

APPENDIX D GEOTECHNICAL INVESTIGATION

D-1

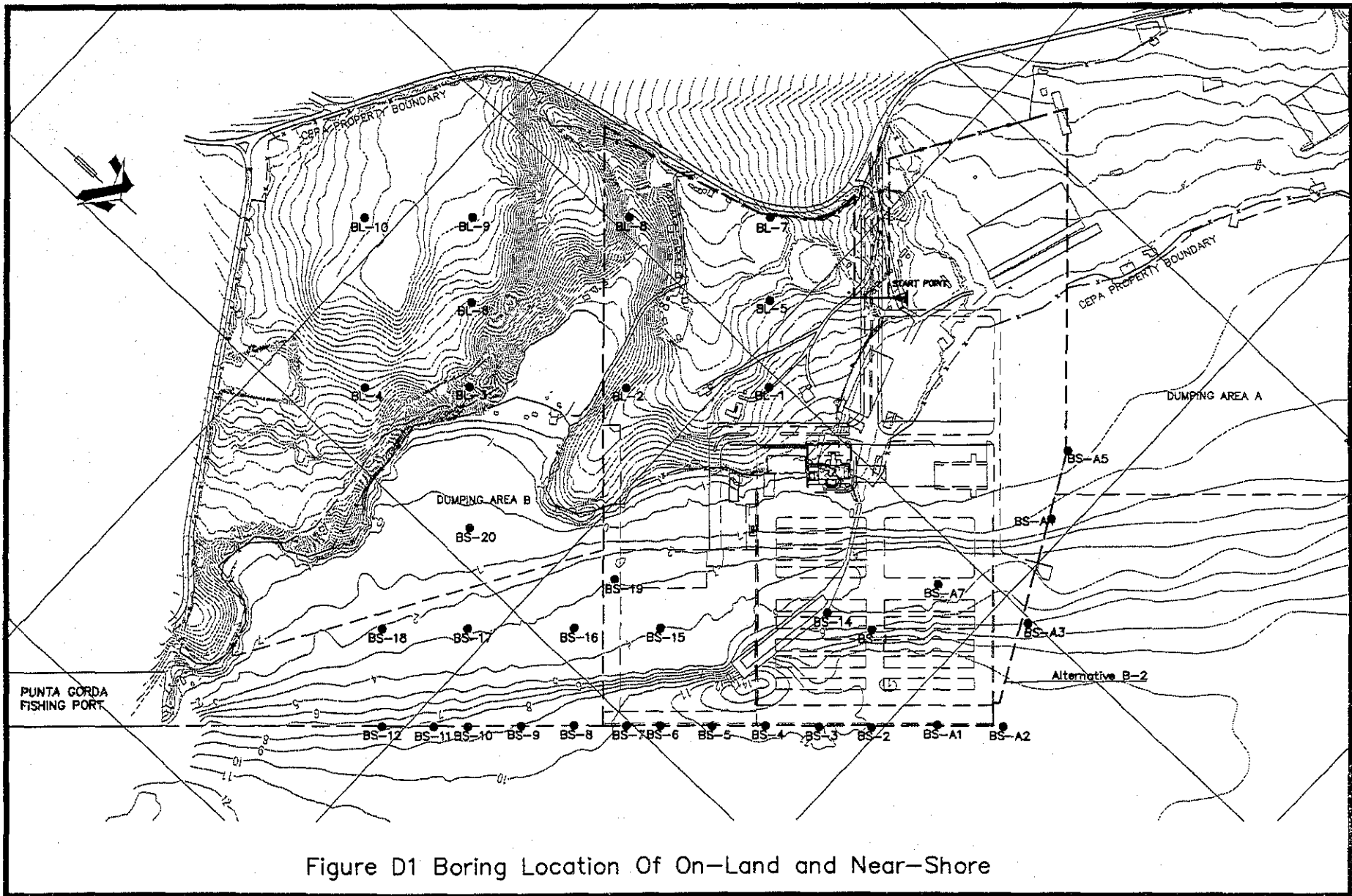


Figure D1 Boring Location Of On-Land and Near-Shore

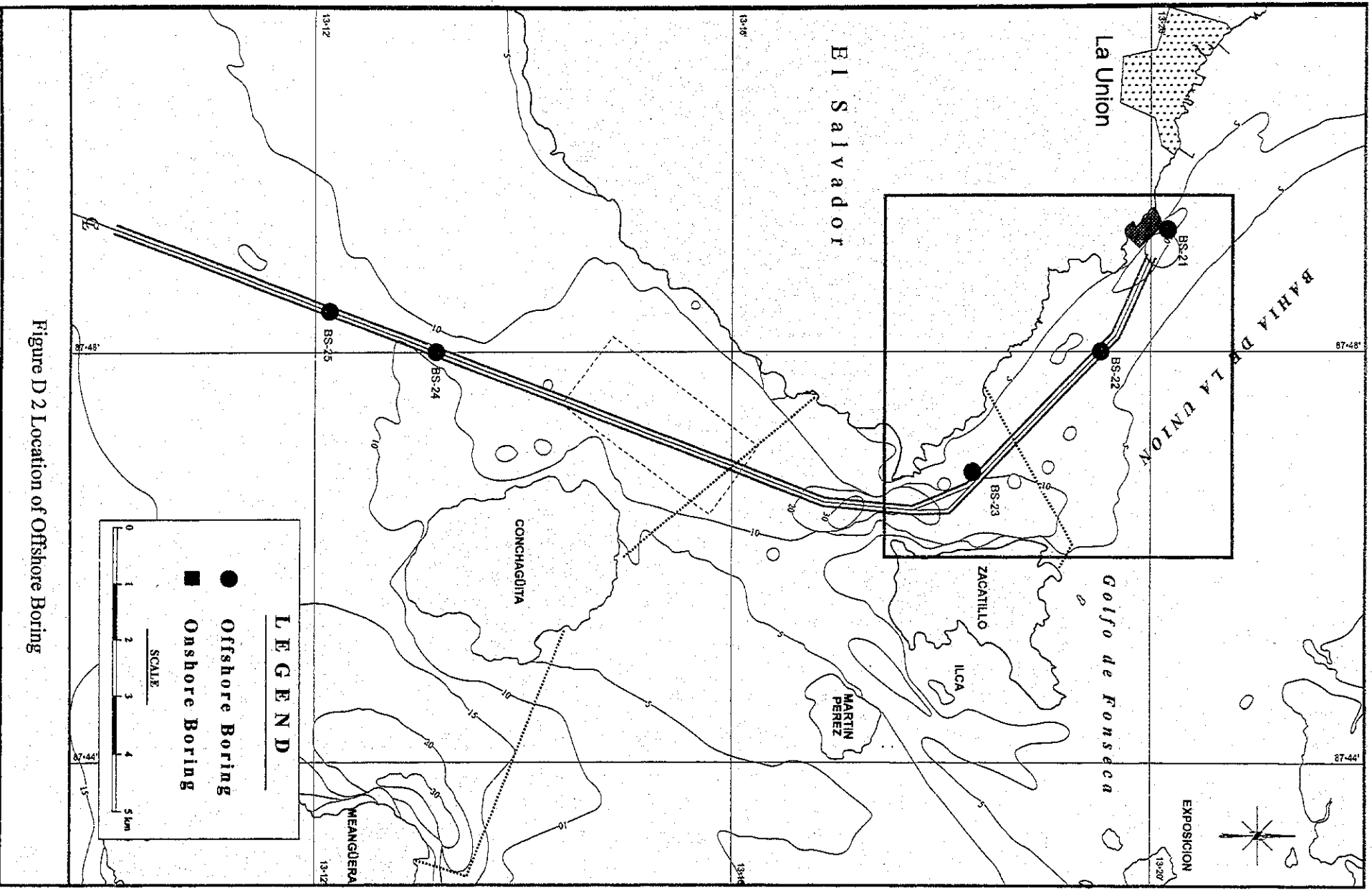


Figure D 2 Location of Offshore Boring

Table D.1 Coordinates of Boring Location

Borehole No.	CDL (m)	Geographic		WGS 84 System		NAD 27 System	
		Latitude	Longitude	Northing	Westing	Northing	Westing
BS-1	-6.92	246392	627666	13° 20' 5.0"	87° 49' 17.8"	13° 20' 1.7"	87° 49' 17.8"
BS-2	-10.52	246487	627767	13° 20' 8.1"	87° 49' 14.5"	13° 20' 4.8"	87° 49' 14.4"
BS-3	-11.27	246432	627818	13° 20' 6.3"	87° 49' 12.8"	13° 20' 3.0"	87° 49' 12.7"
BS-4	-11.02	246375	627870	13° 20' 4.4"	87° 49' 11.1"	13° 20' 1.1"	87° 49' 11.0"
BS-5	-10.92	246320	627923	13° 20' 2.6"	87° 49' 9.3"	13° 19' 59.3"	87° 49' 9.2"
BS-6	-11.22	246265	627963	13° 20' 0.8"	87° 49' 8.0"	13° 19' 57.5"	87° 49' 7.9"
BS-7	-10.82	246230	628007	13° 19' 59.7"	87° 49' 6.5"	13° 19' 56.4"	87° 49' 6.5"
BS-8	-10.17	246175	628058	13° 19' 57.9"	87° 49' 4.8"	13° 19' 54.6"	87° 49' 4.8"
BS-9	-10.17	246120	628110	13° 19' 56.1"	87° 49' 3.1"	13° 19' 52.8"	87° 49' 3.1"
BS-10	-9.87	246065	628163	13° 19' 54.3"	87° 49' 1.4"	13° 19' 51.0"	87° 49' 1.3"
BS-11	-8.17	246030	628197	13° 19' 53.1"	87° 49' 0.2"	13° 19' 49.8"	87° 49' 0.2"
BS-12	-7.32	245975	628247	13° 19' 51.3"	87° 48' 58.6"	13° 19' 48.0"	87° 49' 58.5"
BS-14	-5.74	246309	627759	13° 20' 2.3"	87° 49' 14.8"	13° 19' 59.0"	87° 49' 14.7"
BS-15	-4.72	246170	627872	13° 19' 57.7"	87° 49' 11.0"	13° 19' 54.4"	87° 49' 11.0"
BS-16	-4.67	246080	627957	13° 19' 54.8"	87° 49' 8.2"	13° 19' 51.5"	87° 49' 8.1"
BS-17	-4.67	245969	628062	13° 19' 51.2"	87° 49' 4.7"	13° 19' 47.9"	87° 49' 4.7"
BS-18	-7.02	245880	628146	13° 19' 48.3"	87° 49' 2.0"	13° 19' 45.0"	87° 49' 1.9"
BS-19	-4.47	246075	627867	13° 19' 54.7"	87° 49' 11.2"	13° 19' 51.3"	87° 49' 11.1"
BS-20	-3.57	245873	627957	13° 19' 48.1"	87° 49' 8.2"	13° 19' 44.8"	87° 49' 8.2"
BS-21	-13.22	246471	628194	13° 20' 7.5"	87° 49' 0.3"	13° 20' 4.2"	87° 49' 0.2"
BS-22	-11.52	244948	630277	13° 19' 17.6"	87° 47' 51.3"	13° 19' 14.3"	87° 47' 51.2"
BS-23	-12.32	243276	631950	13° 18' 22.9"	87° 46' 56.0"	13° 18' 19.6"	87° 46' 55.9"
BS-24	-11.67	234904	630607	13° 13' 50.7"	87° 47' 42.0"	13° 13' 47.4"	87° 47' 42.0"
BS-25	-12.07	230223	628656	13° 11' 18.7"	87° 48' 47.6"	13° 11' 15.4"	87° 48' 47.5"
BS-A1	-11.00	246554	627700	13° 20' 10.3"	87° 49' 16.7"	13° 20' 7.0"	87° 49' 16.6"
BS-A2	-11.27	246624	627637	13° 20' 12.6"	87° 49' 18.8"	13° 20' 9.2"	87° 49' 18.7"
BS-A3	-10.20	246548	627506	13° 20' 10.1"	87° 49' 23.1"	13° 20' 6.8"	87° 49' 23.1"
BS-A4	-5.70	246471	627375	13° 20' 7.6"	87° 49' 27.5"	13° 20' 4.3"	87° 49' 27.4"
BS-A5	-4.00	246421	627288	13° 20' 6.0"	87° 49' 30.4"	13° 20' 2.7"	87° 49' 30.3"
BS-A6	-2.20	246345	627206	13° 20' 3.5"	87° 49' 33.1"	13° 20' 0.2"	87° 49' 33.1"
BS-A7	-9.20	246417	627554	13° 20' 5.8"	87° 49' 21.5"	13° 20' 2.5"	87° 49' 21.5"
BL-1	13.41	246048	627517	13° 19' 53.8"	87° 49' 22.8"	13° 19' 50.5"	87° 49' 22.8"
BL-2	13.52	245900	627658	13° 19' 49.0"	87° 49' 18.2"	13° 19' 45.7"	87° 49' 18.1"
BL-3	27.26	245735	627811	13° 19' 43.6"	87° 49' 13.1"	13° 19' 40.3"	87° 49' 13.1"
BL-4	32.20	245627	627915	13° 19' 40.1"	87° 49' 9.7"	13° 19' 36.8"	87° 49' 9.6"
BL-5	19.38	245965	627428	13° 19' 51.1"	87° 49' 25.8"	13° 19' 47.8"	87° 49' 25.7"
BL-6	36.47	245655	627723	13° 19' 41.0"	87° 49' 16.1"	13° 19' 37.7"	87° 49' 16.0"
BL-7	19.90	245883	627341	13° 19' 48.5"	87° 49' 28.7"	13° 19' 45.2"	87° 49' 28.7"
BL-8	17.92	245736	627479	13° 19' 43.7"	87° 49' 24.2"	13° 19' 40.4"	87° 49' 24.1"
BL-9	46.33	245572	627633	13° 19' 38.3"	87° 49' 19.1"	13° 19' 35.0"	87° 49' 19.0"
BL-10	44.49	245460	627740	13° 19' 34.7"	87° 49' 15.5"	13° 19' 31.3"	87° 49' 15.5"

