

**APPENDIX C**  
**BORING LOGS**

# BASELINE

Boring ID: Key

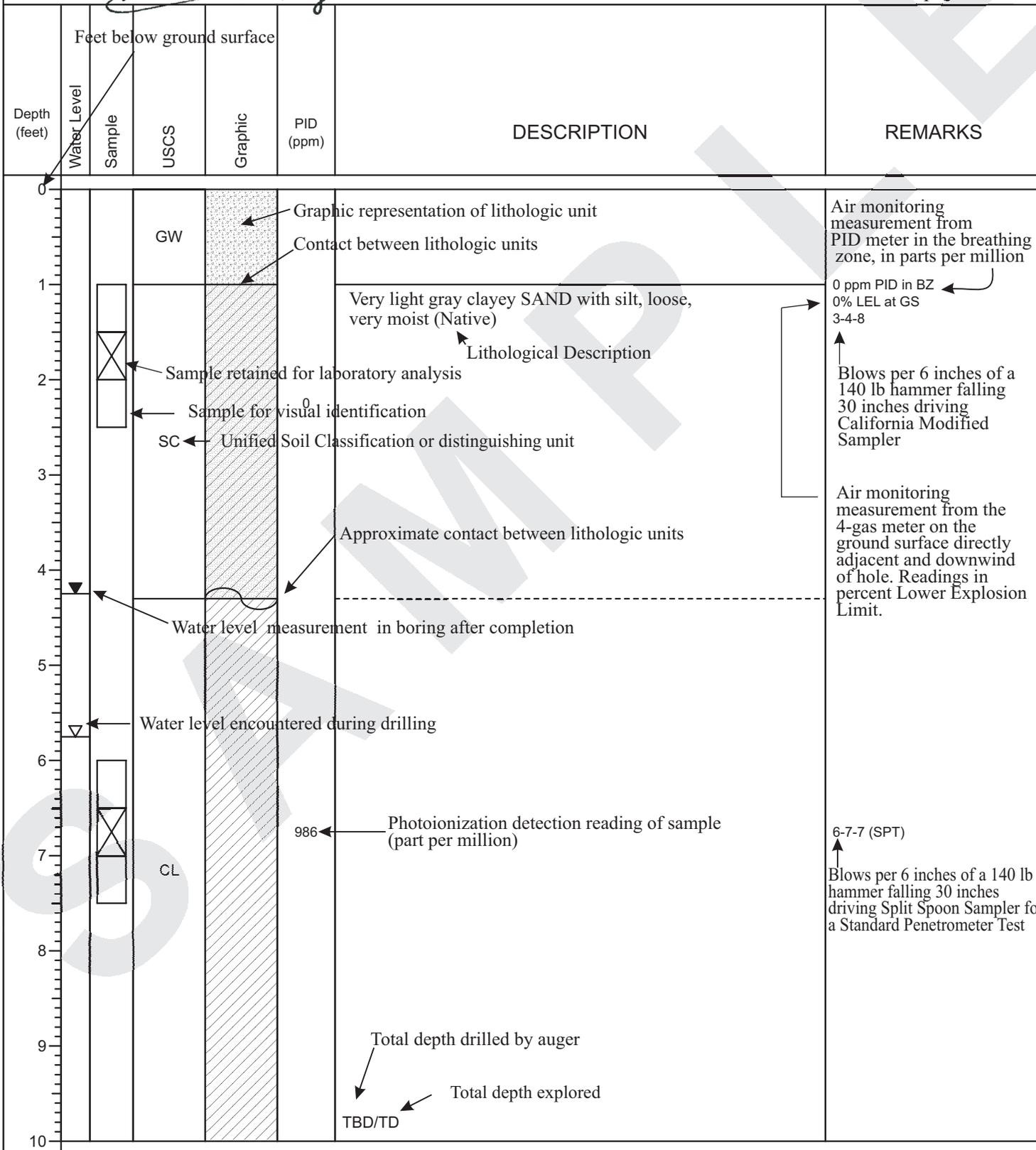
5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 12/15/08  
Project no.: 5Y004  
Driller: ABC Drilling  
Method: HSA/MR

Location: City ZZZ  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): 32.75 feet  
Bore size: 6 inches

Reviewed by: *Peri Page*

page 1 of 1



## UNIFIED SOILS CLASSIFICATION

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
<b>COARSE GRAINED SOILS</b> MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	<b>GRAVELS</b> MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	<b>CLEAN GRAVELS</b> (LESS THAN 5% FINES)	<b>GW</b>	Well graded gravels, gravel-sand mixtures, little or no fines.
		<b>GRAVEL WITH FINES</b>	<b>GP</b>	Poorly graded gravels or gravel-sand mixtures, little or no fines.
			<b>GM</b>	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
		<b>GC</b>	Clayey gravels, gravel-sand-clay mixtures, plastic fines.	
	<b>SANDS</b> MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	<b>CLEAN SANDS</b> (LESS THAN 5% FINES)	<b>SW</b>	Well graded sands, gravelly sands, little or no fines.
			<b>SP</b>	Poorly graded sands or gravelly sands, little or no fines.
		<b>SANDS WITH FINES</b>	<b>SM</b>	Silty sands, sand-silt mixtures, non-plastic fines.
			<b>SC</b>	Clayey sands, sand-clay mixtures, plastic fines.
<b>FINE GRAINED SOILS</b> MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	<b>SILTS AND CLAYS</b> LIQUID LIMIT IS LESS THAN 50%		<b>ML</b>	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
	<b>SILTS AND CLAYS</b> LIQUID LIMIT IS GREATER THAN 50%		<b>CL</b>	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			<b>OL</b>	Organic silts and organic silty clays of low plasticity.
			<b>MH</b>	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
	<b>SILTS AND CLAYS</b> LIQUID LIMIT IS GREATER THAN 50%		<b>CH</b>	Inorganic clays of high plasticity, fat clays.
			<b>OH</b>	Organic clays of medium to high plasticity, organic silts.
<b>HIGHLY ORGANIC SOILS</b>			<b>Pt</b>	Peat and other highly organic soils.

### DEFINITION OF TERMS

U.S. STANDARD SERIES SIEVE

CLEAR SQUARE SIEVE OPENINGS

200

40

10

4

3/4"

3"

12"

<b>SILTS AND CLAYS</b>	<b>SAND</b>			<b>GRAVEL</b>		<b>COBBLES</b>	<b>BOULDERS</b>
	FINE	MEDIUM	COARSE	FINE	COARSE		

### GRAIN SIZES

SANDS AND GRAVELS	BLOWS/FOOT <sup>†</sup>
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

**RELATIVE DENSITY**

SILTS AND CLAYS	STRENGTH <sup>‡</sup>	BLOWS/FOOT <sup>†</sup>
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

**CONSISTENCY**

<sup>†</sup> Number of blows of 140-pound hammer falling 30 inches to drive a 2-inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

<sup>‡</sup> Unconfined compressive strength in tons/square foot as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

# BASELINE

Boring ID: E059

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/23/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 7.75 inches

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0					Olive (5Y 4/4) SAND, fine grained, loose, moist (Fill)	Removed 4" asphalt, 8" base
1	X	SP		0		
2	X			0	Very dark gray (10YR 3/1) CLAY with gravel, high plasticity, moist, 1/3 to 1 inch diameter clasts of brick pieces, sandstone (Fill)	
3						
4		CH				
5						
6						
7	X	OL		0	Very dark gray (10YR 3/2) to black (10YR 2/1) organic layer (Fill?) with sand lenses few inches thick	
Total depth sampled = 7.5 feet					Augered to 12 feet to obtain water; no water accumulated	
8						
9						
10						

# BASELINE

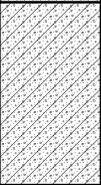
Boring ID: E060

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/23/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): ~8-9 feet  
Bore size: 7.75 inches

Reviewed by: *Kevin Page*

Depth (feet)	Water Level	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0			SP			Very dark brown (10YR 2/2) SAND, fine grained, loose to very loose, moist, rootlets (Fill)	Removed surface vegetation Used 2.5" diameter Cal modified sampler to 2.5 feet, then 2" diameter sampler
1			GC		0	Dark reddish brown (5YR 3/2) clayey GRAVEL, 1/3 to >1.5 inch diameter angular clasts of chert, serpentinite, dense, moist (Fill)	
2					0	Very dark gray (10YR 3/1) SAND, fine grained, loose, moist (Fill)	
4			SP				
6						Dark olive gray (5Y 3/2) SAND, fine grained, loose, moist (Fill) (hydraulic fill)	
7							
8			SP				
9	▼						
10							
Total depth = 10.0 feet							
11							

# BASELINE

Boring ID: E061

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/22/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): 11.5 feet  
Bore size: 7.75 inches

Reviewed by: *Kevin Page*

Depth (feet)	Water Level	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0							
0 - 1		X	SP		0	Very dark brown (10YR 3/3) SAND with gravel, fine grained, medium dense, moist, pieces of landscape fabric?, 1/3 to 3/4 inch diameter subrounded to angular clasts (Fill)	Removed 4" asphalt, 8" baserock Used 2.5" diameter Cal modified sampler, then 2" diameter sampler
1 - 2		X			0	Dark yellowish brown SAND, fine grained, medium dense, moist (Colma)	
2 - 6		X			0	Becoming mottled with strong brown (7.5YR 4/6)	
6 - 11		X	SP		0		
11 - 12.5	▼	X	SP			Dark grayish brown (2.5Y 4/2) SAND, fine grained, medium dense, wet, Colma	
Total depth = 12.5 feet						Grouted boring with neat cement	
13							
14							

