CL/CH); hard; greenish gray; moist; about 5% fine SAND; about 95% medium to high plasticity fines.		2			100				PP = 3.5			
	111														
-31.00	112		Lean CLAY (CL); hard; dark gray; moist; about 5 to 15% fine SAND; about 95 to 85% medium plasticity fines.		3			100				PP = >4.5			
	113														
-33.00	114														
	115		SANDY SILT (ML); very dense; dark gray; moist; about 40% fine SAND; about 60% fines.		4			94				PP = >4.5			
	116														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88525_41B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **5 of 6**

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
	116		SANDY SILT (ML) *(continued)*.		4			94				PP = >4.5			
	117														
-37.00	118		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% low to medium plasticity fines.		5			100				PP = >4.5			
	119														
-39.00	120														
	121														
-41.00	122		SANDY SILT (ML); hard; gray; moist; about 40% fine SAND; about 60% nonplastic to low plasticity fines.		6			100				PP = >4.5			
	123		Lean CLAY (CL); hard; greenish gray; moist; about 10% fine SAND; about 90% medium plasticity fines.												
-43.00	124		SILT (ML); hard; greenish gray; moist; about 10% fine SAND; about 90% medium plasticity fines.												
	125		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% low to medium plasticity fines.		7			94				PP = >4.5			
-45.00	126		SANDY SILT (ML); hard; gray; moist; about 20% fine SAND; about 80% nonplastic to low plasticity fines.												
	127		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% low to medium plasticity fines.												
-47.00	128		SILT (ML); hard; gray; moist; about 10 to 15% fine SAND; about 90 to 85% low plasticity fines.												
	129		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% low to medium plasticity fines.												
-49.00	130		Bottom of borehole at 129.0 ft bgs												
	131		FINAL LOG: The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our final logs represent our interpretation of the field logs and general knowledge of the site and geological conditions.												
-51.00	132														
	133														
-53.00	134														
	135														
-55.00	136														
	137														
-57.00	138														
	139														
	140														

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88525_41B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **6 of 6**

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
John Wright	8-13-13	8-14-13		13_88625_42B
DRILLING CONTRACTOR			BOREHOLE LOCATION (Offset, Station, Line)	SURFACE ELEVATION
Geo-Ex, Driller Name: Ryan			0.00' Rt Sta 886+25 Reach 13	81.0 ft
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Rotary Wash			CME 850	4 in
SAMPLER TYPE(S) AND SIZE(S) (ID)			SPT HAMMER TYPE	HAMMER EFFICIENCY, ERi
Mod Cal (2"), HQ Core, SPT (1.4")			Automatic Trip, 140 lb, 30 inch	
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS: DURING DRILLING N/A; AFTER DRILLING (DATE) N/A	TOTAL DEPTH OF BORING
Cement Grout				130.0 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														
	1														
79.00	2														
	3														
77.00	4														
	5														
75.00	6														
	7														
73.00	8														
	9														
71.00	10														
	11														
69.00	12														
	13														
67.00	14														
	15														
65.00	16														
	17														
63.00	18														
	19														
	20														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				13_88625_42B
DIST.	COUNTY	ROUTE	POSTMILE	EA
03	YUB		D	03-13-120.1
PROJECT OR BRIDGE NAME				
SBFCA				
BRIDGE NUMBER	PREPARED BY		DATE	SHEET
	David Castro			1 of 6

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
	20														
	21														
59.00	22														
	23														
57.00	24														
	25														
55.00	26														
	27														
53.00	28														
	29														
51.00	30														
	31														
49.00	32														
	33														
47.00	34														
	35														
45.00	36														
	37														
43.00	38														
	39														
41.00	40														
	41														
39.00	42														
	43														
	44														

(continued)

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
	44														
	45														
35.00	46														
	47														
33.00	48														
	49														
31.00	50														
	51														
29.00	52														
	53														
27.00	54														
	55														
25.00	56														
	57														
23.00	58														
	59														
21.00	60														
	61														
19.00	62														
	63														
17.00	64														
	65														
15.00	66														
	67														
	68														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88625_42B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **3 of 6**