Note: CDL=Chart Datum Level.

Table D.2 Summary of Unconfined Compressive Strength Together with Index Properties

Layer	Borehole No.	Depth (m)		Unit weight kN/m ³	MC %	Atterberg Limit			UC q _u kN/m ²	Remarks
						LL %	PL %	IL		
1	BS-1	1.30	- 2.00	12.9	164.5	129.4	65.4	1.5	1.4	
1	BS-1	5.30	- 6.00	14.4	103.8	74.3	46.0	2.0	5.0	
1	BS-4	7.30	- 8.00	13.5	114.5	101.8	57.4	1.3	7.0	
2	BS-4	9.30	- 10.00	16.9	38.5	38.3	16.9	1.0	44.6	
1	BS-5	4.00	- 4.70	14.8	89.8	82.4	45.9	1.2	4.2	
1	BS-5	6.00	- 6.70	12.5	172.3	128.0	69.1	1.8	1.3	
1	BS-5	8.00	- 8.70	19.5	86.8	126.8	77.7	0.2	1.2	
1	BS-6	3.00	- 3.90	15.9	75.0	123.3	66.4	0.2	4.5	
1	BS-7	9.30	- 10.00	11.6	102.4	51.0	37.7	4.9	5.1	
1	BS-8	2.00	- 2.70	13.4	134.3				11.2	
1	BS-8	4.00	- 4.70	13.7	122.9	110.5	62.8	1.3	16.9	
1	BS-8	6.00	- 6.90	12.1	166.5				4.4	
1	BS-8	8.00	- 8.70	11.8	197.0				19.9	
1	BS-9	5.30	- 6.00	12.1	131.5	112.7	69.5	1.4	9.6	
1	BS-10	1.30	- 2.00	13.0	115.4	79.9	47.0	2.1	5.4	
1	BS-10	3.30	- 4.00	14.0	113.5	99.3	64.1	1.4	9.4	
1	BS-10	5.30	- 6.00	13.9	121.0	104.1	65.0	1.4	13.8	
1	BS-10	7.30	- 8.00	13.7	122.0	115.2	69.0	1.1	11.8	
1	BS-10	9.00	- 9.70	12.4	173.0	112.4	68.9	2.4	28.7	
1	BS-11	3.30	- 4.00	13.5	128.0	118.6	60.1	1.2	5.8	
1	BS-11	7.30	- 8.00	14.2	108.4	119.4	68.1	0.8	15.9	
1	BS-12	2.65	- 3.35	14.0	121.5	85.0	49.5	2.0	2.6	
2	BS-12	5.00	- 5.40	18.5	38.2	50.5	34.2	0.2	59.8	
1	BS-14	9.30	- 10.00	12.7	202.1	243.3	153.8	0.5	14.6	
1	BS-15	1.30	- 2.00	12.8	93.3	109.0	58.8	0.7	2.8	
1	BS-16	1.30	- 2.00	13.2	145.7	135.5	66.3	1.1	0.9	
1	BS-17	5.30	- 6.00	13.5	135.0	111.9	63.3	1.5	7.0	
1	BS-17	16.00	- 16.70	13.1	95.2	116.1	71.3	0.5	10.0	
1	BS-18	11.50	- 12.30	12.3	147.8	146.2	24.1	1.0	32.5	
1	BS-20	7.45	- 8.15	17.8	43.8	26.0	22.1	5.6	13.1	
1	BS-21	3.00	- 3.70	13.6	125.0	116.7	58.3	1.1	15.4	
1	BS-21	7.00	- 7.70	14.2	100.3	81.0	46.6	1.6	26.2	
1	Minimum			11.6	38.2	26.0	16.9	0.2	0.9	
1	Maximum			19.5	202.1	243.3	153.8	5.6	32.5	
1	Average			13.9	119.7	105.1	58.8	1.5	10.3	

Note: MC=Moisture Content, LL=Liquid Limit, PL=Plastic Limit, IL=Liquid Index(IL= (MC-PL)/(LL-PL)), UC=Unconfined compression strength

of Cohesive soil.

1kgf/m³=10kN/m³, 1kgf/cm²=100kN/m².

Table D.3 Summary of One-Dimensional Consolidation Test Results


Layer	Borehole No.	Depth (m)			Void ratio		Cc	Coefficient of consolidation Cv (cm ² /min)						Coefficient of volume compression mv (m ² /kN)				
					initial	final		at each average pressure stage						at each average pressure stage				
					e _o	e		1st LS	2nd LS	3rd LS	4th LS	5th LS	6th LS	1st LS	2nd LS	3rd LS	4th LS	5th LS
1	BS-1	1.30	-	2.00	4.57	1.18	1.18	0.0035	0.0043	0.0047	0.0068	0.0102	0.0126	2.50E-03	1.02E-03	4.24E-04	1.74E-04	6.79E-05
1	BS-4	9.30	-	10.00	1.16	0.88	0.33	0.8040	0.7830	0.7640	0.7380	0.7000	0.6450	2.58E-04	1.83E-04	1.32E-04	9.90E-05	7.50E-05
1	BS-5	6.00	-	6.70	4.55	1.19	1.09	0.0044	0.0042	0.0045	0.0055	0.0066	0.0131	2.04E-03	9.60E-04	4.40E-04	1.90E-04	6.80E-05
1	BS-7	9.30	-	10.00	2.80	1.37	0.78	0.0730	0.0650	0.1000	0.0870	0.0990	0.1650	1.12E-03	7.04E-04	4.00E-04	2.10E-04	1.07E-04
1	BS-8	2.00	-	2.70	3.72	1.31	0.99	0.0099	0.0072	0.0085	0.0094	0.0154	0.0219	1.96E-03	1.00E-03	4.67E-04	1.69E-04	7.12E-05
1	BS-8	4.00	-	4.70	3.25	1.18	1.13	0.0210	0.0150	0.0120	0.0140	0.0170	0.0180	1.75E-03	1.22E-03	5.85E-04	2.51E-04	1.10E-04
1	BS-8	6.00	-	6.90	4.54	1.83	1.54	0.0180	0.0150	0.0120	0.0100	0.0100	0.0100	1.52E-03	1.06E-03	6.00E-04	2.90E-04	1.27E-04
1	BS-8	8.00	-	8.70	5.55	3.30	1.11	0.1260	0.0460	0.0290	0.1190	0.2130	0.1840	1.35E-03	8.60E-04	2.20E-04	1.66E-04	8.50E-05
1	BS-9	5.30	-	6.00	3.34	1.83	0.75	0.0880	0.0110	0.0320	0.0840	0.1450	0.1780	1.80E-03	6.60E-04	2.20E-04	1.79E-04	6.97E-05
1	BS-10	1.30	-	2.00	3.31	1.68	0.66	0.0270	0.0090	0.0400	0.0640	0.0570	0.3050	2.27E-03	3.77E-04	2.18E-04	1.51E-04	6.08E-05
1	BS-10	3.30	-	4.00	3.28	1.19	1.11	0.0210	0.0120	0.0100	0.0120	0.0130	0.0180	2.20E-03	1.23E-03	5.38E-04	2.28E-04	9.83E-05
1	BS-10	5.30	-	6.00	3.31	1.86	0.75	0.0400	0.0160	0.0350	0.0580	0.0850	0.1050	1.82E-03	6.02E-04	2.33E-04	1.69E-04	7.72E-05
1	BS-10	7.30	-	8.00	3.49	1.73	0.94	0.0350	0.0190	0.0110	0.0490	0.0360	0.0500	1.82E-03	1.25E-03	2.56E-04	1.68E-04	9.33E-05
1	BS-10	9.00	-	9.70	3.57	1.37	1.46	0.1290	0.0840	0.0150	0.0120	0.0120	0.0070	1.33E-03	1.52E-03	7.46E-04	2.90E-04	1.19E-04
1	BS-11	7.30	-	8.00	2.89	1.19	1.20	0.0640	0.0330	0.0200	0.0130	0.0110	0.0100	1.01E-03	9.17E-04	6.37E-04	3.06E-04	1.51E-04
1	BS-12	2.65	-	3.25	3.38	0.93	1.05	0.0150	0.0090	0.0290	0.0240	0.0140	0.0190	2.44E-03	9.52E-04	5.21E-04	2.24E-04	1.16E-04
2	BS-12	5.00	-	5.40	1.20	0.95	0.20	0.3910	0.1890	0.1850	0.2810	0.3430	0.1620	2.53E-04	1.84E-04	1.18E-04	7.50E-05	4.72E-05
2	BS-12	6.00	-	6.70	2.94	1.71	0.66	0.1650	0.0670	0.0640	0.1870	0.1290	0.1340	9.62E-04	6.14E-04	1.97E-04	1.36E-04	8.38E-05
1	BS-15	1.30	-	2.00	4.46	2.48	0.70	0.0050	0.0450	0.0770	0.0530	0.1320	0.1180	3.53E-04	2.68E-04	2.38E-04	1.25E-04	5.74E-05
1	BS-16	1.30	-	2.00	3.84	1.10	1.03	0.0070	0.0060	0.0070	0.0060	0.0090	0.0090	2.22E-03	9.62E-04	4.20E-04	1.84E-04	8.00E-05
1	BS-17	5.00	-	5.70	3.55	1.24	1.14	0.0190	0.0040	0.0080	0.0100	0.0100	0.0140	3.03E-03	1.06E-03	5.00E-04	2.10E-04	7.10E-05
1	BS-18	11.50	-	12.30	3.25	1.71	0.91	0.0630	0.0280	0.0140	0.0290	0.0360	0.0680	1.21E-03	1.25E-03	4.13E-04	1.76E-04	8.10E-05
1	BS-20	7.45	-	8.15	1.72	1.24	0.40	0.6000	0.4430	0.9640	0.9160	1.2150	1.1110	4.79E-04	2.75E-04	1.78E-04	1.15E-04	7.20E-05
1	Minimum				1.16	0.88	0.20	0.0035	0.0040	0.0045	0.0055	0.0066	0.0070	2.53E-04	1.83E-04	1.18E-04	7.50E-05	4.72E-05
1	Maximum				5.55	3.30	1.54	0.8040	0.7830	0.9640	0.9160	1.2150	1.1110	3.03E-03	1.52E-03	7.46E-04	3.06E-04	1.51E-04
1	Average				3.24	1.44	0.88	0.1137	0.0798	0.1019	0.1162	0.1383	0.1407	1.49E-03	7.97E-04	3.63E-04	1.79E-04	8.29E-05

Note: LS=Load Stage.

