

LOGGED BY T. Carroll	BEGIN DATE 3-28-08	COMPLETION DATE 4-3-08	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2120459.851 / E5994825.735 (NAD83)	HOLE ID BTNB-R7-PZ-D
DRILLING CONTRACTOR Gregg Drilling and Testing, Inc.		BOREHOLE LOCATION (Offset, Station, Line) Offset 188ft R Sta 78+17 NB Alignment		SURFACE ELEVATION 79.353 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) SPT (1.4"), HQ-Core		SPT HAMMER TYPE Automatic, 140 lbs., 30-inch drop		HAMMER EFFICIENCY, ERI 72.9%
BOREHOLE BACKFILL AND COMPLETION 2" standpipe Piezo from 50' to 70'		GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) READINGS		TOTAL DEPTH OF BORING 113 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
77.35	0		GRAVEL with SAND (GP), dark gray and brown, moist, gravel is angular, sand is fine. [BASEROCK]												
	1		Poorly graded SAND (SP), poorly compacted, dark yellowish brown, moist, fine. [FILL]												
75.35	2			S1	3	7	50								
	3				3										
	4				4										
73.35	5														
	6		SILTY SAND (SM), poorly compacted, dark brown, wet, fine to very fine.												
71.35	7			S2	0	3	89								
	8		SILT (ML), soft, dark brown, wet, trace fine SAND, with crushable iron-oxide nodules. [BURIED SOIL HORIZON]												
	9				1										
	10				2										
69.35	11														
	12		SILT with SAND (ML), medium stiff, yellowish brown, moist, SAND is fine, with pockets of dark brown iron-oxide staining up to 1/4" diameter. [COLMA FORMATION]												
	13		12.0', black vertical seam of organic filling.	S3	9	33	89								
	14				14					16.8	115.1	UU = 0.87			
	15				19										
67.35	16														
	17		SILTY SAND (SM), loose to medium dense, yellowish brown to reddish brown, moist, with crushable iron-oxide nodules, fine. [COLMA SAND]												
65.35	18			S4	7	18	83								
	19				7										
	20				11										
63.35	21		Poorly graded SAND with SILT (SM), dense, dark yellowish to reddish brown, moist, fine.												
	22														
61.35	23			S5	7	33	100								
	24				13										
	25				20										

Drilling slowed at 10.5'
Clay in cuttings

(continued)

CALTRANS FORMAT DOYLEDRIVE ARUPLOGS 11-2-08.GPJ ARUP LIBRARY CALTRANS FORMAT.GLB 11/3/08



Department of Transportation
Division of Engineering Services
Geotechnical Services

REPORT TITLE BORING RECORD				HOLE ID BTNB-R7-PZ-D	
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 11-3-08	SHEET 1 of 4

Figure

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
53.35	25		Poorly graded SAND with SILT (SM), dense, dark yellowish to reddish brown, moist, fine.												
51.35	28		Grades yellowish brown, with iron-oxide mottling, with black nodules (up to 1/8" diameter).	S6	10 12 13	25	100								
49.35	30														
47.35	32														
45.35	33		Grades without iron-oxide staining.	S7	10 16 20	36	94								
43.35	34														
41.35	37		37.0', harder drilling.												
41.35	38		Grades very dense, with iron-oxide mottling.	S8	14 26 27	53	94								
39.35	39														
37.35	41		METAMORPHIC ROCK (Greenstone), dark greenish gray, intensely fractured, moderately hard, moderately weathered, iron-manganese rich mineral composition, internally foliated with elongated crystals, iron-oxide staining throughout, prominent healed fractures filled with white mineral dipping 68°.	C9				33	0						
35.35	42														
35.35	43														
33.35	44		~44.5', soft, moderately weathered, with moderately soft zones.	C10				75	N/A						
33.35	45		45.1' - 45.2' and 45.3' - 45.5', soft, 0.1' to 0.2' thick intensely sheared zones, locally very intensely weathered, thin mineral filled fractures in soft zones, predominantly sub-horizontal	C11				100	0						
31.35	46		very soft zones with intersecting 45° fractures, manganese-oxide coating on fracture planes.	C12				50	0						
31.35	47		47.0', abrupt color change to purplish brown, moderately soft, moderately strong, moderately to slightly weathered. Orthogonal filled fractures up to 45° dip.	C13				91	0						
29.35	48		47.5', greenish gray, core broken into fragments ranging from 0.05' to 0.2'.												
29.35	49		48.5', intensely fractured.												
29.35	50		Crushed zones at 49.0', 49.3', and 49.8'. Common manganese-oxide coating on fracture planes.												
27.35	51		50.2', very intensely fractured (clayey), intensely sheared, moderately weathered.												
27.35	52		51.25', intensely fractured, moderately hard, slightly weathered, orthogonal fracture planes.	C14				74	29						
25.35	53														
25.35	54		53.0', sub-horizontal and dipping 30° fractures.	C15				67	0						
	55			C16				100	N/A						