# BASELINE

Boring ID: E062

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/16/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: DPT

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 3 inches

Reviewed by: *Heri Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0		SP		0	Dark brown (10YR 3/3) SAND with gravel, fine grained, medium dense to loose, moist, 1/3 to >1.5 inch diameter angular gravel clasts consisting of hard rock, graywacke, brick pieces (Fill)	Removed surface vegetation Used 2.5" diameter Cal modified sampler
1				0		
2	Total depth = 2.5 feet					Backfilled boring with bentonite chips Replaced stake
3						
4						
5						
6						
7						
8						
9						
10						

# BASELINE

Boring ID: E063

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/22/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 7.75 inches

Reviewed by: *Heidi Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0		SP		0	Very dark brown (10YR 2/2) SAND with gravel, fine grained, 1/3 to 3/4 inch diameter angular clasts of chert and shale, loose to medium dense, moist (Fill)	Removed surface vegetation Used 2.5" diameter Cal modified sampler to 2.5 feet, then 2" diameter Cal modified sampler
1					Dark reddish brown (5YR 2.5/2) GRAVEL, trace clay, 1/3 to >1.5 inch diameter angular clasts of chert, loose, moist (Fill) (crushed rock)	
2		GP				
3						
4					Dark yellowish brown (10YR 3/4) CLAY with gravel, low plasticity, stiff, 1/3 to >2 inch diameter subangular to angular clasts of sandstone, shale (Fill)	
5						
6						
7						
8		CL		0		
9						
10						
11					Piece of marble plaque or headstone (Fill)	6" recovery
12		SP		0	Very dark bluish gray (GLE Y2 3/1) SAND with clay, fine grained, loose, moist (Fill)	

# BASELINE

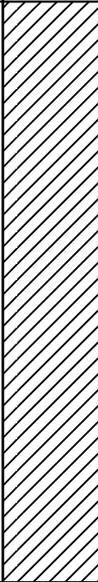
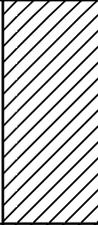
Boring ID: E063

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/22/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 7.75 inches

Reviewed by: *Heri Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
12						
13		SP				
14						
15					Dark greenish gray (GLE Y1 4/1) CLAY, stiff, high plasticity, moist, hint of mottling, some dark brown areas (Fill)	
16						
17		CH		0		
18						
19						
20						
21		CH			Very dark brown (10YR 2/2) with areas of dark yellowish brown (10YR 4/6) CLAY, trace gravel, medium stiff, high plasticity, clasts of serpentine rock (Fill)	
22		CH		0	Mottled very dark gray (GLE Y1 3/N) and dark greenish gray (GLE Y1 4/1) CLAY, medium stiff, high plasticity, trace of serpentine clasts (Fill)	
23					Total depth = 22.5 feet	Backfilled boring with bentonite chips Replaced stake
24						

# BASELINE

Boring ID: E064

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/16/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: DPT

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 3 inches

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0						
0 - 1		SP		0	Very dark brown (10YR 2/2) SAND with gravel, fine grained, medium dense to loose, moist, rootlets, 1/3 to >2 inch diameter subangular to angular gravel clasts consisting of hard rock, pieces of glass, chert, charcoal (Fill)	Removed surface vegetation Used 2.5" diameter Cal modified sampler
1 - 2		CL		0	Brown (10YR 4/3) CLAY with gravel, stiff, moist, gravel of chert, charcoal, sandstone (Fill)	
Total depth = 2.5 feet						Backfilled boring with bentonite chips Replaced stake
3						
4						
5						
6						
7						
8						
9						
10						

# BASELINE

Boring ID: E065

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/22/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 7.75 inches

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0					Very dark brown (10YR 2/2) SAND, trace gravel, fine grained, very loose, moist (Fill)	Removed surface vegetation Used 2.5" diameter Cal modified sampler to 2.5 feet, then 2" diameter Cal modified sampler
1				0	Increase in gravel content at 1.0 foot; clasts of sandstone, chert, shale, glass, charcoal, plastic, roofing tar?	
2				0		
3						
4						
5		SP			Becoming dark yellowish brown (10YR 4/4)	
6					Gravel clasts of graywacke, sandstone?	
7				0		
8						
9						
10					Dark yellowish brown silty SAND, fine grained, medium dense, moist (Fill)	
11		SM				
12		SP			Very dark brown (10YR 2/2) SAND, fine grained, loose, moist, trace gravel clasts of brick, charcoal (Fill)	

# BASELINE

Boring ID: E065

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/22/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 7.75 inches

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
12	☒			0		
13						
14						
15						
16	☐					
17	☒	SP		0		
18						
19						
20						
21						
22	☒	SP		0	Dark yellowish brown (10YR 4/4) SAND, fine grained, medium dense, moist, rootlets, trace gravel consisting of 1/3 to 1.5 inch diameter angular clasts of brick and hard rock (Fill)	12" recovery
Total depth = 22.5 feet						Backfilled boring with bentonite chips Replaced stake
23						
24						

# BASELINE

Boring ID: E066

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/16/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: DPT

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 3 inches

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0		SP		0	Dark brown (10YR 3/3) SAND, trace gravel, fine grained, loose, moist, rootlets (Fill)	Removed surface vegetation Used 2.5" diameter Cal modified sampler
1		GP		0	Very dusky red (2.5YR 1/2) GRAVEL, 1/3 to 3/4 inch diameter angular clasts consisting of chert, loose, moist (Fill)	
2		SP		0	Very dark gray (10YR 3/1) SAND with gravel, fine grained, medium dense, moist, 1/3 to 3/4 inch diameter subrounded to angular gravel clasts consisting of quartz, black charcoal, chert	
2		CL		0	Mottled very dark gray (10YR 3/1) and dark yellowish brown (10YR 4/4) CLAY with sand and gravel, stiff, moist, low plasticity (Fill), gravel consisting of sandstone, chert, quartz, charcoal	
3					Total depth = 2.5 feet	
3						Backfilled boring with bentonite chips Replaced stake
4						
5						
6						
7						
8						
9						
10						

# BASELINE

Boring ID: E067

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/21/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 7.75 inches

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0					Dark brown (10YR 3/3) SAND, trace gravel, fine grained, loose, moist to dry, rootlets (Fill)	Removed surface vegetation Used 2.5" diameter Cal modified sampler to 2.5 feet, then 2" diameter Cal modified sampler
1	X					
2	X					
3		SP				
4						
5						
6					Dark yellowish brown (10YR 4/4) CLAY with silt, medium stiff, medium to low plasticity, dry, oxide stained, Alluvium	
7	X					
8		CL				
9						
10						
11						
11		SC			Dark yellowish brown (10YR 4/4) clayey SAND, fine grained, medium dense, moist, Alluvium	
12						

# BASELINE

Boring ID: E067

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/21/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 7.75 inches

Reviewed by: *Heidi Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
12						
13						
14		SC				
15						
16						
17					Dark yellowish brown (10YR 4/6) SAND, trace silt, fine grained, medium dense to dense, moist, weathered Colma?	
18		SP				
19						
20						
21					Olive (5Y 5/3) SAND, fine grained, medium dense, moist, Colma	
22		SP				
Total depth = 22.5 feet						Backfilled boring with bentonite chips Replaced stake
23						
24						

# BASELINE

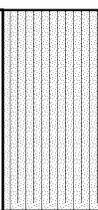
Boring ID: E068

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/16/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: DPT

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 3 inches

Reviewed by: *Heidi Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0					Very dark grayish brown (10YR 3/2) silty SAND with clay and gravel, medium stiff, moist, rootlets, gravel consisting of chert	Removed surface vegetation Used 2.5" diameter Cal modified sampler
1		SM		0		
2		SP		0	Very dark greenish gray (GLE Y2 3/1) SAND with silt, medium dense, moist (Fill), trace brick pieces, sandstone, hard rock	
Total depth = 2.5 feet						Backfilled boring with bentonite chips Replaced stake
3						
4						
5						
6						
7						
8						
9						
10						

# BASELINE

Boring ID: E069

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/21/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 7.75 inches

Reviewed by: *Heri Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0					Dark brown (10YR 3/3) SAND, fine grained, loose, dry, rootlets (Fill)	Removed 1" asphalt, 11" concrete Used 2.5" diameter Cal modified sampler to 2.5 feet, then 2" diameter Cal modified sampler
1	X	SP		0		
2	X			0	Dark grayish brown (10YR 4/2) SILT, medium stiff, dry, trace of yellowish brown, gravel clasts of sandstone (Fill)	
3		ML				
4						
5					Mottled yellowish brown (10YR 5/4) to yellowish brown (10YR 5/6) CLAY, stiff, high plasticity, dry, oxide stained, Alluvium	
6						
7	X			0		
8		CH				
9						
10						
11		SC			Dark yellowish brown (10YR 4/6) clayey SAND, fine grained, medium dense to dense, moist, oxide staining (Alluvium)	
12						

# BASELINE

Boring ID: E069

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/21/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 7.75 inches

