

Appendix F

Liquefaction Calculation Spreadsheets

Part of: The Use of Waste Rock Inclusions to Control the Effects
of Liquefaction in Tailings Impoundments

A Ph.D. Thesis by Michael James
Ecole Polytechnique, Montreal

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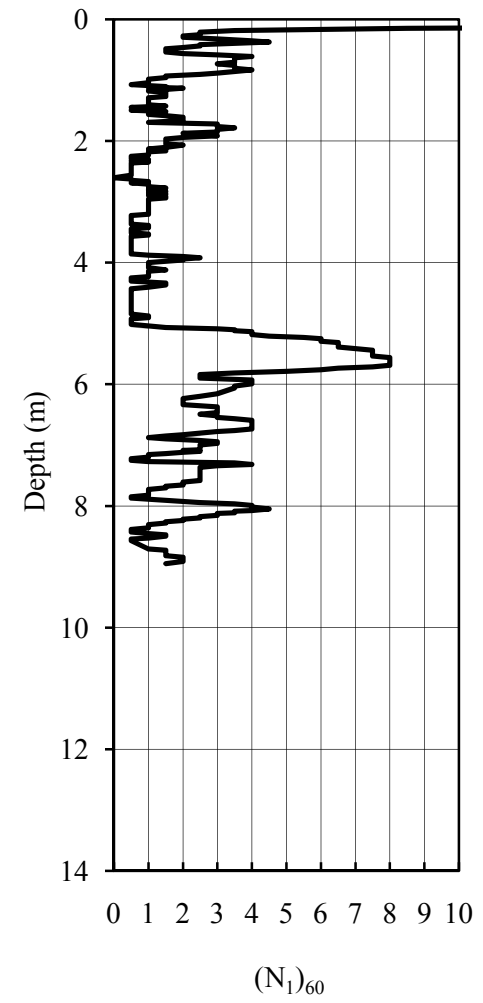
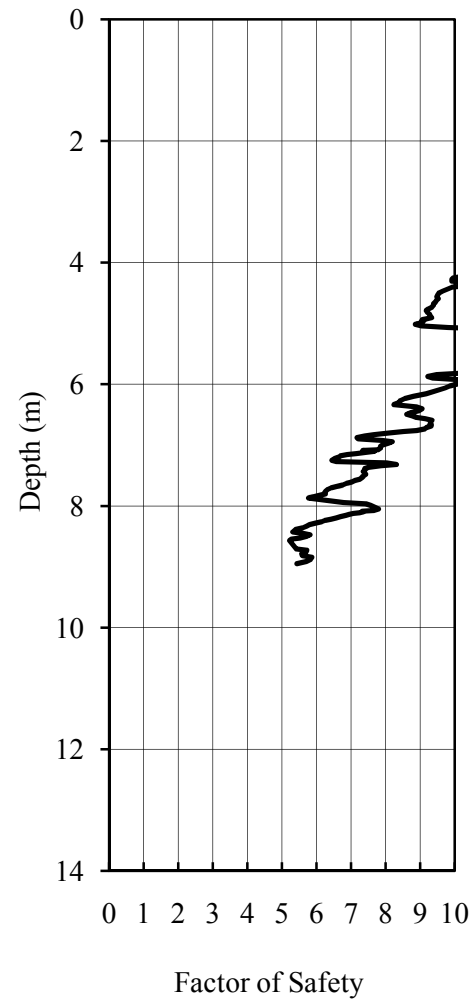
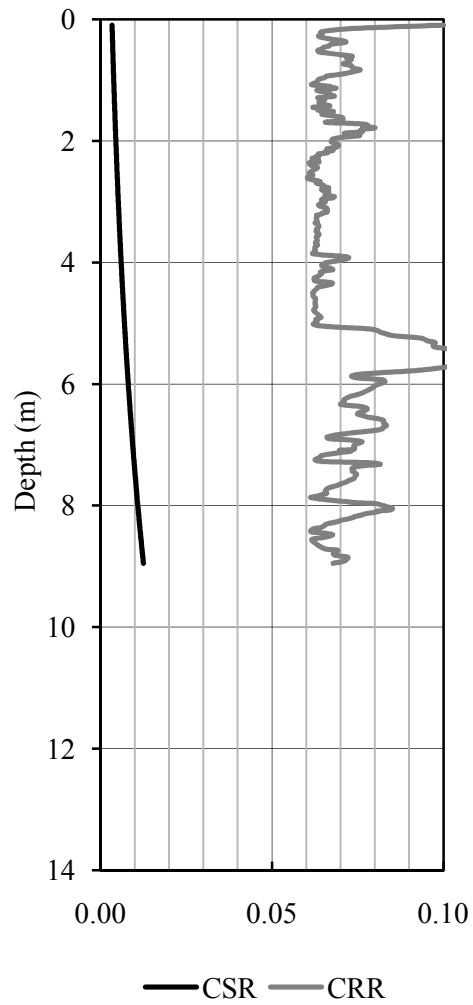
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All of the CPT calculation spreadsheets are contained in the CD-ROM accompanying the thesis in Microsoft Office Excel 2007® format.

Liquefaction Analyses of CPT Data

Earthquake E1 - $M_w=6.5$, PGA (rock)=0.229 g

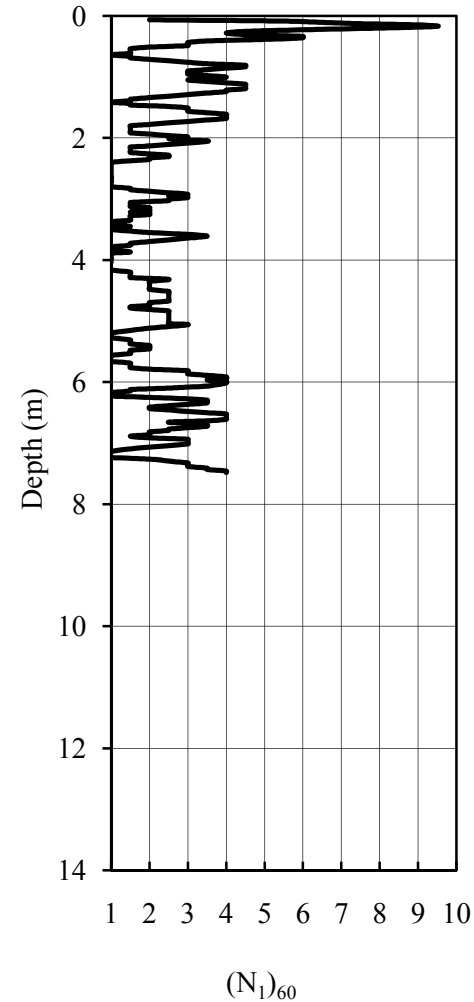
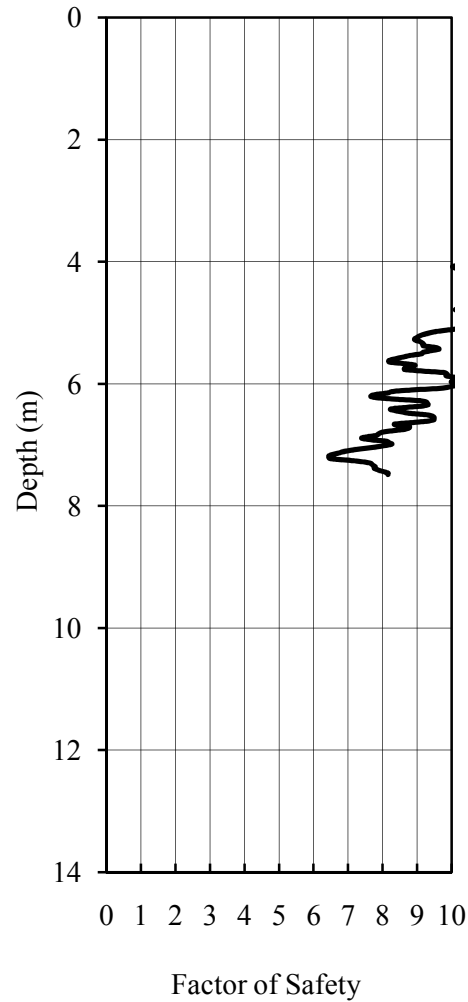
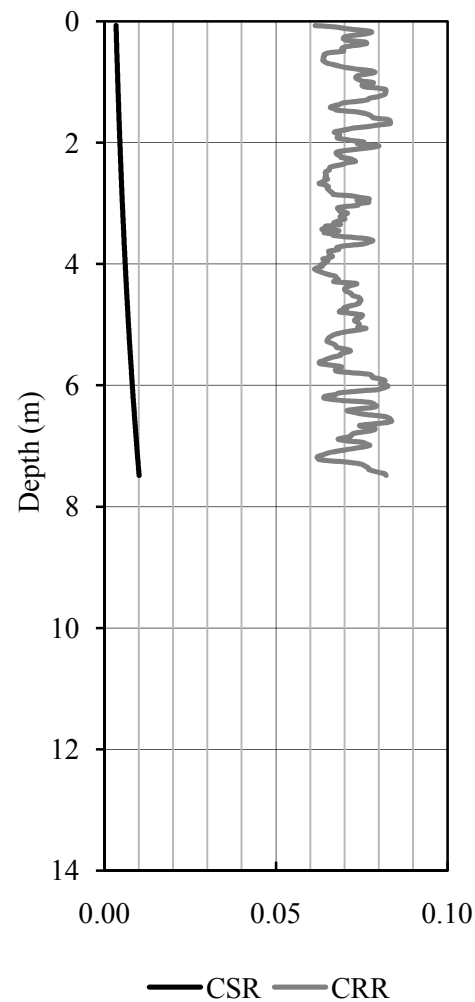
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Liquefaction Analyses of CPT Data

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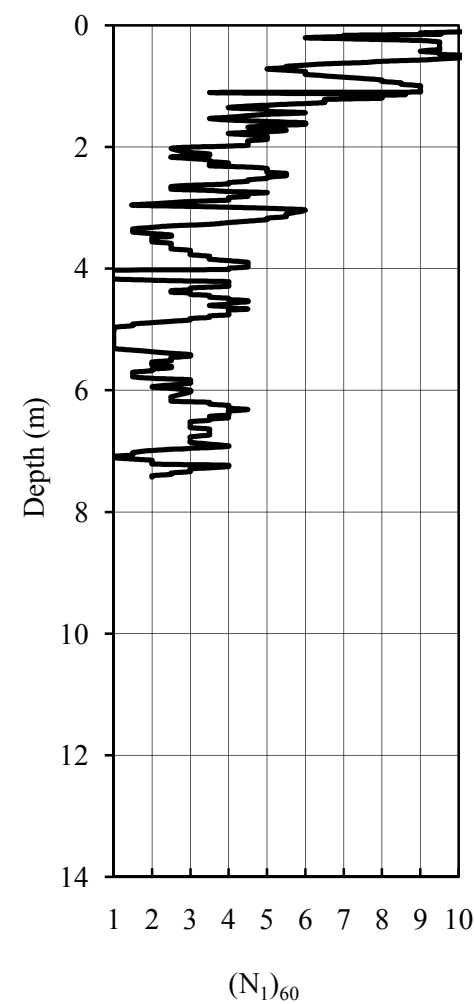
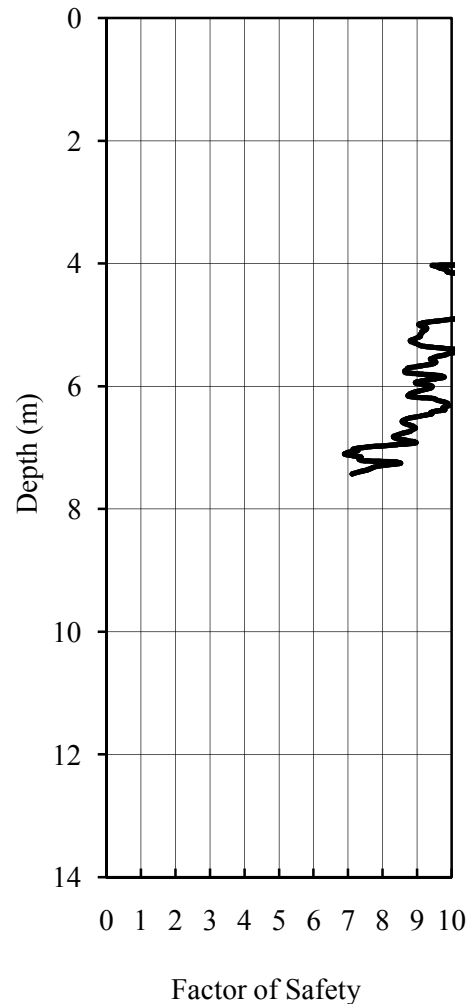
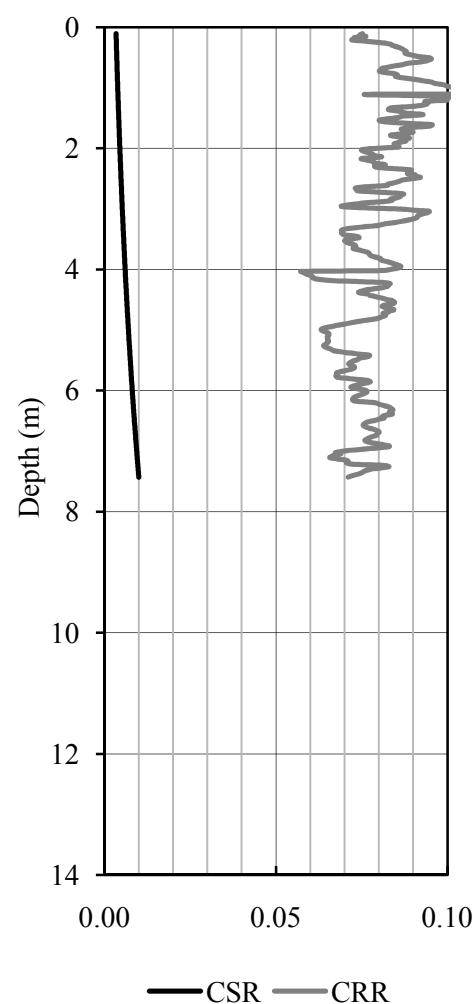
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Liquefaction Analyses of CPT Data

Earthquake E1 - $M_w=6.5$, PGA (rock)=0.229 g

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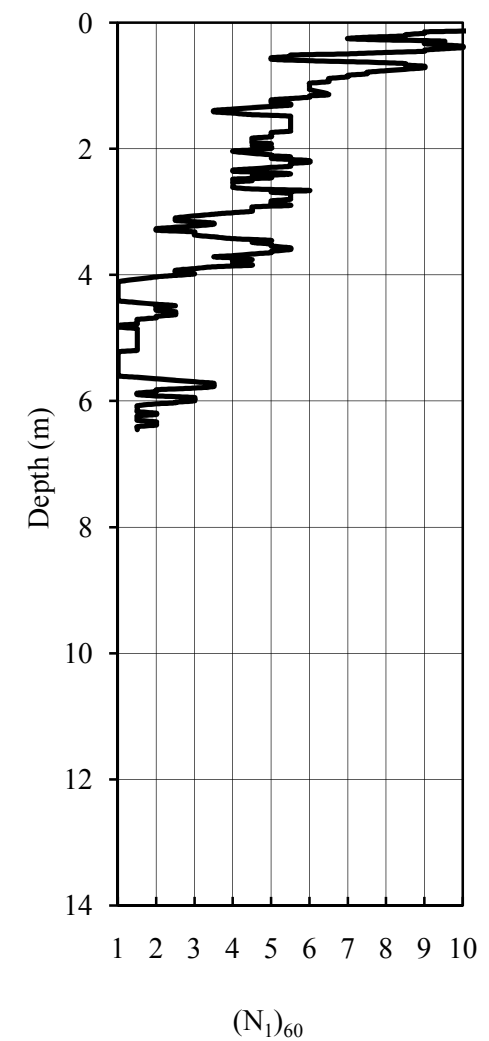
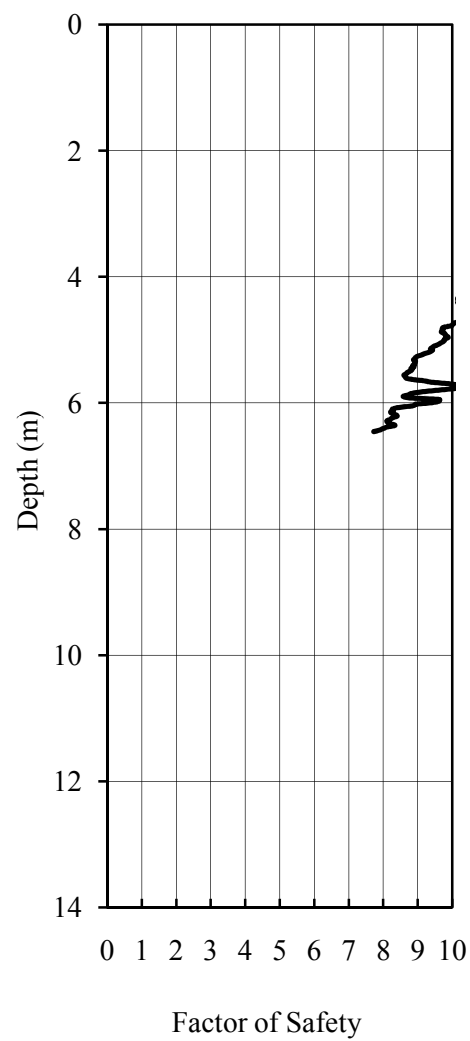
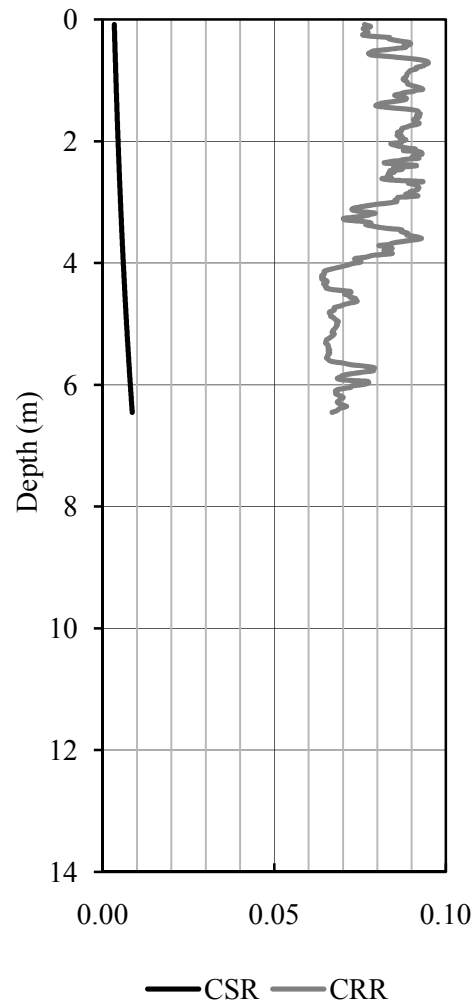


Liquefaction Analyses of CPT Data

Earthquake E1 - $M_w=6.5$, PGA (rock)=0.229 g

CPT

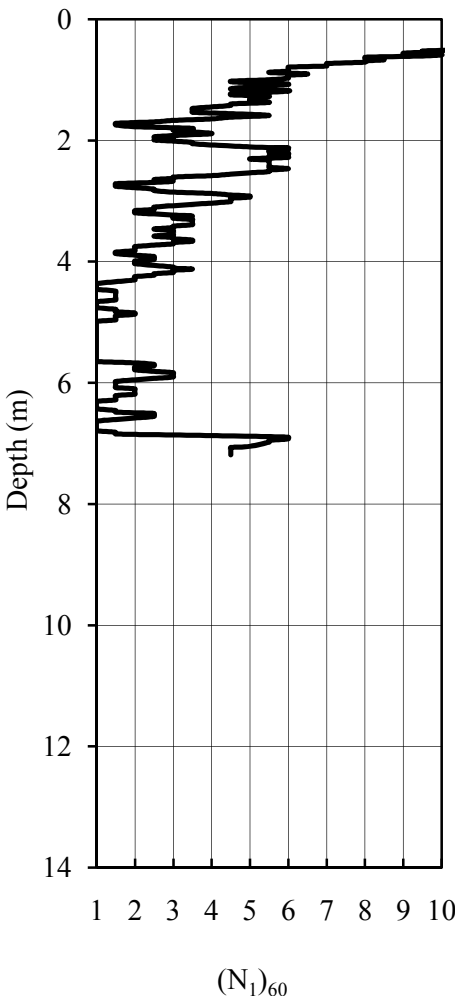
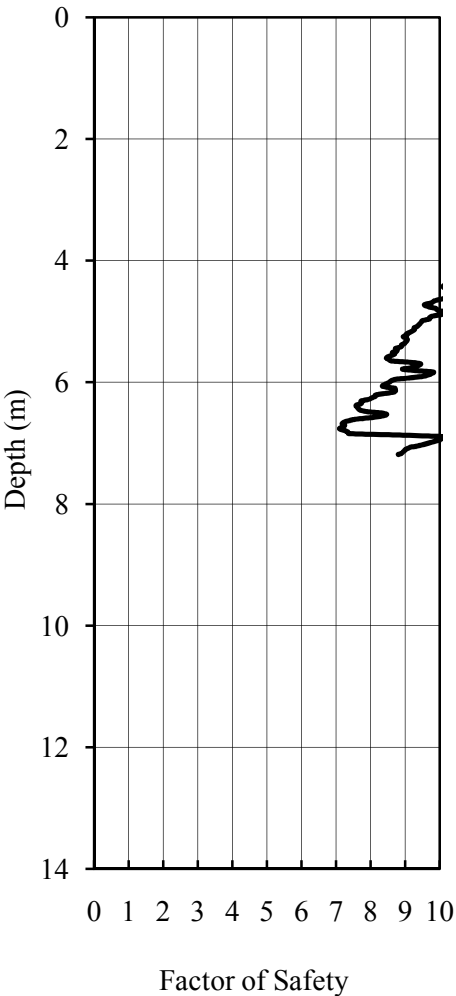
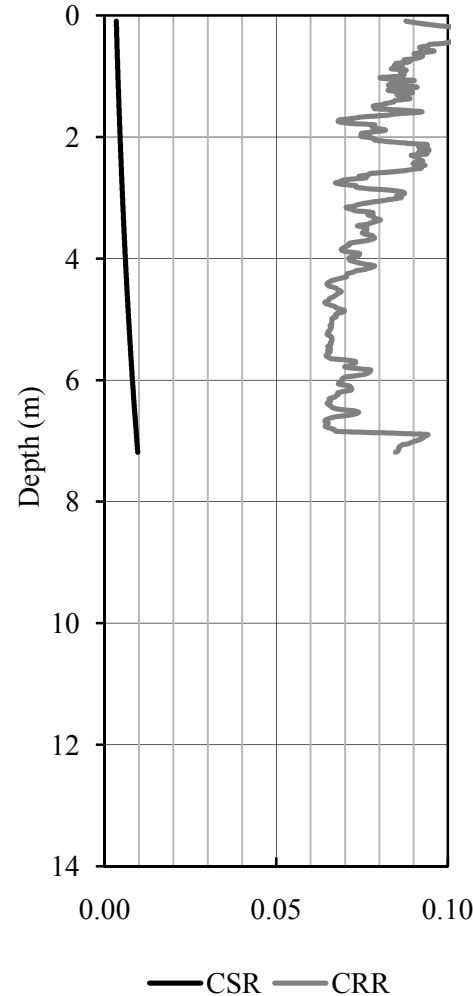
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Liquefaction Analyses of CPT Data

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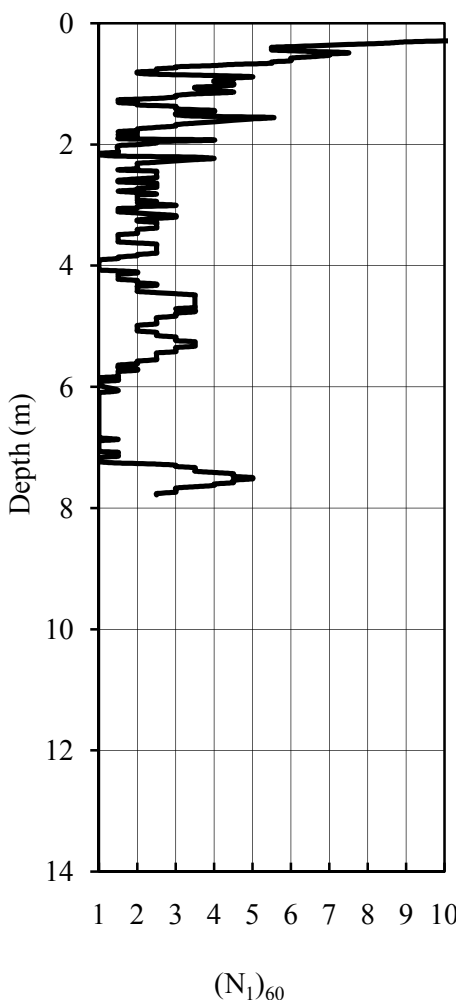
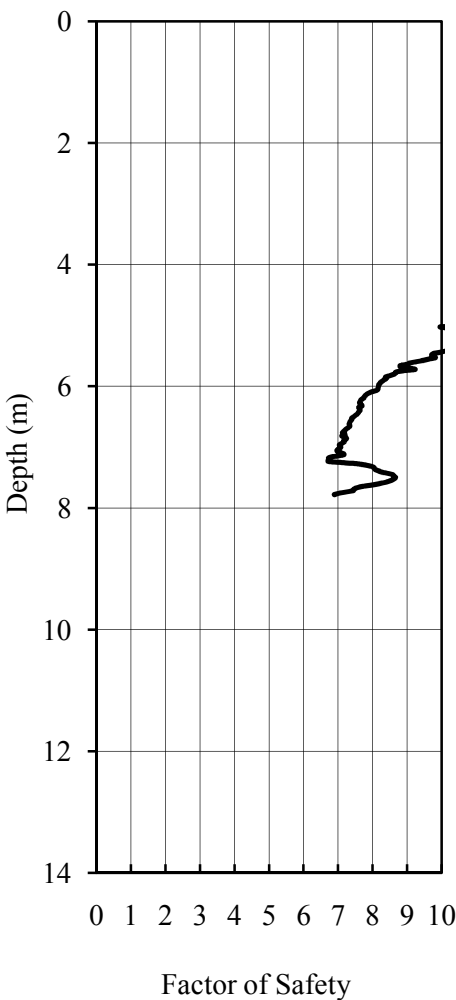
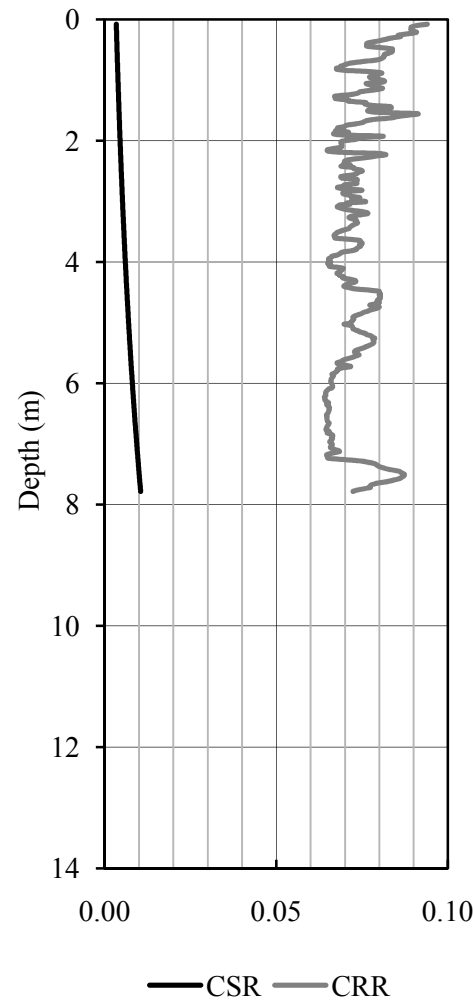
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Liquefaction Analyses of CPT Data

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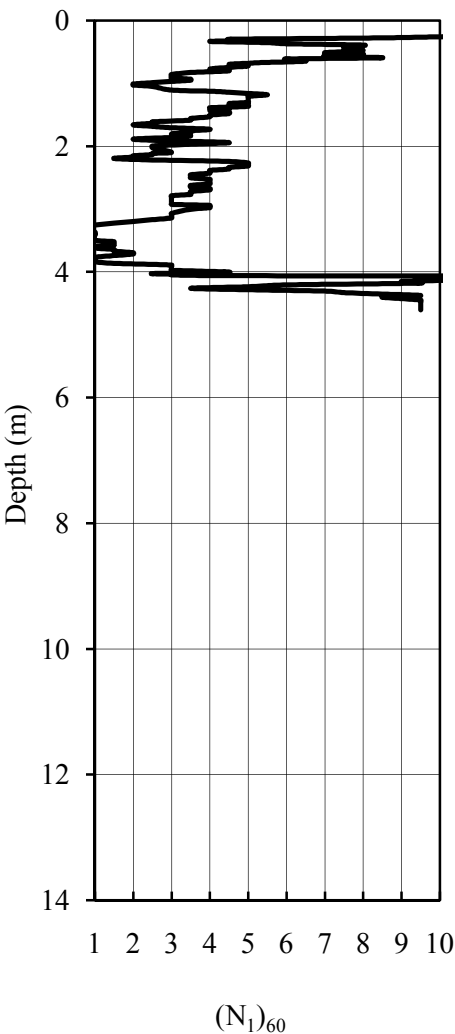
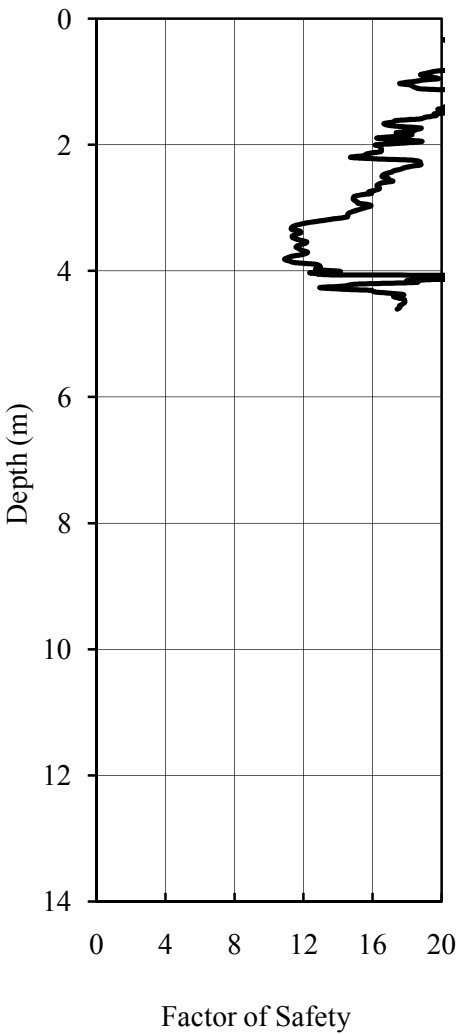
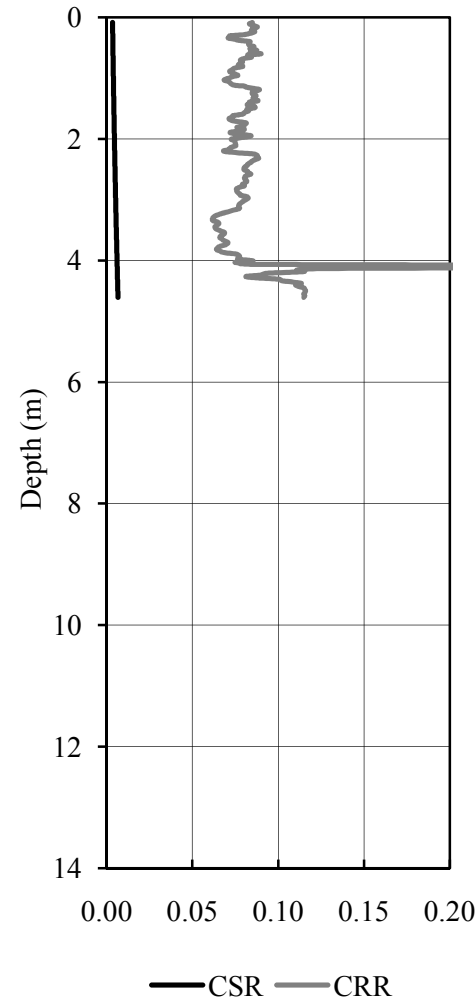
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Liquefaction Analyses of CPT Data