(continued)

Hole is steadily taking water

CALTRANS FORMAT DOYLEDRIVE_ARUPLOGS_11-2-08.GPJ ARUP LIBRARY CALTRANS FORMAT.GLB 11/3/08



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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 11-3-08	SHEET 2 of 4

Figure

CALTRANS FORMAT DOYLEDRIVE ARUPLOGS 11-2-08.GPJ ARUP LIBRARY CALTRANS FORMAT.GLB 11/3/08

ELEVATION (ft)	DEPTH (ft)	Material Graphics	Description	Sample Location	Sample Number	Blows per 6 In	Blows per Foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
55			54.5', moderately fractured, very soft to soft, intensely to moderately weathered.												
23.35	56		METAMORPHIC ROCK (Greenstone), dark greenish gray, intensely fractured, moderately hard, moderately weathered, iron-manganese rich mineral composition, internally foliated with elongated crystals, iron-oxide staining throughout, prominent healed fractures filled with white mineral dipping 68°.		C17			0	N/A						
	57				C18			70	N/A						
21.35	58		55.6', 1/4" thick mylonized clayey fracture filling.		C19			80	50						
	59		55.8', internally crushed, very soft, intensely to moderately weathered.												
19.35	60		57.3' - 57.5', intensely fractured zone.												
	61		58.0', internally fractured, soft to moderately soft, moderately weathered, iron-oxide staining on micro-fractures.												
	62		58.0', medium fractured, moderately hard, moderately strong, moderately weathered.		C20			89	31						
17.35	63		58.2', white precipitate on fracture face (calcite?), 1/16" thick precipitate filling on additional micro-fractures throughout.												
	64		59.7', intensely fractured, friable, very weak, severe to moderate weathering. Highly sheared zone.												
15.35	65		61.0', slightly fractured, moderately hard, slightly weathered, variably oriented fractures, commonly filled with tan to light brown (calcite?) filling. Fractures are commonly closed (intensely spaced internally), localized iron-oxide staining.		C21			88	N/A						
	66		62.0', intensely fractured, soft, locally internally sheared, moderately to slightly weathered, up to 1/4" thick tan to very light brown (calcite?) filling.												
13.35	67		62.1', serpentinized zone (0.2').												
	68		64.5', moderately weathered, locally intensely sheared/crushed.		C22			93	0						
11.35	69		67.0', slightly fractured, moderately hard.												
	70		69.0', variably oriented fractures, grades green, with anastomosing veins of (clear) gray mineral filling (translucent).		C23			42	0						
9.35	71		70.0', intensely fractured, localized iron-oxide staining, translucent vein fillings up to 0.08' thick, variably oriented (healed shear zones), commonly fractured.												
7.35	72														
	73														
5.35	74														
	75		74.5', slightly fractured (internally intensely sheared), serpentinitic, soft (locally plastic), moderately to slightly weathered, continued translucent vein filling.		C24			100	40						
3.35	76		76.0', moderately hard, slightly weathered, abundant closed fractures, abundant fine to medium sand-sized particles along fractures, ferro-magnesium minerals predominate, localized iron-oxide staining (minor).												
	77														
1.35	78		78.0', minor localized iron-oxide staining.		C25			50	10						
	79		78.4', horizontal contact.												
-0.65	80		78.9', intensely fractured, very soft, moderately weathered (internally crushed), predominantly comprised of talc. Remnant rock fabric with serpentinite appearance, highly sheared.												
	81														
-2.65	82														
	83		IGNEOUS ROCK (Gabbro), dark gray and bluish gray, moderately fractured (internally sheared and crushed), very soft to moderately hard, moderately to slightly weathered. Serpentinite appearance with platy mineral structure common.		C26			100	N/A						
-4.65	84														
	85				C27			80	N/A						