Reviewed by: *Heidi Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
12				0		
13		SC				
14						
15					Dark yellowish brown (10YR 3/6) SAND with clay, fine grained, moist, oxide stained (Alluvium?) (weathered Colma?)	
16						
17				0		
18		SP				
19						
20						
21						
22		SP		0	Dark yellowish brown (10YR 4/4) SAND, fine grained, medium dense to dense, moist (Colma sand)	
Total depth = 22.5 feet					Backfilled boring with bentonite chips topped off with cement	
23						
24						

# BASELINE

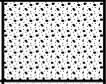
Boring ID: E070

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/16/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: DPT

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 3 inches

Reviewed by: *Heidi Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0		SP			Dark brown (10YR 3/3) SAND with gravel, fine grained, loose, moist (Fill)	No vegetative cover Used 2.5" diameter Cal modified sampler
1		GP		0	Gray (GLE Y1 6/N) to greenish gray (GLE Y1 6/1) GRAVEL with sand, medium dense, moist, 1/3 to 1 inch diameter angular clasts of greenstone (Fill)	
2		SP		0	Very dark greenish gray (10YR 3/2) SAND with gravel, fine grained, medium dense, moist, 1/3 to >2 inch diameter gravel clasts consisting of chert, charcoal pieces, sandstone (Fill)	
Total depth = 2.5 feet					Backfilled boring with bentonite chips Replaced stake	
3						
4						
5						
6						
7						
8						
9						
10						

# BASELINE

Boring ID: E071

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/21/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 7.75 inches

Reviewed by: *Heri Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0					Dark brown (10YR 3/3) SAND, trace gravel, fine grained, loose, moist, rootlets (Fill)	Removed surface vegetation Used 2.5" diameter Cal modified sampler to 2.5 feet, then 2" diameter Cal modified sampler 12" recovery from 1 to 2.5 feet
1	X			0		
2	X	SP		0	Increase in gravel content; 1/3 to 3/4 inch diameter subangular clasts of sandstone, shale, aluminum can pieces	
3						
4					Dark grayish brown (10YR 4/2) SILT, medium stiff, dry, trace of yellowish brown sandstone, piece of charcoal, rootlets (Fill)	
5						
6						
7	X	ML		0		
8						
9						
10						
11						
12	X	CH		0	Dark yellowish brown (10YR 4/4) CLAY with silt, stiff, high plasticity, dry, oxide stained (Alluvium)	
13						
14						
15		CL			----- Becoming CLAY with sand, fine grained, low plasticity	

# BASELINE

Boring ID: E071

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/21/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 7.75 inches

Reviewed by: *Heidi Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
15						
16						
17	X			0		
18		CL				
19						
20						
21						
22	X			0	Strong brown (7.5YR 4/6) SAND, trace silt, fine grained, medium dense to dense, moist (Colma, weathered)	
23		SP				
24						
25						
26						
27	X	SP		0	Yellowish brown (10YR 5/4) SAND, fine grained, medium dense, moist (Colma)	
28					Total depth = 27.5 feet	Backfilled boring with bentonite chips Replaced stake
29						
30						

# BASELINE

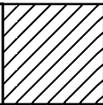
Boring ID: E072

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/16/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: DPT

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 3 inches

Reviewed by: *Heidi Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0		CH		0	Greenish gray (GLE Y1 5/1) CLAY with gravel, medium stiff, high plasticity, moist, 1/3 to 3/4 inch diameter angular gravel consisting of chert, sandstone (Fill)	Removed surface vegetation Used 2.5" diameter Cal modified sampler
1		SP		0	Very dark grayish brown (2.5Y 3/2) SAND, trace gravel, fine grained, medium dense to loose, moist, rootlets, 1/3 to 1/2 inch diameter angular gravel clasts of sandstone (Fill)	
2		SP		0	Very dark gray (10YR 3/1) SAND, trace silt, fine grained, medium dense, moist, rootlets, trace gravel, 1/3 inch diameter gravel clasts consisting of quartz and hard rock (Fill)	
3					Total depth = 2.5 feet	
3						Backfilled boring with bentonite chips Replaced stake
4						
5						
6						
7						
8						
9						
10						

# BASELINE

Boring ID: E073

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/15/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heidi Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0						
1	X			0	Very dark gray (10YR 3/1) SAND, fine grained, loose, moist, rootlets, trace gravel, 1.5 inch diameter angular clasts consisting of greenstone (Fill)	Removed surface vegetation Used 2.5" diameter Cal modified sampler to 2.5 feet, then 1.5" diameter Cal modified sampler
2	X			0		
3		SP				
4						
5						
6						
7	X				Yellowish brown (10YR 5/4) SAND, fine grained, loose to medium dense, dry (Fill)	
8	X	SP				
9						
10						
11						
12	X				Brownish yellow (10YR 6/6) SAND with inclusions of clay and silt, medium dense, dry (Fill)	

# BASELINE

Boring ID: E073

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/15/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
12		SP				
13					Yellowish brown (10YR 5/4) CLAY-SILT, stiff, low plasticity, moist, occasional black grains (Alluvium)	
14						
15						
16						
17						
18						
19		CL/ML				
20						
21						
22						
23						
24						

# BASELINE

Boring ID: E073

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/15/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heidi Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
24		CL/ML				
25		SC/CL			Brown (10YR 4/3) sandy CLAY-clayey SAND, fine grained sand, medium dense, moist, weathered (Colma)	
26						
27					Dark yellowish brown (10YR 4/4) SAND, fine grained, medium dense to dense, moist (Colma sand)	
28						
29						
30		SP				
31						
32						
33						
Total depth = 33.0 feet					Backfilled boring with bentonite chips Replaced stake	
34						
35						
36						

# BASELINE

Boring ID: E074

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/12/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): 34.75 feet  
Bore size: 6.5 inches

Reviewed by: *Kevin Page*

Depth (feet)	Water Level	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0							
0 - 1	X		SP		0	Very dark brown (10YR 2/2) SAND with gravel, trace clay, fine grained, medium dense, moist, 1/3 to 3/4 inch diameter angular gravel clasts of sandstone, asphalt, hard rock, wood pieces (Fill)	
1 - 2							
2 - 3	X		SP/GP		0	Dark reddish brown SAND with gravel-GRAVEL with sand, 1/3 to 3/4 inch diameter clasts of shale, chert, dry, crushed rock? (Fill)	
3 - 7							
7 - 11	X		SM/ML		0	Mottled dark yellowish brown (10YR 4/4) and light yellowish brown (10YR 6/4) silty SAND-sandy SILT, fine to very fine grained, medium dense, medium stiff, low plasticity, oxide stained, moist, rootlets, Alluvium	
11 - 12							
12 - 13	X		SP		0	Dark yellowish brown (10YR 4/4) SAND with clay, fine grained, medium dense, moist, oxide stained (Alluvium grading to Colma?)	
13 - 14							
							Sand becoming coarser at 13.5 feet with black grains

# BASELINE

Boring ID: E074

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/12/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): 34.75 feet  
Bore size: 6.5 inches

Reviewed by: *Kevin Page*

Depth (feet)	Water Level	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
14							
15							
16			SP				
17		X					
18						Dark yellowish brown (10YR 4/4) SAND, trace clay, fine grained, medium dense, moist, Colma	
19							
20							
21							
22		X	SP		0		
23							
24							
25							
26							
27		X	SP		0	Brown (10YR 4/3) SAND, fine to medium grained, dense, moist, Colma, trace of clay in some areas	
28							

# BASELINE

Boring ID: E074

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/12/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): 34.75 feet  
Bore size: 6.5 inches

Reviewed by: *Kevin Page*

Depth (feet)	Water Level	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
28							
29							
30							
31							
32			SP		0		
33							
34							
35							
36							
37					0	Grayish brown (2.5Y 5/2) SAND with silt, fine grained, dense, wet, Colma	
38			SP				
39							
40							
Total depth = 40.0 feet						Backfilled boring with neat cement to 30 feet; remainder with bentonite chips to 0.5 foot bgs	
41							
42							

# BASELINE

Boring ID: E075

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/15/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heidi Page*

page 1 of 3

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0					Very dark gray (10YR 3/1) silty SAND, fine grained, loose, moist, rootlets (Fill)	Removed surface vegetation Used 2.5" diameter Cal modified sampler to 2.5 feet, then 1.5" diameter sampler
1	X	SM		0		
2	X			0	Very dark gray (10YR 3/1) SAND, fine grained, moist, rootlets, pieces of clay and brick (Fill)	
3		SP				
4						
5						
6						
7	X			0	Dark yellowish brown (10YR 4/4) SAND, fine grained, moist (Alluvium?)	
8	X	SP				
9						
10						

# BASELINE

Boring ID: E075

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/15/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heri Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
10		SP				
11				0	Brown (10YR 4/3) CLAY, trace gravel, medium stiff, low plasticity, moist, yellowish brown gravel consisting of siltstone (Alluvium)	
12						
13						
14						
15		CL				
16						
17				0		
18						
19						
20						

# BASELINE

Boring ID: E075

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/15/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heri Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
20		CL				
21					Dark yellowish brown (10YR 4/4) clayey SAND-sandy CLAY, fine grained, medium dense, low plasticity, moist (weathered Colma?)	
22						
23						
24		CL/SC				
25						
26						
27		SP			Dark yellowish brown (10YR 3/4) SAND, fine to medium grained, medium dense, moist, Colma sand	No groundwater
28					Total depth = 28.0 feet	Backfilled boring with bentonite chips Replaced stake
29						
30						