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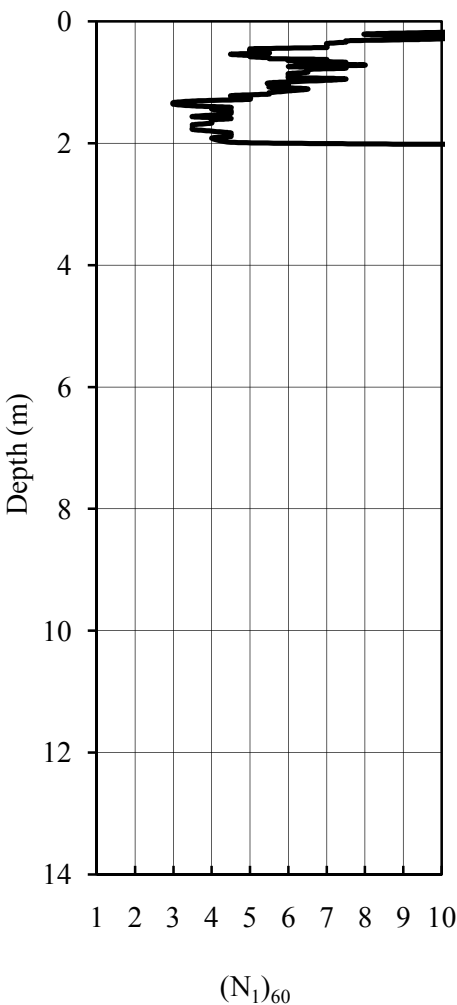
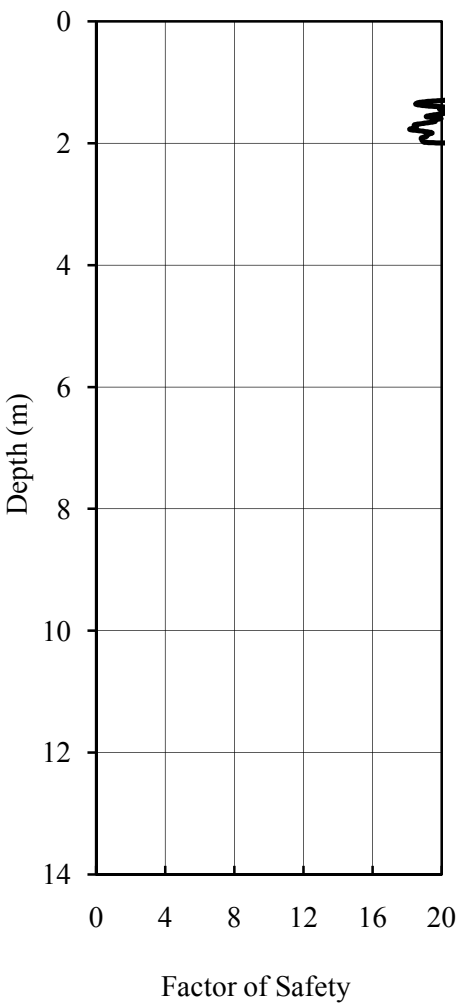
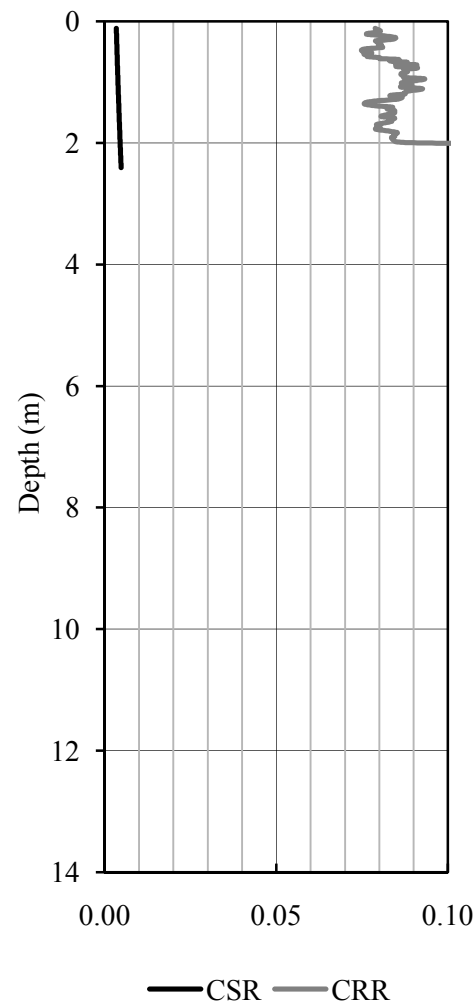
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Liquefaction Analyses of CPT Data

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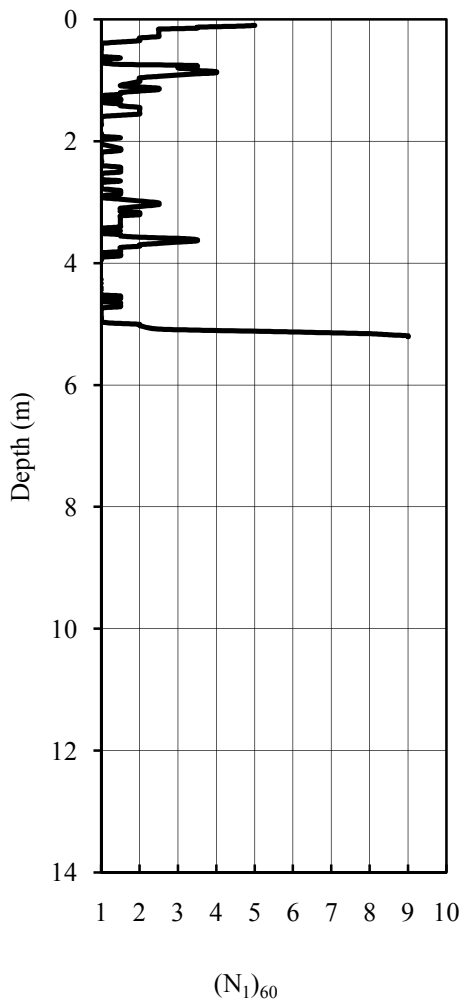
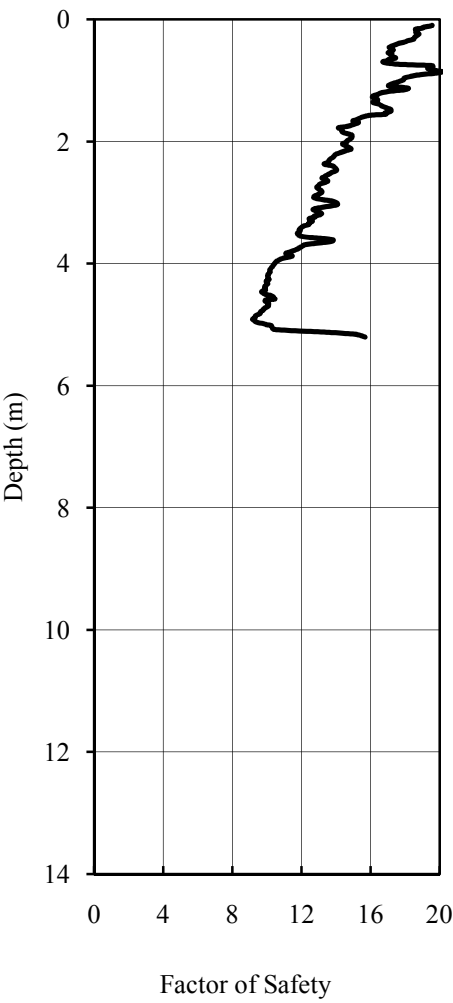
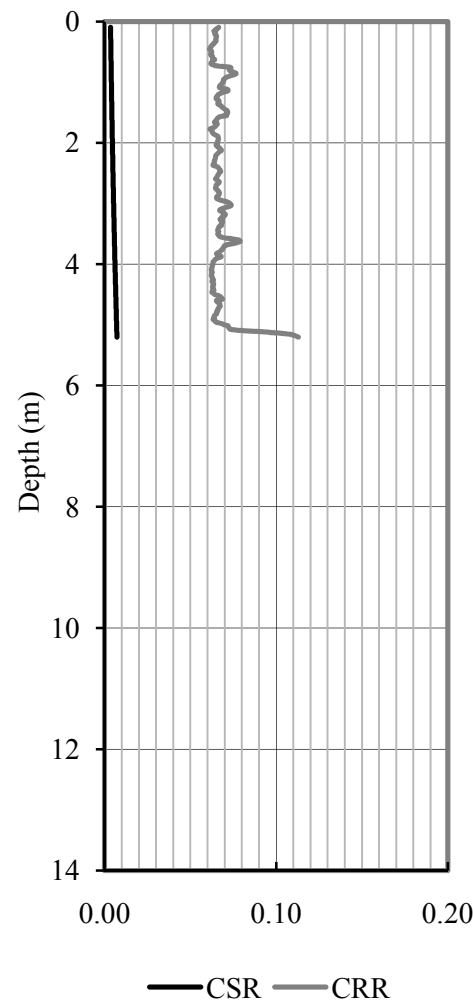
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Liquefaction Analyses of CPT Data

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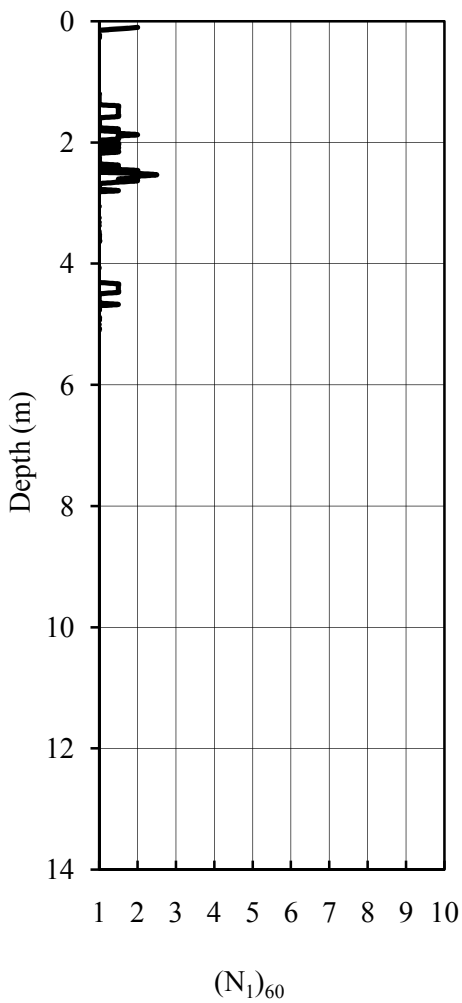
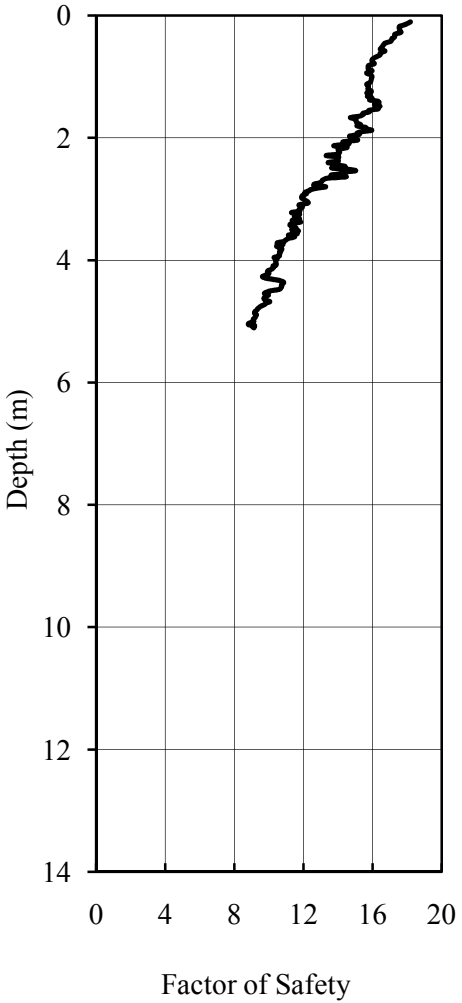
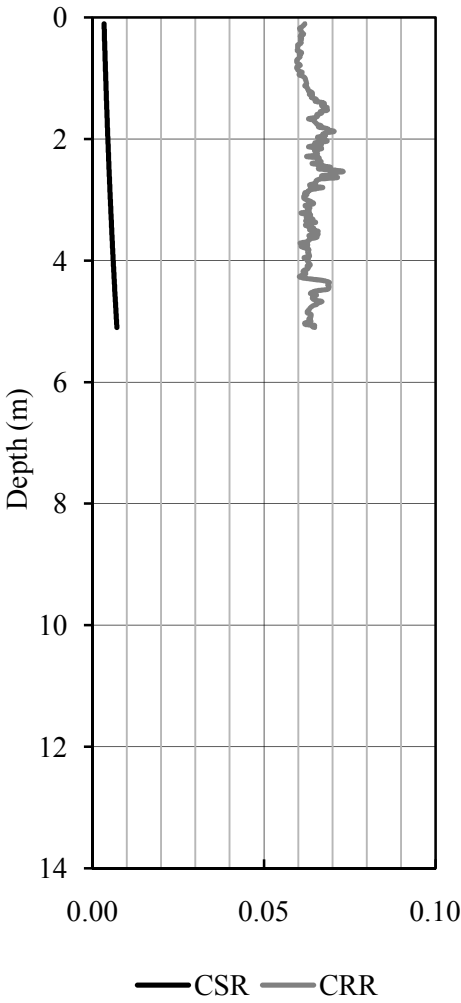
CPT	S9
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Liquefaction Analyses of CPT Data

Earthquake E1 - $M_w=6.5$, $PGA(rock)=0.229\text{ g}$

CPT	S10
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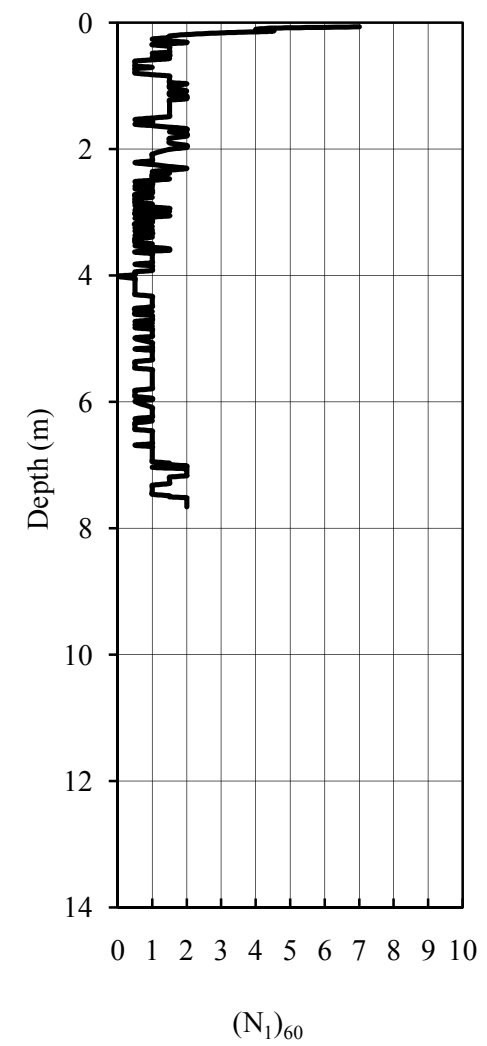
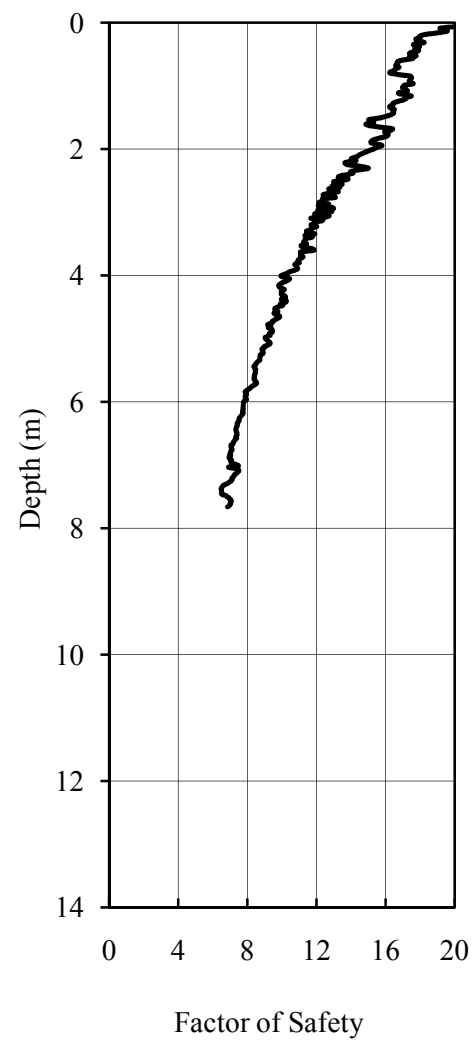
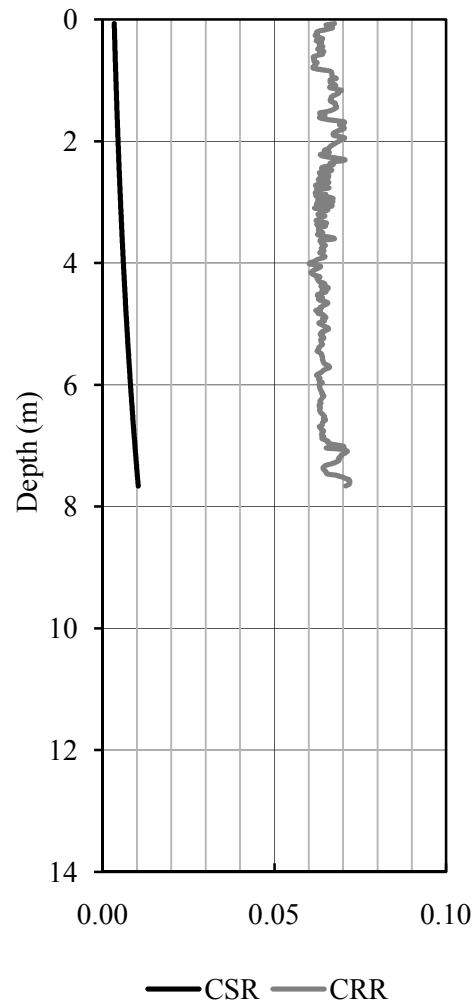


Liquefaction Analyses of CPT Data

Earthquake E1 - $M_w=6.5$, $PGA(rock)=0.229$ g

CPT

S11

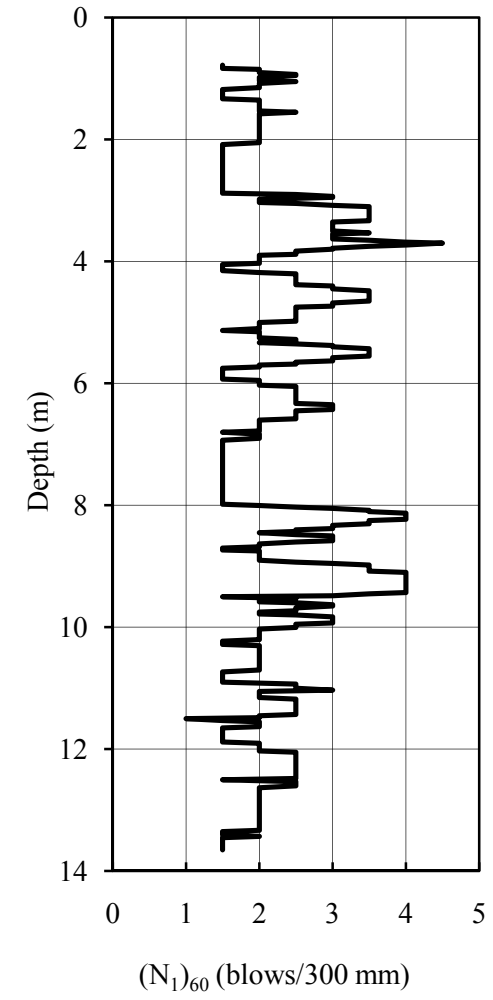
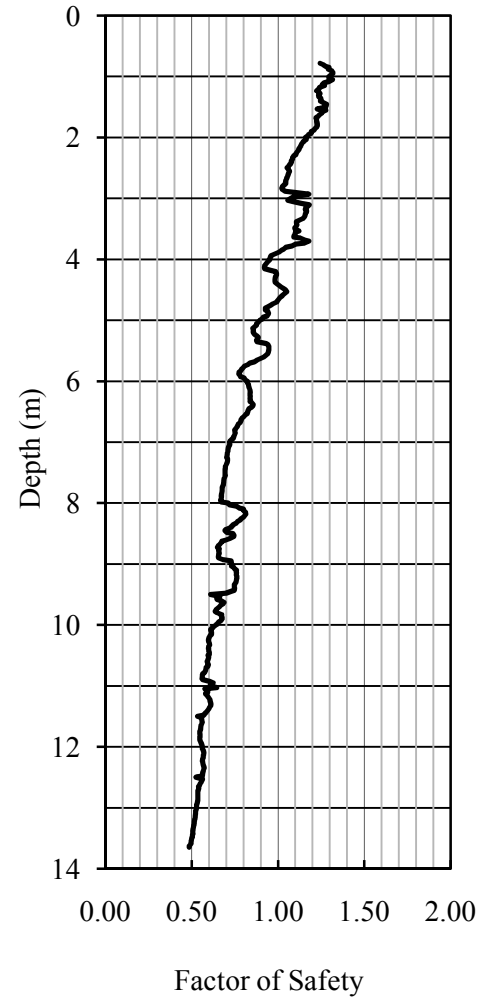
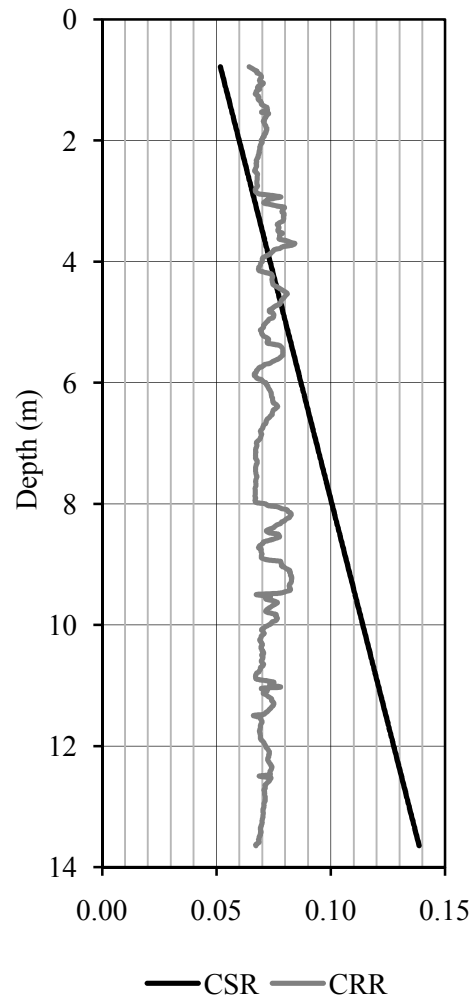


Liquefaction Analyses of CPT Data

Earthquake E1 - Mw=6.5, PGA (rock)=0.229 g.

CPT

02-02

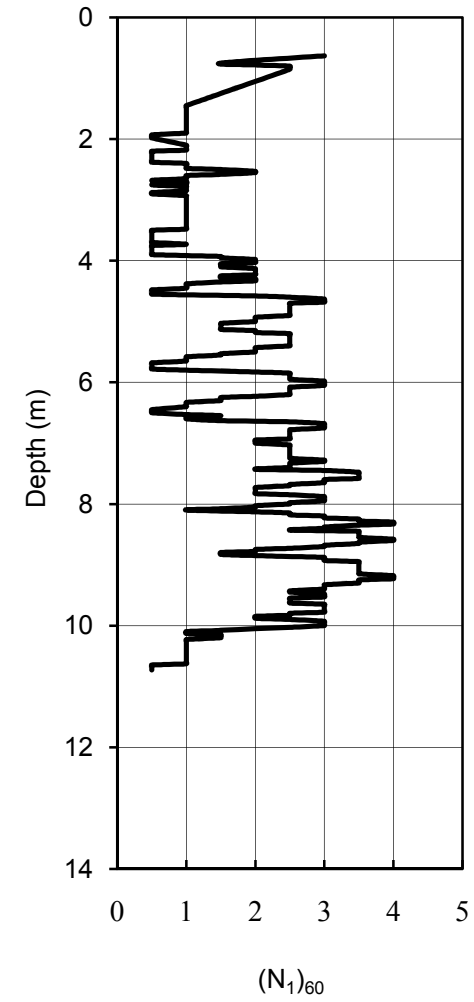
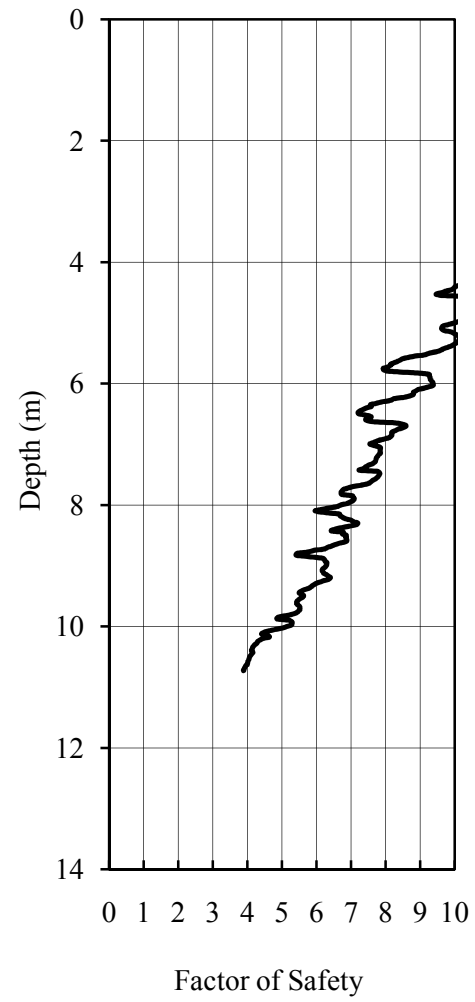
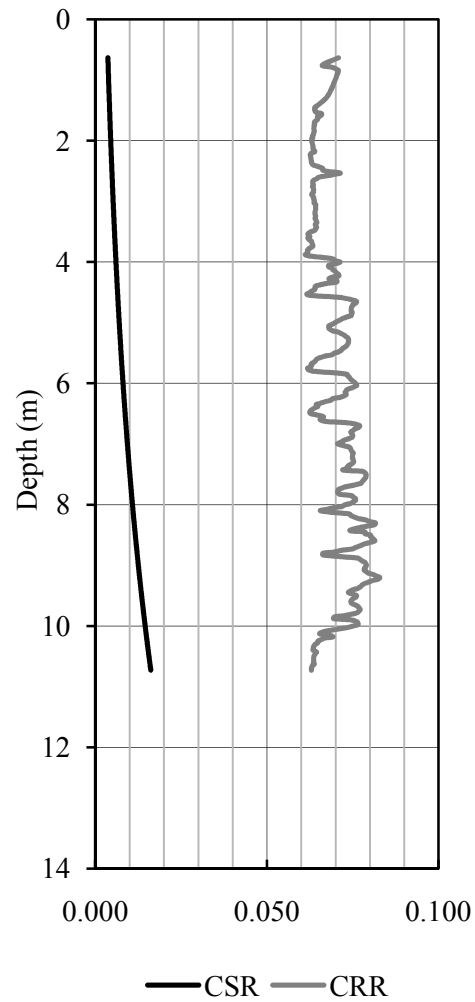


Liquefaction Analyses of CPT Data

Earthquake E1 - $M_w=6.5$, PGA (rock)=0.229 g

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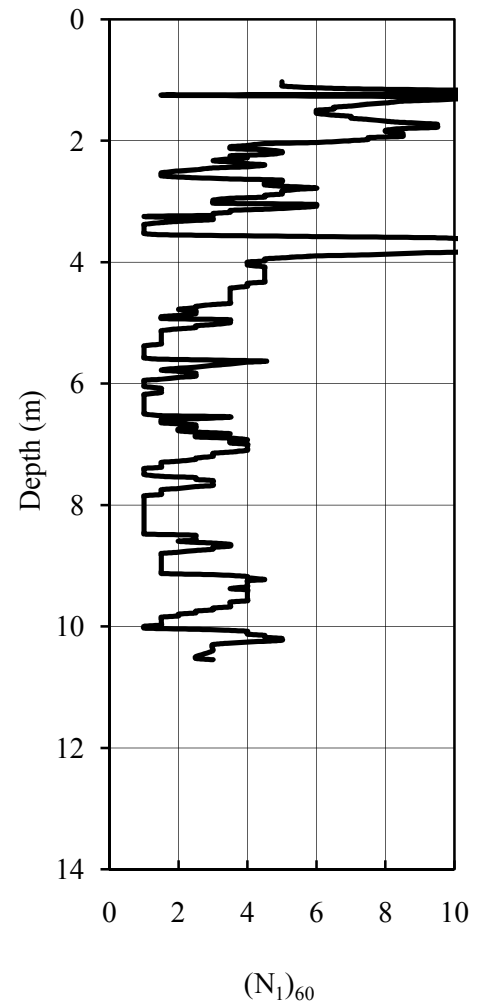
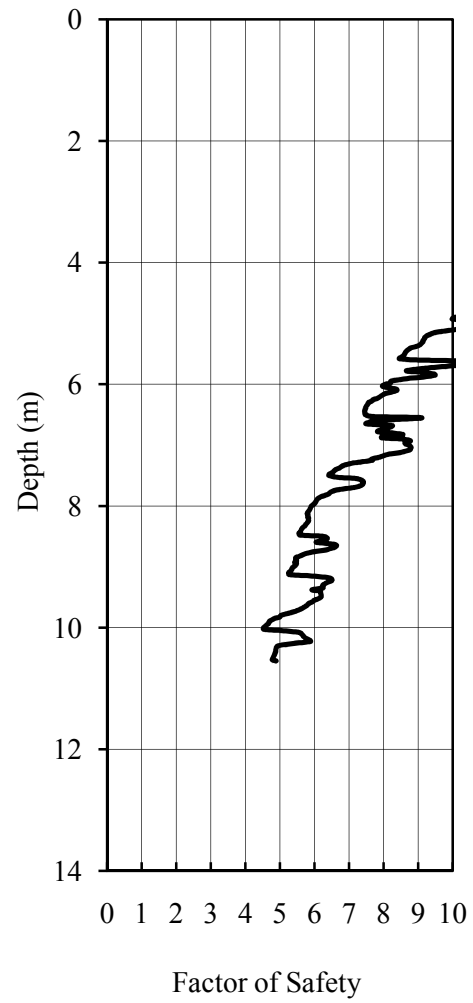
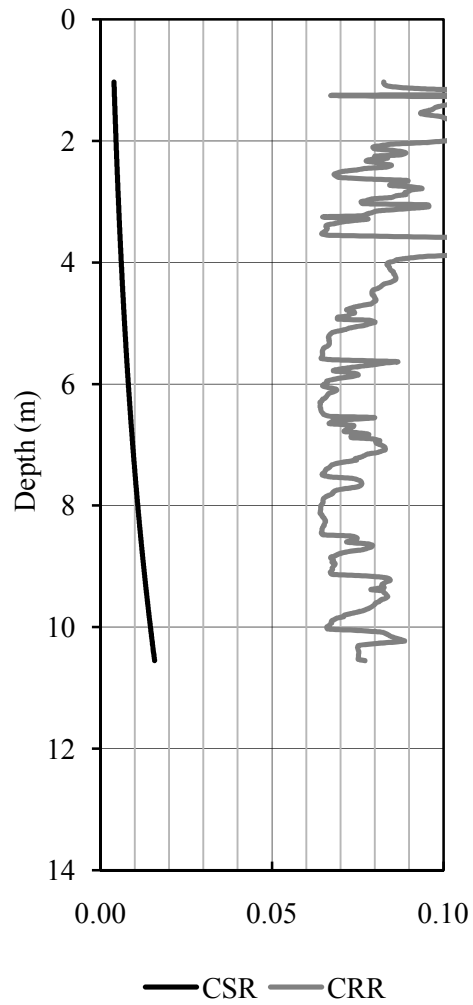