(continued)



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Figure

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-6.65	85		84.0', very intensely to intensely fractured, moderately soft, slightly weathered. Highly weathered (40° to 90°), intensely sheared planes/fractures. Locally phyllitic in appearance, secondary mineralization along micro-fractures, locally serpentinized appearance (chlorite?).		C28			80	N/A	14.8	140.3	UU = 0.29			
-8.65	86		84.2' - 84.4', approximately 40° dipping schistosity.												
	87		IGNEOUS ROCK (Gabbro), dark gray and bluish gray, moderately fractured (internally sheared and crushed), very soft to moderately hard, moderately to slightly weathered. Serpentinite appearance with platy mineral structure common.		C29			93	N/A						
-10.65	88		86.0', intensely fractured, intensely sheared with foliated appearance, alternating light green and dark gray. Green mineral (chlorite?) fibrous, perpendicular to veins. Locally crushed, friable, plastic. Primary orientation of foliation is vertical.												
	89		89.0', with irregular sub-horizontal surfaces.		C30			77	N/A						
-12.65	90		92.0', intensely to moderately fractured (internally sheared/crushed).												
	91														
-14.65	92														
	93														
-16.65	94														
	95		METAMORPHIC ROCK (SERPENTINITE), bluish gray, very slightly fractured, slightly weathered (internally highly sheared), with "platy" texture (tal?) on internal fracture planes.		C31			100	N/A						
-18.65	96														
	97														
-20.65	98														
	99		98.4', slightly weathered to fresh.		C32			100	89						
	100		99.0', dipping 70°.												
-22.65	101														
	102		Grades to shaley serpentinite, moderately fractured, soft to moderately hard, with soft intervals (up to 0.4' at 102.1'), slightly weathered to fresh.		C33			98	85						
-24.65	103		102.1', sub-horizontal fracture.												
	104														
-26.65	105		104.7', healed fractures with secondary mineral formation, vein fillings.												
	106														
-28.65	107		106.0', intensely fractured to crushed (internally sheared), slightly weathered to fresh, abundant chlorite? fracture and vein filling up to 1/8" wide (healed fractures).		C34			65	23						
	108		106.9', moderately fractured, moderately hard, fresh.												
	109		106.9' and 107.25', dipping 40°.												
	110		106.9' to 107.8', gabbroic.												
-30.65	111		107.8', intensely fractured (internally sheared), soft, slightly weathered.												
	112														
-32.65	113		110.0', very slightly fractured (very intensely micro-fractured), fresh (much of core has appearance of highly sheared shale with secondary (chlorite?) mineral formation along weak zones).		C35			100	N/A						
-34.65	114														
	115														

Additional Notes:

1. Oriented rock coring performed.
 Department of Transportation
 On 4/2/2008, downhole geophysical (susension) logging performed by GEOVISION, Inc. Acoustic televiewer performed on 2/20/08. Field Services performed on 4/2/2008.

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Figure