# BASELINE

Boring ID: E076

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/12/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0		SP			Black (10YR 2/1) SAND, fine grained, loose, moist, abundant organic pieces (Fill)	Removed surface vegetation
0.5	X	SP		0	Very dark gray (10YR 3/1) SAND, fine grained, loose, moist (Fill)	
1					Very dark gray (10YR 3/1) CLAY with sand, soft (Fill)	
2	X	CL			Mottled dark yellowish brown (10YR 4/4) and light yellowish brown (10YR 6/4) CLAY, trace sand, medium stiff, low plasticity, moist, oxide stained, rootlets, black grains	
3						
4						
5						
6						
7	X	CL		0		
8						
9						
10						
11						
12						

# BASELINE

Boring ID: E076

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/12/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heri Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
12		CL		0		
13						
14						
15						
16					Dark yellowish brown (10YR 3/4) clayey SAND, fine grained, medium dense, moist	
17		SC		0		
18						
19						
20						
21						
22		SP/SC				Brown (10YR 4/3) SAND with clay-clayey SAND, medium dense, moist, Colma?
23						
24						

# BASELINE

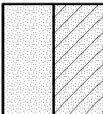
Boring ID: E076

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/12/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heri Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
24		SP/SC				
25					Brown (10YR 4/3) SAND with clay, medium dense, moist, Colma	
26						
27						
28		SP				
29						
30						
31						
32				0	Dark grayish brown (10YR 4/2) SAND, trace silt, dense, moist, Colma	
33		SP				
Total depth = 33.5 feet					Backfilled boring with bentonite chips to 0.5 foot bgs Replaced stake	
34						
35						
36						

# BASELINE

Boring ID: E077

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/15/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heidi Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0						
0.5	X	SP		0	Very dark grayish brown (10YR 3/2) SAND with gravel, fine grained sand, medium dense, moist (Fill), 1/3 to 3/4 inch diameter subangular gravel clasts	Removed 4" asphalt, 8" concrete, 6" baserock Used 2.5" diameter Cal modified sampler to 2.5 feet, then 1.5" diameter sampler
1.5	X				Very dark brown (10YR 2/2) SAND, fine grained, loose, dry, rootlets, Alluvium	
2.5	X					
3						
4						
5						
6					Becoming brown (10YR 4/3)	
7	X	SP		0		
7.5	X					
8	X					
9						
10						
11						
12	X			0		
12.5	X					
13	X					
13.5		CL			Very dark brown (10YR 2/2) CLAY with sand, medium stiff, low plasticity, moist, Alluvium	
14						
15						

# BASELINE

Boring ID: E077

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/15/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heri Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
15						
16						
17	X			0		
18	X					
19		CL				
20						
21						
22	X			0		
23	X				Yellowish brown (10YR 5/4) sandstone BEDROCK, highly weathered, dry	
24						
25		Rock				
26						
27	X			0		No groundwater
28	X					
Total depth = 28.0 feet						Backfilled boring with bentonite chips capped with quick set concrete
29						
30						

# BASELINE

Boring ID: E077A

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/14/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 3 inches

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0		SP		0	Dark brown (10YR 4/3) SAND, fine grained, loose, moist, rootlets (Alluvium)	Removed surface vegetation Hand augered Used 2" diameter sampler with slide hammer
1						
2				0		
Total depth = 2.5 feet					Backfilled boring	
3						
4						
5						
6						
7						
8						
9						
10						

# BASELINE

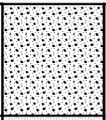
Boring ID: E078

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/14/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): ~20.5 feet  
Bore size: 6.5 inches

Reviewed by: *Kevin Page*

Depth (feet)	Water Level	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0							
0 - 1		X	GP		0	Dark reddish brown (5YR 3/2) crushed chert GRAVEL with sand, 1/3 to >1.5 inch diameter angular clasts, dense, dry (Fill)	Removed 3" asphalt, 9" concrete Used 2.5" diameter Cal modified sampler to 2.5 feet, then 1.5" diameter sampler
1 - 2		X			0	Dark grayish brown (10YR 4/2) SAND, fine grained, loose, moist, Fill?? Alluvium?	
2 - 7		X				Becoming dark yellowish brown (10YR 4/4)	
7 - 8		X			0		
8 - 11			SP				
11 - 12		X				Becoming yellowish brown (10YR 5/4)	
12 - 13		X					
13 - 14							
14 - 15							

# BASELINE

Boring ID: E078

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/14/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): ~20.5 feet  
Bore size: 6.5 inches

Reviewed by: *Kevin Page*

Depth (feet)	Water Level	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
15							
16							
17							
18			SP				
19							
20							
21	▽					Black (10YR 2/1) CLAY with sand, soft, medium plasticity, wet, trace yellowish brown sand inclusions	Groundwater has odor
22			CL				
23							
24							
25						Mottled brown (10YR 4/3) and dark yellowish brown (10YR 4/4) CLAY with sand, medium stiff, medium plasticity, wet, fine grained sand, oxide stained	
26			CL				
27							
28						Total depth = 27.5 feet	Backfilled boring with bentonite chips
29							
30							

# BASELINE

Boring ID: E078A

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/14/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 3 inches

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0		SP		0	Dark brown (10YR 4/3) SAND, fine grained, loose, moist, rootlets (Alluvium)	Removed surface vegetation Used slide hammer with 2" diameter sampler
1				0		
Total depth = 2.5 feet						
3						
4						
5						
6						
7						
8						
9						
10						

# BASELINE

Boring ID: E079

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/16/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heidi Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0					Very dark gray (10YR 3/1) SAND, fine grained, loose, moist, rootlets (Fill)	Removed surface vegetation Used 2.5" diameter Cal modified sampler to 2.5 feet, then 1.5" diameter Cal modified sampler
1	X	SP		0	Dark brown (7.5YR 3/2) SAND, trace silty gravel, fine grained, medium dense to loose, moist, rootlets, 1/3 to 3/4 inch diameter clasts of chert (Fill)	
2	X			0		
3						
4		SP				
5						
6						
7	X			0	Dark yellowish brown (10YR 4/4) SAND, fine grained, loose, dry to moist, rootlets (Alluvium)	
8	X					
9						
10		SP				
11						
12	X			0	Same as above Becoming brown (10YR 4/3)	
13	X					

# BASELINE

Boring ID: E079

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/16/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heri Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
13						
14						
15						
16						
17		SP		0		
18						
19						
20						
21						
22				0	Black (10YR 2/1) CLAY, soft, low plasticity, wet, some peat areas, pieces of vegetation, Alluvium	
23						
24		CL				
25						
26						

# BASELINE

Boring ID: E079

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/16/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heidi Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
26		CL				
27				0	Mottled dark brown (10YR 3/4) and dark bluish gray (GLE Y2 4/1) CLAY with sand and silt, stiff, medium to high plasticity, rootlets (Alluvium? weathered Colma?)	
28						
29		CH				
30						
31						
32				0	Bluish gray (GLE Y2 5/1) and yellowish brown (10YR 5/4) SANDSTONE, well cemented, bedrock, weathered	
33						
34		Rock				
35						
36						
37				0	Some clay seams at 37 feet	No groundwater encountered
38						
Total depth = 38.0 feet						Backfilled boring with bentonite chips Replaced stake
39						

# BASELINE

Boring ID: E080

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/14/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heritage*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0					Very dark grayish brown (10YR 3/2) SILT, soft, low plasticity, moist, rootlets (Fill)	Removed surface vegetation Used 2.5" diameter corer to 2.5 feet, then 1.5" diameter corer
1		ML		0	Dark brown (10YR 3/3) SAND, fine grained, loose, moist, Alluvium	
2				0		
3						
4		SP				
5						
6						
7					Mottled yellowish brown (10YR 5/6) and brown (10YR 4/3) CLAY, stiff, high plasticity, moist, Alluvium	
8		CH				
9						
10						

# BASELINE

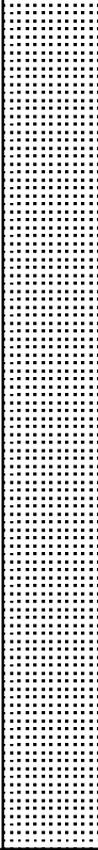
Boring ID: E080

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/14/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Heri Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
10		CH				
11					Yellowish brown (10YR 5/6) sandstone, claystone BEDROCK, highly weathered, clay seams, dry	
12						
13						
14		Rock				
15						
16						
17					Gray (10YR 5/1) shale and sandstone BEDROCK, weathered, dry	
18		Rock				
Total depth = 18.0 feet					Backfilled boring with bentonite chips Replaced stake	
19						
20						

# BASELINE

Boring ID: E081

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/13/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size:

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0					Very dark brown (7.5YR 3/1) SAND, fine grained, loose, large root and rootlets, moist (Fill)	Removed vegetation Used 2.5" diameter Cal modified sampler
1				0		
2						
3					Becoming dense at 3.0 feet bgs	
4		SP				
5						
6						
7					Dark yellowish brown (10YR 4/6) SANDSTONE, well cemented	Used 1.5" diameter Cal modified sampler
8		Rock				Refusal at 8.5 feet
Total depth = 8.5 feet						Backfilled boring with bentonite chips Replaced boring ID stake
9						
10						

# BASELINE

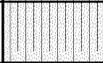
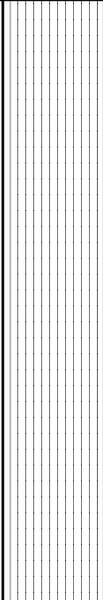
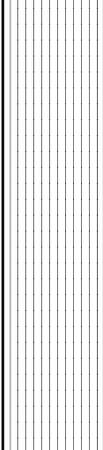
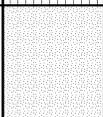
Boring ID: E082

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/13/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
0						
0 - 1	X	SM		0	Black (10YR 2/1) silty SAND, trace clay, fine grained, loose to medium dense, moist, rootlets, alluvium	Removed vegetation Used 2.5" Cal modified sampler for upper 2 to 5 feet
1 - 2		SM			Brown (10YR 4/3) silty SAND, fine grained, medium dense, moist, rootlets, alluvium	
2 - 7	X				Mottled yellowish brown (10YR 5/6) and brown (10YR 4/3) SILT, medium stiff, moist, low plasticity, abundant oxide stained, rootlets, alluvium	
7 - 11	X	ML			Decrease in mottling to yellowish brown (10YR 5/6)	Used micro-core, 1.5" diameter
11 - 12		SP			Dark yellowish brown (10YR 4/6) SAND with silt, fine grained, dense, moist, Colma?	