LOG OF BORING

BOREHOLE: BS-1
sheet 1/2

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13° 20' 5" - 87° 49' 17.8"	DRILLER: SWISSBORING
DEPTH 17.00 m	BOTTOM SEA LEVEL: -6.92 Chart Datum Level	DATE (START - FINISH): 27-28/10/01

SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 SET 15 cm 2 SET 30 cm 3 SET 45 cm N VALUE RECOVERED cm		GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd.	LOGGED BY: RODOLFO ALVARADO
ROCK CORE CORE SIZE RUN NUMBER RUN LENGTH IN cm RECOVERY cm % RECOVERY RQD cm % RQD			INSPECTOR Dr. PUCAI YANG

							DESCRIPTION		SPT TEST					RQD						
									10	20	30	40	50	>5C	N	20	40	60	80	100
SPT	1	1			1	45	-7.92	1	Silty clay - clay, greenish gray, very soft consistency, high water content, high plasticity, moderate dry strength, contains traces of fine sand and shells fragments						1					
							-8.92	2	Shelby tube sample 1											
SPT	2	1			1	45	-9.92	3	Idem material						1					
SPT	3	1			1	45	-10.92	4							1					
SPT	4	1			1	45	-11.92	5							1					
SPT	5	1			1	45	-12.92	6							1					
SPT	6	1	1	1	2	45	-13.92	7	Idem material, moderate water content.						2					
SPT	7	1	3	4	7	45	-14.92	8	8.00 m						7					
SPT	8	9	15	21	36	45	-15.92	9	Sandy gravel, gray to dark, moderate water content, moderate dry strength, low plasticity, exhibits blocks up to 10mm in length, hard consistency.						36					
SPT	9	15	24	32	>50	45	-16.92	10							>50					

LOG OF BORING

BOREHOLE: BS-2
sheet 1/2

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13° 20' 8.1" - 87° 48' 14.5"	DRILLER: Swissboring
DEPTH: 16.00 m	BOTTOM SEA LEVEL: -10.52 chart datum level	DATE (START - FINISH): 20-21/11/01

SOIL SAMPLING						
SAMPLE TYPE	SAMPLE NUMBER	1 SET	2 SET	3 SET	N VALUE	RECOVERED cm
		15 cm	30 cm	45 cm		

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR

swissboring
Swissboring Overseas Corporation Ltd.

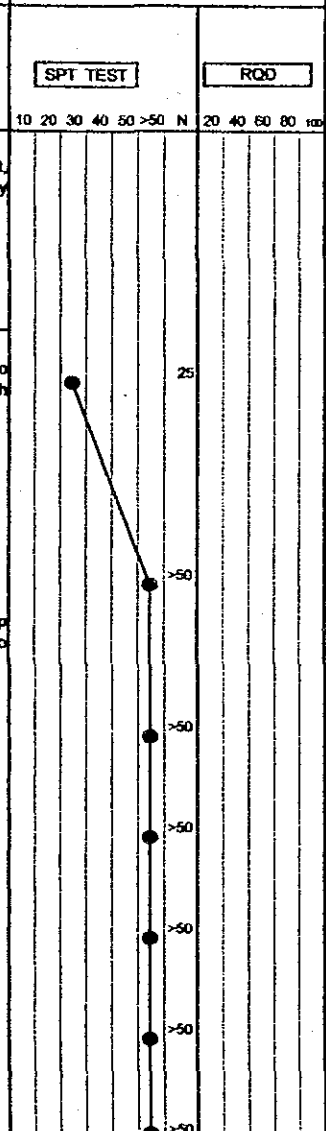
LOGGED BY: **Rodolfo Alvarado**

INSPECTOR **Dr. Pucal Yang**

ROCK CORE


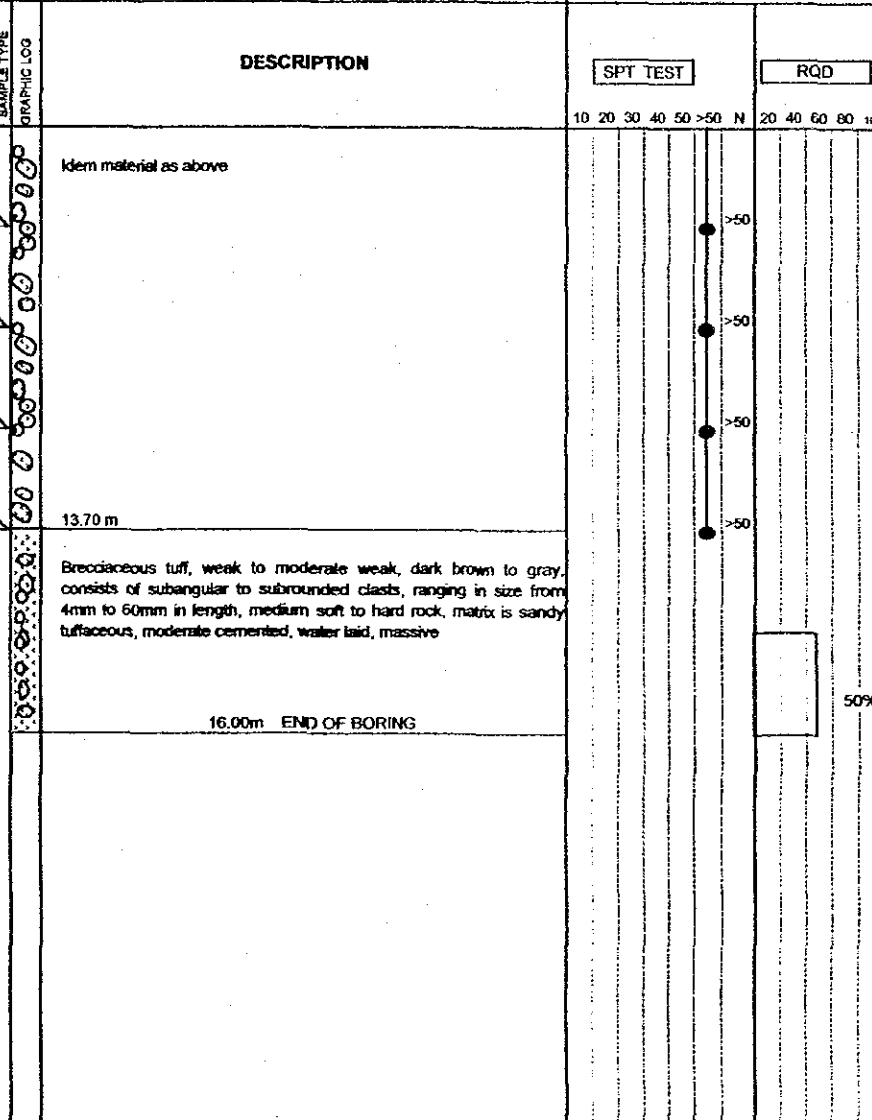
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD
HQ	1	130	130	100	0	0
SPT	1	6	10	15	25	20
HQ	2	85	85	100	0	0
SPT	2	19	25	38	61	15
HQ	3	155	155	100	0	0
SPT	3	5/50		>50	5	
HQ	4	95	95	100	0	0
SPT	4	10/50		>50	10	
HQ	5	95	95	100	0	0
SPT	5	15/50		>50	12	
HQ	6	90	45	50	0	0
SPT	6	14/50		>50	13	
HQ	7	86	30	35	0	0
SPT	7	10/50		>50	10	

CDL m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	DESCRIPTION
-11.52	1			Clay, dark gray-brown, very soft consistency, high water content, moderate to high plasticity, moderate dry strength with traces of silty sand, contains few shell fragments
-12.52	2	Shelby #1.		2.00 m
-13.52	3			From 2.0 to 4.5 m Gravel, weak, consists of abundant subrounded volcanic blocks up to 50mm in length, contains fine to coarse sand, and clayey silt, high water content, low plasticity, low dry strength
-14.52	4			From 4.5 to 13.70 m
-15.52	5			Gravel, weak, consists of abundant basaltic and andesitic blocks up to 200mm in length, hard rock, contains silt and sand, moderate to high water content, low plasticity to non plastic
-16.52	6			
-17.52	7			
-18.52	8			
-19.52	9			
-20.52	10			



LOG OF BORING

BOREHOLE: BS-2
sheet 2/2

CLIENT: NIPPON KOEI Ltd		SOIL INVESTIGATION OFF SHORE				DRILL RIG: LY-34	
COUNTRY: EL SALVADOR		COORDINATES: 13° 20' 8.1" - 87° 49' 14.5"				DRILLER: Swissboring	
DEPTH: 16.00 m		BOTTOM SEA LEVEL: -10.52 chart datum level				DATE (START - FINISH): 20-21/11/01	
SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 BET 15 cm 2 BET 30 cm 3 BET 45 cm N VALUE RECOVERED cm		GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd.				LOGGED BY: Rodolfo Alvarado	
ROCK CORE CORE SIZE RUN NUMBER RUN LENGTH IN RECOVERY cm % RECOVERY RQD cm % RQD						INSPECTOR: Dr. Pucal Yang	
		DESCRIPTION 16.00m END OF BORING				SPT TEST 10 20 30 40 50 >50 N	
						RQD 20 40 60 80 100	
HQ	8	95	30	32	0	0	
SPT	8	13/50			>50	10	
HQ	9	87	30	34	0	0	
SPT	9	10/50			>50	10	
HQ	10	100	50	50	0	0	
SPT	10	13/50			>50	10	
HQ	11	100	100	100	0	0	
SPT	11	10/50			>50	10	
HQ	12	50	50	100	0	0	
HQ	13	55	55	100	0	0	
HQ	14	100	100	100	50	50	
16.00m END OF BORING							

LOG OF BORING

BOREHOLE: BS-3
sheet 1/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°20' 6.3" - 87° 49' 12.8"	DRILLER: Swissboring
DEPTH: 23.20 m	BOTTOM SEA LEVEL: -11.27 Chart Datum Level	DATE (START - FINISH): 11-17/9/01

SOIL SAMPLING					
SAMPLE TYPE	SAMPLE NUMBER	15 cm	30 cm	45 cm	RECOVERED cm
1 SET					
2 SET					
3 SET					
N VALUE					

GEO TECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR

swissboring
Swissboring Overseas Corporation Ltd.