Liquefaction Analyses of CPT Data

Earthquake E1 - $M_w=6.5$, PGA (rock)=0.229 g

CPT

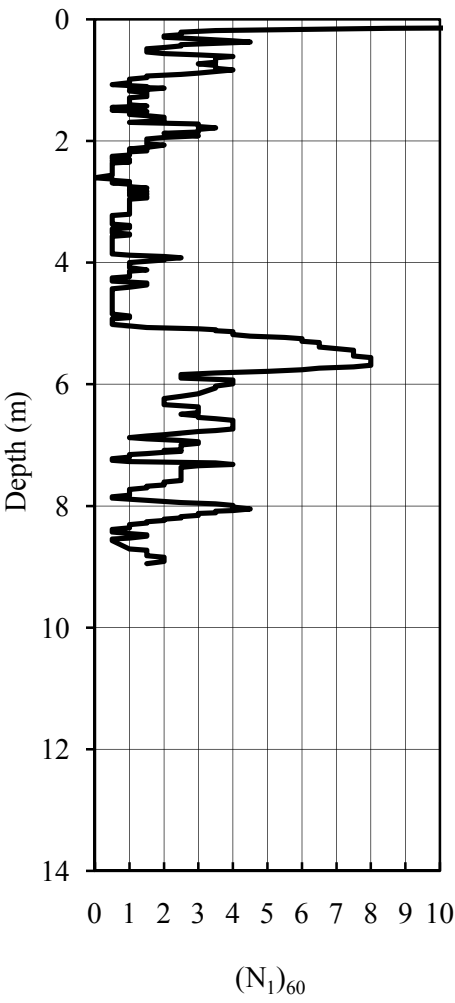
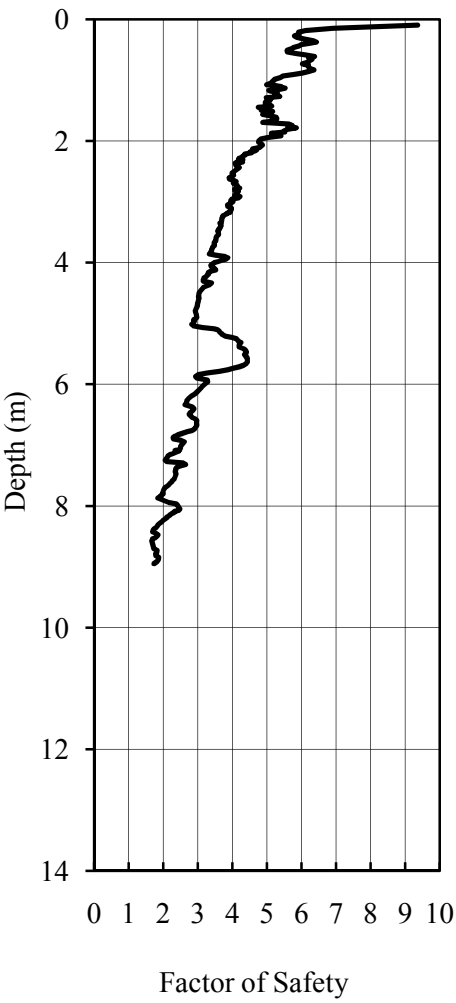
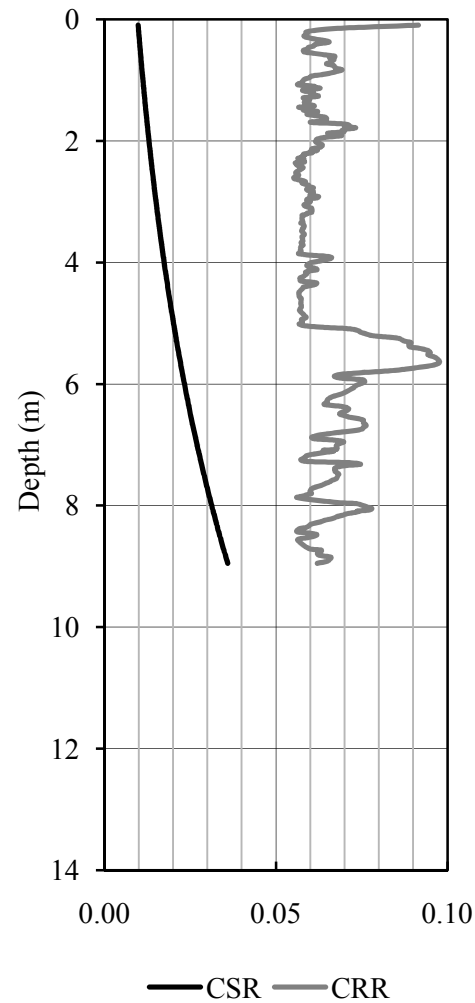
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Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, $PGA(rock)=0.659\text{ g}$

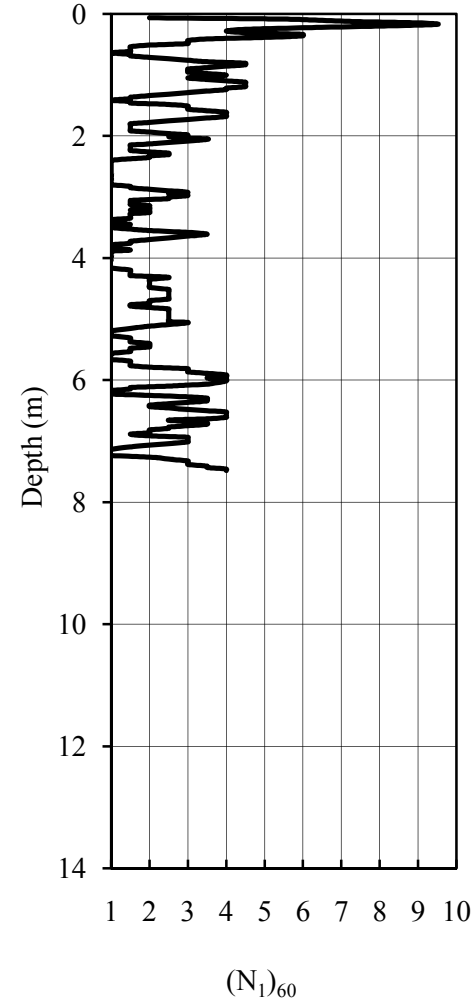
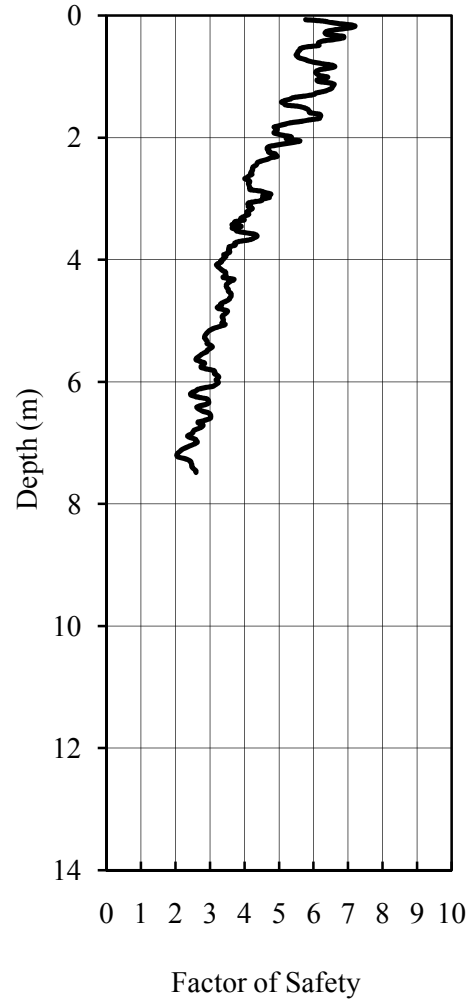
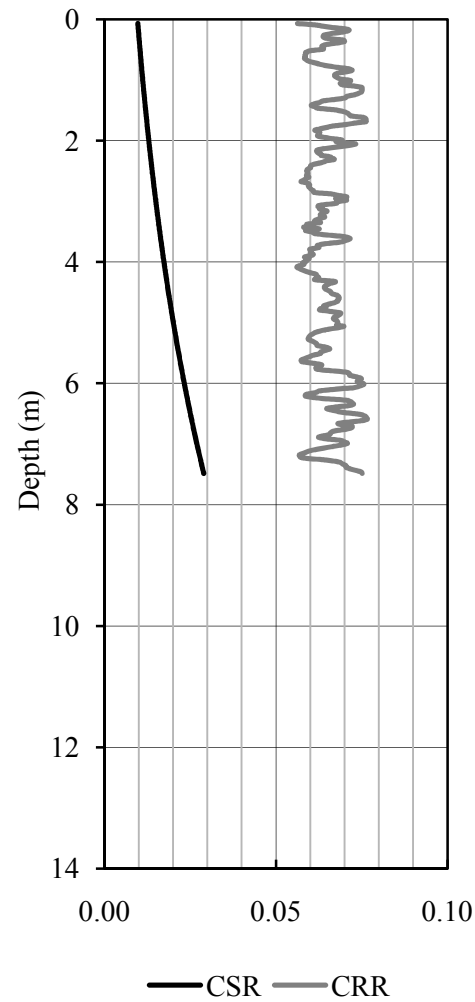
CPT	S1
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Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, PGA (rock)=0.659 g

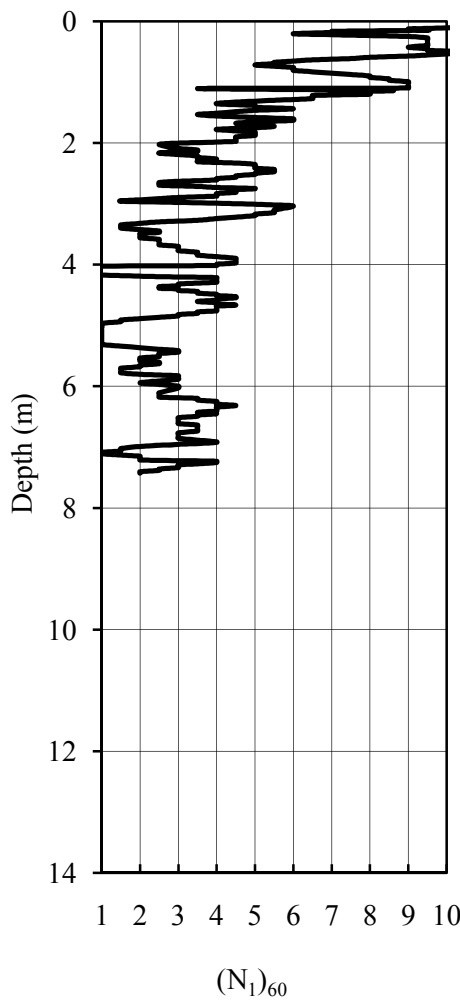
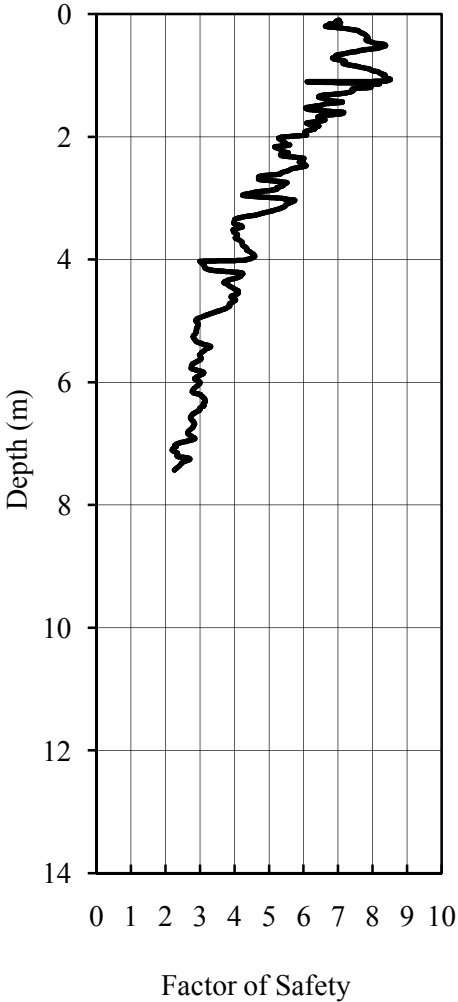
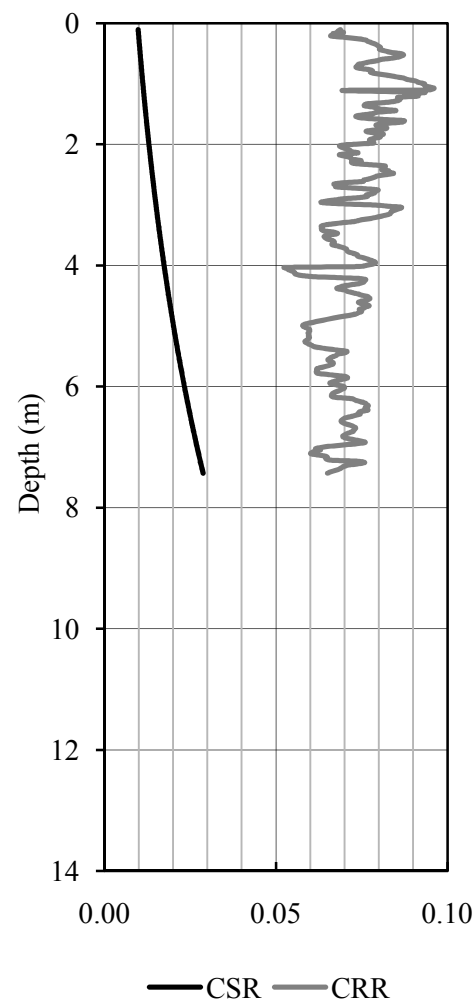
CPT	S2
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Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, PGA (rock)=0.659 g

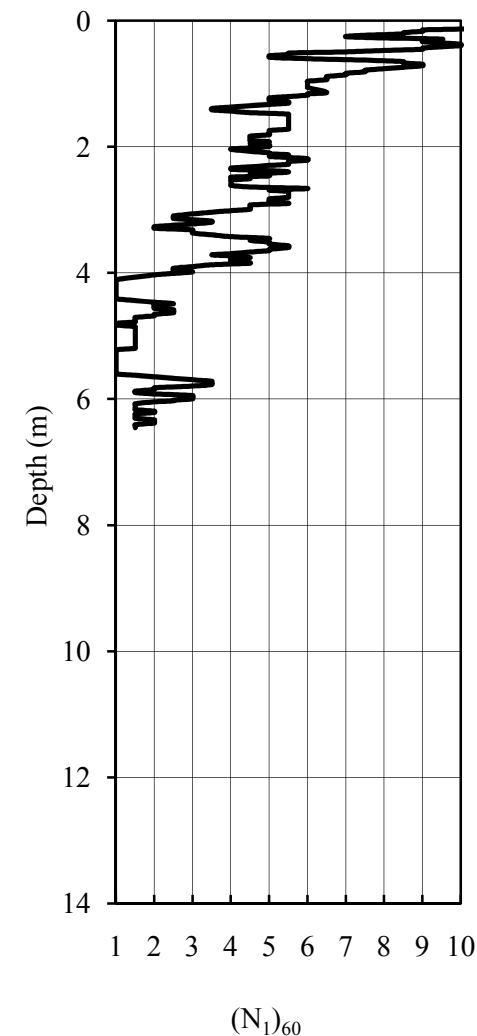
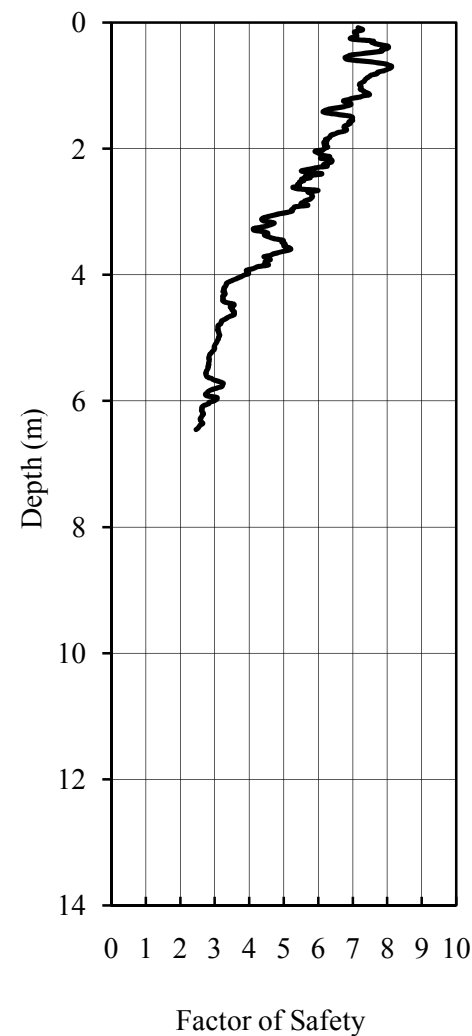
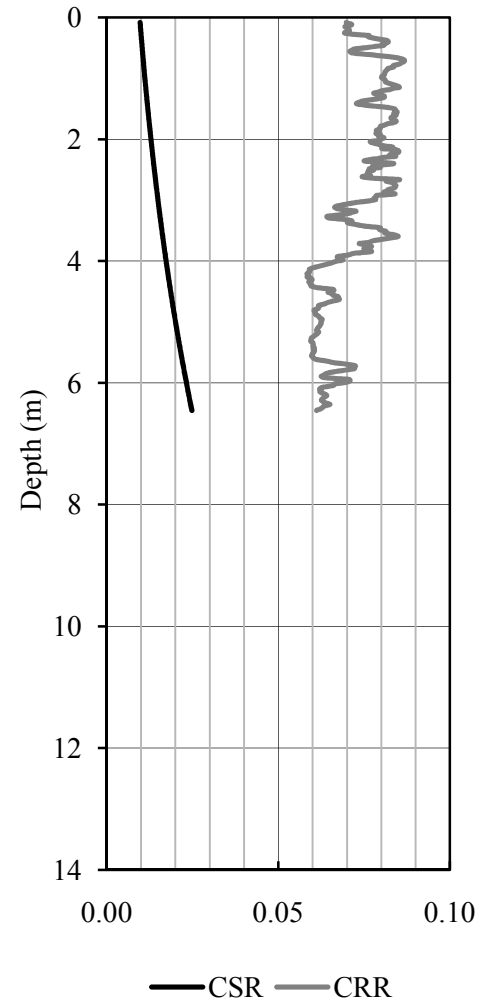
CPT	S3
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Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, $PGA(rock)=0.659\text{ g}$

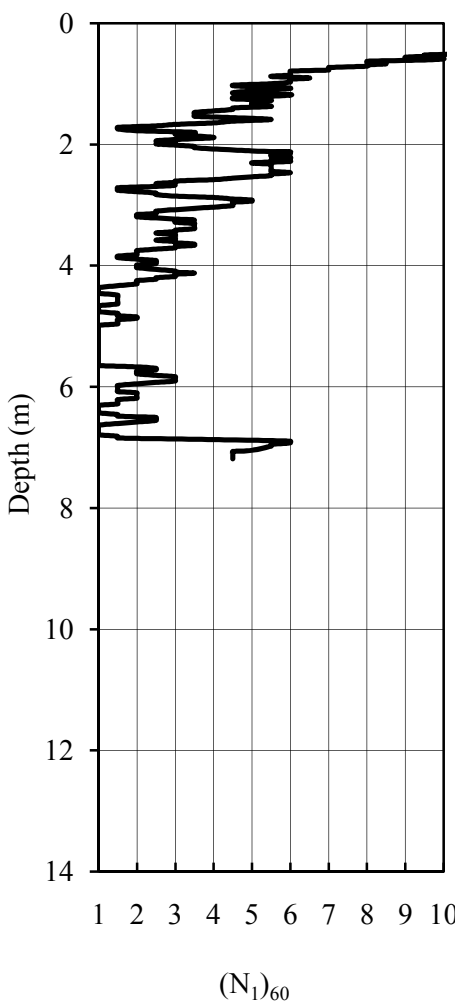
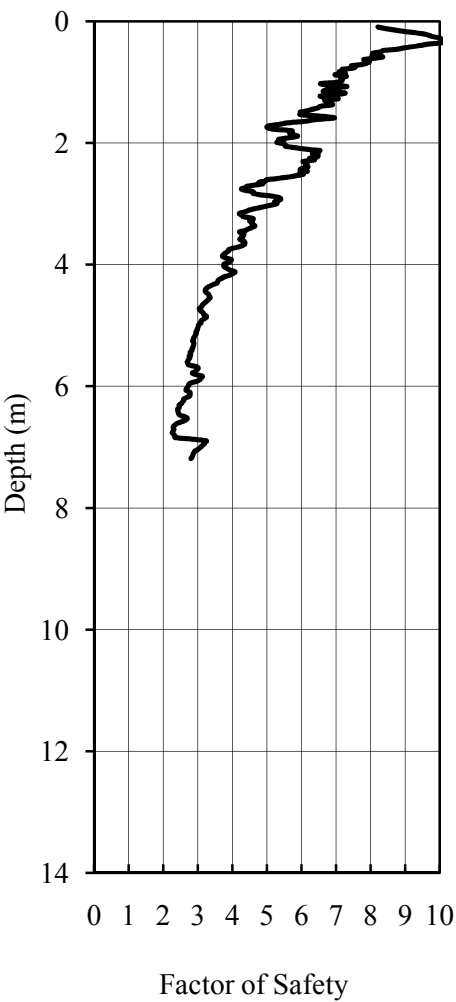
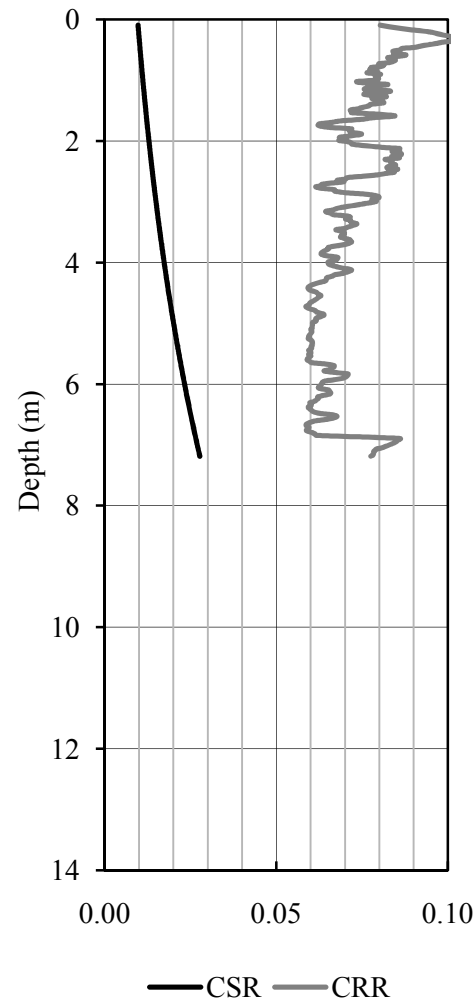
CPT	S4
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Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, $PGA(rock)=0.659\text{ g}$

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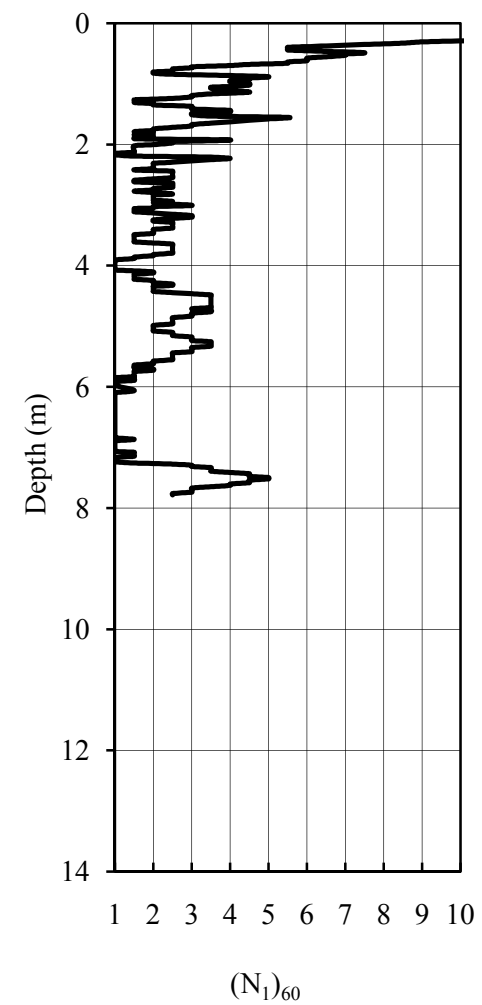
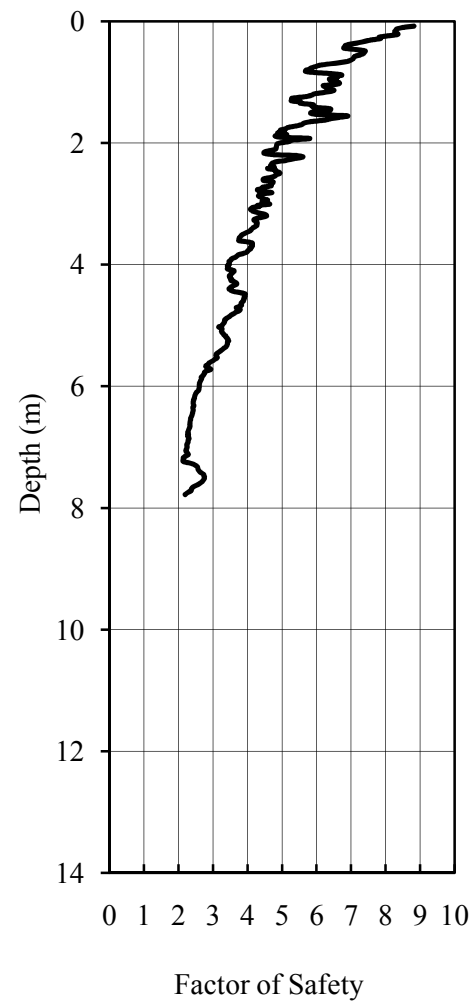
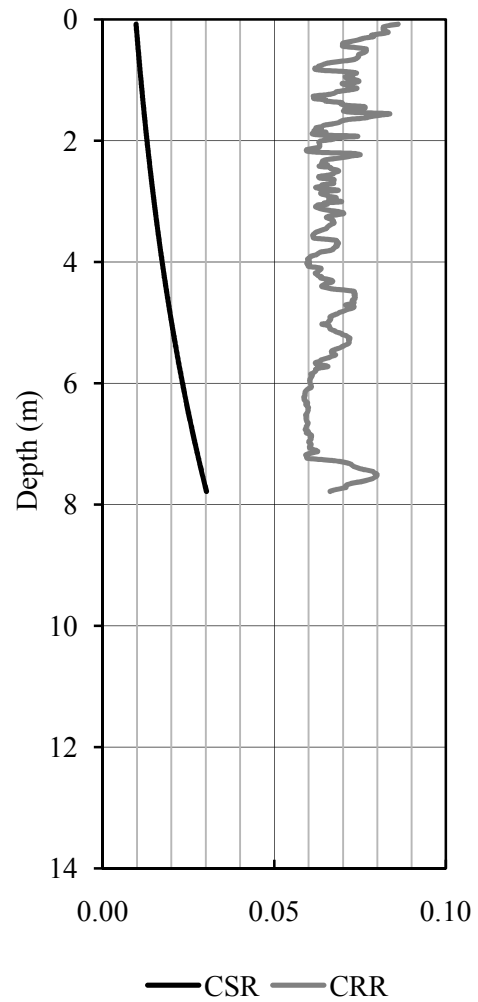


Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, PGA (rock)=0.659 g

CPT

S6

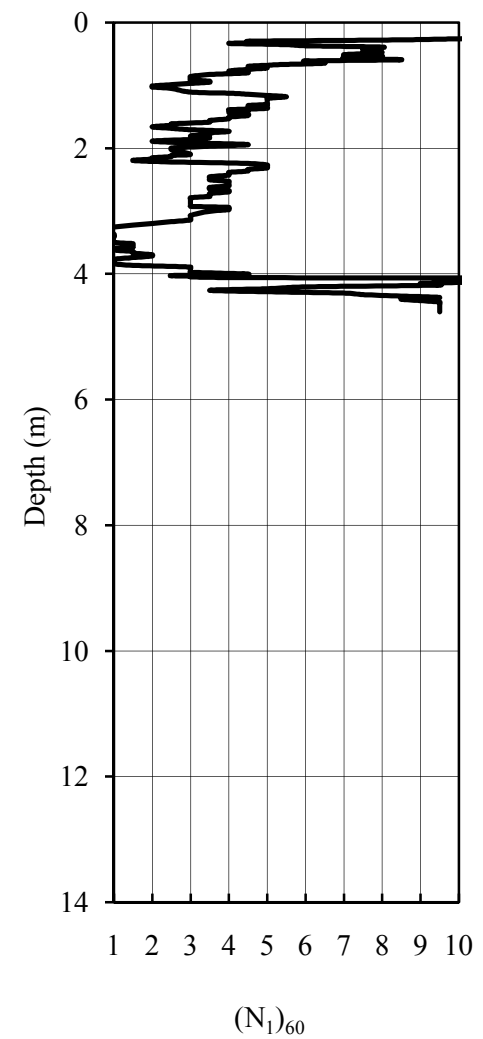
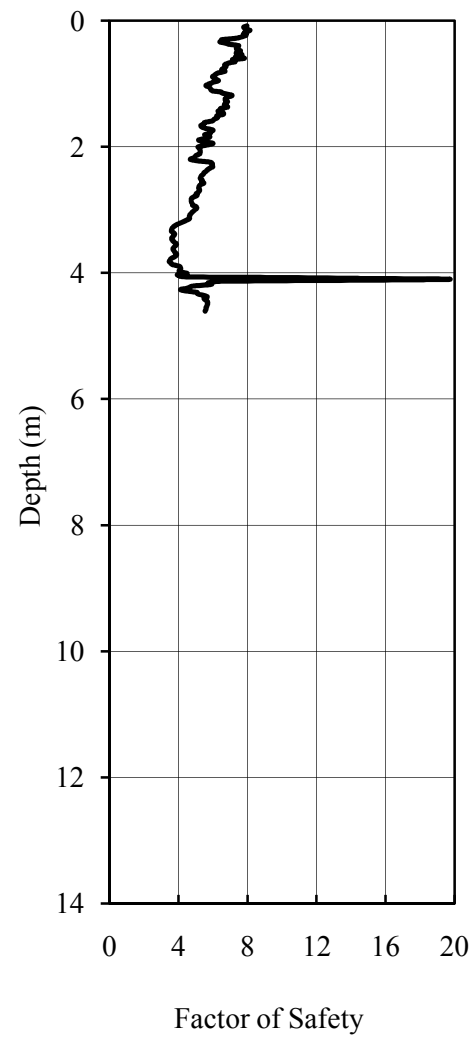
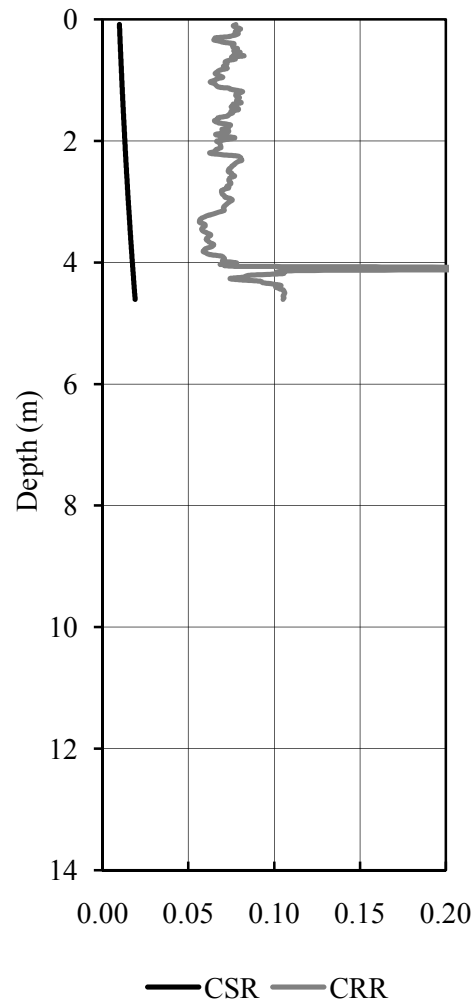


Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, $PGA(rock)=0.659$ g

CPT

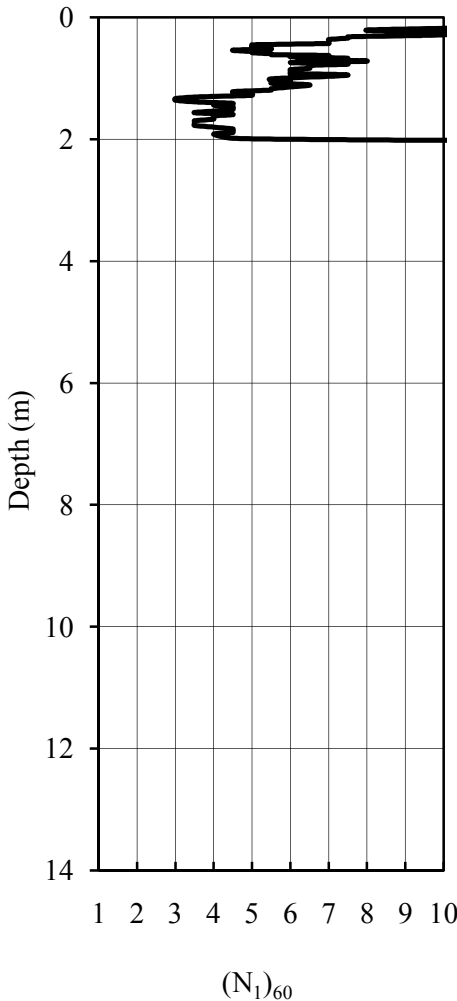
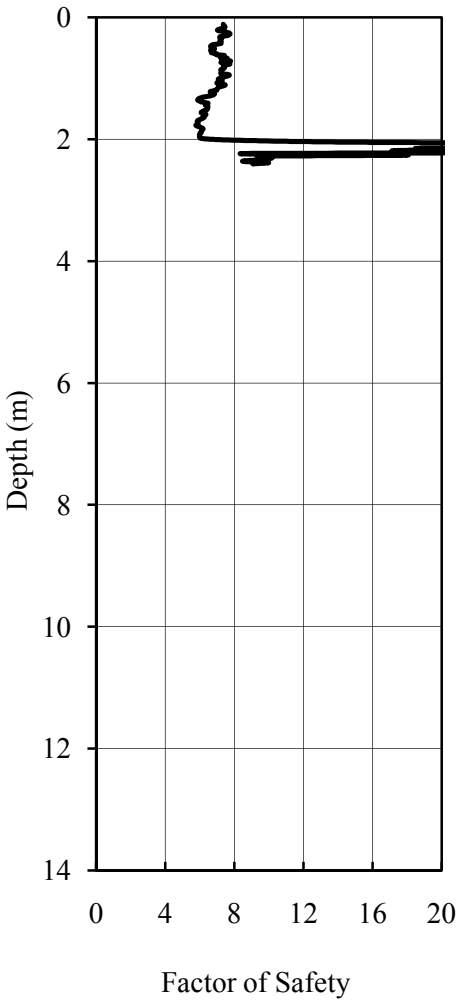
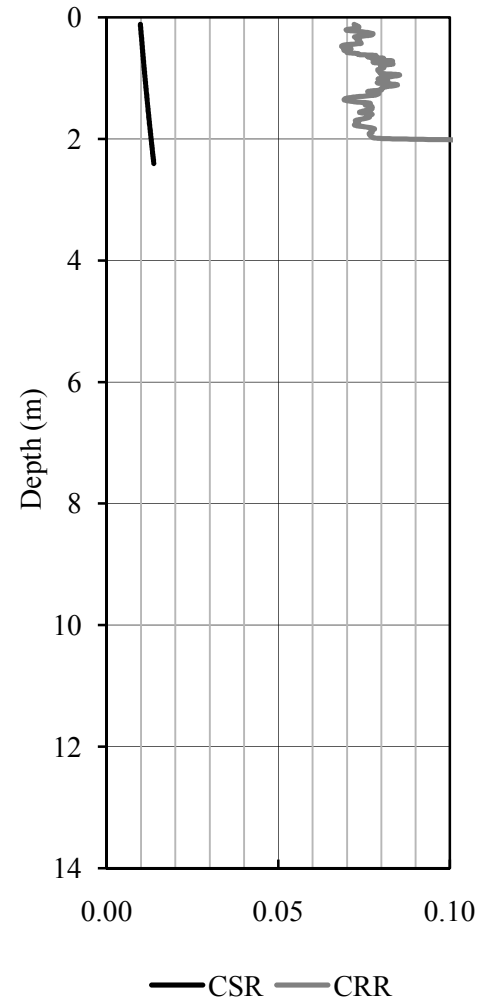
S7



Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, $PGA(rock)=0.659$ g

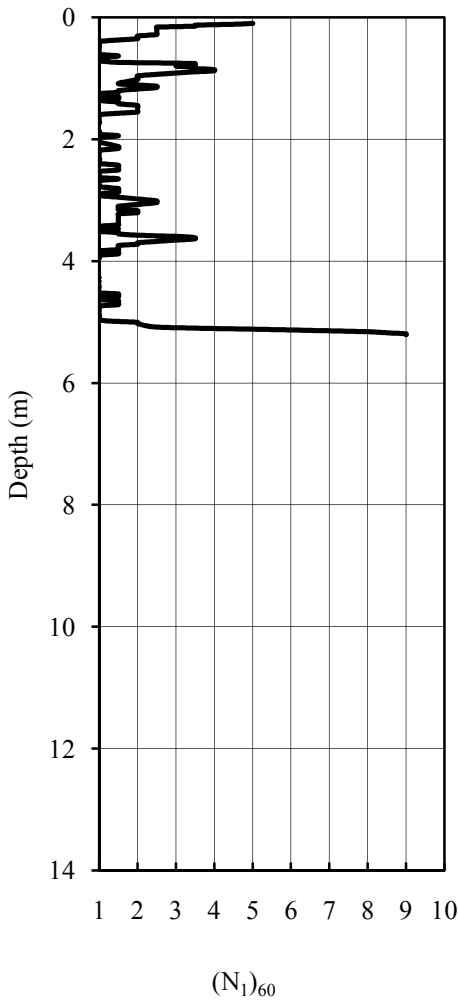
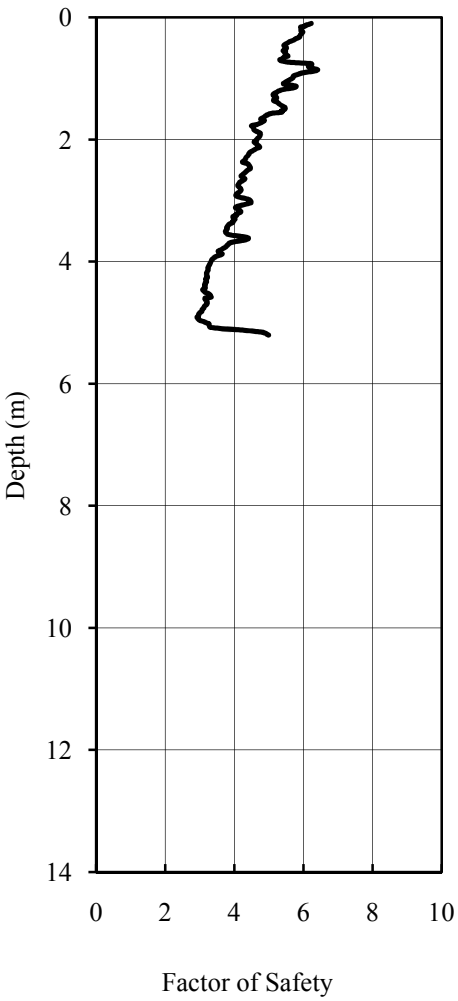
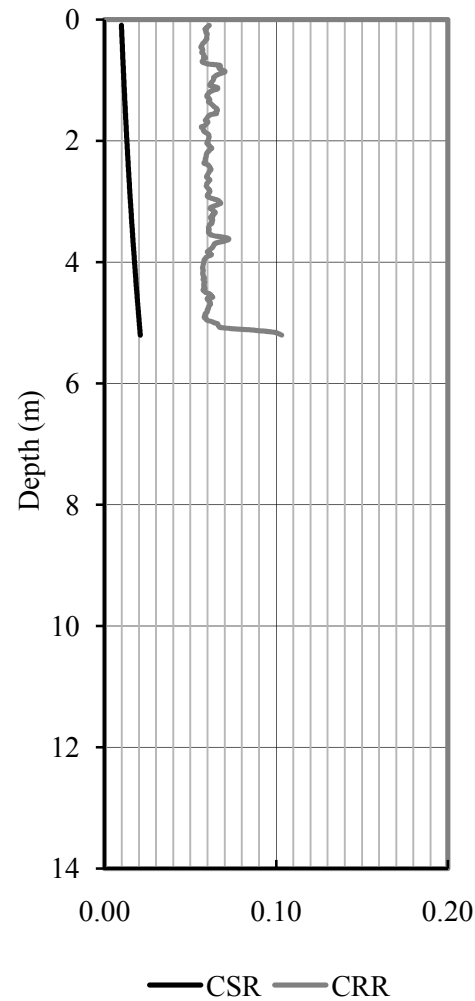
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Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, PGA (rock)=0.659 g

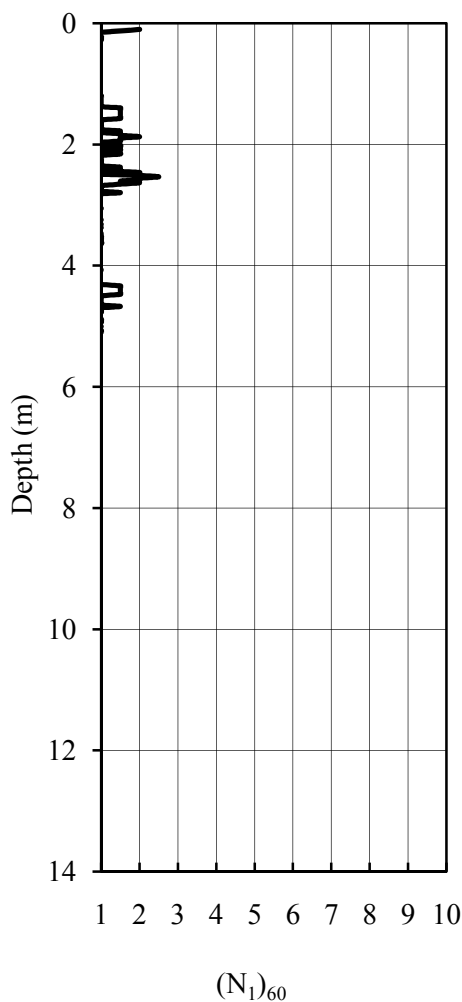
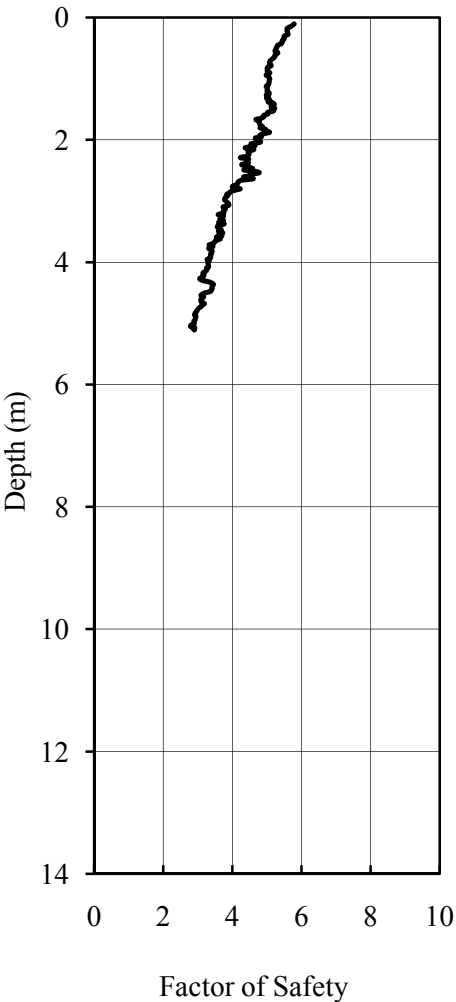
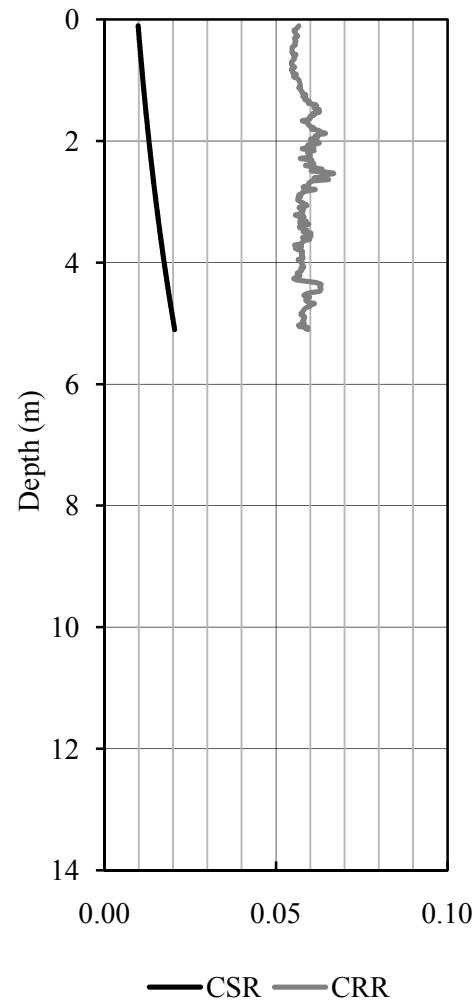
CPT	S9
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Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, $PGA(rock)=0.659\text{ g}$

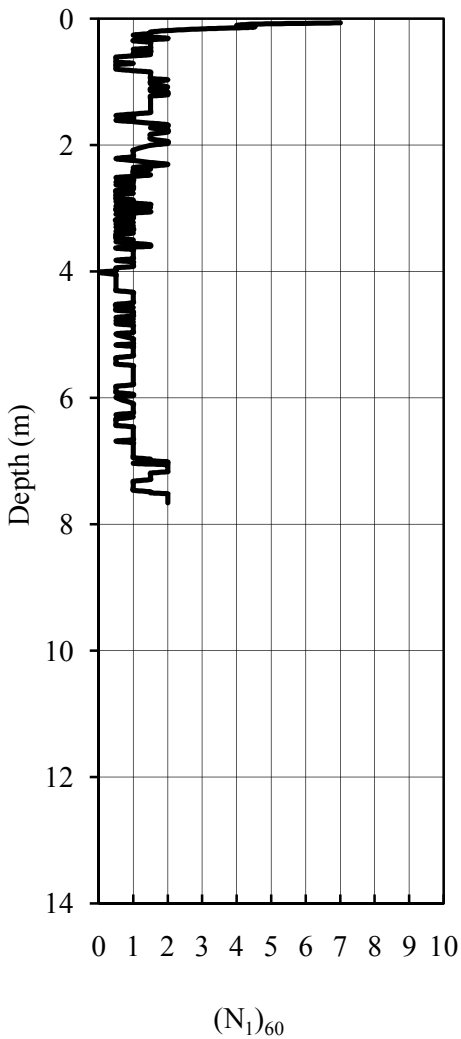
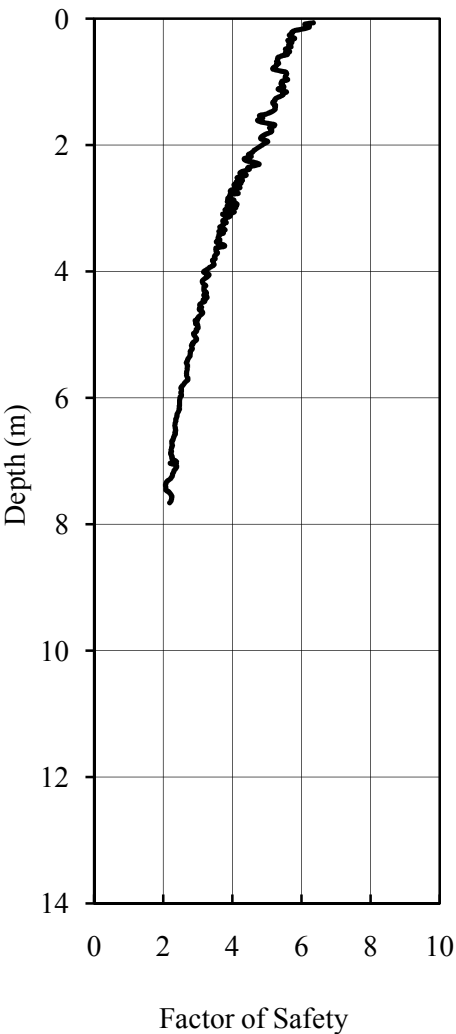
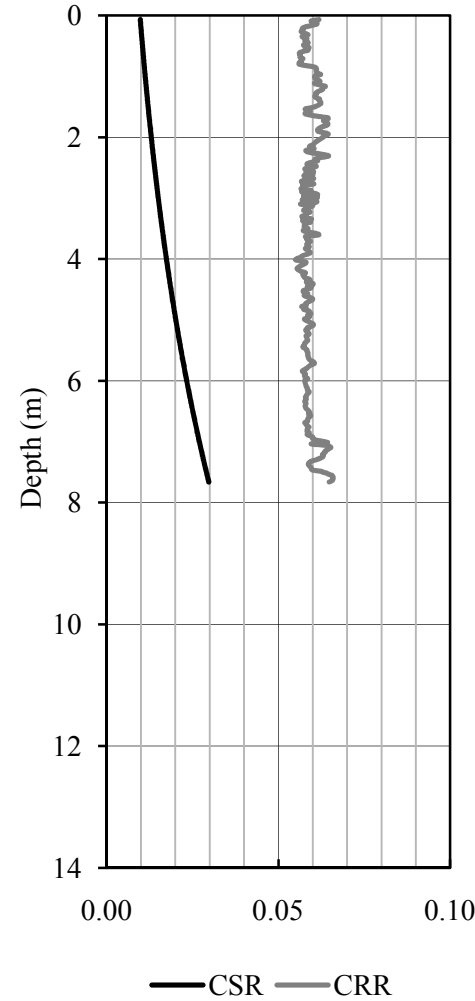
CPT	S10
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Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, $PGA(rock)=0.659$ g

CPT	S11
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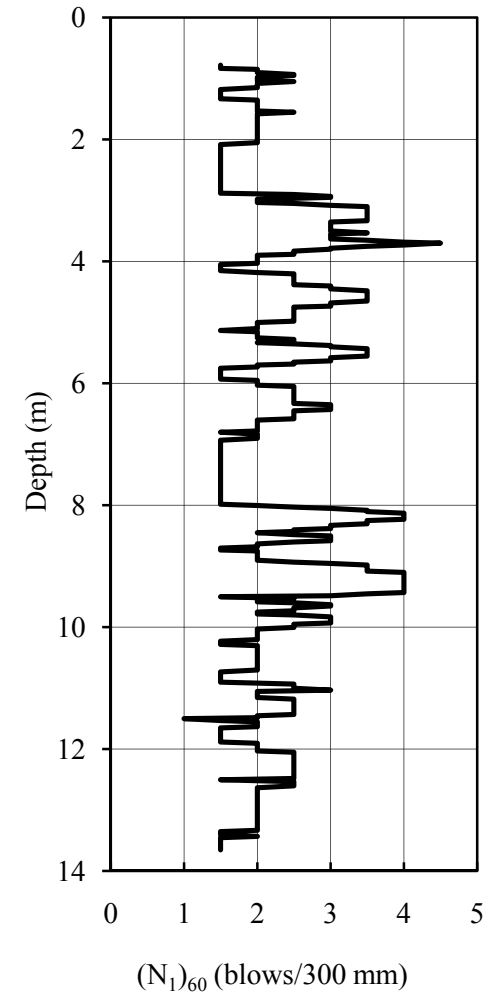
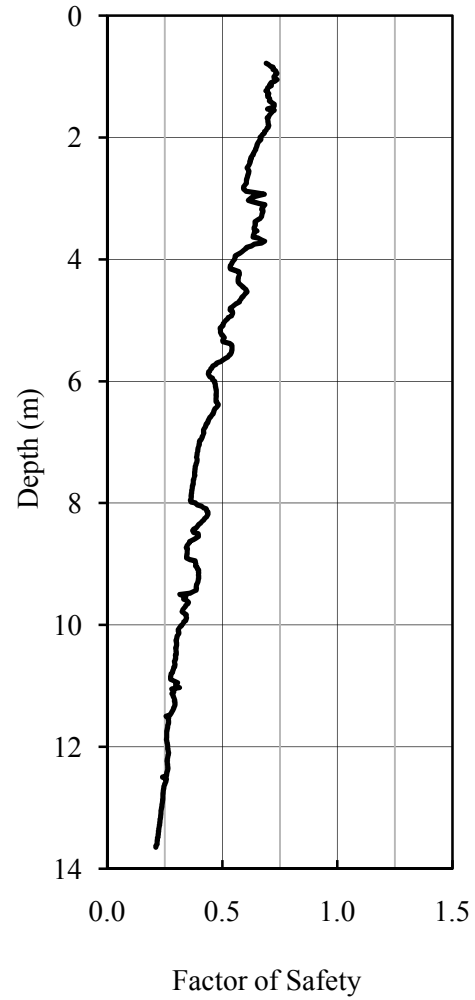
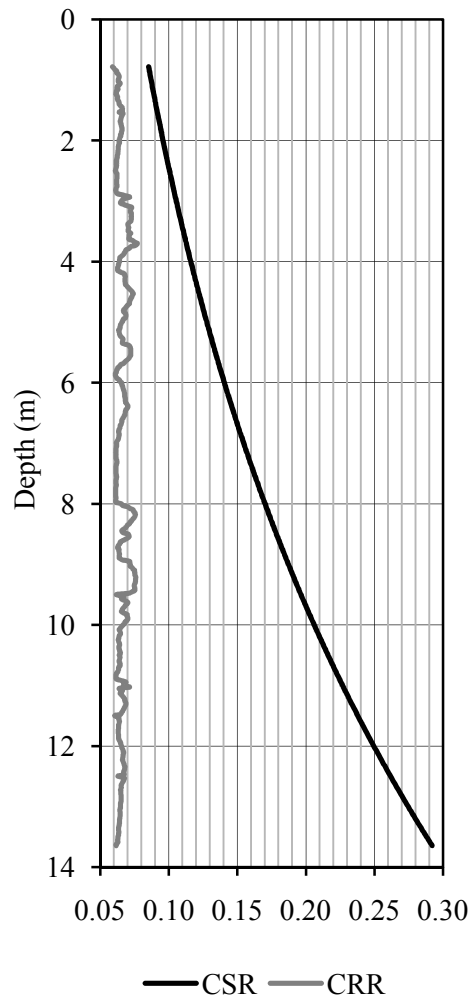


Liquefaction Analyses of CPT Data

Earthquake E3 - Mw=7, PGA (rock)=0.659 g.

CPT

02-02

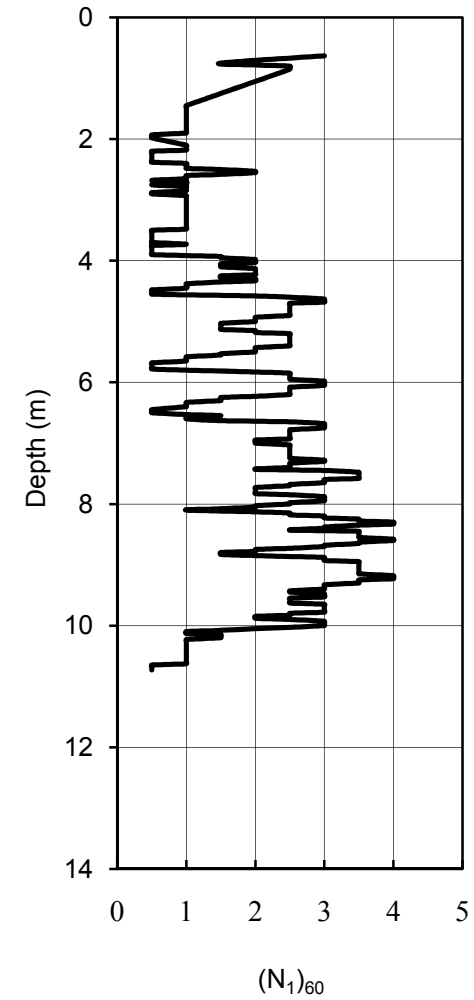
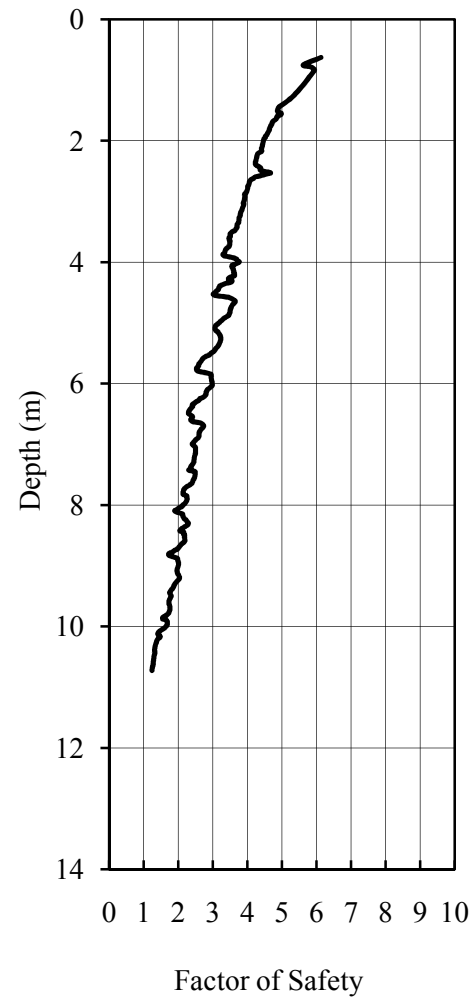
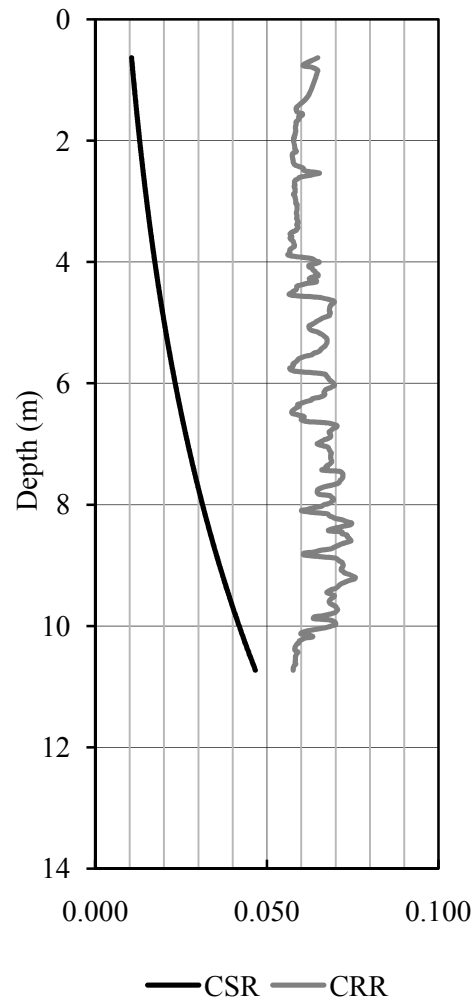


Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, PGA (rock)=0.659 g

CPT

02-03

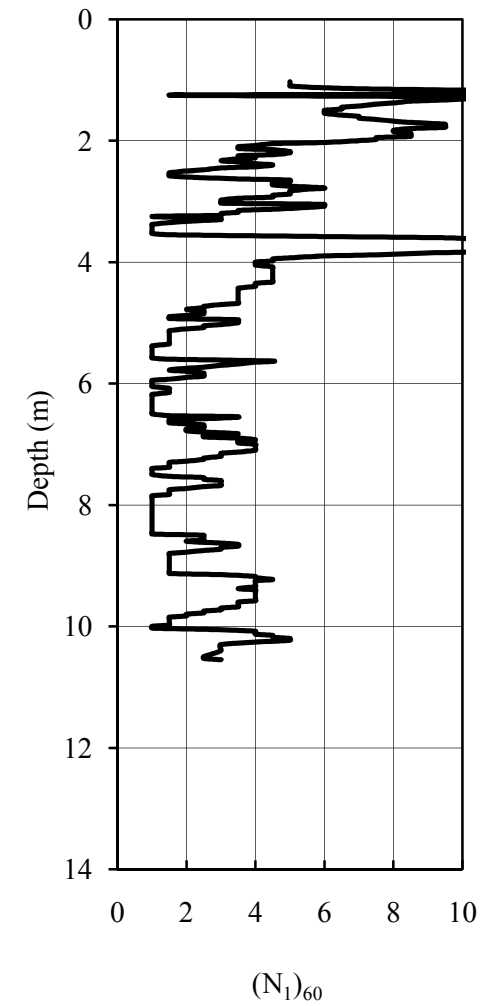
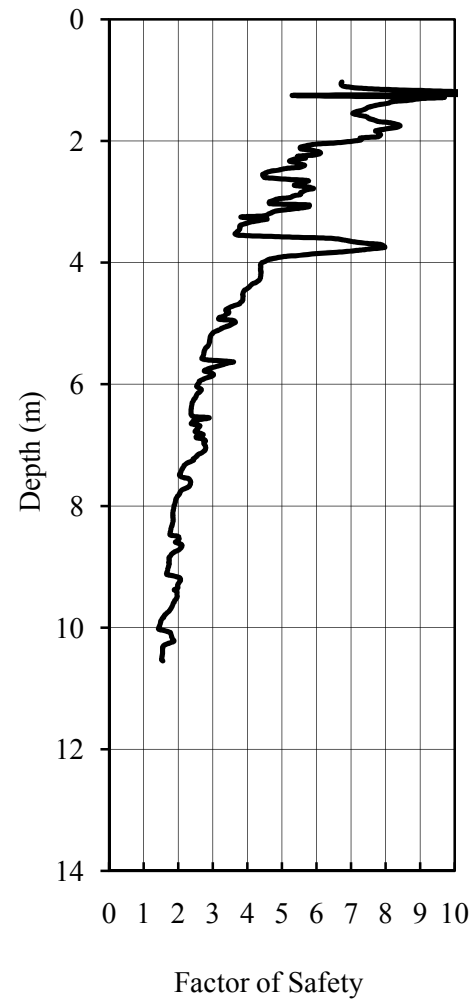
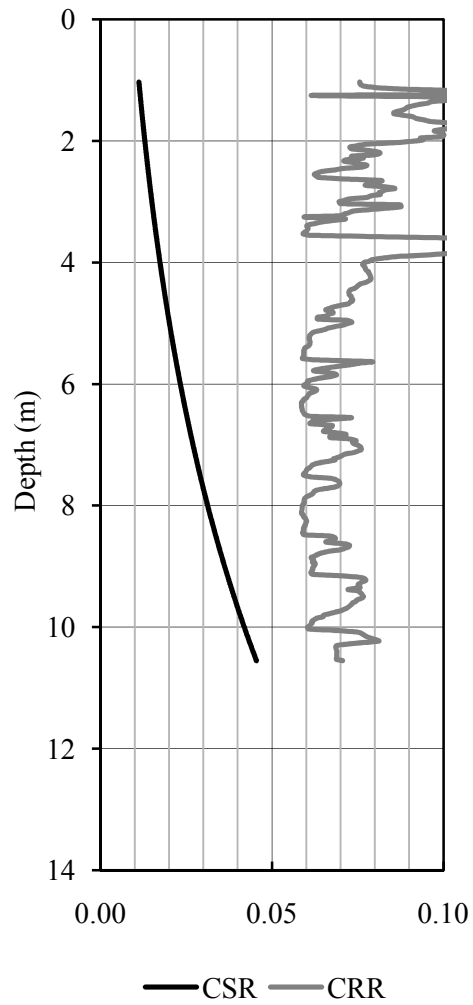