# BASELINE

Boring ID: E082

5900 Hollis Street, D  
Emeryville, CA 94608  
(510) 420-8686  
(510) 420-1707 fax

Date: 1/13/09  
Project no.: Y0239-04.A3  
Driller: Gregg Drilling  
Method: HSA

Location: Doyle Drive, San Francisco  
Logger: WK Scott, P.G. #6104  
Groundwater depth (bgs): None observed  
Bore size: 6.5 inches

Reviewed by: *Kevin Page*

Depth (feet)	Sample	USCS	Graphic	PID (ppm)	DESCRIPTION	REMARKS
12						
13						
14		SP				
15						
16						
17				0	Brownish yellow (10YR 6/6) SANDSTONE, cemented, some clay areas, dry	
18						
19						
20		Rock				
21						
22					Becoming light yellowish brown (10YR 6/3)	6" recovery
23						
Total depth = 23.0 feet					Backfilled boring with bentonite chips	
24						

LOGGED BY T. Carroll	BEGIN DATE 2-25-08	COMPLETION DATE 2-29-08	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2120218.262 / E5994858.344 (NAD83)	HOLE ID BTSB-R2
DRILLING CONTRACTOR Gregg Drilling and Testing, Inc.		BOREHOLE LOCATION (Offset, Station, Line) Offset 47ft L Sta 77+65 SB Alignment		SURFACE ELEVATION 92.121 ft (NAVD88)
DRILLING METHOD Mud Rotary		DRILL RIG Fraste Multi-drill (truck)		BOREHOLE DIAMETER 5 in. (soil); 4 in. (rock)
SAMPLER TYPE(S) AND SIZE(S) (ID) MC (2.4"), SPT (1.4"), 101-Sampler		SPT HAMMER TYPE Automatic, 140 lbs., 30-inch drop		HAMMER EFFICIENCY, ERI 76.2%
BOREHOLE BACKFILL AND COMPLETION Neat Cement Grout Backfill		GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) READINGS 7 feet		TOTAL DEPTH OF BORING 115 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	0		6" ASPHALT CONCRETE.												
1	1		10" UNREINFORCED CONCRETE.												
90.12	2		GRAVELLY fat CLAY (CH), poorly compacted, dark brown, moist, GRAVEL is angular, with SAND. [FILL]												
88.12	3		Poorly graded SAND (SP), loose, dark yellowish brown, dry to moist, fine, trace fines.	S1	4	9	100			5.3	112.8				
	4			S2	4	11	100								
86.12	5														
	6														
	7		Grades dark brown.												
84.12	8		Lean CLAY (CL), medium stiff, dark brown, moist, trace fine SAND.	S3	7	14	50					PP = 0.875			
	9			S4	3	7	89								
82.12	10														
	11														
80.12	12														
	13		Lean CLAY (CL), medium stiff to stiff, yellowish brown, moist, trace fine sand, dark brown oxidized nodules (up to 1/2" diameter).	S5	5	22	83			22.5	104.6	PP = 1.0 UU = 0.93			PI
78.12	14			S6	5	7	89								
	15														
76.12	16														
	17														
74.12	18		SILTY SAND (SM), medium dense, yellowish brown, moist to wet, fine, with root hairs (up to 1/16" diameter), with black oxidized nodules (up to 1/16" diameter).	S7	6	20	83			19.1	114.0	UU = 0.93			PA
	19		Poorly graded SAND with SILT (SP-SM), medium dense, yellowish brown, moist to wet, fine to medium.	S8	6	14	83								
72.12	20														
	21														
70.12	22														
	23		Poorly graded SAND (SP), dense, yellowish brown, moist, fine, trace fines.	S9	20	70	83								
68.12	24			S10	30	60	89								CR
	25														

(continued)

CALTRANS FORM: YLEDRIVE\_ARUPLOGS.GPJ ARUP LIBRARY CALTRANS FORMAT.GLB 7/15/09



Department of Transportation  
Division of Engineering Services  
Geotechnical Services

REPORT TITLE BORING RECORD				HOLE ID BTSB-R2	
DIST. 4	COUNTY S.F.	ROUTE 101	POSTMILE 8.3/9.4	EA 163701	
PROJECT OR BRIDGE NAME Doyle Drive Replacement Project					
BRIDGE NUMBER 34-0161L		PREPARED BY T. Carroll		DATE 7-15-09	SHEET 1 of 5

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
66.12	25		Poorly graded SAND (SP), dense, yellowish brown, moist, fine, trace fines.			20 30 30									
64.12	28			S11	24 41 50	91	72			20.7 21.9	107.6 106.8	DS = 1.87 DS = 1.56 DS = 2.20			Grades to reddish brown with black oxidized nodules (up to 1/4" diameter). PA
62.12	30			S12	12 19 26	45	100			20.6	107.8				Grades with increase in fines content.
60.12	32														
58.12	33		Grades medium dense, yellowish brown.	S13	26 34 35	69	83								
58.12	34		33.8', grades weakly cemented.	S14	12 14 23	37	88			21.2	106.0				PA, C <i>Approx. Bottom of Tunnel ↓</i>
56.12	35		35.0', occasional fine GRAVEL (up to 1/2" diameter), subrounded, reddish brown (chert fragment). Grades with pockets of SANDY CLAY (up to 1/8" diameter).												
54.12	37		Lean CLAY (CL), very stiff, yellowish brown and reddish brown, moist, trace fine SAND, with black specks.	S15	9 13 17	30	83			20.7	108.1	UU = 1.15 PP = 1.63 UU = 1.84		PI	
52.12	39		Fat CLAY (CH), stiff, yellowish brown and grayish brown, dry to moist, trace fines, trace SAND, with black specks, mottled.	S16	10 12 15	27	89			22.3	104.3			PI	
50.12	41														
48.12	43		Lean CLAY (CL), hard, yellowish brown and light gray, trace fine SAND, mottled, with iron-oxide staining, with black specks	S17	15 32 50	82	50			19.4	110.9	PP = >2.0 UU = 3.14		PI	
46.12	45		SEDIMENTARY ROCK (Sandstone), fine to coarse grained, light yellowish brown, decomposed, very soft, very intensely fractured. (CLAYEY SAND (SC), very dense, light yellowish brown, dry, fine to coarse, faint dark reddish brown predefined fracture planes, slight rock structure, with frequent manganese-oxide staining.)	S18	15 33 39	72	67								
44.12	47		SEDIMENTARY ROCK (Siltstone), dark brown, intensely weathered, moderately hard, very intensely fractured.	S19	28 50/5.5"	50/5.5"	70								
42.12	49		METAMORPHIC ROCK (Serpentinite), greenish gray and yellowish brown, very intensely weathered, moderately soft, very intensely fractured.	C20				68	N/A						
40.12	51		METAMORPHIC ROCK (Granulite), medium to coarse SAND and fine GRAVEL-sized, yellowish brown and light greenish gray, intensely weathered, soft, very intensely fractured (crushed), intensely mylonized, localized sheared surfaces on more competent 0.1' to 0.2' thick blocks.	C21				93	N/A						<i>Approx 20' Below Tunnel ↓</i>
38.12	53		METAMORPHIC ROCK (Serpentinite), greenish gray and dark gray, intensely weathered, variably very soft to moderately hard, very intensely fractured, sharp changes in rock texture (non-grading), more intensely weathered intervals exhibit texture of SILT with SAND (ML), soft, moist, SAND is fine.												