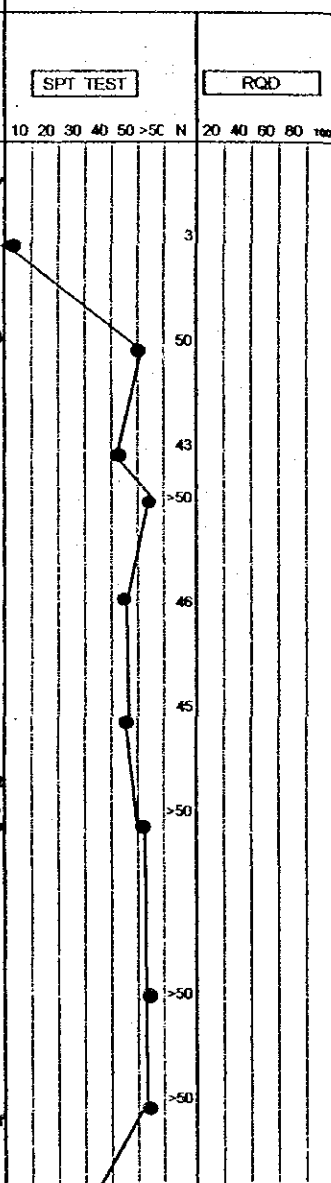
LOGGED BY:
Rodolfo Alvarado

INSPECTOR
Dr. Pucal Yang

ROCK CORE

CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD
HQ	1	55	0	0	0	0
SPT	1	1	1	2	3	45
HQ	2	55	0	0	0	0
SPT	2	11	22	28	50	35
HQ	3	55	0	0	0	0
SPT	3	12	17	26	43	35
SPT	4	25	12/50	>50	20	
HQ	4	55	0	0	0	0
SPT	5	15	22	24	46	20
HQ	5	55	0	0	0	0
SPT	6	13	18	27	45	20
HQ	6	55	0	0	0	0
SPT	7	20	27	35	>50	20
HQ	7	55	0	0	0	0
HQ	7	55	0	0	0	0
HQ	8	120	0	0	0	0
SPT	8	15	25	32	>50	20
HQ	9	55	0	0	0	0
SPT	9	30	39	47	>50	15
HQ	10	75	60	80	0	0


CDL m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	DESCRIPTION
-12.27	1			Clayey silt, with traces of fine-grained sand, greenish gray, exhibits few shell debris, moderate plasticity, soft consistency.
	1.00 m			
-13.27	2			From 1.0 to 6.0 m Coarse to medium-grained sand, with traces of silt, gray, exhibits small to medium, pumiceous gravel, very dense.
-14.27	3			Idem material, exhibits abundant shell debris, dense sand.
-15.27	4			
-16.27	5			
-17.27	6			Idem material, exhibits abundant shell debris, dense sand.
-18.27	7			From 6.0 to 9.25 m Gravel, weak, consists of abundant angular to subangular basaltic and andesitic blocks ranging in size from 6mm to 150mm in length, contains silt and sand, moderate to high water content, low plasticity to non plastic
-19.27	8			Gravel 0% to 80% Fines 20% to 100%
-20.27	9			From 9.25 to 14.0 m Medium to fine-grained sand with traces of silt, beige gray, traces of fine, pumiceous gravel, loose to medium dense.
-21.27	10			



LOG OF BORING

BOREHOLE: BS-3
sheet 2/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°20' 6.3" - 87° 49' 12.8"	DRILLER: Swissboring
DEPTH: 23.20 m	BOTTOM SEA LEVEL: -11.27 Chart Datum Level	DATE (START - FINISH): 11-17/9/01

SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 SET 15 cm 2 SET 30 cm 3 SET 45 cm N VALUE RECOVERED cm		GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd.	LOGGED BY: Rodolfo Alvarado INSPECTOR Dr. Pucal Yang
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ROCK CORE							DESCRIPTION		SPT TEST		RQD											
CORE SIZE	RUN NUMBER	RUN LENGTH (N cm)	RECOVERY cm	% RECOVERY	RQD cm	% RQD	COL m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	10	20	30	40	50	>50	N	20	40	60	80	100
HQ	11	100	70	70	0	0	-22.27	11														
SPT	10	4	6	10	16	35																
HQ	12	55	55	100	0	0	-23.27	12														
SPT	11	6	8	15	23	40																
HQ	13	55	55	100	0	0	-24.27	13														
SPT	12	18	26	33	>50	33																
HQ	14	55	55	100	0	0	-25.27	14														
SPT	13	22	33	45	>50	40																
HQ	15	55	55	100	0	0	-26.27	15														
SPT	14	18	31	39	>50	20																
SPT	15	30	13	49	>50	15																
HQ	16	55	40	73	0	0	-27.27	16														
HQ	17	55	8	15	0	0	-28.27	17														
HQ	18	55	27	49	0	0	-29.27	18														
SPT	16	20	35	40	>50	45																
HQ	19	55	15	27	0	0	-30.27	19														
SPT	17	27	36	49	>50	30																
HQ	20	55	18	33	0	0	-31.27	20														
SPT	18	31	40	48	>50	10																

LOG OF BORING

BOREHOLE: BS-4
sheet 1/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°20' 4.4" - 87° 49' 11.1"	DRILLER: Swissboring
DEPTH: 23.20 m	BOTTOM SEA LEVEL: -11.02 Chart Datum Level	DATE (START - FINISH): 10-11/10/01

SAMPLE TYPE	SAMPLE NUMBER	18 cm	30 cm	45 cm	N VALUE	RECOVERED cm
1 SET						
2 SET						
3 SET						

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR

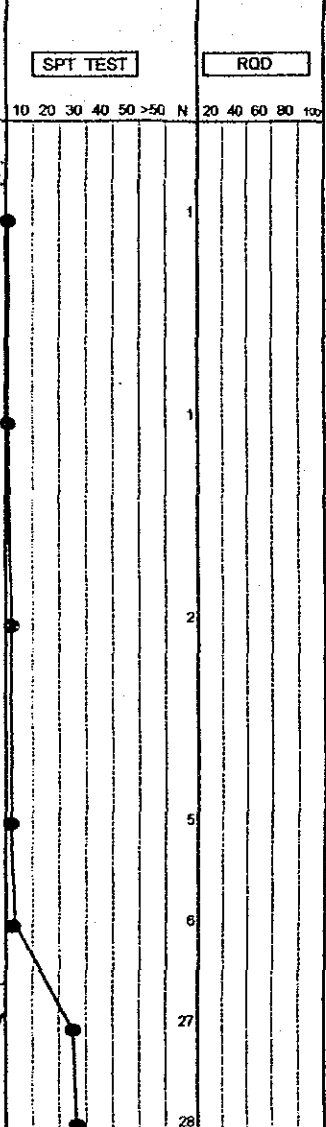
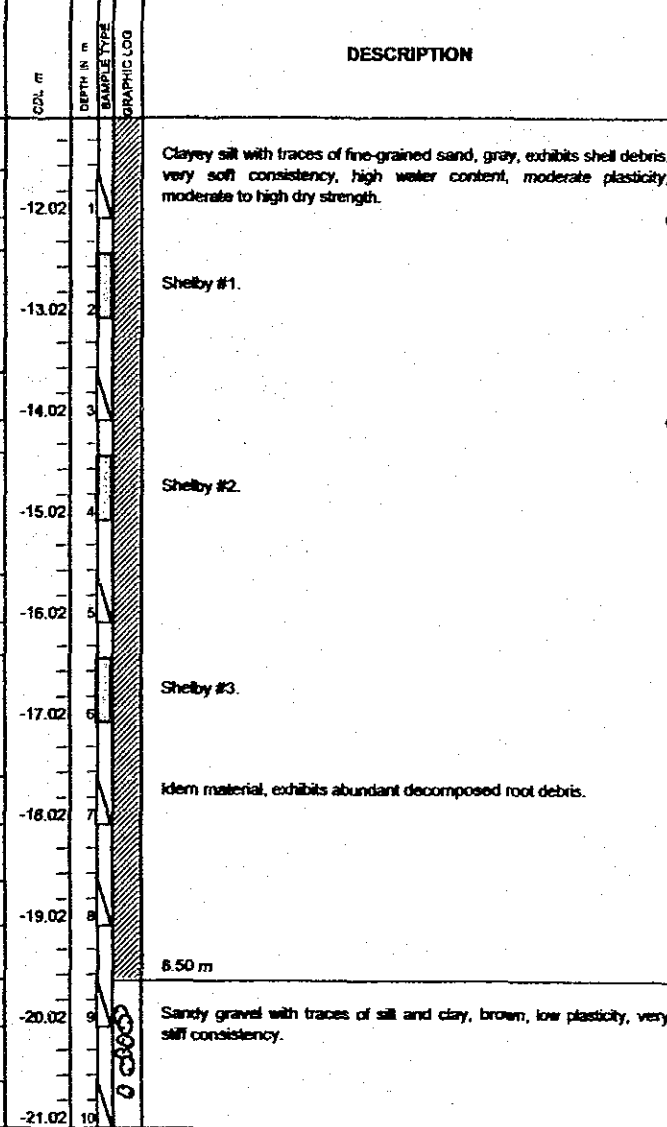
swissboring
Swissboring Overseas Corporation Ltd.

LOGGED BY:
Rodolfo Alvarado

INSPECTOR **Dr. Pucal Yang**

ROCK CORE


CONE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RQD cm	% RQD
HQ	1	55	0	0	0	0
SPT	1	1	0	0	1	45
HQ	2	30	0	0	0	0
HQ	3	55	0	0	0	0
SPT	2	1	0	1	1	45
HQ	4	30	0	0	0	0
HQ	5	55	0	0	0	0
SPT	3	1	1	1	2	45
HQ	6	30	0	0	0	0
HQ	7	55	0	0	0	0
SPT	4	2	2	3	5	45
HQ	8	55	0	0	0	0
SPT	5	1	2	4	6	45
HQ	9	55	0	0	0	0
SPT	6	7	11	16	27	45
HQ	10	55	0	0	0	0
SPT	7	2	11	17	28	45



LOG OF BORING

BOREHOLE: BS-4
Sheet 2/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°20' 4.4" - 87° 49' 11.1"	DRILLER: Swissboring
DEPTH: 23.20 m	BOTTOM SEA LEVEL: -11.02 Chart Datum Level	DATE (START-FINISH): 10-11/10/01


SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 SET 15 cm 2 SET 90 cm 3 SET 45 cm N VALUE RECOVERED cm		GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd.	LOGGED BY: Rodolfo Alvarado
			INSPECTOR Dr. Pucal Yang

ROCK CORE							CDL m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	DESCRIPTION	SPT TEST				RQD			
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RQD cm	% RQD						10	20	30	40	50	>50	N	20
HQ	11	55	0	0	0	0					Material as above								
SPT	8	8	12	17	29	45	-22.02	11											
HQ	12	55	0	0	0	0													
SPT	9	11	13	19	32	45	-23.02	12											
HQ	13	55	0	0	0	0													
SPT	10	14	17	21	38	45	-24.02	13			13.00 m								
HQ	14	55	0	0	0	0													
SPT	11	17	29	30	>50	45	-25.02	14			Gravel, dark brown, pumbeous, low plasticity, hard consistency.								
HQ	15	100	50	50	0	0	-26.02	15											
HQ	16	100	85	85	0	0	-27.02	16											
HQ	17	55	55	100	0	0													
SPT	12	16	28	47	>50	20	-28.02	17											
HQ	18	100	70	70	0	0	-29.02	18											
SPT	13	16	32	45	>50	20													
HQ	19	55	40	73	0	0	-30.02	19											
SPT	14	16	25	50	>50	20													
HQ	20	55	40	73	0	0	-31.02	20											

LOG OF BORING

BOREHOLE: BS-4
sheet 3/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°20' 4.4" - 87° 49' 11.1"	DRILLER: Swissboring
DEPTH: 23.20 m	BOTTOM SEA LEVEL: -11.02 Chart Datum Level	DATE (START - FINISH): 10-11/10/01

SOIL SAMPLING SAMPLE TYPE: 1 BET 15 cm, 2 BET 30 cm, 3 BET 45 cm, N VALUE, RECOVERED cm		GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd.	LOGGED BY: Rodolfo Alvarado
			INSPECTOR: Dr. Pucal Yang

ROCK CORE							DESCRIPTION		SPT TEST					RQD									
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RQD cm	% RQD	CDL m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	10	20	30	40	50	>50	N	20	40	60	80	100	
SPT	15	16	22	45	>50	20																	
HQ	21	55	55	100	0	0	-32.02	21		21.2 m													
HQ	22	100	80	80	40	40	-33.02	22		Brachiaceous tuff, weak, light to dark brown-gray, consists of subangular andesitic and basaltic clasts, up to 100 mm, medium soft and medium hard rock, matrix is fine to medium grained, sandy tuffaceous, moderate water content, non plastic, poorly cemented, massive, water laid												40%	
HQ	23	120	90	75	40	33	-34.02	23		23.20m END OF BORING												33%	
								24															
								25															
								26															
								27															
								28															
								29															
								30															