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
	68														gravel layer
	69														
11.00	70														
	71														
9.00	72														
	73														
7.00	74														
	75														
5.00	76														
	77														
3.00	78														
	79														
1.00	80														
	81														
-1.00	82														
	83														end gravel layer
-3.00	84														
	85														
-5.00	86														
	87														
-7.00	88														
	89														
-9.00	90														
	91														
	92														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88625_42B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **4 of 6**

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
	92														
	93														
-13.00	94														
	95														
-15.00	96														
	97														
-17.00	98														
	99														
-19.00	100														
	101														
-21.00	102														
	103														
-23.00	104														
	105														
-25.00	106														end gravel layer
	107		Lean CLAY (CL); very stiff; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines.		1	10 14 17	31	83				PP = 2.75			
-27.00	108				2	8 10 8	18	100				PP = 2.5			
	109											PP = 2.75			
-29.00	110		Blocky.		3			88				PP = 3.75			
	111											PP = 3.5			
-31.00	112											PP = >4.5			
	113		Lean to fat CLAY (CL/CH); hard; greenish gray; moist; about 5% fine SAND; about 95% medium to high plasticity fines; blocky.									PP = >4.5			
-33.00	114				4			94				PP = 3.5			
	115											PP = 2.75			
	116		SANDY SILT (ML); very stiff; dark gray; moist; about												

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88625_42B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **5 of 6**

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
	116		30% fine SAND; about 70% low plasticity fines.		4			94				PP = 3.5 PP = 2.75 PP = 2.25			
	117														
-37.00	118				5			94				PP = >4.5			
	119											PP = >4.5			
-39.00	120		SANDY lean CLAY (CL); hard; greenish gray; moist; about 45% fine SAND; about 55% medium plasticity fines; very blocky.									PP = >4.5			
	121		SANDY SILT (ML); hard; dark gray; moist; about 50% fine SAND; about 50% nonplastic to low plasticity fines.									PP = >4.5			
-41.00	122				6			94				PP = >4.5			
	123											PP = >4.5			
-43.00	124											PP = >4.5			
	125											PP = >4.5			
-45.00	126				7			100				PP = 4.5			
	127		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines.												
-47.00	128		SANDY SILT (ML); hard; dark gray; moist; about 45% fine SAND; about 55% nonplastic to low plasticity fines.												
	129		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines.									PP = >4.5			
-49.00	130		Bottom of borehole at 130.0 ft bgs												
	131		FINAL LOG: The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our final logs represent our interpretation of the field logs and general knowledge of the site and geological conditions.												
-51.00	132														
	133														
-53.00	134														
	135														
-55.00	136														
	137														
-57.00	138														
	139														
	140														

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88625_42B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **6 of 6**

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
John Wright	8-12-13	8-14-13		13_88825_44B
DRILLING CONTRACTOR: Gulf Shore, Driller Name: Carlos			BOREHOLE LOCATION (Offset, Station, Line): 0.00' Rt Sta 888+25 Reach 13	SURFACE ELEVATION: 81.0 ft
DRILLING METHOD: Hollow-Stem Auger			DRILL RIG: CME 75	BOREHOLE DIAMETER: 8 in
SAMPLER TYPE(S) AND SIZE(S) (ID): Mod Cal (2"), SPT (1.4")			SPT HAMMER TYPE: Automatic Trip, 140 lb, 30 inch	HAMMER EFFICIENCY, ERi
BOREHOLE BACKFILL AND COMPLETION: Cement Grout			GROUNDWATER READINGS: DURING DRILLING N/A; AFTER DRILLING (DATE) N/A	TOTAL DEPTH OF BORING: 130.0 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														
	1														
79.00	2														
	3														
77.00	4														
	5														
75.00	6														
	7														
73.00	8														
	9														
71.00	10														
	11														
69.00	12														
	13														
67.00	14														
	15														cuttings, silty sand, gray
65.00	16														
	17														
63.00	18														
	19														
	20														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				13_88825_44B
DIST. 03	COUNTY YUB	ROUTE	POSTMILE D	EA 03-13-120.1
PROJECT OR BRIDGE NAME: SBFCA				
BRIDGE NUMBER	PREPARED BY David Castro		DATE	SHEET 1 of 6