(continued)

CALTRANS FORM 715/09



Department of Transportation  
Division of Engineering Services  
Geotechnical Services

REPORT TITLE <b>BORING RECORD</b>				HOLE ID BTSB-R2	
DIST. 4	COUNTY S.F.	ROUTE 101	POSTMILE 8.3/9.4	EA 163701	
PROJECT OR BRIDGE NAME Doyle Drive Replacement Project					
BRIDGE NUMBER 34-0161L		PREPARED BY T. Carroll		DATE 7-15-09	SHEET 2 of 5

CALTRANS FORM 700 (REV. 07/15/09) ARUP LIBRARY\_CALTRANS FORMAT.GLB 7/15/09

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
36.12	56		METAMORPHIC ROCK (Serpentinite), greenish gray and dark gray, intensely weathered, variably very soft to moderately hard, very intensely fractured, sharp changes in rock texture (non-grading), more intensely weathered intervals exhibit texture of SILT with SAND (ML), soft, moist, SAND is fine.	C22			47	N/A						
34.12	58			C23			95	N/A						
32.12	60			C24			68	N/A						
30.12	62			C25			95	N/A						
28.12	64			C26			100	N/A						
26.12	66			C27			100	N/A						
24.12	68			C28			43	0						
22.12	70			C29			100	0						
20.12	72			C30			100	N/A						
18.12	74			C31			100	N/A						
16.12	76			C32			100	N/A						
14.12	78			C33			100	N/A						
12.12	80			C34			19	N/A						
10.12	82													
8.12	84													

68.4', white secondary mineralization forming a banding effect.  
 69.0', dark olive gray and very dark gray, moderately weathered, moderately hard to locally soft, intensely fractured, fractures dipping 15° to 25°, common secondary mineralization along closely spaced fractured/sheared surfaces throughout interval, commonly breaks 0.1' to 0.2' fragments (hard).

75.8', greenish gray and dark gray, intensely weathered, variably very soft to moderately hard, very intensely fractured.

Bluish gray and very dark gray.

(continued)



Department of Transportation  
 Division of Engineering Services  
 Geotechnical Services

REPORT TITLE <b>BORING RECORD</b>				HOLE ID BTSS-R2	
DIST. 4	COUNTY S.F.	ROUTE 101	POSTMILE 8.3/9.4	EA 163701	
PROJECT OR BRIDGE NAME Doyle Drive Replacement Project					
BRIDGE NUMBER 34-0161L		PREPARED BY T. Carroll		DATE 7-15-09	SHEET 3 of 5

CALTRANS FORMAT - DOYLEDRIVE\_ARUPLOGS.GPJ ARUP LIBRARY CALTRANS FORMAT.GLB 7/15/09

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	
6.12	86		METAMORPHIC ROCK (Serpentinite), greenish gray and dark gray, intensely weathered, variably very soft to moderately hard, very intensely fractured, sharp changes in rock texture (non-grading), more intensely weathered intervals exhibit texture of SILT with SAND (ML), soft, moist, SAND is fine.													
4.12	87			C35	100	N/A										
	88			C36	95	N/A										
2.12	89					C37	68	N/A								
	90					C38	100	N/A								
0.12	91					C39	19	N/A								
-1.88	92					C40	58	N/A								
-3.88	93															
-5.88	94															
-7.88	95															
-9.88	96															
-11.88	97															
-13.88	98															
-15.88	99															
-17.88	100															
-19.88	101															
-21.88	102															
	103															
	104															
	105															
	106															
	107															
	108															
	109															
	110															
	111															
	112															
	113															
	114															
	115															

96.3' - 96.8', sand-like texture.

Straight drill from 98' to 115' done with CME 550

(continued)



Department of Transportation  
 Division of Engineering Services  
 Geotechnical Services

REPORT TITLE BORING RECORD				HOLE ID BTSB-R2	
DIST. 4	COUNTY S.F.	ROUTE 101	POSTMILE 8.3/9.4	EA 163701	
PROJECT OR BRIDGE NAME Doyle Drive Replacement Project					
BRIDGE NUMBER 34-0161L		PREPARED BY T. Carroll		DATE 7-15-09	SHEET 4 of 5

CALTRANS FORM 700-1 (REV. 12/04) ARUP LOGS.GPJ ARUP LIBRARY CALTRANS FORMAT.GLB 7/15/09

ELEVATION (ft)	DEPTH (ft)	Material Graphics	Description	Sample Location	Sample Number	Blows per 6 In	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
115															
-23.88	116														
	117														
-25.88	118														
	119														
-27.88	120		Borehole terminated at a depth of 115 feet on 2/29/2008.												
	121		See Boring Record Legend for soil classification chart and key to test data and sampler type.												
-29.88	122		Additional Notes:												
	123		1. On 2/29/2008 downhole geophysical (suspension) logging was performed by GEOVision, Inc.												
-31.88	124														
	125														
-33.88	126														
	127														
-35.88	128														
	129														
-37.88	130														
	131														
-39.88	132														
	133														
-41.88	134														
	135														
-43.88	136														
	137														
-45.88	138														
	139														
-47.88	140														
	141														
-49.88	142														
	143														
-51.88	144														
	145														



Department of Transportation  
 Division of Engineering Services  
 Geotechnical Services

REPORT TITLE BORING RECORD				HOLE ID BTSB-R2	
DIST. 4	COUNTY S.F.	ROUTE 101	POSTMILE 8.3/9.4	EA 163701	
PROJECT OR BRIDGE NAME Doyle Drive Replacement Project					
BRIDGE NUMBER 34-0161L		PREPARED BY T. Carroll		DATE 7-15-09	SHEET 5 of 5

LOGGED BY T. Carroll	BEGIN DATE 5-31-08	COMPLETION DATE 6-1-08	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2120407.628 / E5994505.431 (NAD83)	HOLE ID <b>BTNB-R2</b>
DRILLING CONTRACTOR Gregg Drilling and Testing, Inc.			BOREHOLE LOCATION (Offset, Station, Line) Offset 70ft R Sta 81+44 NB Alignment	SURFACE ELEVATION 89.420 ft (NAVD88)
DRILLING METHOD Mud Rotary			DRILL RIG Fraste Multi-drill (truck)	BOREHOLE DIAMETER 5 in. (soil); 4 in. (rock)
SAMPLER TYPE(S) AND SIZE(S) (ID) MC (2.4"), SPT (1.4"), Bulk, Shelby (2.87"), 101-Sampler			SPT HAMMER TYPE Automatic, 140 lbs., 30-inch drop	HAMMER EFFICIENCY, ERI 76.2%
BOREHOLE BACKFILL AND COMPLETION Neat Cement Grout Backfill			GROUNDWATER DURING DRILLING READINGS	AFTER DRILLING (DATE) Not Recorded
				TOTAL DEPTH OF BORING 71.5 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	Description	Sample Location	Sample Number	Blows per 6 In	Blows per Foot	Recovery (%)	RGD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		4" ASPHALT CONCRETE.												
	1		7-8" UNREINFORCED CONCRETE.												
87.42	2		3" Poorly graded SAND (SP), yellowish brown, dry to moist, fine, clean, frequent roots up to 1/4" diameter. [FILL]		B1										Slight horizontal laminations (from compaction?)
	3		SILTY SAND (SM), medium dense, yellowish brown, moist, fine, GRAVEL is fine to coarse.		S2	4	16	83							
85.42	4		SANDY SILT (ML), medium dense, yellowish brown, moist, SAND is fine to medium, piece of coarse GRAVEL.		S3	3	20	78				PP = 1.5			
	5					4									
83.42	6		CLAYEY GRAVEL (GC), loose, yellowish brown and green, moist, GRAVEL is coarse, rounded, serpentinite fragments (up to 3" diameter in shoe at 8.5').		S4	4	15	67							
81.42	8				S5	5									
	9		CLAYEY SAND (SC), medium dense, yellowish brown, fine with coarse SAND, fine GRAVEL (subrounded to rounded, serpentinite fragments in CLAYEY SAND matrix).		S6	4	10	44							
79.42	10				S7	4									
	11					4									
77.42	12				S8	4	15	47							Modified California sample at 12.5' was unlined
75.42	14		Lean CLAY with GRAVEL and SAND (CL), soft, brown and greenish gray, moist to wet, GRAVEL is angular serpentinite fragments, GRAVEL is fine to coarse, SAND is fine to coarse.		S9	8	6	44							
	15				S10	3									
73.42	16		16.5', rig chatter.		S11	3	6	72							Very strong hydrocarbon/oily odor
	17		SILTY SAND (SM), loose, very dark brown, wet, fine.		S12	3									Very strong hydrocarbon/oily odor
71.42	18		Fat CLAY with SAND, medium stiff to stiff, very dark brown, wet, SAND is fine, with rootlets.		S13	3									
	19				U9		500	67				PP = 1.63			
69.42	20						1.63					1.75			
	21		20.5', grades grayish brown, stiff.												Without odor, without organics
67.42	22														
	23				U10		1000	100							
65.42	24		METAMORPHIC ROCK (Serpentinite), very soft, yellowish brown, greenish gray and dark gray, moist, decomposed, very intensely fractured (SANDY SILT (ML), medium stiff,		S11	9	61	67							
	25					19									
						42									

(continued)



Department of Transportation  
Division of Engineering Services  
Geotechnical Services

REPORT TITLE <b>BORING RECORD</b>				HOLE ID BTNB-R2	
DIST. 4	COUNTY S.F.	ROUTE 101	POSTMILE 8.3/9.4	EA 163701	
PROJECT OR BRIDGE NAME Doyle Drive Replacement Project					
BRIDGE NUMBER 34-0161R		PREPARED BY T. Carroll		DATE 7-15-09	SHEET 1 of 3