Liquefaction Analyses of CPT Data

Earthquake E3 - $M_w=7$, PGA (rock)=0.659 g

CPT

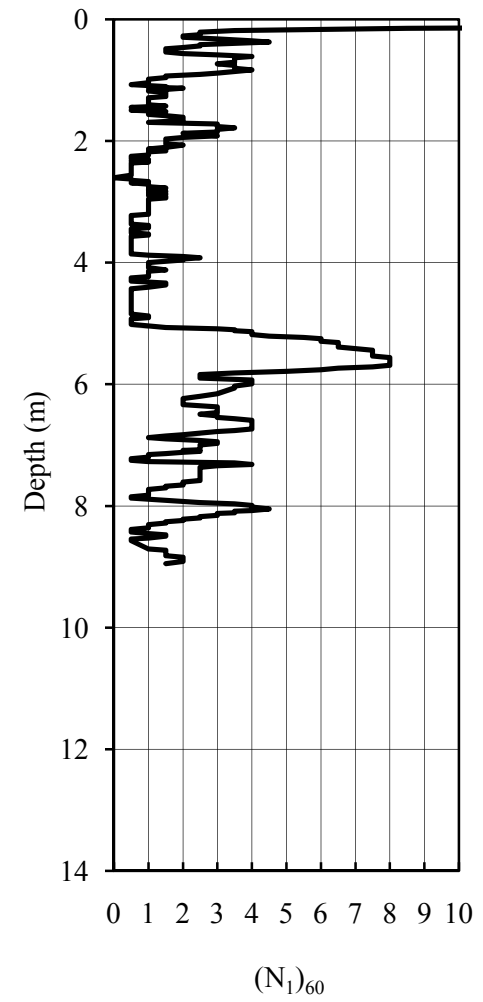
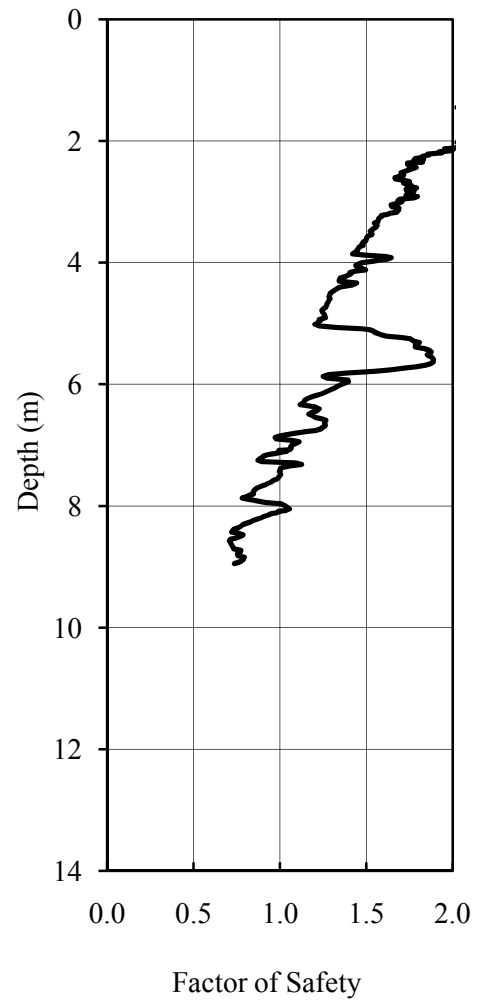
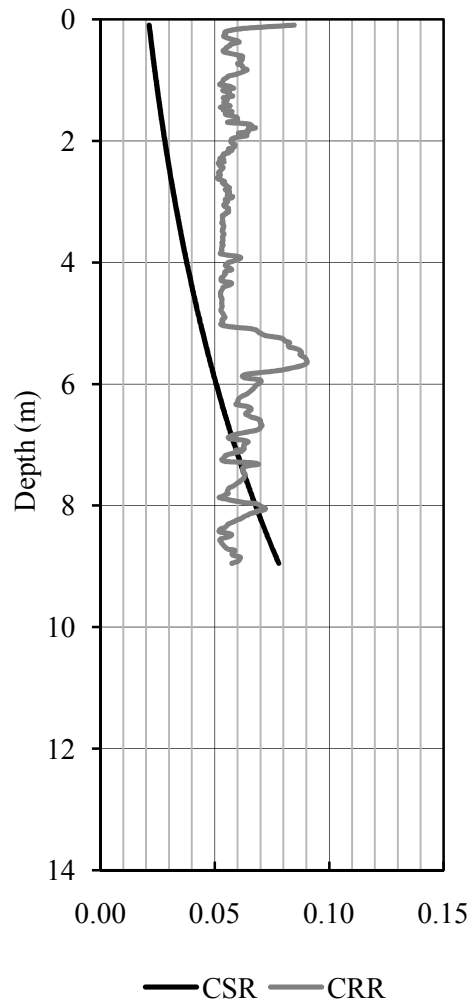
02-04



Liquefaction Analyses of CPT Data

Earthquake E5 - $M_w=7.5$, PGA (rock)=1.432 g

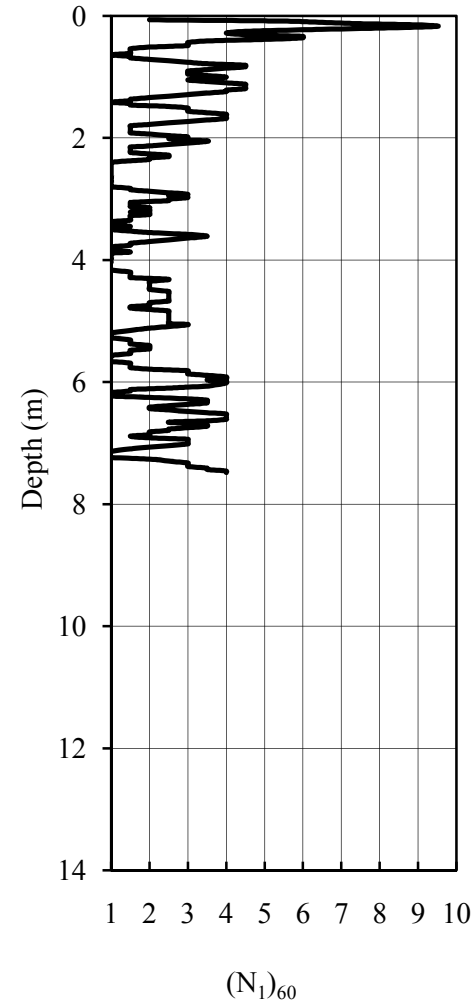
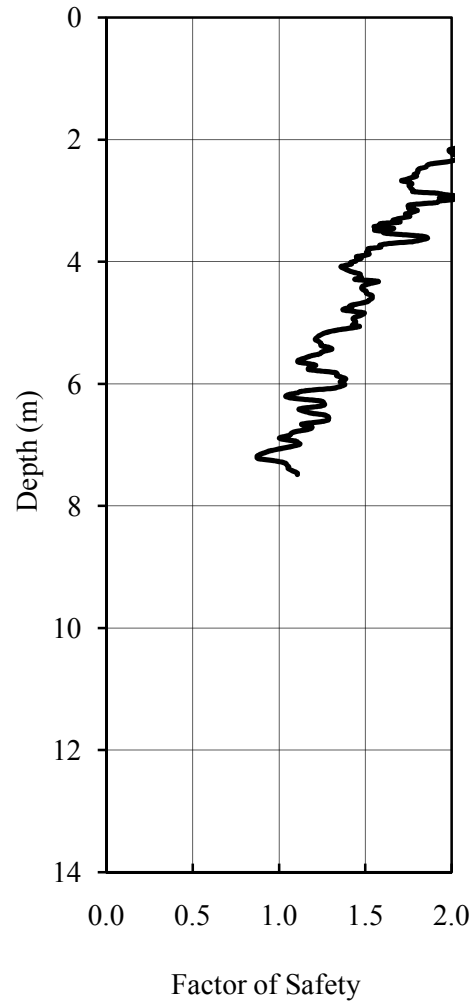
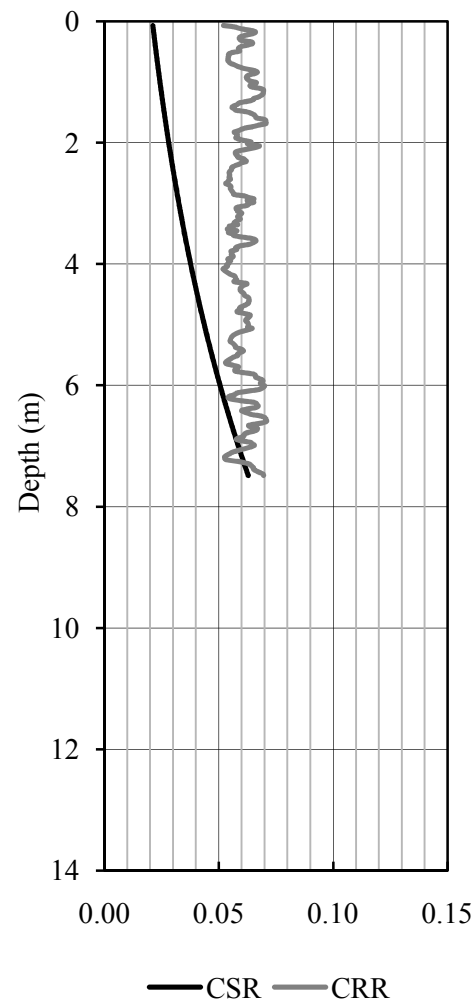
CPT	S1
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Liquefaction Analyses of CPT Data

Earthquake E5 - $M_w=7.5$, PGA (rock)=1.432 g

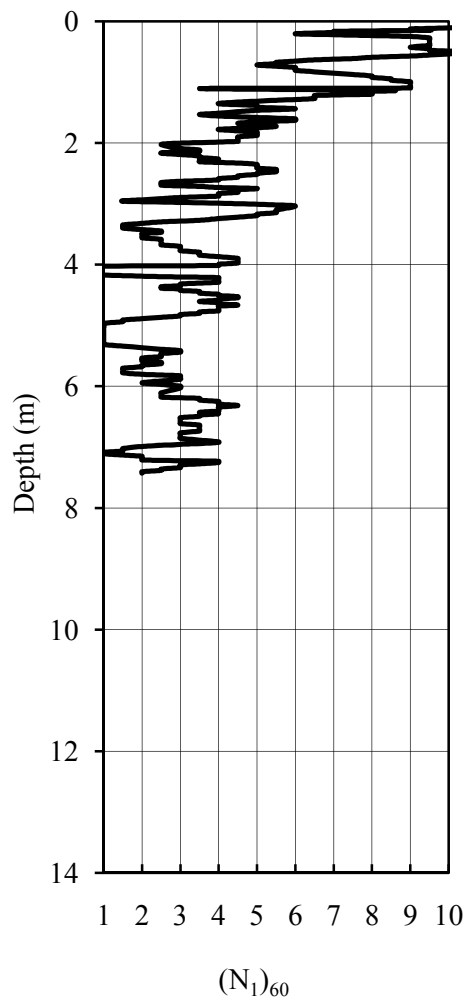
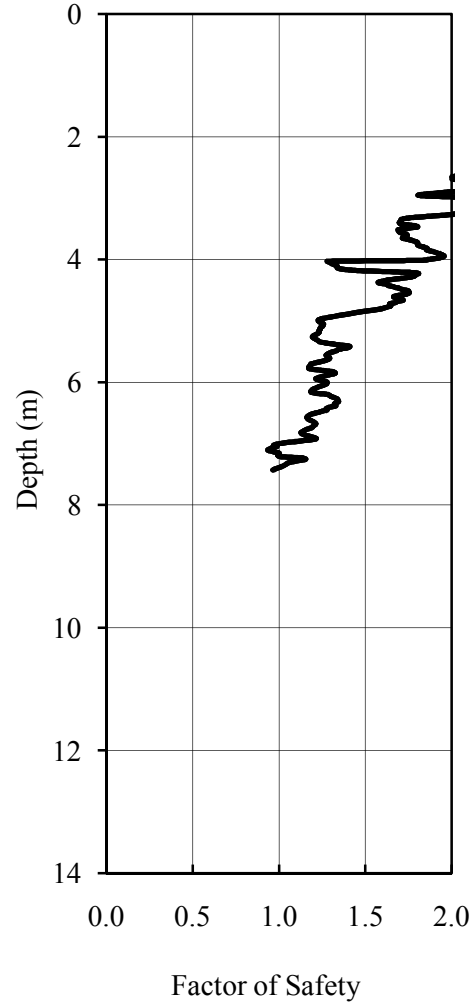
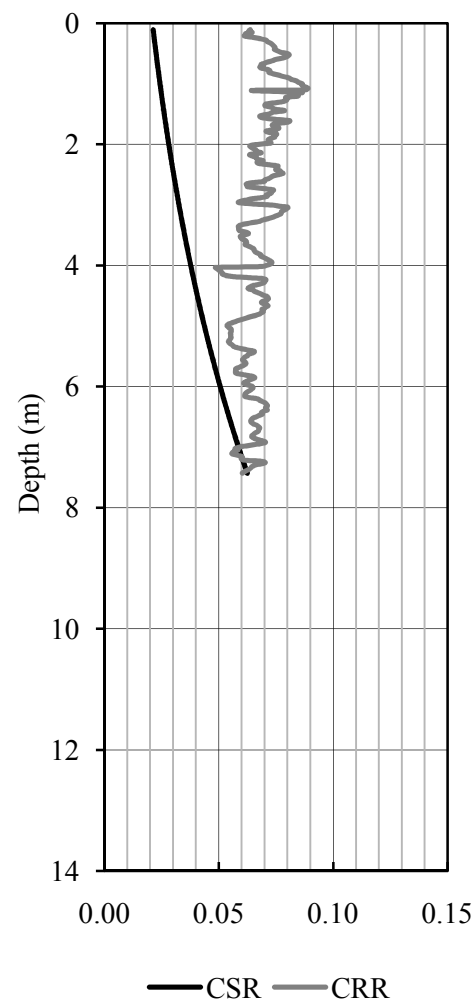
CPT	S2
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Liquefaction Analyses of CPT Data

Earthquake E5 - $M_w=7.5$, PGA (rock)=1.432 g

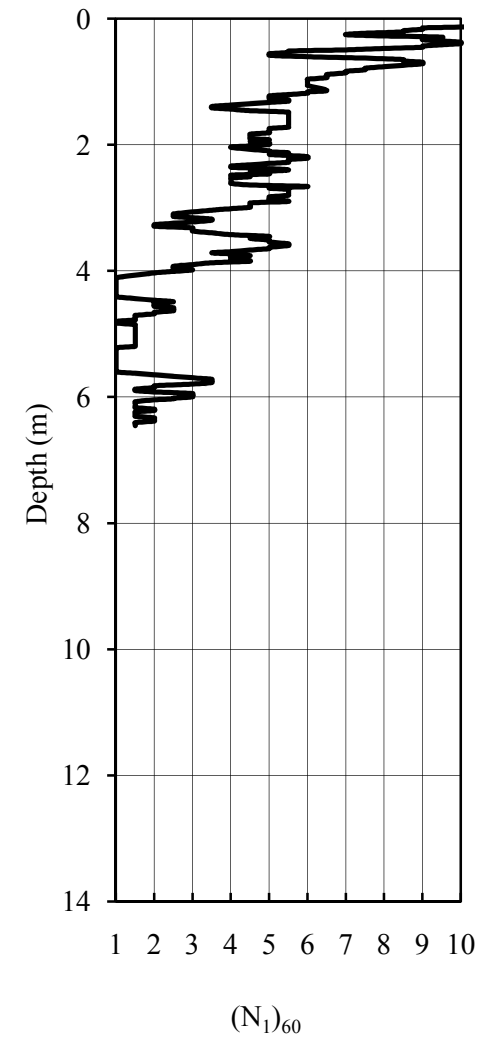
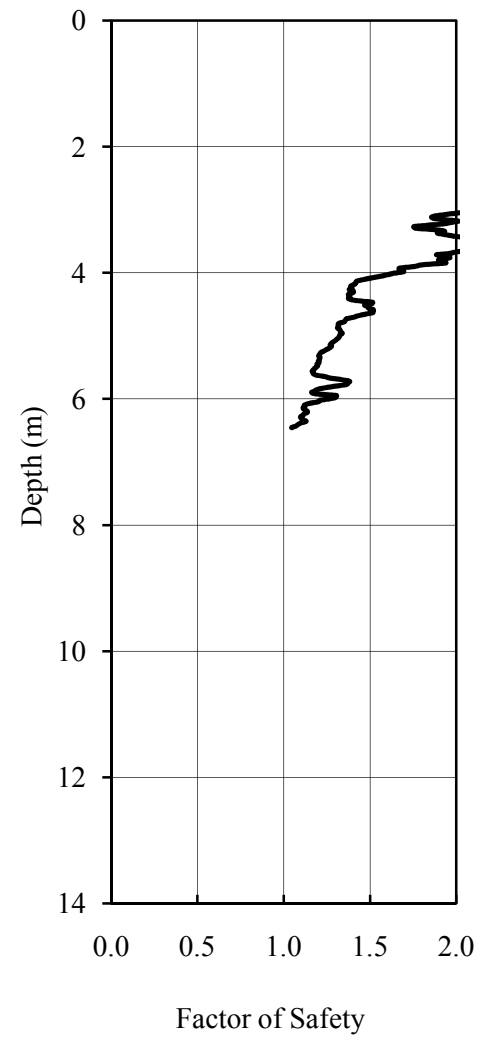
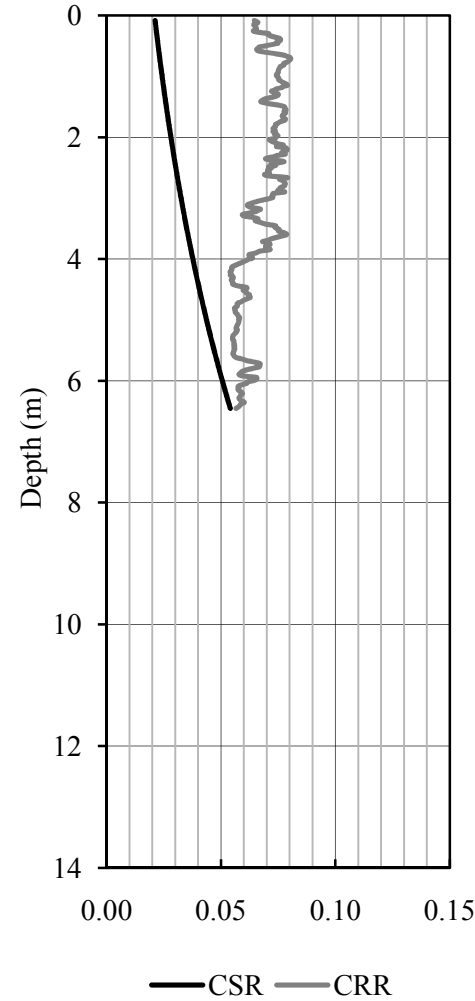
CPT	S3
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Liquefaction Analyses of CPT Data

Earthquake E5 - $M_w=7.5$, PGA (rock)=1.432 g

CPT	S4
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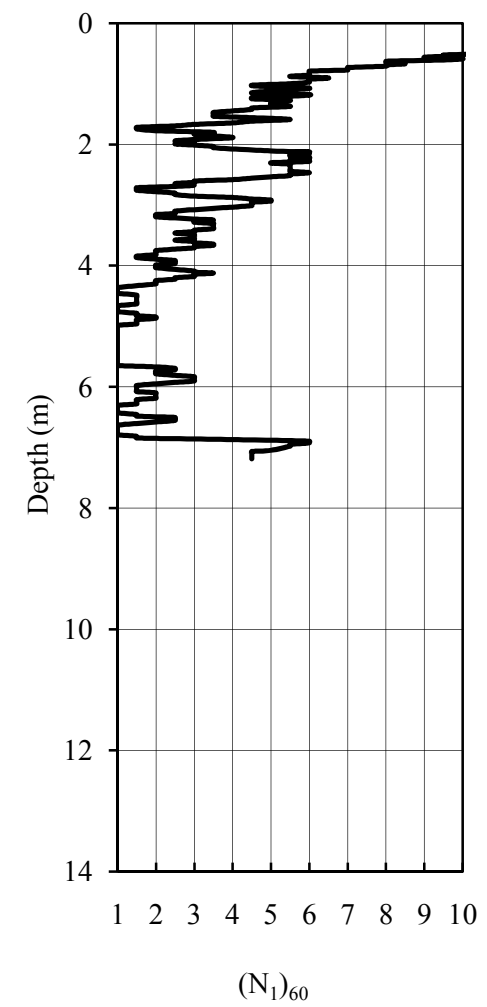
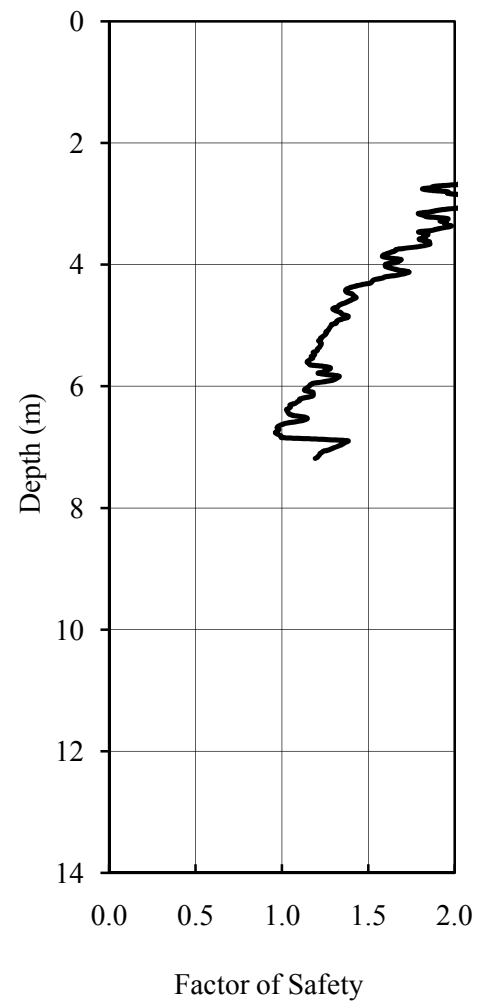
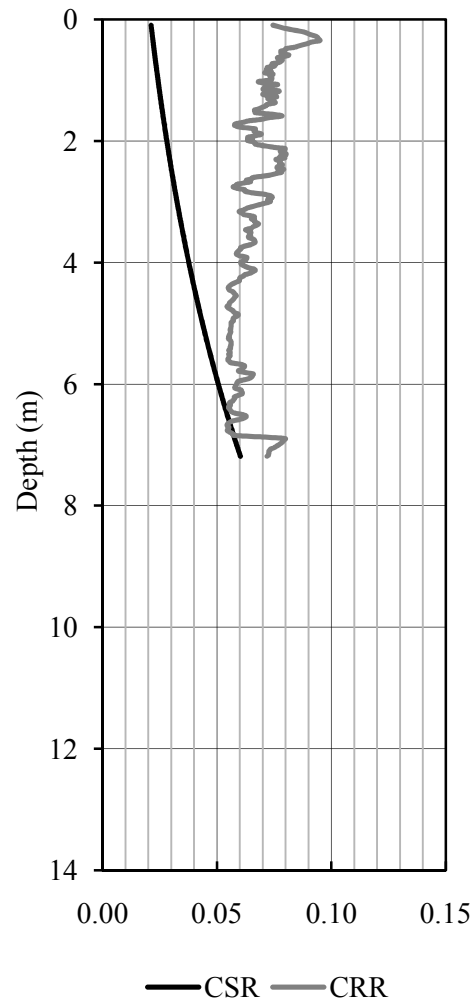


Liquefaction Analyses of CPT Data

Earthquake E5 - $M_w=7.5$, PGA (rock)=1.432 g

CPT

S5

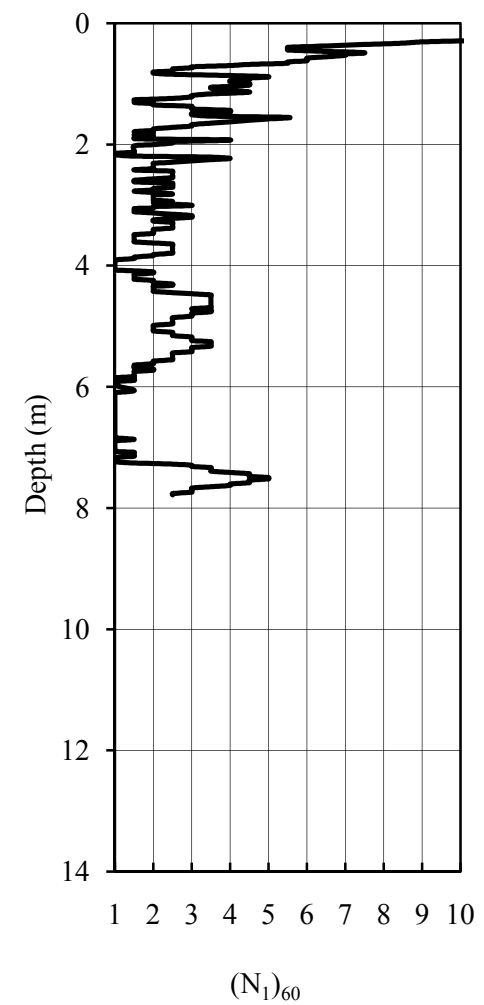
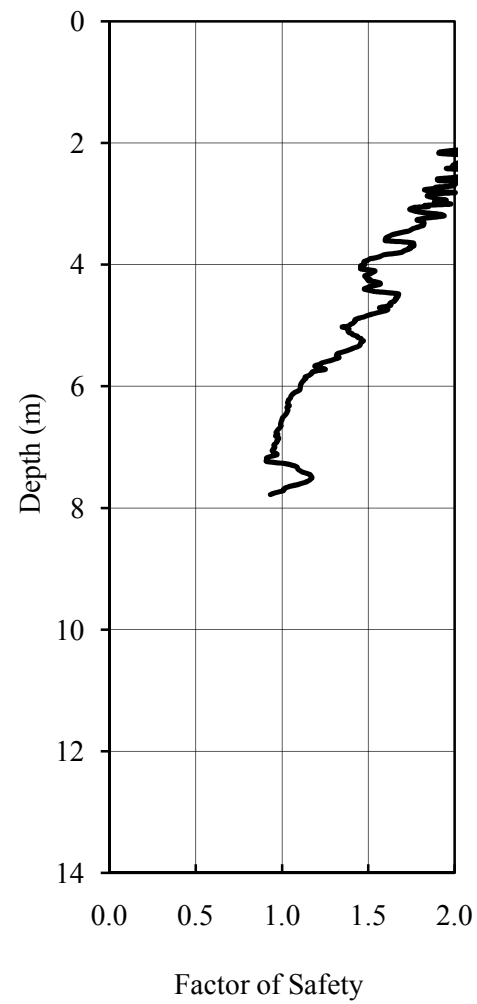
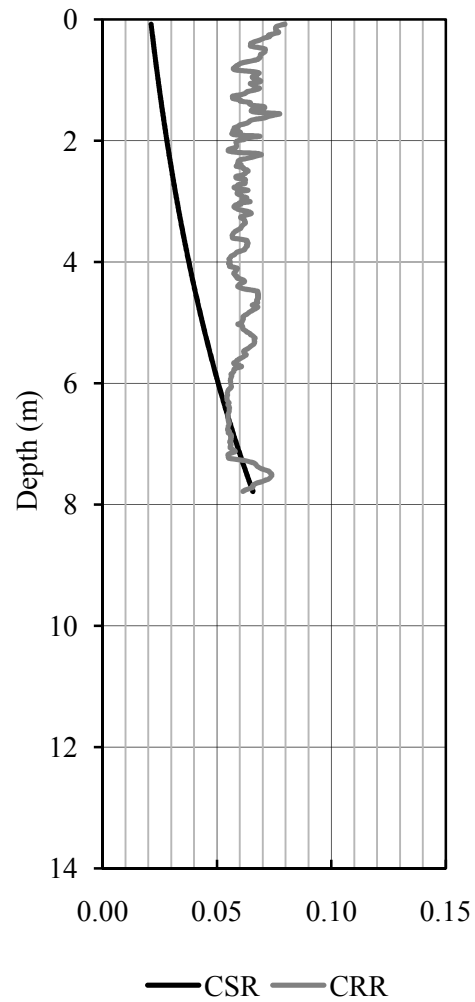


Liquefaction Analyses of CPT Data

Earthquake E5 - $M_w=7.5$, PGA (rock)=1.432 g

CPT

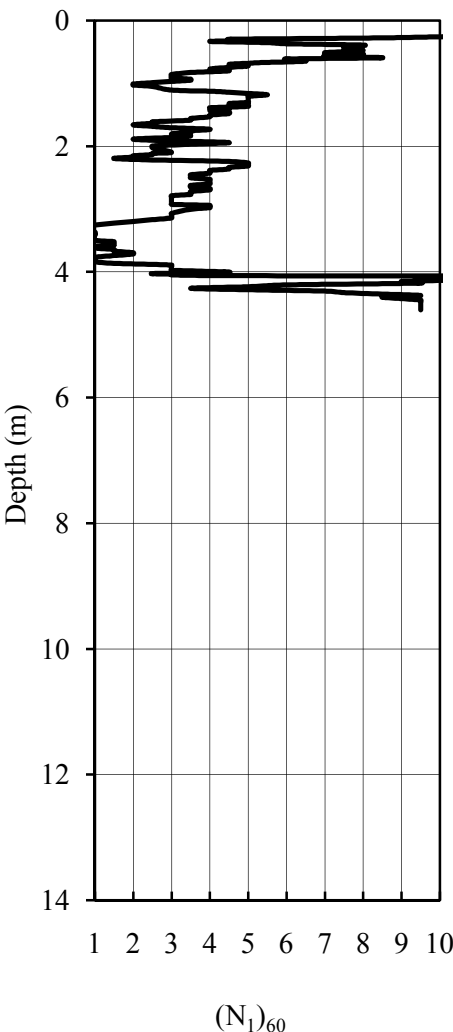
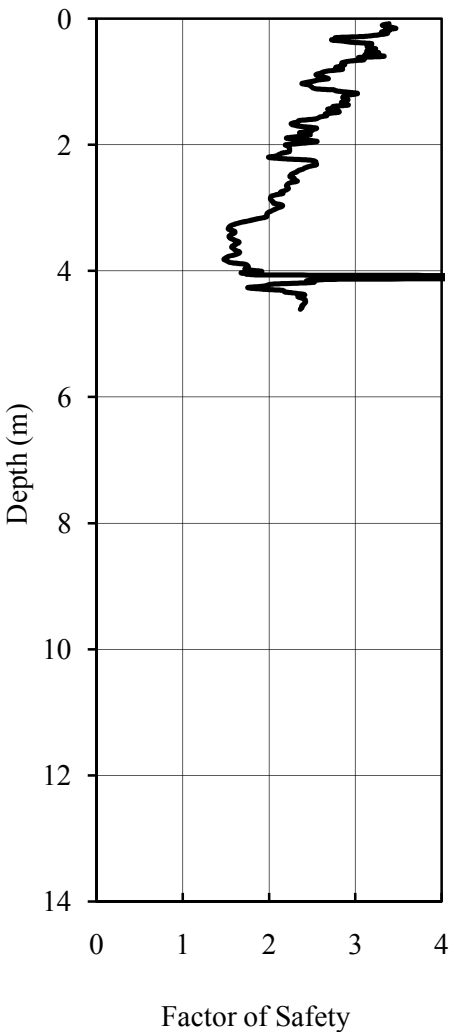
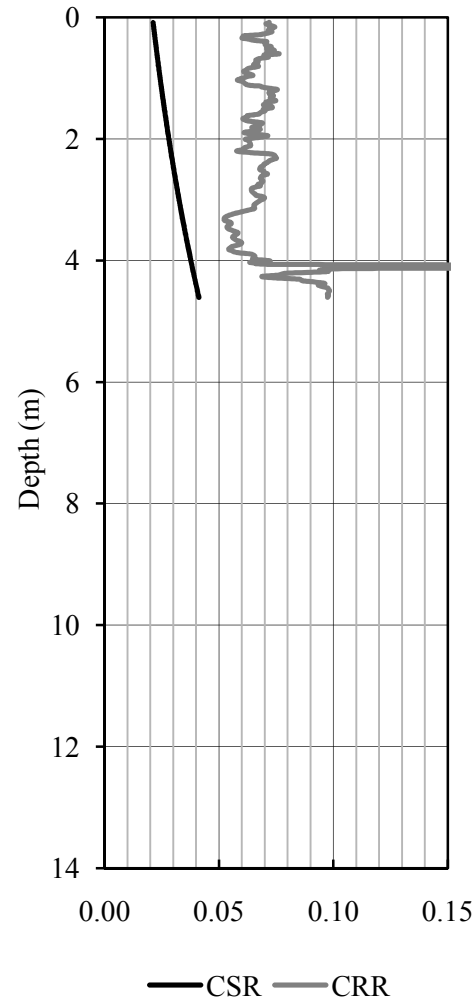
S6