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
	20														
	21														
59.00	22														
	23														
57.00	24														
	25														
55.00	26														gravel layer
	27														
53.00	28														
	29														
51.00	30														
	31														
49.00	32														
	33														
47.00	34														
	35														
45.00	36														
	37														
43.00	38														
	39														
41.00	40														
	41														
39.00	42														
	43														
	44														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88825_44B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **2 of 6**

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
	44														
	45														
35.00	46														gravel layer
	47														
33.00	48														
	49														
31.00	50														end gravel layer
	51														
29.00	52														
	53														
27.00	54														
	55														
25.00	56														
	57														
23.00	58														
	59														
21.00	60														
	61														
19.00	62														
	63														
17.00	64														
	65														
15.00	66														
	67														gravel layer
	68														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88825_44B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **3 of 6**

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
	68														
	69														end gravel layer
11.00	70														
	71														
9.00	72														
	73														
7.00	74														
	75														
5.00	76														
	77														
3.00	78														
	79														
1.00	80														
	81														
-1.00	82														
	83														
-3.00	84														
	85														gravel layer
-5.00	86														
	87														
-7.00	88														
	89														
-9.00	90														end gravel layer
	91														
	92														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88825_44B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **4 of 6**

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
	92														
	93														
-13.00	94														
	95														
-15.00	96														
	97														
-17.00	98														
	99														
-19.00	100														
	101														
-21.00	102														
	103														
-23.00	104		Poorly graded GRAVEL with SAND (GP); dense; gray; moist; about 25% medium to fine SAND; about 75% fines.		1	7 9 28	37	50							
	105														
-25.00	106				2	12 50/5"	50/5	45							
	107		No Sample.		3	8 8 15	23	0							
-27.00	108		CLAYEY GRAVEL with SAND (GC); medium dense; gray; moist; coarse SAND.		4	7 12 21	33	25							
	109		No Sample.		5	6 10 19	29	0							
-29.00	110														
	111		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines.		6	15 25 28	53	78				PP = >4.5			
-31.00	112														
	113				7	22 20 20	40	56							
-33.00	114														
	115		SILTY SAND (SM); dense; dark gray; wet; about 70% medium to fine SAND; about 30% nonplastic to low plasticity fines.		8	9 17 23	40	100							
	116														

(continued)

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88825_44B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **5 of 6**

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
	116		Lean CLAY (CL); hard; light gray; moist; about 5% fine SAND; about 95% medium plasticity fines.		9	9 19 50/5"	69/11	94							
	117		SILT with SAND (ML); hard; gray; moist; about 20% fine SAND; about 80% nonplastic to low plasticity fines.												
-37.00	118				10	10 20 45	65	56							
	119														
-39.00	120		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines.		11	9 18 44	62	100				PP = 4.0 PP = 4.5			
	121														
-41.00	122		SILT (ML); hard; greenish gray; moist; about 5% fine SAND; about 95% nonplastic to low plasticity fines.		12	20 36 58	94	100				PP = 1.5			
	123		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% medium to high plasticity fines; blocky.		13	13 25 36	61	100				PP = >4.5			
-43.00	124														
	125		SANDY SILT (ML); hard; gray; moist; about 45% fine SAND; about 55% nonplastic to low plasticity fines.		14	12 18 32	50	100							
-45.00	126														
	127		CLAYEY SILT with SAND (ML/CL); hard; gray; moist; about 15% fine SAND; about 85% low to medium plasticity fines.		15	10 22 34	56	89				PP = 4.25 PP = 1.0			
-47.00	128											PP = 2.5			
	129		Lean CLAY (CL); hard; greenish gray; moist; about 5% fine SAND; about 95% medium plasticity fines; blocky.		16	9 14 24	38	67				PP = >4.5			
-49.00	130		Bottom of borehole at 130.0 ft bgs												
	131		FINAL LOG: The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our final logs represent our interpretation of the field logs and general knowledge of the site and geological conditions.												
-51.00	132														
	133														
-53.00	134														
	135														
-55.00	136														
	137														
-57.00	138														
	139														
	140														

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

REPORT TITLE				HOLE ID
BORING RECORD				**13_88825_44B**
DIST. **03**	COUNTY **YUB**	ROUTE	POSTMILE **D**	EA **03-13-120.1**
PROJECT OR BRIDGE NAME **SBFCA**				
BRIDGE NUMBER	PREPARED BY **David Castro**		DATE	SHEET **6 of 6**