CALTRANS FORMAT - DOYLE DRIVE - ARUP LOGS.GPJ - ARUP LIBRARY - CALTRANS FORMAT.GLB 7/15/09

CALTRANS FORMAT ARUP LOGS.GPJ ARUP LIBRARY CALTRANS FORMAT.GLB 7/15/09

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
63.42	26		sand is fine - moist). METAMORPHIC ROCK (Serpentinite), dark greenish gray and dark gray, moderately to intensely weathered, very soft, very intensely fractured, common iron-oxide staining (localized), occasional small moderately soft zones.	C12				15	0						101-Coring System
61.42	28			C13				50	N/A						
59.42	30		29.0', grades soft, intensely sheared throughout, fibrous texture common throughout (ML - SANDY SILT, SAND is fine, moist).	C14				100	N/A						
	30			C15				68	N/A						
57.42	32		32.0', slight iron-oxide staining, slightly weathered, harder fragments (angular) of SERPENTINITE with softer material washed away, fragments are moderately hard, up to 0.1' in diameter (SM - SILTY SAND, fine to coarse, angular, with fine GRAVEL fragments, angular to subangular, moist).	C16				37	N/A						
55.42	34			C17				50	N/A						
51.42	38		37.4', soft to moderately soft, faint iron-oxide staining on fracture surfaces.	C18				100	N/A						Slower drilling at 38'
	38			C19				100	N/A						
49.42	40		37.7', fibrous texture noted as long as 0.02'. 37.9', moderately soft, bluish gray. 38.0', soft. 38.0', dark bluish gray with infilling of light greenish gray. 38.65', fibrous texture noted as long as 0.02'. 39.15', thin (0.01' thick) white mineral (talc?) vein dipping 50°. 40.0', moderately weathered with common iron-oxide staining. 41.3', slightly weathered, very soft.	C20				100	N/A						End Box #1 at 42'
47.42	42			C21				50	N/A						
45.42	44		44.35', angular fragments up to 0.1' diameter.	C22				65	N/A						Approx 20' Below Tunnel
43.42	46			C23				40	N/A						
41.42	48		47.9' - 48.6', moderately hard, very intensely fractured, fragments of harder rock, dark gray.	C24				100	N/A						
39.42	50			C25				70	N/A						
37.42	52		50.0', soft to moderately soft.	C26				32	N/A						
35.42	54			C27				75	N/A						
	55		54.2', very intensely fractured zone, fragments are moderately hard, dark bluish gray, overall matrix is very soft.												

(continued)



Department of Transportation  
Division of Engineering Services  
Geotechnical Services

REPORT TITLE BORING RECORD				HOLE ID BTNB-R2	
DIST. 4	COUNTY S.F.	ROUTE 101	POSTMILE 8.3/9.4	EA 163701	
PROJECT OR BRIDGE NAME Doyle Drive Replacement Project					
BRIDGE NUMBER 34-0161R		PREPARED BY T. Carroll		DATE 7-15-09	SHEET 2 of 3

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
33.42	56		54.7', fibrous texture noted.		C28			40	N/A						
	57		METAMORPHIC ROCK (Serpentine), dark greenish gray and dark gray, moderately to intensely weathered, very soft, very intensely fractured, common iron-oxide staining (localized), occasional small moderately soft zones.												
	58		55.7', concentration of white mineral.		C29			50	0						
31.42	58		57.5' - 59.5', recovery is light gray meta-sandstone and gabbro, moderately weathered, hard, 0.1' to 0.2' fragments, significant iron-oxide staining, hard to moderately hard.		C30			33	0						
	59														
29.42	60		59.5', moderately weathered, soft, light greenish gray and orangish brown, heavy iron-oxide staining.		C31			75	N/A						
	61		59.7', concentrated iron-oxide weathering along shear planes.												
	62														
27.42	62		61.5', moderately soft, slightly weathered, greenish gray to olive gray, with moderately hard, white and dark gray minerals (white mineral has very fine, fibrous texture developed along planar surfaces, asbestos? White mineral also common with powdery texture disseminated throughout rock mass).		C32			100	0						
	63				C33			100	N/A						
	64				C34			20	N/A						
25.42	64		61.8', horizontal buff sheared seam (0.01' thick), fibrous texture noted.												
	65		62.5', bluish gray, clayey, with green chlorite? minerals, moderately to slightly weathered, very soft.		C35			89	N/A						
23.42	66														
	67														
	68		67.0', moderately weathered, increase in iron-oxide staining.		C36			54	N/A						
21.42	68		67.4' - 67.7', moderately hard rock fragments (gabbro?).												
	69														
19.42	70				C37			43	N/A						
	71		70.2', moderately to slightly weathered, increase in white mineral (talc) disseminated throughout.		C38			75	N/A						
	71		71.5', hard rock fragments.		C39			0	N/A						Switch to HQ at 71'
17.42	72		Borehole terminated at a depth of 71.5 feet on 6/1/2008.		C40			100							
	73		See Boring Record Legend for soil classification chart and key to test data and sampler type.												
	74														
15.42	74														
	75														
	76														
13.42	76														
	77														
	78														
11.42	78														
	79														
	80														
9.42	80														
	81														
	82														
7.42	82														
	83														
	84														
5.42	84														
	85														

CALTRANS FORM 7/15/09



Department of Transportation  
 Division of Engineering Services  
 Geotechnical Services

REPORT TITLE BORING RECORD				HOLE ID BTNB-R2	
DIST. 4	COUNTY S.F.	ROUTE 101	POSTMILE 8.3/9.4	EA 163701	
PROJECT OR BRIDGE NAME Doyle Drive Replacement Project					
BRIDGE NUMBER 34-0161R		PREPARED BY T. Carroll		DATE 7-15-09	SHEET 3 of 3

LOGGED BY B. Kluzniak	BEGIN DATE 7-26-08	COMPLETION DATE 7-26-08	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2120351.985 / E5994725.98 (NAD83)	HOLE ID BTNB-R3
DRILLING CONTRACTOR Gregg Drilling and Testing, Inc.		BOREHOLE LOCATION (Offset, Station, Line) Offset 67ft R Sta 79+10 NB Alignment		SURFACE ELEVATION 86.286 ft (NAVD88)
DRILLING METHOD Mud Rotary		DRILL RIG Fraste Multi-drill (track)		BOREHOLE DIAMETER 5 in. (soil); 4 in. (rock)
SAMPLER TYPE(S) AND SIZE(S) (ID) MC (2.4"), SPT (1.4"), Bulk, 101-Sampler		SPT HAMMER TYPE Automatic, 140 lbs., 30-inch drop		HAMMER EFFICIENCY, ERI 72.9%
BOREHOLE BACKFILL AND COMPLETION Neat Cement Grout Backfill		GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) READINGS 21.6 feet		TOTAL DEPTH OF BORING 100 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		4.5" ASPHALT CONCRETE; 6" UNREINFORCED CONCRETE.												
84.29	1		SILTY SAND (SM), yellowish brown, moist, SAND is fine to medium, with subangular serpentinite fragments, with dark brown oxidized nodules. [FILL]		B1										Augering slow at 2'
	2		2.0', serpentinite cobble up to 1/8" diameter.												
82.29	3		SANDY SILT (ML), medium stiff, dark yellowish brown, moist, SAND is fine, with black specks.		S2	9	26	83							Driller reports easier drilling/harder zone alternating from 6' to 7.5'
	4		4.0', block of serpentinite, yellowish brown and greenish brown, fine-grained, decomposed (SILT (ML), stiff, dry to moist).		S3	12	17	83				PP = 2.0			
80.29	5					14									
	6					8									Drills faster at 12.5'
78.29	8		Poorly graded SAND (SP), medium dense, dark brown, moist, trace SILT, fine to medium, with occasional rootlets up to 1/16" diameter.		S4	8	18	50							
	9					10									With increased SAND content
76.29	10		SANDY Lean CLAY (CL), very stiff, yellowish brown to dark yellowish brown, moist, SAND is fine, with dark brown specks, with thin gray seams. Cuttings are yellowish brown SANDY CLAY.		S5	4	15	0							
	11					6									
74.29	12		12.5', increased SAND content, increased plasticity.		S6	9	31	100		18.9	109.4	PP = 2.125			Slight bouncing of drill rods at 24.5'
	13					13						2.125			
72.29	14					18									
	15					7									
70.29	16		CLAYEY SAND (SC), medium dense, yellowish brown, moist, fine to medium, with black specks, slightly cemented.		S8	8	26	83							
	17					11									
68.29	18					15									
	19					7									
66.29	20		Poorly graded SAND with CLAY (SP-SC), dense, yellowish brown, moist, fine to medium, with black specks		S9	7	24	100		18.2					
	21					11									
64.29	22					13									
	23					17									
62.29	24		Grades very dense.		S10	23	57	94							
	25					34									
						16									
						21									
						22									

(continued)



Department of Transportation  
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REPORT TITLE BORING RECORD				HOLE ID BTNB-R3	
DIST. 4	COUNTY S.F.	ROUTE 101	POSTMILE 8.3/9.4	EA 163701	
PROJECT OR BRIDGE NAME Doyle Drive Replacement Project					
BRIDGE NUMBER 34-0161R		PREPARED BY T. Carroll		DATE 7-15-09	SHEET 1 of 4

CALTRANS FORM 670 (REV. 12/04) CALTRANS FORM 670 (REV. 12/04)