LOG OF BORING

BOREHOLE: BS-5
sheet 2/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°20' 2.6" - 87° 49' 9.3"	DRILLER: Swissboring
DEPTH: 20.90 m	BOTTOM SEA LEVEL: -10.92 Chart Datum Level	DATE (START - FINISH): 21-24/11/01

SOIL SAMPLING						
SAMPLE TYPE	SAMPLE NUMBER	1 BET 15 cm	2 BET 30 cm	3 SET 45 cm	N VALUE	RECOVERED cm

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR



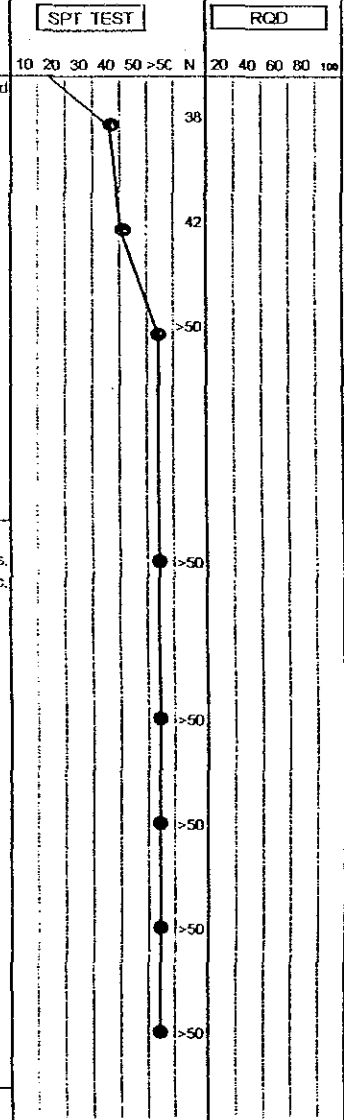
LOGGED BY:
Rodolfo Alvarado

INSPECTOR: Dr. Pucal Yang

ROCK CORE

CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD
SPT	10	9	17	21	38	45
HQ	9	55	0	0	0	0
SPT	11	11	19	23	42	45
HQ	10	55	0	0	0	0
SPT	12	17	22	36	>50	45
HQ	11	55	55	100	0	0
HQ	12	100	70	70	0	0
HQ	13	70	70	100	0	0
SPT	13	14/50		>50	10	
HQ	14	30	30	100	0	0
HQ	15	100	100	100	0	0
SPT	14	38	5/50	>50	20	
HQ	16	80	80	100	0	0
SPT	15	14/50		>50	10	
HQ	17	95	95	100	0	0
SPT	16	10/50		>50	10	
HQ	18	90	90	100	0	0
SPT	17	45	10/50	>50	20	
HQ	19	100	100	100	0	0


CDL m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	DESCRIPTION
				Sandy and gravelly silt with traces of clay, beige, low plasticity, hard consistency.
	-21.92	11		Idem material, some traces of fine gravel.
	-22.92	12		Idem material, with coarse to fine gravel.
	-23.92	13		
	-24.92	14		14.2 m
	-25.92	15		Tuff, very weak, reddish brown, consists of sandy silt, tuffaceous, poorly cemented, high water content, low plasticity to non plastic, water laid, poorly cemented
	-26.92	16		
	-27.92	17		
	-28.92	18		
	-29.92	19		
	-30.92	20		19.90 m



LOG OF BORING

BOREHOLE: BS-5
sheet 3/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°20' 2.6" - 87° 49' 9.3"	DRILLER: Swissboring
DEPTH: 20.90 m	BOTTOM SEA LEVEL: -10.92 Chart Datum Level	DATE (START - FINISH): 21-24/11/01

SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 SET 15 cm 2 SET 30 cm 3 SET 45 cm N VALUE RECOVERED cm		GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd.	LOGGED BY: Rodolfo Alvarado
			INSPECTOR Dr. Pucal Yang

ROCK CORE CORE SIZE RUN NUMBER RUN LENGTH IN cm RECOVERY cm % RECOVERY RQD cm % RQD CDL m DEPTH IN m SAMPLE TYPE GRAPHIC LOG								DESCRIPTION		SPT TEST 10 20 30 40 50 >5C N	RQD 20 40 60 80 100
--	--	--	--	--	--	--	--	-------------	--	----------------------------------	------------------------

HO	20	90	90	100	0	0	31.92	21	Tuffous rock, very weak, reddish brown, moderately cemented, high water content, low plasticity to non plastic, water laid. 20.90 m END OF BORING										
								22											
								23											
								24											
								25											
								26											
								27											
								28											
								29											
								30											

LOG OF BORING

BOREHOLE: BS-6
sheet 2/2

CLIENT: NIIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°20' 0.8" - 87° 49' 8.0"	DRILLER: Swissboring
DEPTH: 20.40 m	BOTTOM SEA LEVEL: -11.22 Chart Datum Level	DATE (START - FINISH): 4-9/10/01

SOIL SAMPLING					
SAMPLE TYPE	SAMPLE NUMBER	15 cm	30 cm	45 cm	RECOVERED cm
1 BET					
2 BET					
3 BET					
N VALUE					

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR



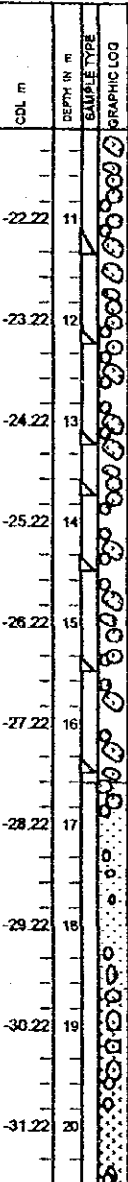
Swissboring Overseas Corporation Ltd.

LOGGED BY:
Rodolfo Alvarado

INSPECTOR **Dr. Pucal Yang**

ROCK CORE

CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RQD cm	% RQD
HQ	8	100	0	0	0	0
SPT	8	50	10/50	>50	20	
HQ	9	75	0	0	0	0
SPT	9	10/50		>50	10	
HQ	10	90	0	0	0	0
SPT	10	10/50		>50	10	
HQ	11	45	45	100	0	0
SPT	11	14/50		>50	10	
HQ	12	70	0	0	0	0
SPT	12	15/50		>50	12	
HQ	13	100	30	30	0	0
SPT	13	14/50		>50	10	
HQ	14	100	35	35	0	0
SPT	14	12/50		>50	10	
HQ	15	75	20	27	0	0
HQ	16	100	65	65	0	0
HQ	17	25	15	60	0	0
HQ	18	75	30	40	0	0
HQ	19	100	25	25	0	0
HQ	20	40	40	100	0	0



DESCRIPTION	SPT TEST					RQD				
	10	20	30	40	50	20	40	60	80	100
From 13.0 to 16.5 m Gravel, weak, consists of abundant angular to subangular basaltic and andesitic blocks ranging in size from 5mm to 250mm in length, fines was not recovered										
16.50 m Sandy silt with clay, orange brown, high water content, moderate plasticity, high dry strength, contains few and scattered rock fragments up to 8mm										
18.40 m Brecciateous tuff, weak, dark gray-brown, consists of volcanic rock clasts, ranging in size from 4mm to 50mm, medium hard rock, matrix is sandy tuffaceous, poorly cemented, water laid, few parts exhibit thin										
20.40 m END OF BORING										

LOG OF BORING

BOREHOLE: BS-8
sheet 1/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 57.9" - 87° 49' 4.8"	DRILLER: Swissboring
DEPTH: 23.20 m	BOTTOM SEA LEVEL: -10.17 Chart Datum Level	DATE (START - FINISH): 30/9-2/10/01

<p>SOIL SAMPLING</p> <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>1 SET 15 cm</th> <th>2 SET 30 cm</th> <th>3 SET 45 cm</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		SAMPLE TYPE	SAMPLE NUMBER	1 SET 15 cm	2 SET 30 cm	3 SET 45 cm	N VALUE	RECOVERED cm								<p>GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR</p> <p>swissboring</p> <p>Swissboring Overseas Corporation Ltd.</p>	<p>LOGGED BY:</p> <p>Rodolfo Abarado</p>
SAMPLE TYPE	SAMPLE NUMBER	1 SET 15 cm	2 SET 30 cm	3 SET 45 cm	N VALUE	RECOVERED cm											
<p>ROCK CORE</p> <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RCD cm</th> <th>% RCD</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD								<p>INSPECTOR: Dr. Pucal Yang</p>	
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD											

ROCK CORE							CDL m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	DESCRIPTION	SPT TEST					ROD				
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD						10	20	30	40	50	>50	N	20	40	60
HQ	1	55	0	0	0	0															
SPT	1	1	0	0	1	45	-11.17	1													
HQ	2	165	0	0	0	0	-12.17	2													
SPT	2	1	0	0	1	45	-13.17	3													
HQ	3	115	0	0	0	0	-14.17	4													
SPT	3	1	0	0	1	45	-15.17	5													
HQ	4	55	0	0	0	0	-16.17	6													
SPT	4	1	0	1	1	45	-17.17	7													
HQ	5	85	0	0	0	0	-18.17	8													
SPT	5	1	0	1	1	45	-19.17	9													
HQ	6	55	0	0	0	0	-20.17	10													
SPT	6	2	2	1	3	45															
HQ	7	55	0	0	0	0															

LOG OF BORING

BOREHOLE: BS-8
sheet 2/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 57.9" - 87° 49' 4.8"	DRILLER: Swissboring
DEPTH: 23.20 m	BOTTOM SEA LEVEL: -10.17 Chart Datum level	DATE (START - FINISH): 30/9-2/10/01

SOIL SAMPLING						
SAMPLE TYPE	SAMPLE NUMBER	1 SET 15 cm	2 SET 30 cm	3 SET 45 cm	N VALUE	RECOVERED cm

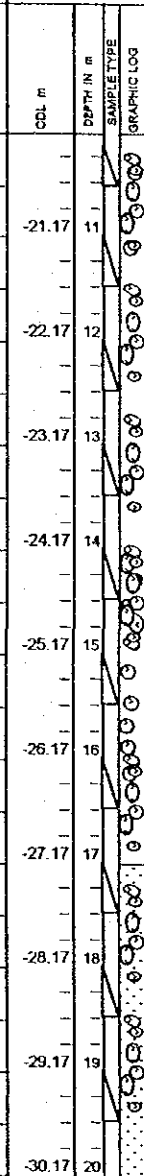
GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR



LOGGED BY: Rodolfo Anarado
INSPECTOR Dr. Pucal Yang

ROCK CORE						
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RQD cm	% RQD

CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RQD cm	% RQD
SPT	7	42	24	33	>50	40
HQ	8	50	0	0	0	0
SPT	8	13	14	22	36	35
HQ	9	55	0	0	0	0
SPT	9	44	46	48	>50	35
HQ	10	55	0	0	0	0
SPT	10	36	50	52	>50	28
HQ	11	55	0	0	0	0
SPT	11	35	30	14	44	8
HQ	12	55	0	0	0	0
SPT	12	8	9	6	15	30
HQ	13	55	0	0	0	0
SPT	13	6	5	6	11	30
HQ	14	55	25	45	0	0
SPT	14	23	13	16	29	45
HQ	15	55	30	55	0	0
SPT	15	16	18	13	31	28
HQ	16	55	20	36	0	0
SPT	16	10	17	18	35	32
HQ	17	55	20	36	0	0



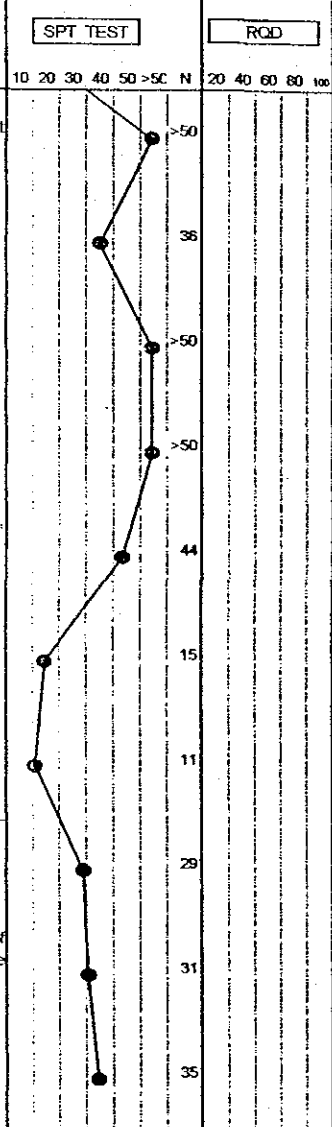
DESCRIPTION

Silty gravel, medium-to fine-grained sand, grayish beige, abundant small to medium-sized gravel, very dense

from 14.0 to 17.0 m
Coarse to medium-grained sand with traces of clay, yellowish beige, with ochre yellow stains, low plasticity, medium dense.