Liquefaction Analyses of CPT Data

Earthquake E5 - $M_w=7.5$, $PGA(rock)=1.432\text{ g}$

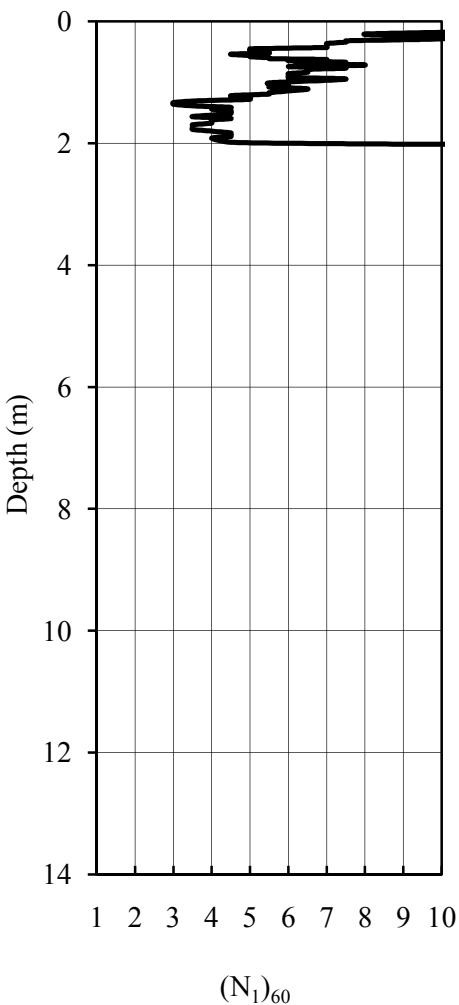
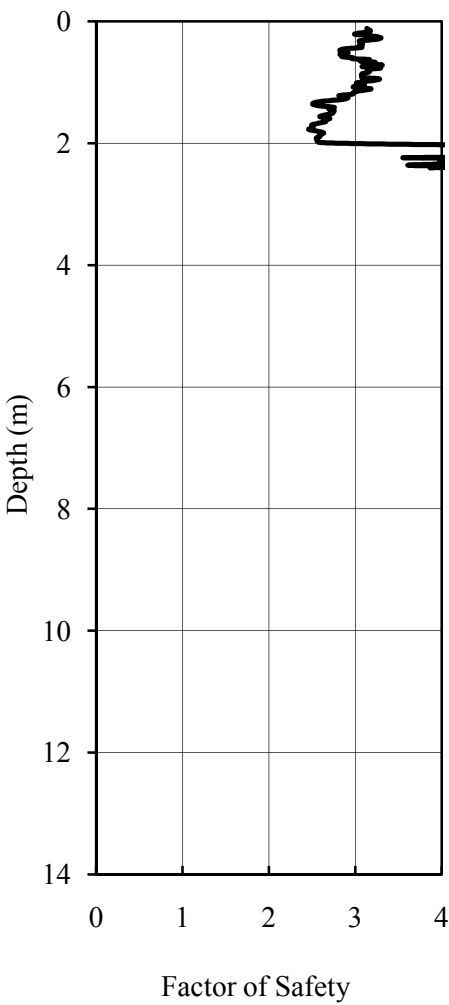
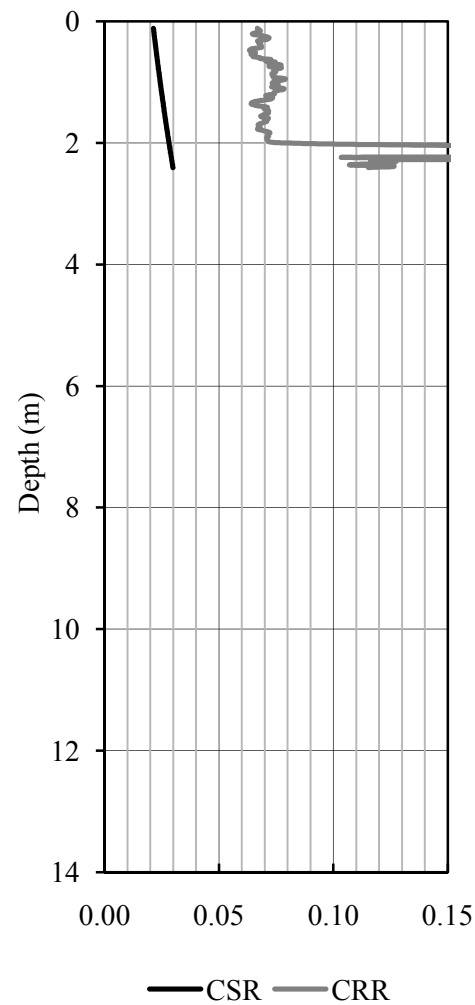
CPT	S7
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Liquefaction Analyses of CPT Data

Earthquake E5 - $M_w=7.5$, $PGA(rock)=1.432\text{ g}$

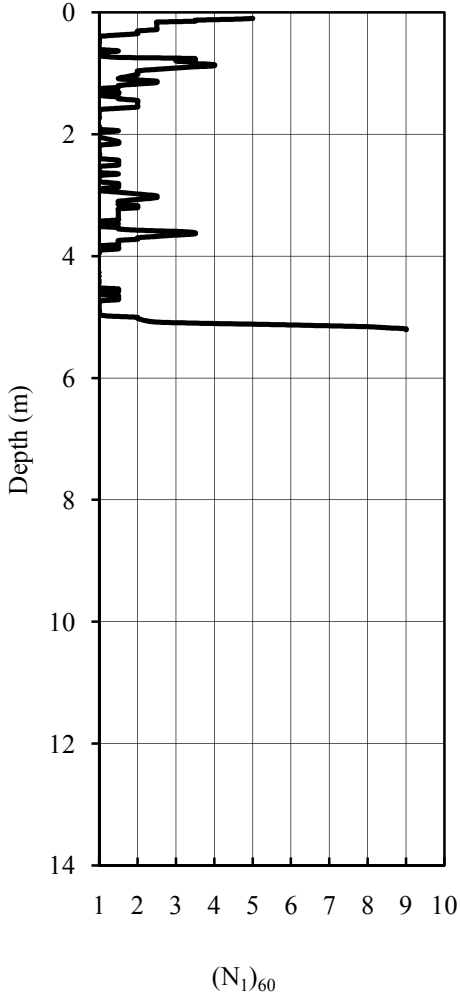
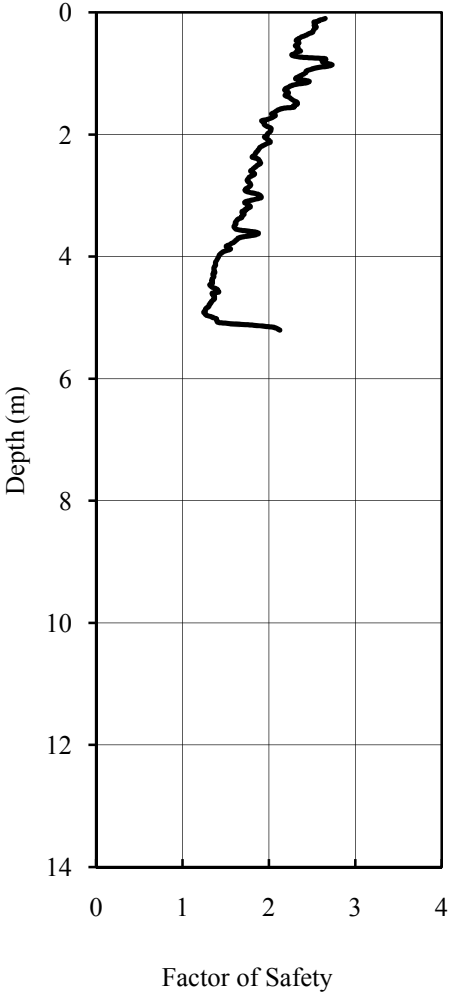
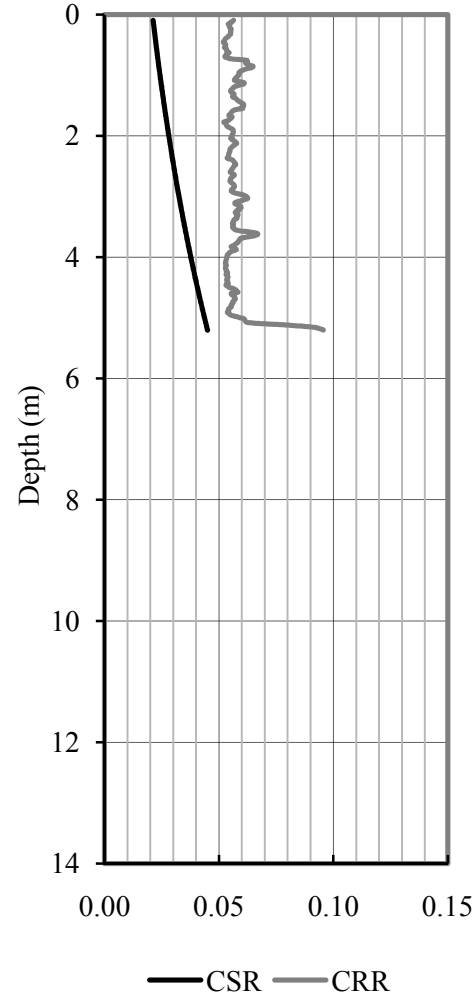
CPT	S8
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Liquefaction Analyses of CPT Data

Earthquake E5 - $M_w=7.5$, $PGA(rock)=1.432\text{ g}$

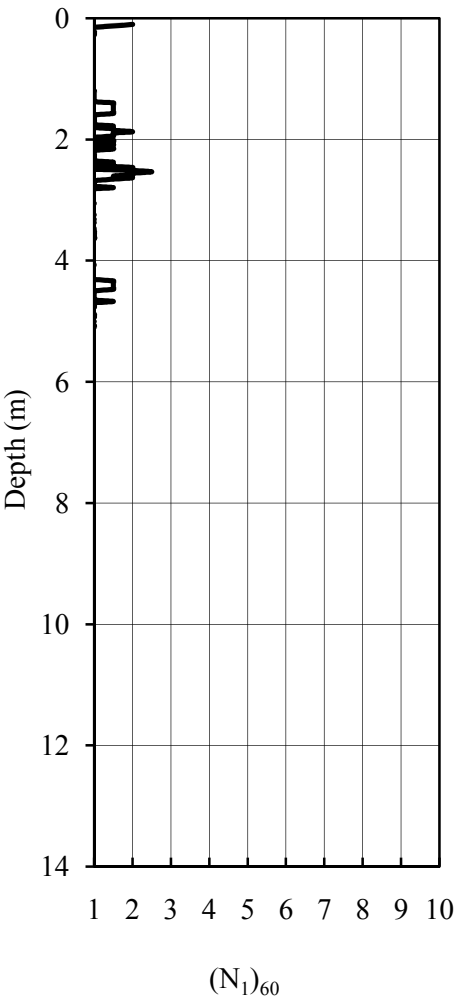
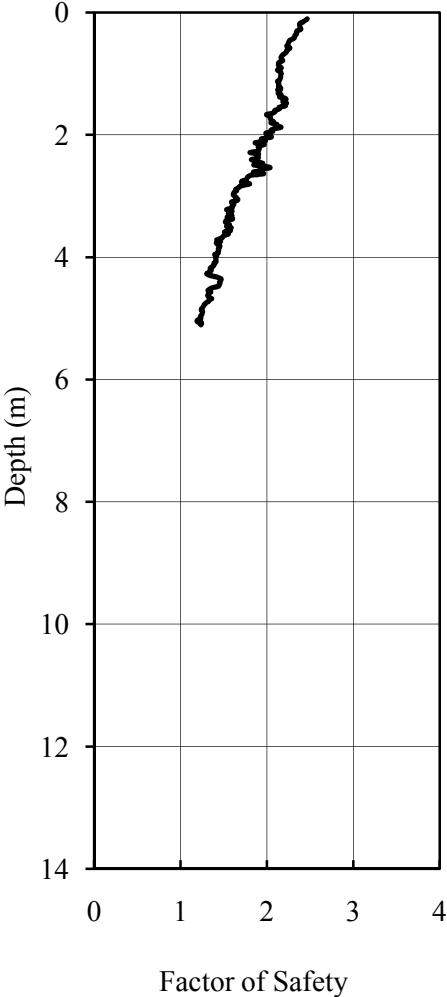
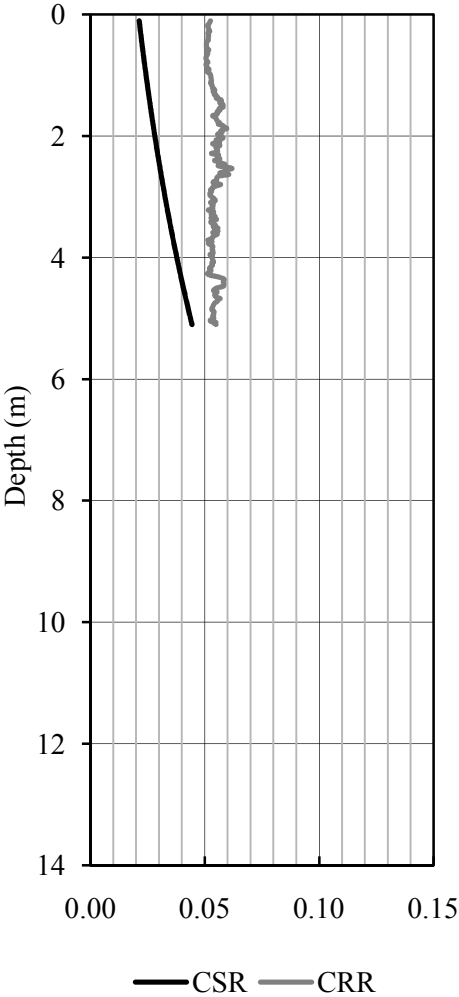
CPT	S9
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Liquefaction Analyses of CPT Data

Earthquake E5 - $M_w=7.5$, $PGA(rock)=1.432\text{ g}$

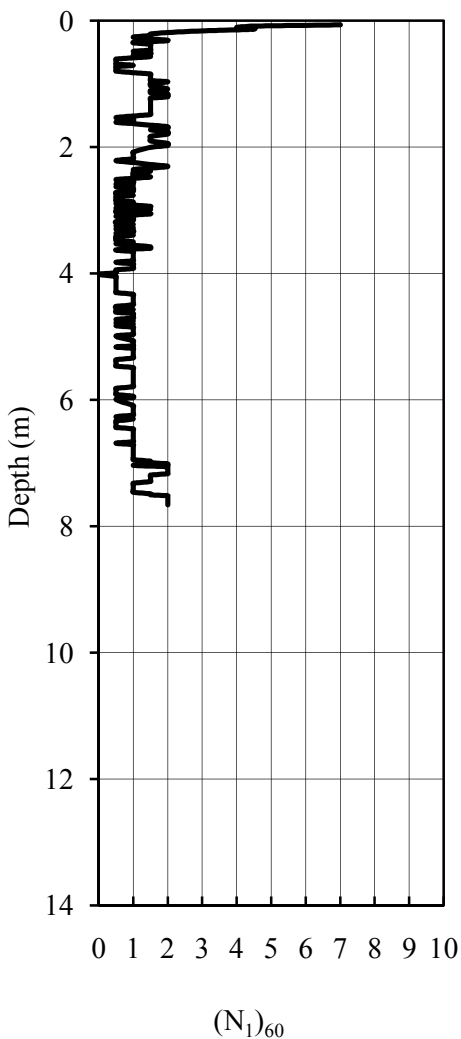
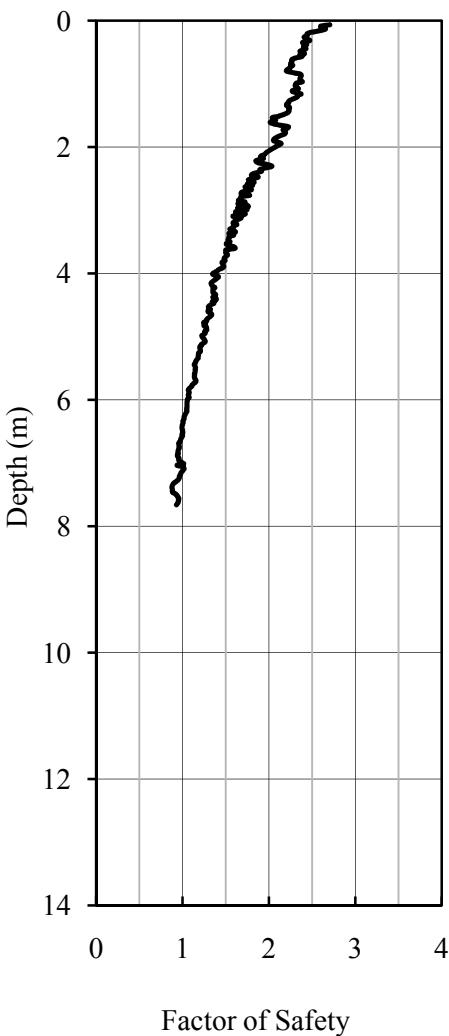
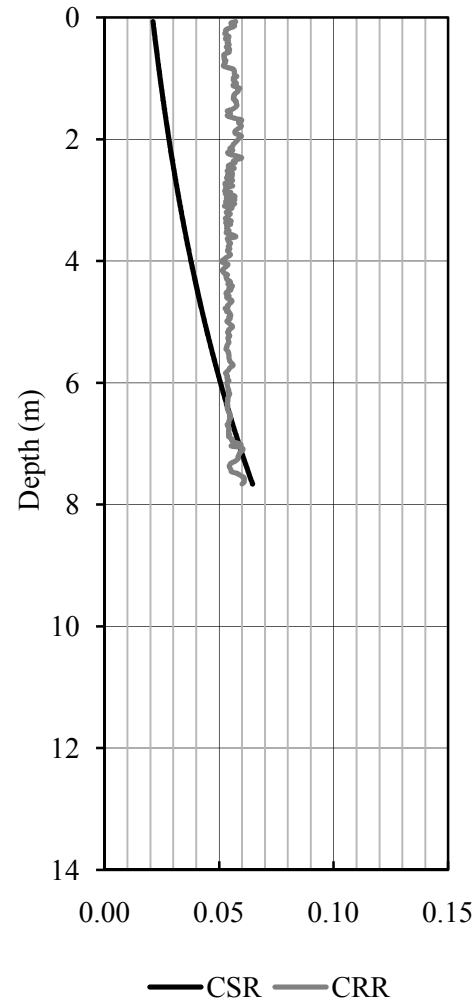
CPT	S10
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Liquefaction Analyses of CPT Data

Earthquake E5 - $M_w=7.5$, $PGA(rock)=1.432\text{ g}$

CPT	S11
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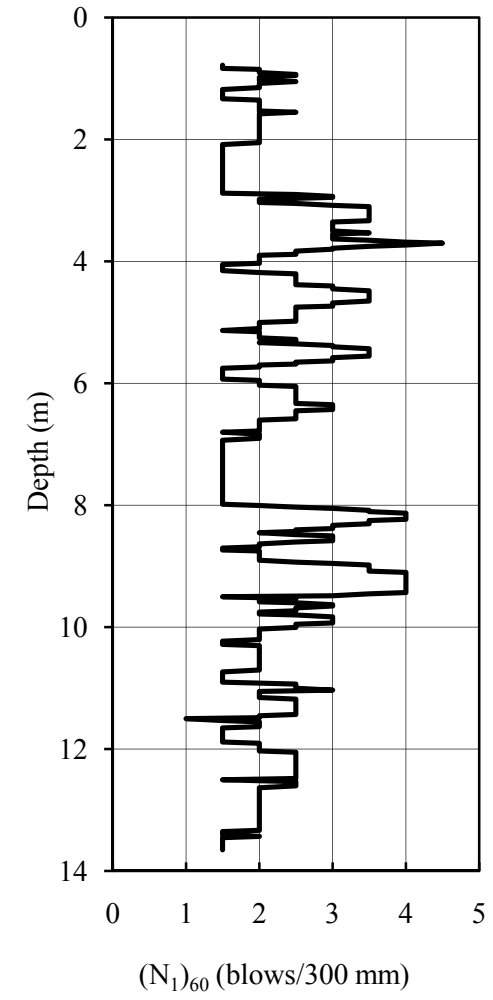
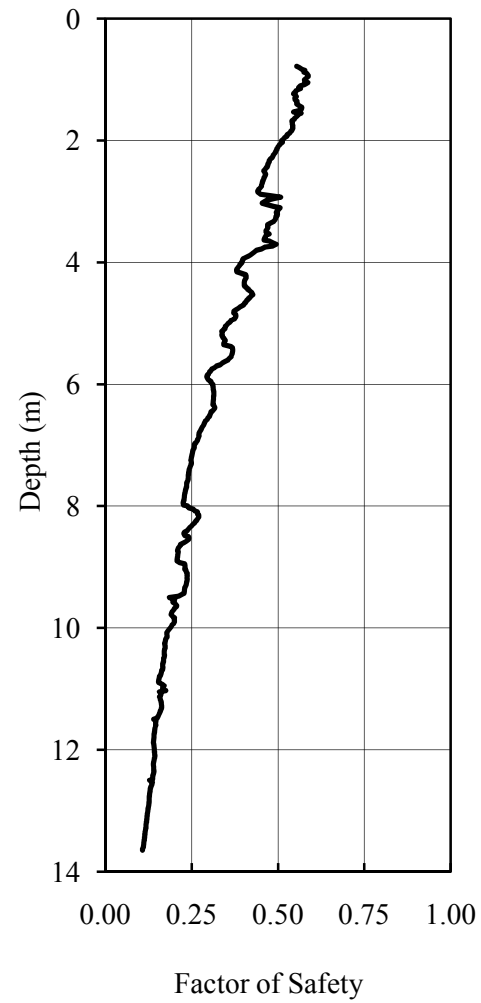
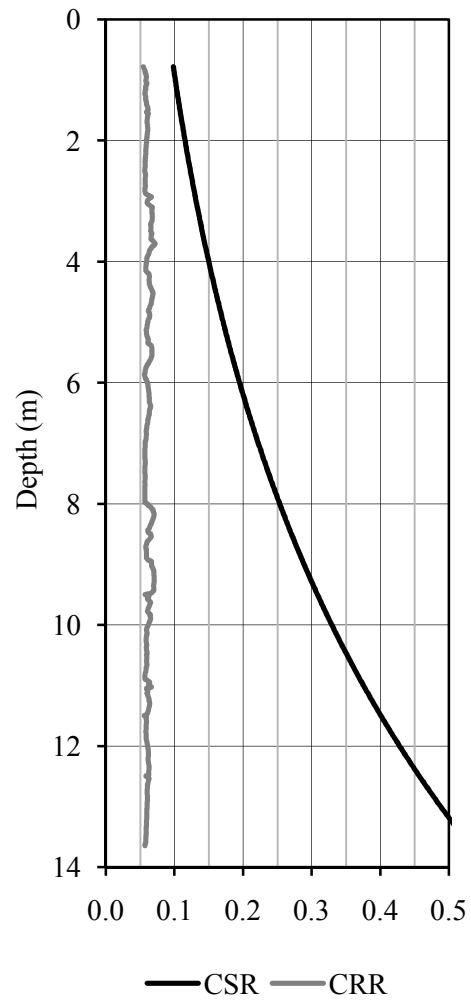


Liquefaction Analyses of CPT Data

Earthquake E5 - Mw=7.5, PGA (rock)=1.432 g.

CPT

02-02

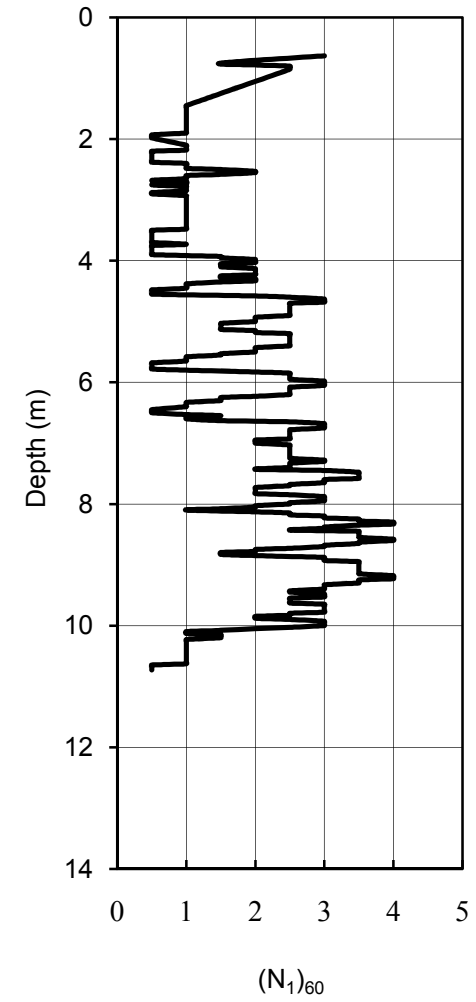
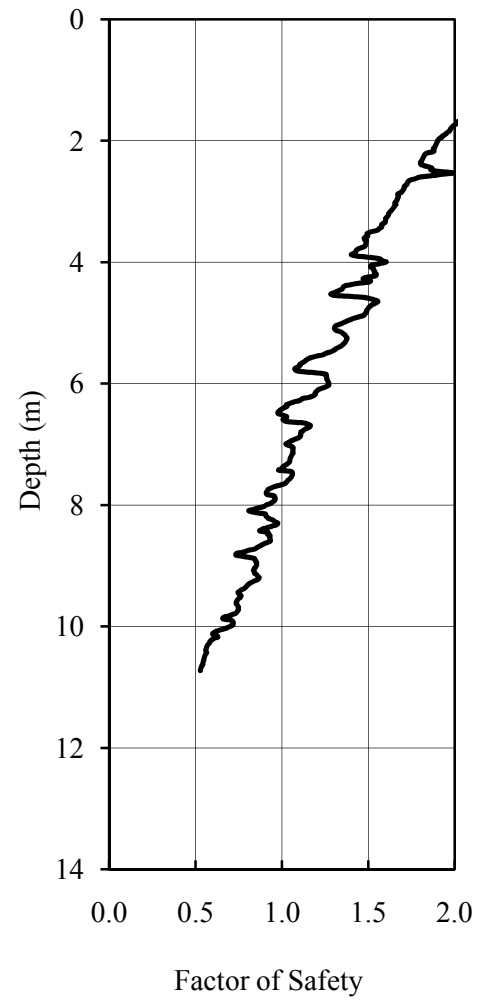
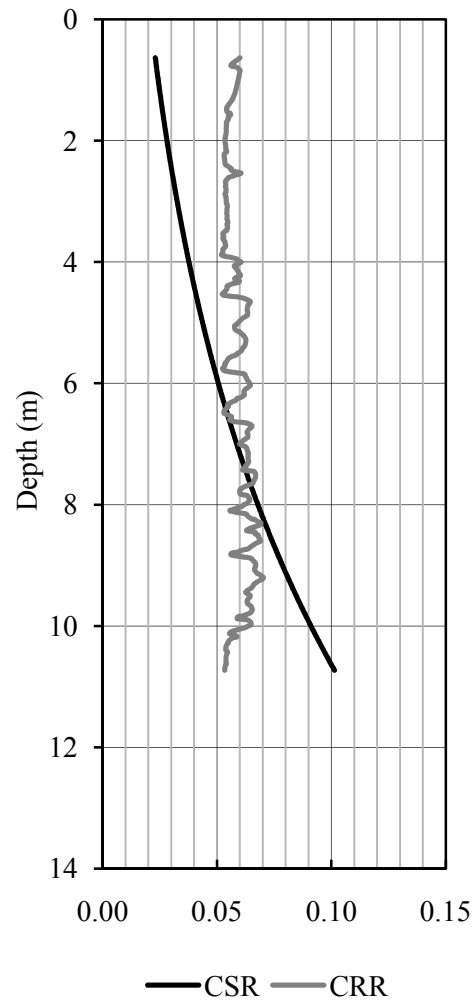


Liquefaction Analyses of CPT Data

Earthquake E5 - $M_w=7.5$, PGA (rock)=1.432 g

CPT

02-03



Analyses of CPT Data
Impoundment at Dike 1 - Laronde Mine

CPT No.	S1
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Soil Data	
Dry unit weight, γ_d (kN/m ³):	23.2
Void ratio, e:	0.64
Depth to groundwater (m):	0.0
Soil type factor, n_s :	0.50

Earthquake Data	
Moment Magnitude, M_w :	6.5
PGA on rock:	0.229g
PGA on ground surface:	0.004g
Magnitude Scaling Factor, MSF:	1.18

CPT/SPT Conversion	
$q_{c1N}/(N_1)_{60}$:	6.0
where: q_{c1N} (unitless)	
$(N_1)_{60}$ in blows per 300 mm	
Average $(N_1)_{60}$:	2.12

Analysis

Depth (m)	q_c (kPa)	f_s (kPa)	σ_{vo} (kPa)	σ_{vo}' (kPa)	r_d	CSR	Q	F	I_c	C_Q	q_{c1N}	$N_{1,60}$	$CRR_{7.5}$	CRR_{Mw}	F.S. (Mw)
<i>DATA</i>	<i>DATA</i>	<i>DATA</i>	<i>CALC</i>	<i>CALC</i>	<i>CALC</i>	<i>(1)</i>	<i>(15)</i>	<i>(16)</i>	<i>(14)</i>	<i>(13)</i>	<i>(12)</i>	<i>Calc</i>	<i>(11)</i>	<i>CALC</i>	<i>(23)</i>
0.09	2455.24	24.55	3.06	2.15	0.016	0.0034	167	1.0	1.74	1.70	41.74	28.0	0.085	0.100	29.44
0.15	917.01	27.65	4.83	3.40	0.016	0.0034	49	3.0	2.46	1.70	15.59	8.5	0.063	0.074	21.70
0.18	433.68	18.34	6.09	4.28	0.016	0.0034	21	4.3	2.84	1.70	7.37	3.5	0.056	0.066	19.23
0.21	313.71	14.75	6.87	4.83	0.016	0.0035	14	4.8	3.00	1.70	5.33	2.5	0.054	0.064	18.59
0.23	336.47	11.86	7.64	5.37	0.016	0.0035	14	3.6	2.92	1.70	5.72	2.5	0.055	0.065	18.63
0.25	326.81	11.24	8.28	5.82	0.016	0.0035	13	3.5	2.94	1.70	5.56	2.5	0.055	0.064	18.53
0.27	273.03	11.31	8.97	6.31	0.016	0.0035	11	4.3	3.07	1.70	4.64	2.0	0.054	0.064	18.22
0.29	326.81	11.31	9.72	6.83	0.017	0.0035	12	3.6	2.97	1.70	5.56	2.0	0.055	0.064	18.42
0.32	471.60	9.86	10.54	7.41	0.017	0.0035	17	2.1	2.72	1.70	8.02	3.0	0.057	0.067	19.04
0.35	688.10	10.89	11.55	8.11	0.017	0.0035	24	1.6	2.53	1.70	11.70	4.0	0.060	0.070	19.98
0.37	754.29	10.96	12.27	8.62	0.017	0.0035	25	1.5	2.49	1.70	12.82	4.5	0.061	0.072	20.23
0.39	632.25	11.72	12.88	9.05	0.017	0.0035	21	1.9	2.63	1.70	10.75	3.5	0.059	0.070	19.60
0.41	484.01	10.89	13.58	9.54	0.017	0.0036	15	2.3	2.78	1.70	8.23	2.5	0.057	0.067	18.84
0.44	460.57	8.96	14.37	10.10	0.017	0.0036	14	2.0	2.78	1.70	7.83	2.5	0.057	0.067	18.66
0.46	361.98	7.79	15.17	10.66	0.017	0.0036	11	2.2	2.91	1.70	6.15	2.0	0.055	0.065	18.14
0.48	338.53	8.00	15.97	11.22	0.017	0.0036	10	2.5	2.96	1.70	5.76	1.5	0.055	0.065	17.97
0.51	262.69	8.89	16.77	11.78	0.017	0.0036	7	3.6	3.16	1.70	4.47	1.5	0.054	0.063	17.55
0.53	279.93	8.20	17.64	12.40	0.017	0.0036	7	3.1	3.11	1.70	4.76	1.5	0.054	0.064	17.56
0.56	475.74	8.62	18.44	12.96	0.017	0.0036	13	1.9	2.80	1.70	8.09	2.0	0.057	0.067	18.40
0.58	662.59	9.72	19.16	13.46	0.017	0.0037	18	1.5	2.63	1.70	11.26	3.0	0.059	0.070	19.20
0.61	863.23	9.72	20.01	14.06	0.017	0.0037	22	1.2	2.48	1.70	14.67	4.0	0.062	0.073	20.04
0.63	761.88	9.58	20.83	14.64	0.017	0.0037	19	1.3	2.56	1.70	12.95	3.5	0.061	0.072	19.50
0.66	848.06	8.89	21.68	15.24	0.017	0.0037	21	1.1	2.48	1.70	14.42	3.5	0.062	0.073	19.82
0.68	802.55	8.34	22.47	15.80	0.017	0.0037	20	1.1	2.51	1.70	13.64	3.5	0.061	0.072	19.55
0.70	794.97	8.41	23.27	16.36	0.018	0.0037	19	1.1	2.52	1.70	13.51	3.5	0.061	0.072	19.44
0.73	703.27	8.20	24.12	16.95	0.018	0.0037	16	1.2	2.60	1.70	11.96	3.0	0.060	0.071	18.96