CALTRANS FORM 715/09 ARUP LOGS: GPJ ARUP LIBRARY CALTRANS FORMAT.GLB 7/15/09

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
60.29	26		Poorly graded SAND with CLAY (SP-SC), dense, yellowish brown, moist, fine to medium, with black specks	X	S12	19	58	94							With decrease in CLAY content
	27		25												
58.29	28		33												
	29		13												
	30		17												
56.29	30		Grades light yellowish brown and olive gray, mottled.		S13	37	41	94						Without iron-oxide staining, with decrease in CLAY content	
	31		20												
54.29	32		15												
	33		19												
	34		22												
52.29	34		Poorly graded SAND (SP), dense, yellowish brown to grayish brown, moist, SAND is fine to medium.	X	S14	41	91	83		23.1	102.1			Approx. Bottom of Tunnel	
	35		36												
50.29	36		10												
	37		15												
	38		21												
48.29	38		Grades grayish brown with iron-oxide mottling, SAND is fine.	X	S15	36	72	83						Run #3 dropped from barrel, unable to recover	
	39		11												
46.29	40		15												
	41		30												
44.29	42		23												
42.29	43		Poorly graded SAND with CLAY, medium dense, yellowish brown, moist, SAND is fine, with very dark brown mottling.	X	S16	20	23	89							
	44		36												
	45		55												
40.29	46		9												
	47		11												
38.29	48		Lean CLAY with SAND and GRAVEL (CL), medium stiff to stiff, yellowish brown, moist, GRAVEL is fine to coarse, subangular serpentinite fragments.	X	S17	42	50/	52							
	49		15												
	50		27												
	51		30												
	52		50/												
36.29	50		METAMORPHIC ROCK (Serpentinite), fine-grained, yellow and greenish gray, decomposed, very soft (SILT (ML), stiff, horizontally laminated, dry).	X	S18	50/	100	N/A							
	51		5.5"												
	52		5.5"												
	53		5.5"												
	54		5.5"												
34.29	52		Grades greenish gray, light gray and reddish brown, intensely weathered, very soft, very intensely fractured, internally crushed and sheared (SILT (ML), medium stiff, moist to wet, trace fine to medium SAND), pervasively sheared, iron-oxide staining throughout rock mass. 50.25', white clay seam infilling.	X	S19	23	77	N/A							
	53		36												
	54		36												
	55		36												
	56		36												
32.29	54		51.5', 0.2' thick zone, horizontally fissured, soft, dark mineral fragments up to 0.01' in diameter. 52.0' - 52.6', moderately hard, gabbroic with localized shearing.	X	S20	9	100	N/A							
	55		15												
	56		27												
	57		30												
	58		50/												
	59	5.5"													
	60		52.0' - 52.6', moderately hard, gabbroic with localized shearing.	X	S21	50/	100	N/A							
	61		5.5"												
	62		5.5"												
	63		5.5"												
	64		5.5"												
	65	5.5"													
	66		51.5', 0.2' thick zone, horizontally fissured, soft, dark mineral fragments up to 0.01' in diameter. 52.0' - 52.6', moderately hard, gabbroic with localized shearing.	X	S22	42	100	N/A							
	67		15												
	68		27												
	69		30												
	70		50/												
	71	5.5"													
	72		51.5', 0.2' thick zone, horizontally fissured, soft, dark mineral fragments up to 0.01' in diameter. 52.0' - 52.6', moderately hard, gabbroic with localized shearing.	X	S23	42	100	N/A							
	73		15												
	74		27												
	75		30												
	76		50/												
	77	5.5"													

(continued)



Department of Transportation  
 Division of Engineering Services  
 Geotechnical Services

REPORT TITLE BORING RECORD				HOLE ID BTNB-R3	
DIST. 4	COUNTY S.F.	ROUTE 101	POSTMILE 8.3/9.4	EA 163701	
PROJECT OR BRIDGE NAME Doyle Drive Replacement Project					
BRIDGE NUMBER 34-0161R		PREPARED BY T. Carroll		DATE 7-15-09	SHEET 2 of 4

CALTRANS FORM 7115/09

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
30.29	55		Grades greenish gray, light gray and reddish brown, intensely weathered, very soft, very intensely fractured, internally crushed and sheared (SILT (ML), medium stiff, moist to wet, trace fine to medium SAND), pervasively sheared, iron-oxide staining throughout rock mass.		C24			0							Appendix 20' Below Tunnel
28.29	58		58.0', moderately hard, with localized shearing.		C25			100	0						
	59		58.5' - 58.7', white minerals common with tan CLAY infilling.												
26.29	60		60.5', intensely weathered, very soft, heavy iron-oxide staining.		C26			95	0						
24.29	61		61.6' - 62.0' and 62.4' - 62.6', 45° dipping fractures.												
	62		62.05', 62.5', and 62.65', black staining on fracture surfaces (manganese-oxide?).												
	63		62.7', moderately weathered, moderately hard, iron-oxide staining limited to fracture planes.												
22.29	64		63.3', 63.65', and 63.8', light yellowish brown CLAY infilling.												
	65		65.0' - 65.3' and 65.55' - 65.8', zones of very soft serpentinite.		C27			28	N/A						
20.29	66		Heavy iron-oxide staining throughout run.												
	67														
18.29	68														
	69		69.1', white secondary mineral deposit on fracture plane, moderately to intensely weathered, moderately hard.		C28			100	N/A						
16.29	70		69.6', sub-horizontal shearing planes with heavy iron-oxide staining.		C29			95	N/A						
	71														
14.29	72		72.4', light orangish brown staining.		C30			100	N/A						
	73		72.9' - 73.7', intensely weathered, very soft serpentinite.												
12.29	74		IGNEOUS ROCK (Gabbro), aphanitic, very dark gray to black, moderately to slightly weathered, moderately hard to hard, very intensely fractured.		C31			90	N/A						
	75		74.4', thin light gray secondary mineral deposit, localized shearing on through fractures, color change to very dark gray/black.												
10.29	76		76.0', very intensely fractured (entire run).		C32			100	N/A						
	77		76.4' - 77.2', heavy iron-oxide staining.												
8.29	78		METAMORPHIC ROCK (Serpentinite), intensely weathered, moderately soft, light greenish gray.		C33			88	N/A						
	79		78.5' - 78.7', very soft.												
6.29	80		79.5' - 79.6', very soft (CLAY-like).												
	81		79.7' - 80.3', reduced diameter.												
4.29	82		81.0', color change to dark bluish gray.		C34			83	N/A						
	83		82.2', very light gray.												
2.29	84														
	85				C35			67	10						

(continued)



Department of Transportation  
Division of Engineering Services  
Geotechnical Services

REPORT TITLE BORING RECORD				HOLE ID BTNB-R3	
DIST. 4	COUNTY S.F.	ROUTE 101	POSTMILE 8.3/9.4	EA 163701	
PROJECT OR BRIDGE NAME Doyle Drive Replacement Project					
BRIDGE NUMBER 34-0161R		PREPARED BY T. Carroll		DATE 7-15-09	SHEET 3 of 4

CALTRANS FORM 670 (REV. 12/04) LEADRIVE\_ARUPLOGS.GPJ ARUP LIBRARY, CALTRANS FORMAT.GLB 7/15/09

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
0.29	85		84.7', very soft (CLAY-like), bluish gray (gabbroic), secondary white mineral on shearing planes.												
	86		METAMORPHIC ROCK (Serpentinite), intensely weathered, moderately soft, light greenish gray.												
-1.71	88		87.4' - 87.6', 88.0' - 88.2', and 88.5' - 88.7', severely weathered, very soft.		C36			100	10						
	89		88.2' - 88.5', reduced diameter.												
-3.71	90		88.8', moderately weathered, intensely fractured, moderately hard, dark to very dark gray, predominantly gabbroic.		C37			100	20						
	91		89.5' - 89.8', mechanical breaks.												
	92		89.9' - 90.5', very soft (CLAY-like), light bluish gray.												
	93		90.5' - 91.5', variable softness (very soft to moderately hard).												
-5.71	92		92.0' - 93.7', moderately hard, with horizontal markings from drill bit.		C38			100	N/A						
-7.71	94														
	95		94.2' - 94.6', slightly weathered, very soft.		C39			100	20						
-9.71	96														
	97		96.5' - 96.8', secondary white mineral on predominant fracture plane, dipping approximately 70°.												
-11.71	98		97.5' - 97.8', intensely fractured, slightly weathered to fresh, very soft.		C40			60	N/A						
	99		97.8' - 100.0', moderately hard, with very soft to soft zones at 98.0', 98.4', and 98.6'.												
-13.71	100		Borehole terminated at a depth of 100 feet on 7/26/2008.												
	101		See Boring Record Legend for soil classification chart and key to test data and sampler type.												
-15.71	102														
	103														
-17.71	104														
	105														
-19.71	106														
	107														
-21.71	108														
	109														
-23.71	110														
	111														
-25.71	112														
	113														
-27.71	114														
	115														



Department of Transportation  
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REPORT TITLE BORING RECORD				HOLE ID BTNB-R3
DIST. 4	COUNTY S.F.	ROUTE 101	POSTMILE 8.3/9.4	EA 163701
PROJECT OR BRIDGE NAME Doyle Drive Replacement Project				
BRIDGE NUMBER 34-0161R	PREPARED BY T. Carroll	DATE 7-15-09	SHEET 4 of 4	