17.00 m


Coarse to medium-grained, weathered sand with silt and traces of clay, brown, exhibits medium to small gravel, low plasticity, dense sand.



LOG OF BORING

BOREHOLE: BS-8
sheet 3/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 57.8" - 87° 49' 4.8"	DRILLER: Swissboring
DEPTH 23.20 m	BOTTOM SEA LEVEL: -10.17 Chart Datum Level	DATE (START - FINISH): 30/9-2/10/01

SOIL SAMPLING SAMPLE TYPE: 1 BET 16 cm, 2 BET 30 cm, 3 BET 45 cm, N VALUE, RECOVERED cm.		GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd.	LOGGED BY: Rodolfo Alvarado
			INSPECTOR Dr. Pucal Yang

ROCK CORE							CDL m	DEPTH IN m	SAMPLE TYPE	PHOTOLOG	DESCRIPTION	SPT TEST					RQD							
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD						10	20	30	40	50	>50	N	20	40	60	80	100	
HQ	18	100	40	40	0	0	-31.17	21			21.20 m													
HQ	19	100	27	27	0	0	-32.17	22			Brecciated tuff, dark brown-gray, weak to moderate strength, consists of andesitic and basaltic clasts ranging in size from 5mm to 130mm, contains few blocks up to 200mm in length, matrix is sandy tuffaceous, moderately cemented, medium soft, water laid, massive bedding													
HQ	20	120	70	58	0	0	-33.17	23			23.20 m END OF BORING													
								24																
								25																
								26																
								27																
								28																
								29																
								30																

LOG OF BORING

BOREHOLE: BS-9
sheet 2/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 56.1" - 87° 49' 3.1"	DRILLER: Swissboring
DEPTH: 22.00 m	BOTTOM SEA LEVEL: -10.17 Chart Datum Level	DATE (START - FINISH): 9-10/10/01

SOIL SAMPLING					
SAMPLE TYPE	SAMPLE NUMBER	1 SET	2 SET	3 SET	N VALUE
16 cm					
30 cm					
45 cm					
RECOVERED cm					

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR



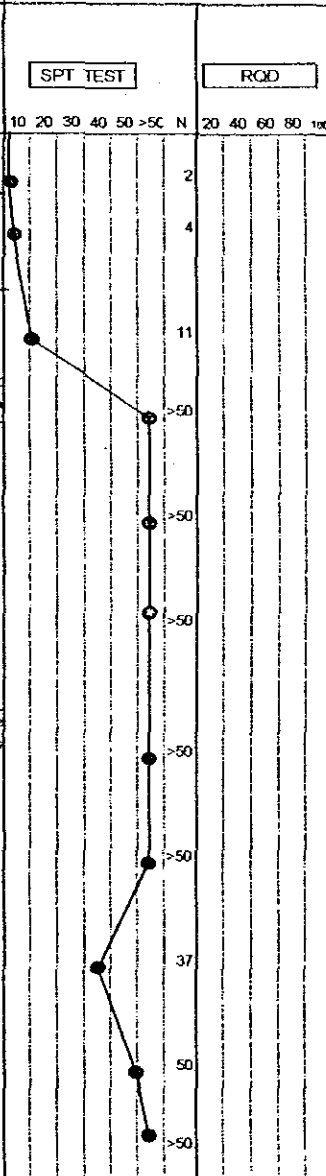
LOGGED BY:
Rodolfo Alvarado

INSPECTOR: Dr. Fucal Yang

ROCK CORE

CORE SIZE	RUN NUMBER	RUN LENGTH (in cm)	RECOVERY cm	% RECOVERY	RQD cm	% RQD
SPT	6	1	1	1	2	45
SPT	7	1	2	2	4	45
HQ	6	55	55	100	0	0
SPT	8	3	5	6	11	40
HQ	7	55	55	100	0	0
SPT	9	30	5/50	>50	20	
HQ	8	80	80	100	0	0
SPT	10	14/50		>50	13	
HQ	9	45	25	56	0	0
SPT	11	15/50		>50	15	
HQ	10	55	55	100	0	0
SPT	12	19	34	42	>50	30
HQ	11	55	0	0	0	0
SPT	13	9	20	31	>50	40
HQ	12	55	0	0	0	0
SPT	14	12	17	20	37	45
HQ	13	55	0	0	0	0
SPT	15	10	20	30	50	40
SPT	16	14/50		>50	10	


CDL m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	DESCRIPTION
-21.17	11			Clay, black, soft consistency, high water content, high plasticity, moderate to high dry strength, organic smell, consists of almost pure clay with variable silt and traces of fine sand
				11.50 m
-22.17	12			Gravel, weak, consists of abundant angular basaltic and andesitic rock fragments up to 150mm in length, medium hard rock, slightly to moderate weathered, contains clay, sand, and silt, moderate water content, non plastic, low dry strength
-23.17	13			
-24.17	14			
-25.17	15			
				15.50 m
-26.17	16			Tuff, reddish brown, weak clayey silt grained, consistency, moderate water content, low to moderate plasticity, high dry strength, contains some angular and weathered rock fragments up to 70mm in length
-27.17	17			
-28.17	18			
-29.17	19			
-30.17	20			



LOG OF BORING

BOREHOLE: BS-9
sheet 3/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 56.1" - 87° 49' 3.1"	DRILLER: Swissboring
DEPTH 22.00 m	BOTTOM SEA LEVEL: -10.17 Chart Datum Level	DATE (START-FINISH): 9-10/10/01

SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 BET 16 cm 2 BET 30 cm 3 BET 46 cm N VALUE RECOVERED cm		GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd.	LOGGED BY: Rodolfo Alvarado
ROCK CORE CORE SIZE RUN NUMBER RUN LENGTH IN cm RECOVERY cm % RECOVERY RCD cm % RCD			INSPECTOR Dr. Fucal Yang

ROCK CORE		DESCRIPTION		SPT TEST					RQD													
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD	COX. m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	10	20	30	40	50	>50	N	20	40	60	80	100
HQ	14	140	140	100	15	11	-31.17	21		Breccaceous tuff, dark gray-brown with some beige clasts, weak, consists of basaltic and andesitic clasts ranging in size from 5mm to 300mm, subangular to sub rounded, slightly to moderately weathered, matrix is sandy tuffaceous, poorly cemented, water laid, massive												11%
HQ	15	90	90	100	26	29	-32.17	22			22.00m END OF BORING											
								23														
								24														
								25														
								26														
								27														
								28														
								29														
								30														

LOG OF BORING

BOREHOLE: BS-10
sheet 1/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 54.3" - 87° 49' 1.4"	DRILLER: Swissboring
DEPTH 22.00 m	BOTTOM SEA LEVEL: -9.87 Chart Datum Level	DATE (START - FINISH): 4-6/10/01

<p>SOIL SAMPLING</p> <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>16 cm</th> <th>30 cm</th> <th>45 cm</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td>1 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		SAMPLE TYPE	SAMPLE NUMBER	16 cm	30 cm	45 cm	N VALUE	RECOVERED cm	1 SET							2 SET							3 SET							<p>GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR</p> <p>swissboring Swissboring Overseas Corporation Ltd.</p>	<p>LOGGED BY:</p> <p>Rodolfo Abarado</p>																																																							
SAMPLE TYPE	SAMPLE NUMBER	16 cm	30 cm	45 cm	N VALUE	RECOVERED cm																																																																																
1 SET																																																																																						
2 SET																																																																																						
3 SET																																																																																						
<p>ROCK CORE</p> <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RED cm</th> <th>% RED</th> </tr> <tr> <td>SPT</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>1</td> <td>85</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>2</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>2</td> <td>85</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>3</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>3</td> <td>85</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>4</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>4</td> <td>85</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>5</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>5</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>6</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td>45</td> </tr> </table>		CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RED cm	% RED	SPT	1	1	0	0	1	45	HQ	1	85	0	0	0	0	SPT	2	1	1	0	1	45	HQ	2	85	0	0	0	0	SPT	3	1	1	0	1	45	HQ	3	85	0	0	0	0	SPT	4	1	1	0	1	45	HQ	4	85	0	0	0	0	SPT	5	1	1	1	2	45	HQ	5	55	0	0	0	0	SPT	6	1	1	1	2	45	<p>INSPECTOR Dr. Pucal Yang</p>
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RED cm	% RED																																																																																
SPT	1	1	0	0	1	45																																																																																
HQ	1	85	0	0	0	0																																																																																
SPT	2	1	1	0	1	45																																																																																
HQ	2	85	0	0	0	0																																																																																
SPT	3	1	1	0	1	45																																																																																
HQ	3	85	0	0	0	0																																																																																
SPT	4	1	1	0	1	45																																																																																
HQ	4	85	0	0	0	0																																																																																
SPT	5	1	1	1	2	45																																																																																
HQ	5	55	0	0	0	0																																																																																
SPT	6	1	1	1	2	45																																																																																

							DESCRIPTION		SPT TEST					ROD								
							COL. m	DEPTH IN m	SAMPLE TYPE GRAPHIC LOG													
											10	20	30	40	50	>50	N	20	40	60	80	100
								0.0	From 0.0 to 3.30 m													
								-10.87	Clayey silt with fine-to medium-grained sand, greenish gray, very soft consistency, high water content, high plasticity, moderate dry strength.								1					
								-11.87	Shelby #1.													
								-12.87										1				
								-13.87	From 3.3 to 12.50 m													
								-13.87	Shelby #2.													
								-14.87	Silty clay with fine-grained sand, dark gray, moderate plasticity, very loose.								1					
								-15.87														
								-16.87	Shelby #3.													
								-17.87										1				
								-18.87														
								-18.87										2				
								-19.87														
								-19.87										2				

LOG OF BORING

BOREHOLE: BS-10
sheet 2/3

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 54.3" - 87° 49' 1.4"	DRILLER: Swissboring
DEPTH: 22.00 m	BOTTOM SEA LEVEL: -9.87 Chart Datum Level	DATE (START - FINISH): 4-6/10/01


<p>SOIL SAMPLING</p> <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>NUMBER</th> <th>1 SET</th> <th>2 SET</th> <th>3 SET</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		SAMPLE TYPE	NUMBER	1 SET	2 SET	3 SET	N VALUE	RECOVERED cm								<p>GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR</p> <p>swissboring Swissboring Overseas Corporation Ltd.</p>	<p>LOGGED BY: Rodolfo Alvarado</p>
SAMPLE TYPE	NUMBER	1 SET	2 SET	3 SET	N VALUE	RECOVERED cm											
<p>ROCK CORE</p> <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN CM</th> <th>RECOVERY CM</th> <th>% RECOVERY</th> <th>RED CM</th> <th>% RED</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		CORE SIZE	RUN NUMBER	RUN LENGTH IN CM	RECOVERY CM	% RECOVERY	RED CM	% RED								<p>INSPECTOR Dr. Pucal Yang</p>	
CORE SIZE	RUN NUMBER	RUN LENGTH IN CM	RECOVERY CM	% RECOVERY	RED CM	% RED											