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
0.76	837.72	8.41	24.94	17.53	0.018	0.0037	19	1.0	2.51	1.70	14.24	3.5	0.062	0.073	19.49
0.78	855.64	8.76	25.66	18.04	0.018	0.0038	20	1.1	2.51	1.70	14.55	3.5	0.062	0.073	19.51
0.80	883.91	8.89	26.46	18.60	0.018	0.0038	20	1.0	2.50	1.70	15.03	3.5	0.063	0.074	19.56
0.83	1001.12	9.03	27.33	19.21	0.018	0.0038	22	0.9	2.43	1.70	17.02	4.0	0.064	0.076	20.00
0.85	906.67	9.86	28.18	19.81	0.018	0.0038	20	1.1	2.52	1.70	15.41	3.5	0.063	0.074	19.51
0.88	786.70	11.24	29.06	20.42	0.018	0.0038	17	1.5	2.64	1.70	13.37	3.0	0.061	0.072	18.91
0.91	636.39	11.24	29.88	21.00	0.018	0.0038	13	1.9	2.78	1.70	10.82	2.5	0.059	0.070	18.19
0.93	417.82	10.27	30.76	21.62	0.018	0.0038	8	2.7	3.03	1.70	7.10	1.5	0.056	0.066	17.17
0.96	381.28	4.83	31.58	22.19	0.018	0.0039	7	1.4	2.93	1.70	6.48	1.5	0.055	0.065	16.95
0.98	282.69	7.10	32.48	22.83	0.018	0.0039	5	2.8	3.22	1.70	4.81	1.0	0.054	0.064	16.45
1.01	254.42	9.51	33.38	23.46	0.018	0.0039	5	4.3	3.37	1.70	4.33	1.0	0.054	0.063	16.26
1.04	231.67	9.45	34.25	24.07	0.018	0.0039	4	4.8	3.44	1.70	3.94	1.0	0.053	0.063	16.10
1.07	152.38	7.10	35.44	24.90	0.019	0.0039	2	6.1	3.69	1.70	2.59	0.5	0.052	0.062	15.68
1.09	349.57	6.14	35.92	25.25	0.019	0.0039	6	2.0	3.07	1.70	5.94	1.0	0.055	0.065	16.49
1.10	485.39	8.96	36.44	25.61	0.019	0.0039	9	2.0	2.94	1.70	8.25	1.5	0.057	0.067	17.02
1.11	372.32	10.14	36.77	25.84	0.019	0.0039	7	3.0	3.15	1.70	6.33	1.0	0.055	0.065	16.52
1.13	580.54	10.62	37.26	26.19	0.019	0.0040	11	2.0	2.87	1.70	9.87	2.0	0.058	0.069	17.36
1.15	465.40	9.17	37.90	26.64	0.019	0.0040	8	2.1	2.99	1.70	7.91	1.5	0.057	0.067	16.83
1.16	250.28	10.48	38.42	27.00	0.019	0.0040	4	4.9	3.44	1.70	4.25	1.0	0.054	0.063	15.89
1.18	283.38	12.00	38.91	27.34	0.019	0.0040	5	4.9	3.39	1.70	4.82	1.0	0.054	0.064	15.99
1.20	450.23	7.65	39.50	27.76	0.019	0.0040	8	1.9	2.98	1.70	7.65	1.5	0.056	0.067	16.65
1.22	406.79	8.00	40.14	28.21	0.019	0.0040	7	2.2	3.06	1.70	6.92	1.5	0.056	0.066	16.42
1.24	486.77	8.62	40.99	28.81	0.019	0.0040	8	1.9	2.96	1.70	8.28	1.5	0.057	0.067	16.69
1.26	544.69	7.79	41.74	29.33	0.019	0.0040	9	1.5	2.87	1.70	9.26	1.5	0.058	0.068	16.87
1.29	263.38	8.96	42.51	29.87	0.019	0.0041	4	4.1	3.40	1.70	4.48	1.0	0.054	0.063	15.65
1.31	375.77	10.34	43.30	30.43	0.019	0.0041	6	3.1	3.19	1.70	6.39	1.0	0.055	0.065	16.06
1.34	368.87	11.58	44.10	30.99	0.019	0.0041	6	3.6	3.23	1.70	6.27	1.0	0.055	0.065	15.98
1.36	283.38	8.14	44.87	31.54	0.019	0.0041	4	3.4	3.34	1.70	4.82	1.0	0.054	0.064	15.57
1.38	295.79	10.20	45.62	32.06	0.019	0.0041	4	4.1	3.37	1.70	5.03	1.0	0.054	0.064	15.57
1.41	406.10	8.69	46.39	32.60	0.019	0.0041	6	2.4	3.11	1.70	6.90	1.0	0.056	0.066	15.97
1.43	464.71	11.93	47.06	33.07	0.020	0.0041	7	2.9	3.10	1.70	7.90	1.5	0.057	0.067	16.15
1.45	173.75	8.34	47.70	33.53	0.020	0.0041	2	6.6	3.74	1.70	2.95	0.5	0.052	0.062	14.94
1.47	415.76	7.10	48.42	34.03	0.020	0.0042	6	1.9	3.07	1.70	7.07	1.0	0.056	0.066	15.86
1.49	262.69	8.14	49.22	34.59	0.020	0.0042	4	3.8	3.42	1.70	4.47	0.5	0.054	0.063	15.19
1.51	539.17	9.93	49.99	35.13	0.020	0.0042	8	2.0	2.98	1.69	9.10	1.5	0.058	0.068	16.23
1.54	359.91	12.13	50.74	35.66	0.020	0.0042	5	3.9	3.30	1.67	6.03	1.0	0.055	0.065	15.45
1.56	341.98	12.55	51.53	36.22	0.020	0.0042	5	4.3	3.35	1.66	5.68	1.0	0.055	0.065	15.32
1.58	521.94	12.76	52.30	36.76	0.020	0.0042	8	2.7	3.07	1.65	8.61	1.5	0.057	0.067	15.95

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo'} (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
1.61	698.44	10.00	53.08	37.30	0.020	0.0042	11	1.5	2.82	1.64	11.44	2.0	0.060	0.070	16.55
1.63	737.05	17.58	53.82	37.83	0.020	0.0043	11	2.6	2.92	1.63	11.98	2.0	0.060	0.071	16.62
1.65	721.20	16.48	54.46	38.28	0.020	0.0043	11	2.5	2.92	1.62	11.66	2.0	0.060	0.070	16.50
1.67	608.81	12.34	55.29	38.86	0.020	0.0043	9	2.2	2.97	1.60	9.77	1.5	0.058	0.069	16.00
1.69	437.13	14.41	55.93	39.31	0.020	0.0043	6	3.8	3.23	1.59	6.97	1.0	0.056	0.066	15.32
1.72	1121.78	15.31	56.75	39.89	0.020	0.0043	17	1.4	2.63	1.58	17.76	3.0	0.065	0.076	17.72
1.74	1224.52	18.89	57.47	40.39	0.020	0.0043	18	1.6	2.63	1.57	19.27	3.0	0.066	0.078	18.00
1.76	1139.02	22.61	58.17	40.88	0.021	0.0043	17	2.1	2.72	1.56	17.81	3.0	0.065	0.077	17.62
1.78	1377.58	21.72	58.84	41.35	0.021	0.0044	21	1.6	2.59	1.56	21.42	3.5	0.068	0.080	18.38
1.81	1168.67	26.89	59.66	41.93	0.021	0.0044	17	2.4	2.75	1.54	18.05	3.0	0.065	0.077	17.56
1.83	1107.30	27.79	60.33	42.40	0.021	0.0044	16	2.7	2.80	1.54	17.01	3.0	0.064	0.076	17.27
1.85	1150.74	25.23	61.07	42.92	0.021	0.0044	17	2.3	2.75	1.53	17.56	3.0	0.065	0.076	17.34
1.87	814.97	22.68	61.77	43.41	0.021	0.0044	11	3.0	2.95	1.52	12.37	2.0	0.060	0.071	16.13
1.89	1003.88	22.41	62.49	43.92	0.021	0.0044	14	2.4	2.81	1.51	15.15	2.5	0.063	0.074	16.69
1.91	1117.65	22.34	63.16	44.39	0.021	0.0044	16	2.1	2.75	1.50	16.78	3.0	0.064	0.075	17.00
1.94	783.25	21.17	64.00	44.98	0.021	0.0045	11	2.9	2.97	1.49	11.68	2.0	0.060	0.070	15.81
1.97	607.43	19.79	64.90	45.62	0.021	0.0045	8	3.6	3.12	1.48	8.99	1.5	0.057	0.068	15.16
1.99	581.92	18.82	65.68	46.16	0.021	0.0045	8	3.6	3.14	1.47	8.57	1.5	0.057	0.067	15.02
2.02	581.92	16.48	66.60	46.81	0.021	0.0045	8	3.2	3.11	1.46	8.51	1.5	0.057	0.067	14.94
2.04	682.59	12.41	67.50	47.44	0.021	0.0045	9	2.0	2.94	1.45	9.91	1.5	0.058	0.069	15.19
2.07	737.05	15.03	68.30	48.00	0.021	0.0045	10	2.2	2.94	1.44	10.64	2.0	0.059	0.069	15.29
2.10	696.37	16.82	69.40	48.78	0.022	0.0046	9	2.7	3.01	1.43	9.97	1.5	0.058	0.069	15.07
2.13	503.32	16.13	70.28	49.39	0.022	0.0046	6	3.7	3.22	1.42	7.16	1.0	0.056	0.066	14.41
2.15	634.32	14.96	70.87	49.81	0.022	0.0046	8	2.7	3.05	1.42	8.99	1.5	0.057	0.068	14.76
2.16	606.05	14.34	71.36	50.15	0.022	0.0046	8	2.7	3.07	1.41	8.56	1.5	0.057	0.067	14.64
2.18	469.54	13.86	71.85	50.50	0.022	0.0046	6	3.5	3.24	1.41	6.61	1.0	0.056	0.065	14.19
2.19	522.63	12.41	72.41	50.89	0.022	0.0046	6	2.8	3.14	1.40	7.33	1.0	0.056	0.066	14.31
2.21	331.64	12.69	73.03	51.33	0.022	0.0046	4	4.9	3.48	1.40	4.63	1.0	0.054	0.064	13.70
2.23	359.22	9.31	73.62	51.74	0.022	0.0047	4	3.3	3.35	1.39	4.99	1.0	0.054	0.064	13.74
2.25	287.51	9.31	74.32	52.23	0.022	0.0047	3	4.4	3.53	1.38	3.98	0.5	0.053	0.063	13.48
2.27	275.10	7.65	74.93	52.66	0.022	0.0047	3	3.8	3.53	1.38	3.79	0.5	0.053	0.063	13.41
2.29	197.88	7.45	75.50	53.06	0.022	0.0047	2	6.1	3.81	1.37	2.72	0.5	0.052	0.062	13.15
2.30	341.29	7.65	76.06	53.46	0.022	0.0047	4	2.9	3.36	1.37	4.67	1.0	0.054	0.064	13.52
2.32	202.71	9.45	76.71	53.91	0.022	0.0047	2	7.5	3.85	1.36	2.76	0.5	0.052	0.062	13.09
2.34	359.22	11.24	77.40	54.40	0.022	0.0047	4	4.0	3.41	1.36	4.87	1.0	0.054	0.064	13.48
2.36	139.27	12.27	77.89	54.74	0.022	0.0047	1	20.0	4.35	1.35	1.88	0.5	0.052	0.061	12.84
2.38	167.54	12.89	78.43	55.12	0.022	0.0048	1	14.5	4.14	1.35	2.26	0.5	0.052	0.061	12.88
2.39	164.79	12.89	78.76	55.36	0.022	0.0048	1	15.0	4.16	1.34	2.21	0.5	0.052	0.061	12.85

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
2.40	184.78	11.24	79.23	55.68	0.023	0.0048	1	10.6	4.01	1.34	2.48	0.5	0.052	0.061	12.88
2.42	233.04	9.10	79.82	56.10	0.023	0.0048	2	5.9	3.74	1.34	3.11	0.5	0.053	0.062	12.98
2.43	328.19	10.34	80.36	56.48	0.023	0.0048	3	4.2	3.48	1.33	4.37	0.5	0.054	0.063	13.21
2.46	292.34	10.00	81.10	57.00	0.023	0.0048	3	4.7	3.57	1.32	3.87	0.5	0.053	0.063	13.06
2.48	240.63	10.82	81.85	57.53	0.023	0.0048	2	6.8	3.76	1.32	3.17	0.5	0.053	0.062	12.87
2.52	149.62	9.10	83.29	58.54	0.023	0.0049	1	13.7	4.25	1.31	1.96	0.5	0.052	0.061	12.55
2.56	228.22	10.48	84.55	59.42	0.023	0.0049	2	7.3	3.82	1.30	2.96	0.5	0.052	0.062	12.68
2.60	105.49	8.83	85.86	60.35	0.023	0.0049	0	45.0	4.98	1.29	1.36	0.0	0.051	0.060	12.28
2.62	133.07	8.89	86.61	60.87	0.023	0.0049	1	19.1	4.46	1.28	1.71	0.5	0.051	0.061	12.31
2.65	295.10	9.31	87.35	61.39	0.023	0.0049	3	4.5	3.58	1.28	3.77	0.5	0.053	0.063	12.68
2.67	405.41	10.07	88.10	61.92	0.023	0.0050	4	3.2	3.34	1.27	5.15	1.0	0.054	0.064	12.91
2.69	315.78	11.45	88.69	62.33	0.023	0.0050	3	5.0	3.57	1.27	4.00	0.5	0.053	0.063	12.65
2.71	379.21	11.03	89.41	62.84	0.024	0.0050	4	3.8	3.42	1.26	4.78	1.0	0.054	0.064	12.77
2.73	491.60	11.72	90.08	63.31	0.024	0.0050	5	2.9	3.24	1.26	6.18	1.0	0.055	0.065	13.00
2.75	499.18	13.44	90.85	63.85	0.024	0.0050	5	3.3	3.26	1.25	6.25	1.0	0.055	0.065	12.97
2.77	619.15	13.72	91.47	64.29	0.024	0.0050	7	2.6	3.12	1.25	7.72	1.5	0.056	0.067	13.22
2.79	450.92	13.72	92.14	64.76	0.024	0.0051	4	3.8	3.35	1.24	5.60	1.0	0.055	0.065	12.77
2.81	476.43	13.79	92.83	65.24	0.024	0.0051	5	3.6	3.31	1.24	5.90	1.0	0.055	0.065	12.79
2.83	623.98	16.20	93.40	65.64	0.024	0.0051	7	3.1	3.15	1.23	7.70	1.5	0.056	0.067	13.11
2.85	570.20	16.48	94.09	66.13	0.024	0.0051	6	3.5	3.22	1.23	7.01	1.0	0.056	0.066	12.93
2.87	623.98	11.72	94.81	66.63	0.024	0.0051	6	2.2	3.08	1.23	7.64	1.5	0.056	0.067	13.01
2.89	540.55	10.89	95.50	67.12	0.024	0.0051	5	2.4	3.17	1.22	6.60	1.0	0.055	0.065	12.77
2.91	767.39	12.20	96.20	67.61	0.024	0.0051	8	1.8	2.96	1.22	9.33	1.5	0.058	0.068	13.26
2.94	723.95	13.79	96.95	68.13	0.024	0.0052	8	2.2	3.02	1.21	8.77	1.5	0.057	0.068	13.10
2.96	476.43	13.10	97.59	68.59	0.024	0.0052	5	3.5	3.31	1.21	5.75	1.0	0.055	0.065	12.49
2.98	460.57	12.34	98.21	69.02	0.025	0.0052	4	3.4	3.33	1.20	5.54	1.0	0.055	0.064	12.42
2.99	557.79	12.00	98.72	69.38	0.025	0.0052	6	2.6	3.18	1.20	6.70	1.0	0.056	0.066	12.61
3.01	540.55	13.44	99.39	69.85	0.025	0.0052	5	3.0	3.23	1.20	6.47	1.0	0.055	0.065	12.53
3.03	471.60	14.34	100.03	70.30	0.025	0.0052	4	3.9	3.35	1.19	5.62	1.0	0.055	0.065	12.34
3.05	394.38	14.89	100.70	70.77	0.025	0.0052	3	5.1	3.50	1.19	4.69	1.0	0.054	0.064	12.12
3.07	431.61	15.51	101.50	71.33	0.025	0.0053	4	4.7	3.44	1.18	5.11	1.0	0.054	0.064	12.16
3.10	601.23	16.00	102.47	72.02	0.025	0.0053	6	3.2	3.21	1.18	7.08	1.0	0.056	0.066	12.47
3.12	593.64	15.72	103.09	72.45	0.025	0.0053	6	3.2	3.21	1.17	6.97	1.0	0.056	0.066	12.42
3.14	621.91	14.48	103.55	72.78	0.025	0.0053	6	2.8	3.16	1.17	7.29	1.0	0.056	0.066	12.45
3.15	580.54	14.62	104.12	73.18	0.025	0.0053	6	3.1	3.21	1.17	6.79	1.0	0.056	0.066	12.33
3.17	616.40	16.00	104.69	73.57	0.025	0.0053	6	3.1	3.19	1.17	7.19	1.0	0.056	0.066	12.37
3.19	488.15	17.24	105.20	73.94	0.025	0.0054	4	4.5	3.39	1.16	5.68	1.0	0.055	0.065	12.06
3.20	475.05	18.06	105.77	74.33	0.025	0.0054	4	4.9	3.42	1.16	5.51	1.0	0.055	0.064	12.00

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
3.22	352.32	19.10	106.36	74.75	0.025	0.0054	3	7.8	3.68	1.16	4.08	0.5	0.053	0.063	11.71
3.24	375.08	19.17	106.92	75.15	0.025	0.0054	3	7.1	3.63	1.15	4.33	0.5	0.054	0.063	11.73
3.25	361.98	17.24	107.39	75.47	0.026	0.0054	3	6.8	3.64	1.15	4.17	0.5	0.053	0.063	11.67
3.27	346.12	13.72	108.05	75.94	0.026	0.0054	3	5.8	3.62	1.15	3.97	0.5	0.053	0.063	11.60
3.29	357.15	12.07	108.67	76.38	0.026	0.0054	3	4.9	3.57	1.14	4.09	0.5	0.053	0.063	11.59
3.31	359.22	12.55	109.31	76.83	0.026	0.0055	3	5.0	3.57	1.14	4.10	0.5	0.053	0.063	11.56
3.33	377.15	12.96	109.93	77.26	0.026	0.0055	3	4.9	3.54	1.14	4.29	0.5	0.054	0.063	11.56
3.35	318.54	13.10	110.52	77.68	0.026	0.0055	2	6.3	3.70	1.13	3.61	0.5	0.053	0.063	11.41
3.37	384.73	13.86	111.17	78.13	0.026	0.0055	3	5.1	3.55	1.13	4.35	0.5	0.054	0.063	11.51
3.39	415.76	12.55	111.83	78.60	0.026	0.0055	3	4.1	3.46	1.13	4.69	1.0	0.054	0.064	11.54
3.41	418.51	11.45	112.43	79.01	0.026	0.0055	3	3.7	3.44	1.12	4.71	1.0	0.054	0.064	11.51
3.43	408.17	12.48	113.09	79.48	0.026	0.0055	3	4.2	3.48	1.12	4.58	1.0	0.054	0.064	11.45
3.44	367.49	14.75	113.69	79.90	0.026	0.0056	3	5.8	3.61	1.12	4.11	0.5	0.053	0.063	11.34
3.46	379.90	15.93	114.28	80.32	0.026	0.0056	3	6.0	3.60	1.12	4.24	0.5	0.054	0.063	11.33
3.48	349.57	15.72	115.02	80.84	0.026	0.0056	3	6.7	3.68	1.11	3.89	0.5	0.053	0.063	11.23
3.51	395.76	13.51	115.74	81.35	0.026	0.0056	3	4.8	3.53	1.11	4.39	0.5	0.054	0.063	11.29
3.53	428.86	10.89	116.44	81.83	0.027	0.0056	3	3.5	3.42	1.11	4.74	1.0	0.054	0.064	11.31
3.55	428.86	11.58	117.05	82.27	0.027	0.0056	3	3.7	3.44	1.10	4.73	1.0	0.054	0.064	11.28
3.57	372.32	13.51	117.80	82.79	0.027	0.0057	3	5.3	3.59	1.10	4.09	0.5	0.053	0.063	11.13
3.59	366.80	13.44	118.47	83.26	0.027	0.0057	3	5.4	3.61	1.10	4.02	0.5	0.053	0.063	11.09
3.61	384.73	11.10	119.16	83.75	0.027	0.0057	3	4.2	3.53	1.09	4.20	0.5	0.054	0.063	11.08
3.63	384.73	11.38	119.78	84.18	0.027	0.0057	3	4.3	3.53	1.09	4.19	0.5	0.053	0.063	11.05
3.65	395.76	12.27	120.37	84.60	0.027	0.0057	3	4.5	3.53	1.09	4.30	0.5	0.054	0.063	11.04
3.66	354.39	12.89	120.94	85.00	0.027	0.0057	3	5.5	3.64	1.08	3.84	0.5	0.053	0.063	10.93
3.68	346.12	12.27	121.50	85.39	0.027	0.0058	2	5.5	3.65	1.08	3.75	0.5	0.053	0.063	10.89
3.70	390.25	11.31	122.09	85.81	0.027	0.0058	3	4.2	3.53	1.08	4.21	0.5	0.054	0.063	10.94
3.72	403.35	11.45	122.69	86.23	0.027	0.0058	3	4.1	3.51	1.08	4.34	0.5	0.054	0.063	10.93
3.74	344.05	11.58	123.38	86.71	0.027	0.0058	2	5.2	3.65	1.07	3.69	0.5	0.053	0.063	10.79
3.76	338.53	10.14	124.02	87.17	0.027	0.0058	2	4.7	3.64	1.07	3.63	0.5	0.053	0.063	10.75
3.78	333.71	9.79	124.61	87.58	0.028	0.0058	2	4.7	3.65	1.07	3.57	0.5	0.053	0.063	10.71
3.79	330.95	11.65	125.23	88.01	0.028	0.0059	2	5.7	3.70	1.07	3.53	0.5	0.053	0.062	10.67
3.82	353.70	13.03	125.95	88.52	0.028	0.0059	2	5.7	3.67	1.06	3.76	0.5	0.053	0.063	10.68
3.84	300.61	12.96	126.62	88.99	0.028	0.0059	2	7.4	3.83	1.06	3.19	0.5	0.053	0.062	10.55
3.86	277.17	14.00	127.26	89.44	0.028	0.0059	2	9.3	3.94	1.06	2.93	0.5	0.052	0.062	10.48
3.88	623.98	14.41	127.98	89.95	0.028	0.0059	5	2.9	3.23	1.05	6.58	1.0	0.055	0.065	11.05
3.90	1130.06	14.55	128.65	90.42	0.028	0.0059	11	1.5	2.81	1.05	11.88	2.0	0.060	0.071	11.90
3.92	1296.91	15.38	129.32	90.89	0.028	0.0060	12	1.3	2.73	1.05	13.60	2.5	0.061	0.072	12.14
3.94	1240.37	16.34	130.04	91.39	0.028	0.0060	12	1.5	2.78	1.05	12.97	2.0	0.061	0.072	12.00

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
3.96	1068.00	18.06	130.66	91.83	0.028	0.0060	10	1.9	2.90	1.04	11.15	2.0	0.059	0.070	11.67
3.98	908.73	20.20	131.35	92.32	0.028	0.0060	8	2.6	3.04	1.04	9.46	1.5	0.058	0.068	11.36
4.00	677.76	21.03	132.05	92.80	0.028	0.0060	6	3.9	3.26	1.04	7.04	1.0	0.056	0.066	10.93
4.02	597.78	22.41	132.74	93.29	0.029	0.0061	5	4.8	3.38	1.04	6.19	1.0	0.055	0.065	10.76
4.04	539.17	18.62	133.51	93.83	0.029	0.0061	4	4.6	3.41	1.03	5.57	1.0	0.055	0.064	10.62
4.06	572.27	15.31	134.08	94.23	0.029	0.0061	5	3.5	3.32	1.03	5.90	1.0	0.055	0.065	10.64
4.08	711.54	14.96	134.75	94.70	0.029	0.0061	6	2.6	3.15	1.03	7.31	1.0	0.056	0.066	10.84
4.12	872.88	21.86	135.90	95.52	0.029	0.0061	8	3.0	3.10	1.02	8.93	1.5	0.057	0.068	11.05
4.14	616.40	27.10	136.60	96.00	0.029	0.0062	5	5.6	3.41	1.02	6.29	1.0	0.055	0.065	10.59
4.16	508.15	28.96	137.29	96.49	0.029	0.0062	4	7.8	3.58	1.02	5.17	1.0	0.054	0.064	10.38
4.18	554.34	28.20	137.99	96.98	0.029	0.0062	4	6.8	3.51	1.02	5.63	1.0	0.055	0.065	10.42
4.20	502.63	24.48	138.73	97.50	0.029	0.0062	4	6.7	3.55	1.01	5.09	1.0	0.054	0.064	10.30
4.23	448.85	20.55	139.55	98.08	0.029	0.0062	3	6.6	3.61	1.01	4.53	1.0	0.054	0.063	10.17
4.25	341.29	18.34	140.35	98.64	0.030	0.0063	2	9.1	3.84	1.01	3.44	0.5	0.053	0.062	9.97
4.28	333.71	17.44	141.12	99.18	0.030	0.0063	2	9.1	3.86	1.00	3.35	0.5	0.053	0.062	9.92
4.30	359.22	13.17	142.05	99.83	0.030	0.0063	2	6.1	3.72	1.00	3.60	0.5	0.053	0.063	9.92
4.33	870.12	17.79	143.08	100.56	0.030	0.0063	7	2.4	3.07	1.00	8.68	1.5	0.057	0.068	10.66
4.37	790.83	25.10	144.21	101.35	0.030	0.0064	6	3.9	3.22	0.99	7.86	1.5	0.057	0.067	10.48
4.40	464.71	25.92	145.29	102.11	0.030	0.0064	3	8.1	3.65	0.99	4.60	1.0	0.054	0.064	9.93
4.43	420.58	26.06	146.29	102.82	0.030	0.0064	3	9.5	3.75	0.99	4.15	0.5	0.053	0.063	9.81
4.47	350.95	20.89	147.40	103.59	0.030	0.0065	2	10.3	3.88	0.98	3.45	0.5	0.053	0.062	9.66
4.50	302.68	18.13	148.45	104.33	0.031	0.0065	2	11.8	4.01	0.98	2.96	0.5	0.052	0.062	9.54
4.53	313.02	17.44	149.56	105.11	0.031	0.0065	2	10.7	3.97	0.98	3.05	0.5	0.053	0.062	9.51
4.56	320.61	18.00	150.53	105.80	0.031	0.0065	2	10.6	3.95	0.97	3.12	0.5	0.053	0.062	9.48
4.59	388.87	16.62	151.54	106.50	0.031	0.0066	2	7.0	3.73	0.97	3.77	0.5	0.053	0.063	9.53
4.62	381.28	17.17	152.54	107.21	0.031	0.0066	2	7.5	3.76	0.97	3.68	0.5	0.053	0.063	9.48
4.65	386.80	17.17	153.42	107.82	0.031	0.0066	2	7.4	3.75	0.96	3.73	0.5	0.053	0.063	9.45
4.68	374.39	17.37	154.39	108.51	0.031	0.0067	2	7.9	3.79	0.96	3.59	0.5	0.053	0.063	9.39
4.71	399.90	16.75	155.32	109.16	0.032	0.0067	2	6.9	3.72	0.96	3.83	0.5	0.053	0.063	9.38
4.73	397.83	18.06	156.30	109.85	0.032	0.0067	2	7.5	3.75	0.95	3.80	0.5	0.053	0.063	9.34
4.76	359.22	18.75	157.20	110.48	0.032	0.0067	2	9.3	3.86	0.95	3.42	0.5	0.053	0.062	9.24
4.79	338.53	19.31	158.07	111.09	0.032	0.0068	2	10.7	3.94	0.95	3.21	0.5	0.053	0.062	9.18
4.82	389.56	20.89	159.00	111.74	0.032	0.0068	2	9.1	3.81	0.95	3.69	0.5	0.053	0.063	9.21
4.85	466.78	18.00	160.00	112.45	0.032	0.0068	3	5.9	3.61	0.94	4.40	0.5	0.054	0.063	9.27
4.88	515.73	16.13	160.95	113.12	0.032	0.0069	3	4.5	3.49	0.94	4.85	1.0	0.054	0.064	9.30
4.90	574.34	18.20	161.85	113.75	0.033	0.0069	4	4.4	3.43	0.94	5.39	1.0	0.054	0.064	9.33
4.92	477.12	17.79	162.54	114.24	0.033	0.0069	3	5.7	3.59	0.94	4.46	0.5	0.054	0.063	9.18
4.94	410.24	18.41	162.98	114.55	0.033	0.0069	2	7.4	3.75	0.93	3.83	0.5	0.053	0.063	9.07