ROCK CORE							COL m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	DESCRIPTION	SPT TEST					RQD			
CORE SIZE	RUN NUMBER	RUN LENGTH IN CM	RECOVERY CM	% RECOVERY	RED CM	% RED						10	20	30	40	50	>50	N	20	40
HQ	6	55	0	0	0	0					Same material as above									
SPT	7	1	2	2	4	45	-20.87	11												
HQ	7	55	0	0	0	0														
SPT	8	2	2	3	5	45	-21.87	12												
HQ	8	55	0	0	0	0					12.5 m									
SPT	9	8	11	15	26	45	-22.87	13			Gravel, weak, consists of abundant angular andesitic blocks up to 200mm in length, medium hard rock, contains clay, sand and silt, moderate water content, low plasticity to non plastic, low dry strength.									
HQ	9	55	0	0	0	0														
SPT	10	8	14	18	32	45	-23.87	14												
HQ	10	55	0	0	0	0														
SPT	11	41	50		>50	30	-24.87	15												
HQ	11	55	0	0	0	0					15.40 m									
SPT	12	8	14	18	32	45	-25.87	16			Tuff, reddish brown, hard consistency, consists of sandy silt tuffaceous, moderate water content, low plasticity, high dry strength, contains highly weathered and scattered rock fragments up to 30mm in length, water laid, massive									
HQ	12	55	0	0	0	0														
SPT	13	9	20	31	>50	45	-26.87	17												
HQ	13	55	0	0	0	0														
SPT	14	14	24	35	>50	45	-27.87	18												
HQ	14	55	0	0	0	0														
SPT	15	24	33	48	>50	40	-28.87	19												
HQ	15	55	0	0	0	0														
SPT	16	8	10	20	30	35	-29.87	20												

LOG OF BORING

BOREHOLE: BS-11
sheet 1/2

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 53.1" - 87° 49' 0.2"	DRILLER: Swissboring
DEPTH 19.80 m	BOTTOM SEA LEVEL: -8.17 Chart Datum Level	DATE (START - FINISH): 8-8/10/01

SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 SET 15 cm 2 SET 30 cm 3 SET 45 cm N VALUE RECOVERED cm		GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd.	LOGGED BY: Rodolfo Alvarado
ROCK CORE CORE SIZE RUN NUMBER RUN LENGTH IN cm RECOVERY cm % RECOVERY RED cm % RED		DESCRIPTION	INSPECTOR Dr. Pucal Yang

ROCK CORE		DESCRIPTION		SPT TEST					ROQ													
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RED cm	% RED	CDL m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	10	20	30	40	50	>50	N	20	40	60	80	100
HQ	1	130	0	0	0	0	-9.17	1														
SPT	1	1	0	0	1	45	-10.17	2	Shelby #1.													
HQ	2	85	0	0	0	0	-11.17	3														
SPT	2	1	0	0	1	45	-12.17	4	Shelby #2.													
HQ	3	85	0	0	0	0	-13.17	5														
SPT	3	1	1	1	2	45	-14.17	6														
HQ	4	85	0	0	0	0	-15.17	7														
SPT	4	1	2	2	4	45	-16.17	8														
HQ	5	85	0	0	0	0	-17.17	9														
							-18.17	10														

LOG OF BORING

BOREHOLE: BS-11
sheet 2/2

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 53.1" - 87° 49' 0.2"	DRILLER: Swissboring
DEPTH 19.80 m	BOTTOM SEA LEVEL: -8.17 Chart Datum Level	DATE (START - FINISH): 8-8/10/01

SOIL SAMPLING						
SAMPLE TYPE	SAMPLE NUMBER	1 BET	2 SET	3 SET	N VALUE	RECOVERED cm
		15 cm	30 cm	45 cm		

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR

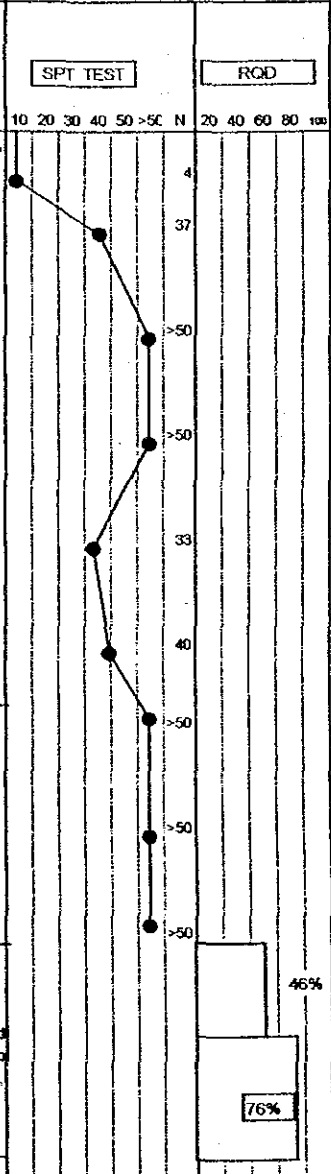
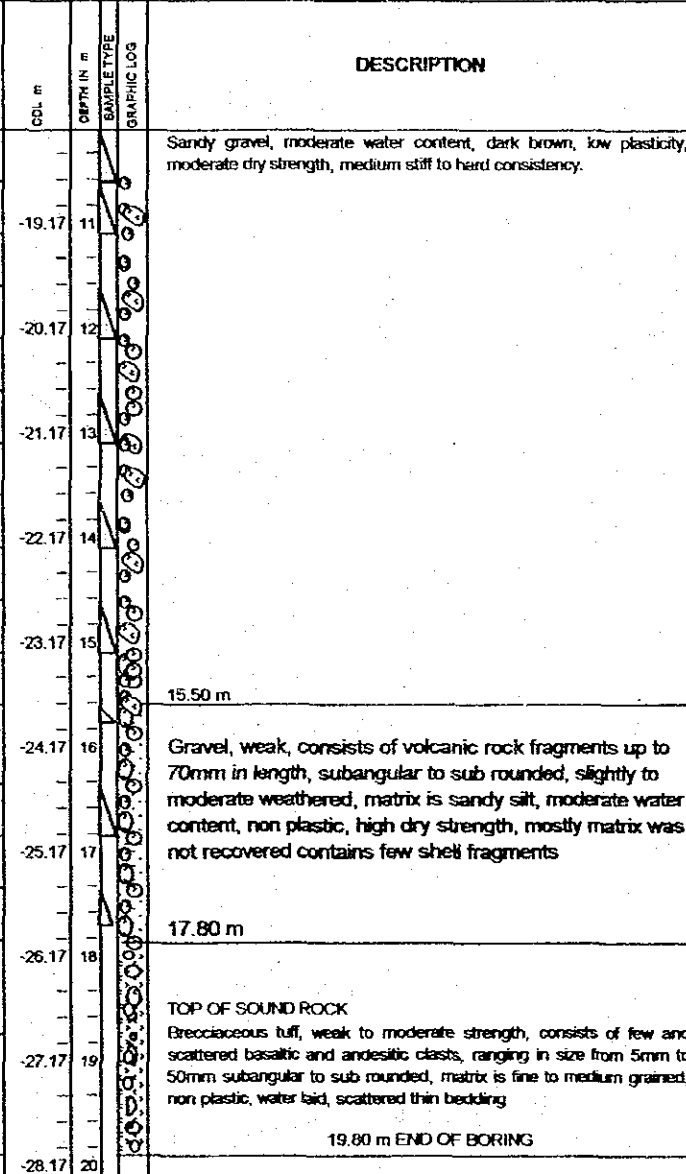


LOGGED BY:
Rodolfo Alvarado

INSPECTOR Dr. Pucal Yang

ROCK CORE

CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RED cm	% RED
SPT	5	2	2	2	4	45
SPT	6	13	17	20	37	40
HQ	6	55	0	0	0	0
SPT	7	15	26	38	>50	45
HQ	7	55	0	0	0	0
SPT	8	17	26	38	>50	45
HQ	8	55	0	0	0	0
SPT	9	9	14	19	33	45
HQ	9	55	0	0	0	0
SPT	10	11	18	22	40	40
HQ	10	55	0	0	0	0
SPT	11	50			>50	10
HQ	11	55	55	100	0	0
SPT	12	17	24	32	>50	35
HQ	12	55	55	100	0	0
SPT	13	30	50		>50	25
HQ	13	110	110	100	51	46
HQ	14	90	90	100	68	76



LOG OF BORING

BOREHOLE: BS-12
sheet 1/2

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 51.3" - 87° 40' 58.6"	DRILLER: Swissboring
DEPTH: 13.00 m	BOTTOM SEA LEVEL: -7.32 Chart Datum Level	DATE (START - FINISH): 26-30/9/01


<p>SOIL SAMPLING</p> <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>15 cm</th> <th>30 cm</th> <th>46 cm</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td>1 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		SAMPLE TYPE	SAMPLE NUMBER	15 cm	30 cm	46 cm	N VALUE	RECOVERED cm	1 SET							2 SET							3 SET							<p>GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR</p> <p>swissboring Swissboring Overseas Corporation Ltd.</p>	<p>LOGGED BY: Rodolfo Alvarado</p>																																																																					
SAMPLE TYPE	SAMPLE NUMBER	15 cm	30 cm	46 cm	N VALUE	RECOVERED cm																																																																																														
1 SET																																																																																																				
2 SET																																																																																																				
3 SET																																																																																																				
<p>ROCK CORE</p> <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RCD cm</th> <th>% RCD</th> </tr> <tr> <td>HQ</td> <td>1</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>2</td> <td>165</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>HQ</td> <td>3</td> <td>120</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>2</td> <td>5</td> <td>2</td> <td>3</td> <td>5</td> <td>45</td> </tr> <tr> <td>SPT</td> <td>3</td> <td>5</td> <td>10</td> <td>10</td> <td>20</td> <td>20</td> </tr> <tr> <td>HQ</td> <td>4</td> <td>80</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>4</td> <td>7</td> <td>12</td> <td>9</td> <td>21</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>5</td> <td>45</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>5</td> <td>4</td> <td>4</td> <td>7</td> <td>11</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>6</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>6</td> <td>14</td> <td>24</td> <td>31</td> <td>>50</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>7</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>		CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD	HQ	1	55	0	0	0	0	SPT	1	1	0	0	1	45	HQ	2	165	0	0	0	0	HQ	3	120	0	0	0	0	SPT	2	5	2	3	5	45	SPT	3	5	10	10	20	20	HQ	4	80	0	0	0	0	SPT	4	7	12	9	21	45	HQ	5	45	0	0	0	0	SPT	5	4	4	7	11	45	HQ	6	55	0	0	0	0	SPT	6	14	24	31	>50	45	HQ	7	55	0	0	0	0	<p>INSPECTOR: Dr. Pucal Yang</p>
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD																																																																																														
HQ	1	55	0	0	0	0																																																																																														
SPT	1	1	0	0	1	45																																																																																														
HQ	2	165	0	0	0	0																																																																																														
HQ	3	120	0	0	0	0																																																																																														
SPT	2	5	2	3	5	45																																																																																														
SPT	3	5	10	10	20	20																																																																																														
HQ	4	80	0	0	0	0																																																																																														
SPT	4	7	12	9	21	45																																																																																														
HQ	5	45	0	0	0	0																																																																																														
SPT	5	4	4	7	11	45																																																																																														
HQ	6	55	0	0	0	0																																																																																														
SPT	6	14	24	31	>50	45																																																																																														
HQ	7	55	0	0	0	0																																																																																														

							DESCRIPTION		SPT TEST					RCD					
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD	CDL m	DEPTH IN m	DEPTH IN m	DEPTH IN m	DEPTH IN m	DEPTH IN m	DEPTH IN m	DEPTH IN m	DEPTH IN m	DEPTH IN m	DEPTH IN m	DEPTH IN m	DEPTH IN m
							10	20	30	40	50	>5C	N	20	40	60	80	100	
HQ	1	55	0	0	0	0													
SPT	1	1	0	0	1	45	-8.32	1											
									Clay, greenish gray, very soft to soft consistency, high water content, high plasticity, moderate dry strength, with traces of sandy silt										
HQ	2	165	0	0	0	0													
									Shelby #1.										
HQ	3	120	0	0	0	0													
SPT	2	5	2	3	5	45	-12.32	5											
									5.10 m Shelby #2.										
SPT	3	5	10	10	20	20	-13.32	6											
									Clayey gravel, gray to dark brown, low water content, low plasticity, low dry strength, medium stiff to very stiff consistency.										
HQ	4	80	0	0	0	0													
SPT	4	7	12	9	21	45	-14.32	7											
HQ	5	45	0	0	0	0													
SPT	5	4	4	7	11	45	-15.32	8											
HQ	6	55	0	0	0	0													
SPT	6	14	24	31	>50	45	-16.32	9											
									9.00 m										
HQ	7	55	0	0	0	0													
									Gravel, consists of abundant angular volcanic rock blocks, slightly to moderate weathered, ranging in size from 5mm to 350mm, hard rock fines was not recovered										

LOG OF BORING

BOREHOLE: BS-12
sheet 2/2

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19'51.3" - 87°48'58.6"	DRILLER: Swissboring
DEPTH: 13.00 m	BOTTOM SEA LEVEL: -7.32 Chart Datum Level	DATE (START - FINISH): 26-30/9/01

SOIL SAMPLING SAMPLE TYPE: 1 SET (15 cm), 2 SET (30 cm), 3 SET (45 cm) N VALUE, RECOVERED cm		GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd.	LOGGED BY: Rodolfo Aharado
ROCK CORE CORE SIZE, RUN NUMBER, RUN LENGTH, RECOVERY, % RECOVERY, ROD cm, % ROD			INSPECTOR: Dr. Pucal Yang

CORE SIZE	RUN NUMBER	RUN LENGTH (in cm)	RECOVERY (cm)	% RECOVERY	ROD (cm)	% ROD	COL (m)	DEPTH (in m)	SAMPLE TYPE	GRAPHIC LOG	DESCRIPTION	SPT TEST					ROD									
												10	20	30	40	50	>5C	N	20	40	60	80	100			
HO	8	20	20	100	0	0																				
SPT	7	8	25	1050	>50	40																				
HO	9	60	0	0	0	0	-18.32	11			11.00 m															
HO	10	80	80	100	0	0	-19.32	12			Brecciaceous tuff, dark brown-gray, weak to moderate strength, consists of basaltic and andesitic clasts, up to 250mm in length, hard rock, matrix is sandy tuffaceous, poorly to moderately cemented, water laid															
HO	11	100	100	100	0	0	-20.32	13			13.00 m END OF BORING															
								14																		
								15																		
								16																		
								17																		
								18																		
								19																		
								20																		

LOG OF BORING

BOREHOLE: BS-15
sheet 1/2

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 57.7" - 87° 49' 11.0"	DRILLER: Swissboring
DEPTH 17.50 m	BOTTOM SEA LEVEL: -4.72 Chart Datum Level	DATE (START - FINISH): 16-17/10/01

SOIL SAMPLING					
SAMPLE TYPE	SAMPLE NUMBER	1 SET	2 SET	3 SET	N VALUE
		15 cm	30 cm	45 cm	
					RECOVERED cm

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR

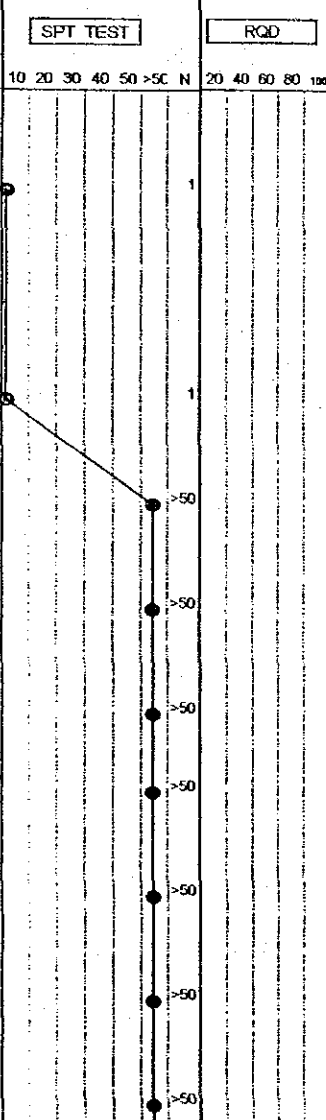
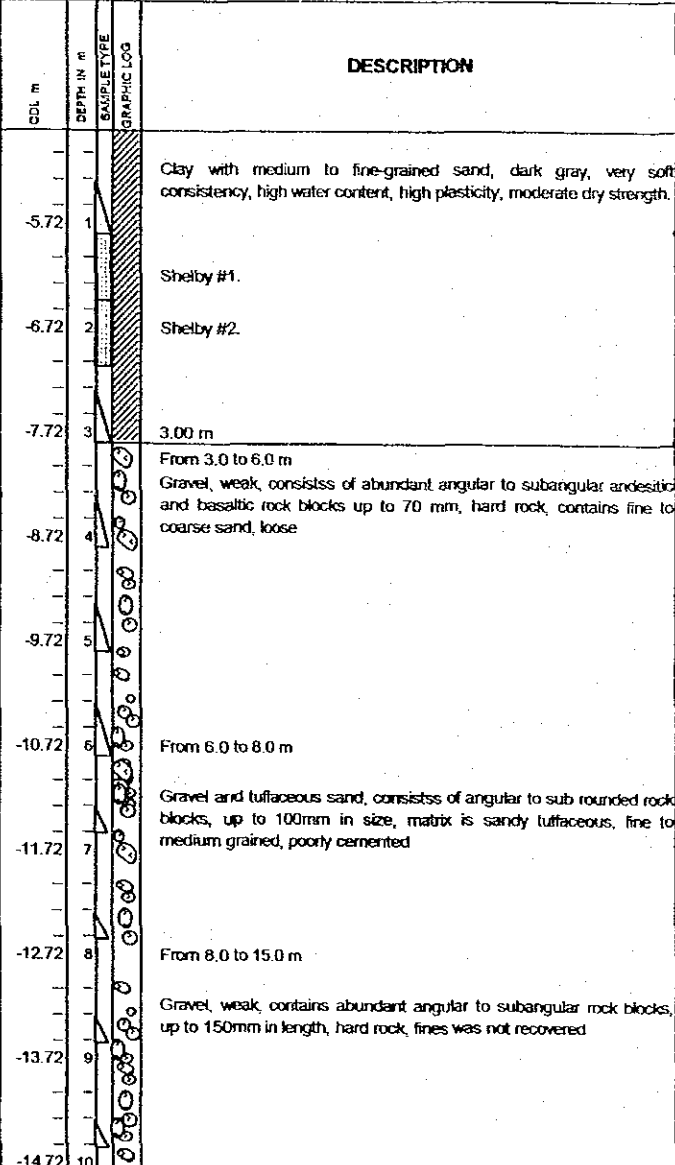
swissboring
Swissboring Overseas Corporation Ltd.

LOGGED BY:
Rodolfo Alvarado

INSPECTOR: Dr. Pucal Yang

ROCK CORE					
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RQD cm
					% RQD

CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RQD cm	% RQD
HQ	1	55	0	0	0	0
SPT	1	1	0	0	1	45
HQ	3	25	0	0	0	0
SPT	2	1	0	1	1	45
HQ	4	55	55	100	0	0
SPT	3	28	33	42	>50	45
HQ	5	55	55	100	0	0
SPT	4	33	42	56	>50	45
HQ	6	55	55	100	0	0
SPT	5	43	33	48	>50	45
HQ	7	55	55	100	0	0
SPT	6	14/50			>50	12
HQ	8	100	100	100	0	0
SPT	7	14/50			>50	13
HQ	9	100	100	100	0	0
SPT	8	14/50			>50	10
HQ	10	100	100	100	0	0
SPT	9	15/50			>50	13



LOG OF BORING

BOREHOLE: BS-15
sheet 2/2

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 57.7" - 87° 49' 11.0"	DRILLER: Swissboring
DEPTH 17.50 m	BOTTOM SEA LEVEL: -4.72 Chart Datum Level	DATE (START - FINISH): 16-17/10/01

SOIL SAMPLING						
SAMPLE TYPE	SAMPLE NUMBER	1 SET 15 cm	2 SET 30 cm	3 SET 45 cm	N VALUE	RECOVERED cm

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR

swissboring
Swissboring Overseas Corporation Ltd.

LOGGED BY:
Rodolfo Alvarado

INSPECTOR: Dr. Pucal Yang

ROCK CORE						
CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD
HQ	11	100	100	100	0	0
SPT	10	13/50			>50	12
HQ	12	100	100	100	0	0
SPT	11	14/50			>50	14
HQ	13	100	100	100	0	0
SPT	12	12/50			>50	12
HQ	14	100	100	100	0	0
SPT	13	14/50			>50	11

DESCRIPTION


SPT TEST					RQD					
10	20	30	40	50 >5C	N	20	40	60	80	100

CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD	CDL m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	DESCRIPTION	SPT TEST	RQD
HQ	11	100	100	100	0	0	-15.72	11			Same material as above		
SPT	10	13/50			>50	12							
HQ	12	100	100	100	0	0	-16.72	12					
SPT	11	14/50			>50	14							
HQ	13	100	100	100	0	0	-17.72	13					
SPT	12	12/50			>50	12							
HQ	14	100	100	100	0	0	-18.72	14					
SPT	13	14/50			>50	11							
HQ	15	145	73	50	0	0	-19.72	15			15.00 m		
HQ	16	100	50	50	0	0	-20.72	16			Tuff, yellowish brown, moderate water content, non plastic, high dry strength, contains few and scattered rock volcanic clast, up to 50mm in length, weak, water laid.		
HQ	17	100	70	70	0	0	-21.72	17					
HQ	18	50	30	60	0	0					17.50 m END OF BORING		

LOG OF BORING

BOREHOLE: BS-16
sheet 1/2

CLIENT: NIPPON KOEI Ltd	SOIL INVESTIGATION OFF SHORE	DRILL RIG: LY-34
COUNTRY: EL SALVADOR	COORDINATES: 13°19' 54.8" - 87° 49' 8.2"	DRILLER: Swissboring
DEPTH 14.90 m	BOTTOM SEA LEVEL: -4.67 Chart Datum Level	DATE (START - FINISH): 19-20/10/01

SOIL SAMPLING SAMPLE TYPE: 1 SET (15 cm), 2 SET (30 cm), 3 SET (45 cm), N VALUE, RECOVERED cm		GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd.	LOGGED BY: Rodolfo Avarado
ROCK CORE CORE SIZE, RUN NUMBER, RUN LENGTH IN cm, RECOVERY cm, % RECOVERY, RCD cm, % RCD			INSPECTOR: Dr. Pucal Yang

CORE SIZE	RUN NUMBER	RUN LENGTH IN cm	RECOVERY cm	% RECOVERY	RCD cm	% RCD	CBL m	DEPTH IN m	SAMPLE TYPE	GRAPHIC LOG	DESCRIPTION	SPT TEST					RCD				
												10	20	30	40	50	>5C	N	20	40	60
HQ	1	130	0	0	0	0	-5.67	1			Clay, greenish gray, very soft consistency, high water content, high plasticity, moderate dry strength.										
											Shelby #1.										
SPT	1	1	0	0	1	45	-6.67	2													
HQ	2	85	0	0	0	0	-7.67	3													
											Shelby #2.										
SPT	2	1	0	0	1	45	-8.67	4													
HQ	3	55	0	0	0	0	-9.67	5													
SPT	3	1	1	1	2	45	-10.67	6													
HQ	4	55	0	0	0	0	-11.67	7													
SPT	4	1	1	1	2	45	-12.67	8													
HQ	5	55	0	0	0	0	-13.67	9													
SPT	5	2	1	1	2	45	-14.67	10													
HQ	6	55	0	0	0	0															
SPT	6	1	3	3	6	45					8.50 m										
HQ	7	55	0	0	0	0															
SPT	7	4	6	14	20	45															
HQ	8	55	0	0	0	0															