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
4.95	453.68	19.44	163.55	114.94	0.033	0.0069	3	6.7	3.66	0.93	4.23	0.5	0.054	0.063	9.10
4.97	418.51	19.99	163.91	115.20	0.033	0.0070	2	7.9	3.75	0.93	3.90	0.5	0.053	0.063	9.04
4.99	443.34	20.75	164.65	115.72	0.033	0.0070	3	7.4	3.70	0.93	4.12	0.5	0.053	0.063	9.04
5.01	335.78	20.96	165.53	116.34	0.033	0.0070	2	12.3	4.01	0.93	3.11	0.5	0.053	0.062	8.86
5.04	499.87	19.31	166.32	116.90	0.033	0.0070	3	5.8	3.58	0.92	4.62	1.0	0.054	0.064	9.04
5.06	1125.23	21.03	167.17	117.49	0.033	0.0071	9	2.2	2.97	0.92	10.38	1.5	0.059	0.069	9.81
5.09	2000.18	25.30	167.89	118.00	0.033	0.0071	17	1.4	2.62	0.92	18.41	3.0	0.065	0.077	10.90
5.10	2275.28	27.99	168.43	118.38	0.033	0.0071	19	1.3	2.56	0.92	20.91	3.5	0.067	0.080	11.22
5.12	2404.22	30.20	168.95	118.74	0.034	0.0071	21	1.4	2.55	0.92	22.06	3.5	0.068	0.081	11.35
5.13	2471.79	33.99	169.44	119.08	0.034	0.0071	21	1.5	2.56	0.92	22.65	4.0	0.069	0.081	11.41
5.15	2515.22	37.58	169.92	119.43	0.034	0.0071	21	1.6	2.57	0.92	23.02	4.0	0.069	0.082	11.43
5.16	2637.26	40.33	170.44	119.79	0.034	0.0072	23	1.6	2.56	0.91	24.10	4.0	0.070	0.083	11.56
5.18	2766.19	40.27	171.13	120.27	0.034	0.0072	24	1.6	2.53	0.91	25.22	4.0	0.071	0.084	11.67
5.21	2995.79	39.78	171.85	120.78	0.034	0.0072	26	1.4	2.47	0.91	27.26	4.5	0.073	0.086	11.91
5.23	3545.31	39.51	172.57	121.29	0.034	0.0072	31	1.2	2.37	0.91	32.19	5.5	0.077	0.091	12.55
5.25	3905.21	39.58	173.24	121.76	0.034	0.0072	34	1.1	2.31	0.91	35.39	6.0	0.079	0.094	12.94
5.27	4023.12	40.27	174.04	122.32	0.034	0.0073	35	1.0	2.29	0.90	36.38	6.0	0.080	0.095	13.03
5.29	4129.99	45.44	174.73	122.81	0.034	0.0073	36	1.1	2.31	0.90	37.27	6.0	0.081	0.096	13.11
5.32	4364.41	49.02	175.48	123.33	0.035	0.0073	38	1.2	2.29	0.90	39.30	6.5	0.083	0.098	13.34
5.36	4305.80	48.88	176.87	124.31	0.035	0.0074	37	1.2	2.30	0.90	38.62	6.5	0.082	0.097	13.17
5.39	4368.55	51.64	177.92	125.05	0.035	0.0074	37	1.2	2.31	0.89	39.07	6.5	0.083	0.097	13.17
5.41	4750.52	51.64	178.72	125.61	0.035	0.0074	41	1.1	2.25	0.89	42.39	7.0	0.085	0.101	13.56
5.44	4987.70	50.47	179.59	126.22	0.035	0.0075	43	1.0	2.22	0.89	44.40	7.5	0.087	0.103	13.77
5.46	5106.98	49.71	180.39	126.78	0.035	0.0075	44	1.0	2.20	0.89	45.36	7.5	0.088	0.104	13.85
5.49	5140.76	49.64	181.21	127.36	0.035	0.0075	44	1.0	2.20	0.89	45.55	7.5	0.088	0.104	13.82
5.51	5064.23	51.92	182.01	127.92	0.036	0.0075	43	1.1	2.22	0.88	44.78	7.5	0.087	0.103	13.67
5.53	5171.79	51.30	182.70	128.41	0.036	0.0076	44	1.0	2.20	0.88	45.64	7.5	0.088	0.104	13.74
5.56	5360.02	50.47	183.53	128.99	0.036	0.0076	46	1.0	2.18	0.88	47.19	8.0	0.089	0.105	13.89
5.58	5441.38	50.95	184.27	129.51	0.036	0.0076	46	1.0	2.17	0.88	47.81	8.0	0.090	0.106	13.93
5.61	5509.63	51.78	185.15	130.12	0.036	0.0076	47	1.0	2.17	0.88	48.30	8.0	0.090	0.106	13.94
5.63	5557.21	52.88	185.94	130.69	0.036	0.0077	47	1.0	2.17	0.87	48.61	8.0	0.090	0.107	13.93
5.66	5526.87	54.12	186.84	131.32	0.036	0.0077	47	1.0	2.18	0.87	48.23	8.0	0.090	0.106	13.82
5.69	5377.25	54.19	187.69	131.91	0.036	0.0077	45	1.0	2.20	0.87	46.82	8.0	0.089	0.105	13.59
5.71	5059.40	53.02	188.57	132.53	0.037	0.0078	42	1.1	2.23	0.87	43.95	7.5	0.087	0.102	13.18
5.74	4647.78	52.40	189.36	133.09	0.037	0.0078	39	1.2	2.28	0.87	40.29	6.5	0.084	0.099	12.67
5.76	4231.34	54.12	190.19	133.67	0.037	0.0078	35	1.3	2.35	0.86	36.60	6.0	0.080	0.095	12.16
5.79	3588.05	55.37	191.06	134.28	0.037	0.0078	29	1.6	2.46	0.86	30.96	5.0	0.076	0.089	11.40
5.82	2611.75	51.57	191.99	134.93	0.037	0.0079	21	2.1	2.65	0.86	22.48	3.5	0.069	0.081	10.30

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
5.84	1894.69	42.06	192.84	135.53	0.037	0.0079	15	2.5	2.81	0.86	16.28	2.5	0.064	0.075	9.49
5.87	1687.85	34.96	193.79	136.20	0.037	0.0079	13	2.3	2.85	0.86	14.46	2.5	0.062	0.073	9.22
5.90	1869.87	26.68	194.74	136.87	0.038	0.0080	14	1.6	2.72	0.85	15.98	2.5	0.063	0.075	9.37
5.93	2784.12	25.37	195.74	137.57	0.038	0.0080	22	1.0	2.45	0.85	23.74	4.0	0.070	0.082	10.28
5.96	2867.55	28.41	196.80	138.31	0.038	0.0080	23	1.1	2.45	0.85	24.38	4.0	0.070	0.083	10.31
6.00	2709.66	30.41	197.90	139.09	0.038	0.0081	21	1.2	2.51	0.85	22.98	4.0	0.069	0.082	10.09
6.03	2528.32	31.44	198.96	139.83	0.038	0.0081	20	1.3	2.56	0.85	21.38	3.5	0.068	0.080	9.85
6.06	2455.93	32.54	200.06	140.61	0.039	0.0082	19	1.4	2.59	0.84	20.71	3.5	0.067	0.079	9.72
6.15	2061.55	27.23	203.17	142.79	0.039	0.0083	16	1.5	2.67	0.84	17.25	3.0	0.064	0.076	9.18
6.20	1745.07	26.20	204.56	143.77	0.039	0.0083	13	1.7	2.77	0.83	14.55	2.5	0.062	0.073	8.80
6.23	1547.88	23.58	205.77	144.62	0.040	0.0084	11	1.8	2.83	0.83	12.87	2.0	0.061	0.072	8.56
6.27	1465.15	22.68	206.85	145.38	0.040	0.0084	10	1.8	2.86	0.83	12.15	2.0	0.060	0.071	8.43
6.30	1469.97	23.65	208.01	146.19	0.040	0.0085	10	1.9	2.87	0.83	12.16	2.0	0.060	0.071	8.39
6.34	1367.24	21.72	209.19	147.02	0.040	0.0085	10	1.9	2.90	0.82	11.28	2.0	0.059	0.070	8.24
6.37	2093.26	20.82	210.27	147.78	0.040	0.0085	15	1.1	2.61	0.82	17.22	3.0	0.064	0.076	8.89
6.40	2324.24	26.20	211.35	148.54	0.041	0.0086	17	1.2	2.59	0.82	19.07	3.0	0.066	0.078	9.06
6.43	2273.91	31.16	212.41	149.28	0.041	0.0086	17	1.5	2.64	0.82	18.61	3.0	0.066	0.077	8.96
6.46	2069.82	36.68	213.41	149.99	0.041	0.0087	15	2.0	2.75	0.82	16.90	3.0	0.064	0.076	8.73
6.49	1992.60	36.75	214.39	150.67	0.041	0.0087	14	2.1	2.77	0.81	16.23	2.5	0.064	0.075	8.61
6.52	2199.44	33.16	215.21	151.25	0.041	0.0087	16	1.7	2.68	0.81	17.88	3.0	0.065	0.077	8.77
6.54	2373.88	29.51	216.01	151.81	0.041	0.0088	18	1.4	2.61	0.81	19.27	3.0	0.066	0.078	8.89
6.57	2690.35	28.27	216.73	152.32	0.042	0.0088	20	1.1	2.52	0.81	21.80	3.5	0.068	0.080	9.15
6.59	2953.04	29.10	217.63	152.95	0.042	0.0088	22	1.1	2.46	0.81	23.88	4.0	0.070	0.082	9.34
6.62	2962.70	31.58	218.53	153.58	0.042	0.0089	22	1.2	2.48	0.81	23.91	4.0	0.070	0.082	9.31
6.64	2978.55	35.92	219.32	154.14	0.042	0.0089	22	1.3	2.51	0.81	23.99	4.0	0.070	0.083	9.28
6.67	3064.05	39.44	220.02	154.63	0.042	0.0089	23	1.4	2.51	0.80	24.64	4.0	0.071	0.083	9.33
6.69	3086.11	43.09	220.76	155.16	0.042	0.0090	23	1.5	2.53	0.80	24.78	4.0	0.071	0.083	9.31
6.71	2978.55	43.64	221.56	155.72	0.042	0.0090	22	1.6	2.56	0.80	23.87	4.0	0.070	0.082	9.18
6.74	2961.32	46.33	222.36	156.28	0.043	0.0090	22	1.7	2.58	0.80	23.69	4.0	0.070	0.082	9.13
6.76	2742.06	49.99	223.13	156.82	0.043	0.0090	20	2.0	2.65	0.80	21.90	3.5	0.068	0.081	8.90
6.78	2335.27	53.30	223.77	157.27	0.043	0.0091	17	2.5	2.77	0.80	18.62	3.0	0.066	0.077	8.52
6.80	1843.67	53.02	224.59	157.85	0.043	0.0091	13	3.3	2.93	0.80	14.67	2.5	0.062	0.073	8.06
6.83	1393.44	50.26	225.37	158.39	0.043	0.0091	9	4.3	3.11	0.79	11.07	2.0	0.059	0.070	7.65
6.85	1114.89	44.20	226.11	158.91	0.043	0.0092	7	5.0	3.25	0.79	8.84	1.5	0.057	0.068	7.38
6.88	901.15	33.30	226.96	159.51	0.043	0.0092	5	4.9	3.34	0.79	7.14	1.0	0.056	0.066	7.17
6.90	978.37	27.44	227.76	160.07	0.044	0.0092	6	3.7	3.23	0.79	7.73	1.5	0.056	0.067	7.21
6.92	1851.25	27.65	228.53	160.61	0.044	0.0093	13	1.7	2.77	0.79	14.61	2.5	0.062	0.073	7.92
6.95	2220.82	30.20	229.33	161.17	0.044	0.0093	16	1.5	2.67	0.79	17.49	3.0	0.065	0.076	8.19

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
6.97	2121.53	32.06	230.12	161.73	0.044	0.0093	15	1.7	2.72	0.79	16.68	3.0	0.064	0.075	8.08
7.00	1965.02	34.34	231.00	162.35	0.044	0.0094	14	2.0	2.79	0.78	15.42	2.5	0.063	0.074	7.92
7.02	1926.41	32.89	231.87	162.96	0.044	0.0094	13	1.9	2.79	0.78	15.09	2.5	0.063	0.074	7.85
7.05	1972.60	29.58	232.80	163.61	0.045	0.0094	14	1.7	2.75	0.78	15.42	2.5	0.063	0.074	7.85
7.08	1931.23	30.06	233.65	164.21	0.045	0.0095	13	1.8	2.77	0.78	15.07	2.5	0.063	0.074	7.79
7.09	1395.51	30.61	234.03	164.48	0.045	0.0095	9	2.6	3.00	0.78	10.88	2.0	0.059	0.070	7.34
7.10	1827.81	33.23	234.52	164.82	0.045	0.0095	12	2.1	2.83	0.78	14.24	2.5	0.062	0.073	7.67
7.12	1565.81	34.75	235.03	165.19	0.045	0.0095	10	2.6	2.95	0.78	12.18	2.0	0.060	0.071	7.44
7.14	1241.06	35.23	235.65	165.62	0.045	0.0096	8	3.5	3.12	0.78	9.64	1.5	0.058	0.068	7.16
7.16	924.59	30.75	236.27	166.05	0.045	0.0096	5	4.5	3.32	0.78	7.18	1.0	0.056	0.066	6.89
7.18	708.10	25.51	236.94	166.52	0.045	0.0096	4	5.4	3.50	0.77	5.49	1.0	0.055	0.064	6.69
7.20	677.07	20.89	237.66	167.03	0.046	0.0097	3	4.8	3.50	0.77	5.24	1.0	0.054	0.064	6.65
7.23	545.38	16.89	238.56	167.66	0.046	0.0097	2	5.5	3.66	0.77	4.21	0.5	0.054	0.063	6.52
7.25	473.67	15.79	239.28	168.17	0.046	0.0097	2	6.7	3.81	0.77	3.65	0.5	0.053	0.063	6.44
7.27	687.41	15.51	240.10	168.75	0.046	0.0098	3	3.5	3.42	0.77	5.29	1.0	0.054	0.064	6.58
7.30	2598.65	18.75	240.82	169.25	0.046	0.0098	18	0.8	2.48	0.77	19.97	3.5	0.067	0.079	8.03
7.32	2999.93	23.03	241.62	169.81	0.046	0.0098	21	0.8	2.43	0.77	23.02	4.0	0.069	0.082	8.31
7.34	2442.83	26.41	242.26	170.26	0.047	0.0098	17	1.2	2.59	0.77	18.72	3.0	0.066	0.077	7.86
7.36	2020.87	31.30	243.11	170.86	0.047	0.0099	14	1.8	2.76	0.77	15.46	2.5	0.063	0.074	7.50
7.39	1911.24	31.92	243.88	171.40	0.047	0.0099	13	1.9	2.80	0.76	14.60	2.5	0.062	0.073	7.39
7.41	1952.61	31.37	244.68	171.96	0.047	0.0100	13	1.8	2.78	0.76	14.89	2.5	0.062	0.074	7.40
7.43	1928.48	31.65	245.42	172.49	0.047	0.0100	13	1.9	2.80	0.76	14.68	2.5	0.062	0.073	7.35
7.46	2024.31	32.61	246.19	173.03	0.047	0.0100	14	1.8	2.77	0.76	15.39	2.5	0.063	0.074	7.40
7.48	2099.47	33.72	247.04	173.63	0.048	0.0101	14	1.8	2.75	0.76	15.93	2.5	0.063	0.075	7.42
7.51	2062.92	34.68	247.87	174.20	0.048	0.0101	14	1.9	2.77	0.76	15.63	2.5	0.063	0.074	7.36
7.53	2038.79	35.51	248.71	174.80	0.048	0.0101	14	2.0	2.79	0.76	15.42	2.5	0.063	0.074	7.32
7.56	1993.29	36.82	249.54	175.38	0.048	0.0102	13	2.1	2.81	0.76	15.05	2.5	0.063	0.074	7.25
7.58	1827.81	37.03	250.33	175.94	0.048	0.0102	12	2.3	2.87	0.75	13.78	2.5	0.061	0.073	7.11
7.61	1740.94	37.03	251.11	176.48	0.048	0.0102	11	2.5	2.91	0.75	13.10	2.0	0.061	0.072	7.02
7.63	1576.15	38.06	251.90	177.04	0.049	0.0103	10	2.9	2.99	0.75	11.85	2.0	0.060	0.071	6.87
7.65	1447.22	38.06	252.67	177.58	0.049	0.0103	9	3.2	3.05	0.75	10.86	2.0	0.059	0.070	6.75
7.68	1276.92	36.06	253.50	178.16	0.049	0.0104	8	3.5	3.13	0.75	9.57	1.5	0.058	0.068	6.61
7.70	1061.11	34.61	254.32	178.74	0.049	0.0104	6	4.3	3.27	0.75	7.94	1.5	0.057	0.067	6.43
7.73	945.28	32.89	255.12	179.30	0.049	0.0104	5	4.8	3.35	0.75	7.06	1.0	0.056	0.066	6.32
7.75	898.39	27.44	255.99	179.92	0.049	0.0105	5	4.3	3.35	0.75	6.70	1.0	0.056	0.066	6.26
7.78	890.81	22.20	256.79	180.48	0.050	0.0105	5	3.5	3.31	0.74	6.63	1.0	0.056	0.066	6.24
7.80	952.86	18.13	257.51	180.98	0.050	0.0105	5	2.6	3.21	0.74	7.08	1.0	0.056	0.066	6.26
7.82	754.29	14.27	258.23	181.49	0.050	0.0106	4	2.9	3.35	0.74	5.60	1.0	0.055	0.065	6.10

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo'} (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
7.85	519.87	14.69	259.08	182.08	0.050	0.0106	2	5.6	3.74	0.74	3.85	0.5	0.053	0.063	5.91
7.87	331.64	14.96	259.77	182.57	0.050	0.0106	1	20.8	4.52	0.74	2.45	0.5	0.052	0.061	5.77
7.94	1936.06	25.44	262.21	184.29	0.051	0.0108	12	1.5	2.76	0.74	14.26	2.5	0.062	0.073	6.78
7.97	2942.01	32.75	263.01	184.85	0.051	0.0108	20	1.2	2.54	0.74	21.64	3.5	0.068	0.080	7.43
7.99	3200.57	40.13	263.89	185.46	0.051	0.0108	22	1.4	2.53	0.73	23.50	4.0	0.070	0.082	7.57
8.02	3418.44	42.47	264.79	186.10	0.051	0.0109	23	1.3	2.50	0.73	25.06	4.0	0.071	0.084	7.68
8.05	3642.52	41.02	265.69	186.73	0.052	0.0109	25	1.2	2.45	0.73	26.66	4.5	0.072	0.085	7.79
8.08	3470.15	39.99	266.61	187.38	0.052	0.0110	23	1.2	2.48	0.73	25.35	4.0	0.071	0.084	7.64
8.09	3010.96	39.23	267.02	187.67	0.052	0.0110	20	1.4	2.57	0.73	21.98	3.5	0.068	0.081	7.33
8.10	3059.91	39.37	267.36	187.90	0.052	0.0110	20	1.4	2.56	0.73	22.32	3.5	0.069	0.081	7.35
8.11	2913.05	39.44	267.77	188.19	0.052	0.0110	19	1.5	2.59	0.73	21.23	3.5	0.068	0.080	7.24
8.13	2671.05	39.16	268.26	188.54	0.052	0.0111	17	1.6	2.65	0.73	19.45	3.0	0.066	0.078	7.06
8.14	2506.95	38.96	268.64	188.81	0.052	0.0111	16	1.7	2.69	0.73	18.24	3.0	0.065	0.077	6.95
8.16	2391.12	38.82	269.24	189.22	0.052	0.0111	15	1.8	2.72	0.73	17.38	3.0	0.064	0.076	6.85
8.18	2173.93	39.16	269.90	189.69	0.053	0.0111	14	2.1	2.79	0.73	15.78	2.5	0.063	0.075	6.69
8.20	2019.49	37.92	270.62	190.20	0.053	0.0112	13	2.2	2.83	0.73	14.64	2.5	0.062	0.073	6.57
8.22	1836.77	36.89	271.40	190.74	0.053	0.0112	11	2.4	2.89	0.72	13.30	2.0	0.061	0.072	6.43
8.24	1570.64	37.16	272.09	191.23	0.053	0.0112	9	2.9	3.01	0.72	11.36	2.0	0.059	0.070	6.24
8.26	1447.22	36.34	272.68	191.64	0.053	0.0113	8	3.1	3.06	0.72	10.45	1.5	0.059	0.069	6.14
8.28	1223.14	34.68	273.35	192.11	0.053	0.0113	7	3.7	3.18	0.72	8.82	1.5	0.057	0.068	5.98
8.31	957.69	34.06	274.25	192.75	0.054	0.0114	5	5.0	3.38	0.72	6.90	1.0	0.056	0.066	5.79
8.34	862.54	36.27	275.20	193.42	0.054	0.0114	4	6.2	3.48	0.72	6.20	1.0	0.055	0.065	5.71
8.36	726.02	33.72	276.02	193.99	0.054	0.0114	3	7.5	3.63	0.72	5.21	1.0	0.054	0.064	5.60
8.39	419.20	28.20	276.80	194.54	0.054	0.0115	1	19.8	4.28	0.72	3.01	0.5	0.053	0.062	5.39
8.43	344.74	22.34	278.34	195.62	0.055	0.0116	0	33.6	4.68	0.71	2.46	0.5	0.052	0.061	5.31
8.45	932.18	23.37	279.08	196.14	0.055	0.0116	5	3.6	3.32	0.71	6.66	1.0	0.056	0.066	5.65
8.48	1236.24	30.48	279.83	196.67	0.055	0.0116	7	3.2	3.15	0.71	8.82	1.5	0.057	0.068	5.81
8.50	1132.82	37.92	280.60	197.21	0.055	0.0117	6	4.4	3.27	0.71	8.07	1.5	0.057	0.067	5.73
8.53	813.59	42.13	281.50	197.84	0.055	0.0117	4	7.9	3.59	0.71	5.78	1.0	0.055	0.065	5.52
8.55	452.99	39.23	282.14	198.30	0.056	0.0118	1	23.0	4.26	0.71	3.22	0.5	0.053	0.062	5.28
8.57	375.77	31.58	282.97	198.87	0.056	0.0118	1	34.0	4.57	0.71	2.66	0.5	0.052	0.062	5.22
8.71	893.57	24.06	287.39	201.98	0.057	0.0120	4	4.0	3.37	0.70	6.29	1.0	0.055	0.065	5.41
8.73	1460.32	34.68	288.24	202.58	0.057	0.0121	8	3.0	3.06	0.70	10.26	1.5	0.059	0.069	5.72
8.76	1452.73	43.44	289.14	203.21	0.057	0.0121	8	3.7	3.12	0.70	10.19	1.5	0.058	0.069	5.69
8.79	1287.95	37.09	290.14	203.92	0.058	0.0122	7	3.7	3.18	0.70	9.02	1.5	0.058	0.068	5.57
8.82	1375.51	30.82	291.09	204.59	0.058	0.0122	8	2.8	3.08	0.70	9.62	1.5	0.058	0.068	5.59
8.85	1911.24	28.34	292.07	205.27	0.058	0.0123	11	1.8	2.83	0.70	13.34	2.0	0.061	0.072	5.87
8.88	1877.45	31.30	293.15	206.03	0.058	0.0124	11	2.0	2.86	0.70	13.08	2.0	0.061	0.072	5.82

Depth (m)	q_c (kPa)	f_s (kPa)	σ_{vo} (kPa)	σ_{vo}' (kPa)	r_d	CSR	Q	F	I_c	C_Q	q_{c1N}	$N_{1,60}$	$CRR_{7.5}$	CRR_{Mw}	F.S. (Mw)
8.92	1745.76	42.89	294.33	206.86	0.059	0.0124	10	3.0	2.99	0.70	12.14	2.0	0.060	0.071	5.71
8.95	1290.71	45.57	295.46	207.66	0.059	0.0125	7	4.6	3.23	0.69	8.96	1.5	0.057	0.068	5.43

Analyses of CPT Data
Impoundment at Dike 1 - Laronde Mine

CPT No.	S1
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Soil Data	
Dry unit weight, γ_d (kN/m ³):	23.2
Void ratio, e:	0.64
Depth to groundwater (m):	0.0
Soil type factor, n_s :	0.50

Earthquake Data	
Moment Magnitude, M_w :	7
PGA on rock:	0.659g
PGA on ground surface:	0.011g
Magnitude Scaling Factor, MSF:	1.08

CPT/SPT Conversion	
$q_{c1N}/(N_1)_{60}$:	6.0
where: q_{c1N} (unitless)	
$(N_1)_{60}$ in blows per 300 mm	
Average $(N_1)_{60}$:	2.12

Analysis

Depth (m)	q_c (kPa)	f_s (kPa)	σ_{vo} (kPa)	σ_{vo}' (kPa)	r_d	CSR	Q	F	I_c	C_Q	q_{c1N}	$N_{1,60}$	$CRR_{7.5}$	CRR_{Mw}	F.S. (M_w)
<i>DATA</i>	<i>DATA</i>	<i>DATA</i>	<i>CALC</i>	<i>CALC</i>	<i>CALC</i>	<i>(1)</i>	<i>(15)</i>	<i>(16)</i>	<i>(14)</i>	<i>(13)</i>	<i>(12)</i>	<i>Calc</i>	<i>(11)</i>	<i>CALC</i>	<i>(23)</i>
0.09	2455.24	24.55	3.06	2.15	0.016	0.0098	167	1.0	1.74	1.70	41.74	28.0	0.085	0.092	9.36
0.15	917.01	27.65	4.83	3.40	0.016	0.0099	49	3.0	2.46	1.70	15.59	8.5	0.063	0.068	6.90
0.18	433.68	18.34	6.09	4.28	0.016	0.0099	21	4.3	2.84	1.70	7.37	3.5	0.056	0.061	6.12
0.21	313.71	14.75	6.87	4.83	0.016	0.0099	14	4.8	3.00	1.70	5.33	2.5	0.054	0.059	5.91
0.23	336.47	11.86	7.64	5.37	0.016	0.0100	14	3.6	2.92	1.70	5.72	2.5	0.055	0.059	5.93
0.25	326.81	11.24	8.28	5.82	0.016	0.0100	13	3.5	2.94	1.70	5.56	2.5	0.055	0.059	5.89
0.27	273.03	11.31	8.97	6.31	0.016	0.0100	11	4.3	3.07	1.70	4.64	2.0	0.054	0.058	5.79
0.29	326.81	11.31	9.72	6.83	0.017	0.0101	12	3.6	2.97	1.70	5.56	2.0	0.055	0.059	5.86
0.32	471.60	9.86	10.54	7.41	0.017	0.0101	17	2.1	2.72	1.70	8.02	3.0	0.057	0.061	6.05
0.35	688.10	10.89	11.55	8.11	0.017	0.0102	24	1.6	2.53	1.70	11.70	4.0	0.060	0.065	6.35
0.37	754.29	10.96	12.27	8.62	0.017	0.0102	25	1.5	2.49	1.70	12.82	4.5	0.061	0.066	6.43
0.39	632.25	11.72	12.88	9.05	0.017	0.0102	21	1.9	2.63	1.70	10.75	3.5	0.059	0.064	6.23
0.41	484.01	10.89	13.58	9.54	0.017	0.0102	15	2.3	2.78	1.70	8.23	2.5	0.057	0.061	5.99
0.44	460.57	8.96	14.37	10.10	0.017	0.0103	14	2.0	2.78	1.70	7.83	2.5	0.057	0.061	5.94
0.46	361.98	7.79	15.17	10.66	0.017	0.0103	11	2.2	2.91	1.70	6.15	2.0	0.055	0.060	5.77
0.48	338.53	8.00	15.97	11.22	0.017	0.0104	10	2.5	2.96	1.70	5.76	1.5	0.055	0.059	5.71
0.51	262.69	8.89	16.77	11.78	0.017	0.0104	7	3.6	3.16	1.70	4.47	1.5	0.054	0.058	5.58
0.53	279.93	8.20	17.64	12.40	0.017	0.0104	7	3.1	3.11	1.70	4.76	1.5	0.054	0.058	5.59
0.56	475.74	8.62	18.44	12.96	0.017	0.0105	13	1.9	2.80	1.70	8.09	2.0	0.057	0.061	5.85
0.58	662.59	9.72	19.16	13.46	0.017	0.0105	18	1.5	2.63	1.70	11.26	3.0	0.059	0.064	6.11
0.61	863.23	9.72	20.01	14.06	0.017	0.0105	22	1.2	2.48	1.70	14.67	4.0	0.062	0.067	6.37
0.63	761.88	9.58	20.83	14.64	0.017	0.0106	19	1.3	2.56	1.70	12.95	3.5	0.061	0.066	6.20
0.66	848.06	8.89	21.68	15.24	0.017	0.0106	21	1.1	2.48	1.70	14.42	3.5	0.062	0.067	6.30
0.68	802.55	8.34	22.47	15.80	0.017	0.0107	20	1.1	2.51	1.70	13.64	3.5	0.061	0.066	6.22
0.70	794.97	8.41	23.27	16.36	0.018	0.0107	19	1.1	2.52	1.70	13.51	3.5	0.061	0.066	6.18
0.73	703.27	8.20	24.12	16.95	0.018	0.0107	16	1.2	2.60	1.70	11.96	3.0	0.060	0.065	6.03

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
0.76	837.72	8.41	24.94	17.53	0.018	0.0108	19	1.0	2.51	1.70	14.24	3.5	0.062	0.067	6.20
0.78	855.64	8.76	25.66	18.04	0.018	0.0108	20	1.1	2.51	1.70	14.55	3.5	0.062	0.067	6.20
0.80	883.91	8.89	26.46	18.60	0.018	0.0109	20	1.0	2.50	1.70	15.03	3.5	0.063	0.068	6.22
0.83	1001.12	9.03	27.33	19.21	0.018	0.0109	22	0.9	2.43	1.70	17.02	4.0	0.064	0.069	6.36
0.85	906.67	9.86	28.18	19.81	0.018	0.0109	20	1.1	2.52	1.70	15.41	3.5	0.063	0.068	6.21
0.88	786.70	11.24	29.06	20.42	0.018	0.0110	17	1.5	2.64	1.70	13.37	3.0	0.061	0.066	6.01
0.91	636.39	11.24	29.88	21.00	0.018	0.0110	13	1.9	2.78	1.70	10.82	2.5	0.059	0.064	5.78
0.93	417.82	10.27	30.76	21.62	0.018	0.0111	8	2.7	3.03	1.70	7.10	1.5	0.056	0.060	5.46
0.96	381.28	4.83	31.58	22.19	0.018	0.0111	7	1.4	2.93	1.70	6.48	1.5	0.055	0.060	5.39
0.98	282.69	7.10	32.48	22.83	0.018	0.0111	5	2.8	3.22	1.70	4.81	1.0	0.054	0.058	5.23
1.01	254.42	9.51	33.38	23.46	0.018	0.0112	5	4.3	3.37	1.70	4.33	1.0	0.054	0.058	5.17
1.04	231.67	9.45	34.25	24.07	0.018	0.0112	4	4.8	3.44	1.70	3.94	1.0	0.053	0.058	5.12
1.07	152.38	7.10	35.44	24.90	0.019	0.0113	2	6.1	3.69	1.70	2.59	0.5	0.052	0.056	4.99
1.09	349.57	6.14	35.92	25.25	0.019	0.0113	6	2.0	3.07	1.70	5.94	1.0	0.055	0.059	5.24
1.10	485.39	8.96	36.44	25.61	0.019	0.0113	9	2.0	2.94	1.70	8.25	1.5	0.057	0.061	5.41
1.11	372.32	10.14	36.77	25.84	0.019	0.0114	7	3.0	3.15	1.70	6.33	1.0	0.055	0.060	5.25
1.13	580.54	10.62	37.26	26.19	0.019	0.0114	11	2.0	2.87	1.70	9.87	2.0	0.058	0.063	5.52
1.15	465.40	9.17	37.90	26.64	0.019	0.0114	8	2.1	2.99	1.70	7.91	1.5	0.057	0.061	5.35
1.16	250.28	10.48	38.42	27.00	0.019	0.0114	4	4.9	3.44	1.70	4.25	1.0	0.054	0.058	5.05
1.18	283.38	12.00	38.91	27.34	0.019	0.0115	5	4.9	3.39	1.70	4.82	1.0	0.054	0.058	5.09
1.20	450.23	7.65	39.50	27.76	0.019	0.0115	8	1.9	2.98	1.70	7.65	1.5	0.056	0.061	5.29
1.22	406.79	8.00	40.14	28.21	0.019	0.0115	7	2.2	3.06	1.70	6.92	1.5	0.056	0.060	5.22
1.24	486.77	8.62	40.99	28.81	0.019	0.0116	8	1.9	2.96	1.70	8.28	1.5	0.057	0.061	5.31
1.26	544.69	7.79	41.74	29.33	0.019	0.0116	9	1.5	2.87	1.70	9.26	1.5	0.058	0.062	5.37
1.29	263.38	8.96	42.51	29.87	0.019	0.0117	4	4.1	3.40	1.70	4.48	1.0	0.054	0.058	4.98
1.31	375.77	10.34	43.30	30.43	0.019	0.0117	6	3.1	3.19	1.70	6.39	1.0	0.055	0.060	5.11
1.34	368.87	11.58	44.10	30.99	0.019	0.0117	6	3.6	3.23	1.70	6.27	1.0	0.055	0.060	5.08
1.36	283.38	8.14	44.87	31.54	0.019	0.0118	4	3.4	3.34	1.70	4.82	1.0	0.054	0.058	4.95
1.38	295.79	10.20	45.62	32.06	0.019	0.0118	4	4.1	3.37	1.70	5.03	1.0	0.054	0.059	4.95
1.41	406.10	8.69	46.39	32.60	0.019	0.0119	6	2.4	3.11	1.70	6.90	1.0	0.056	0.060	5.08
1.43	464.71	11.93	47.06	33.07	0.020	0.0119	7	2.9	3.10	1.70	7.90	1.5	0.057	0.061	5.14
1.45	173.75	8.34	47.70	33.53	0.020	0.0119	2	6.6	3.74	1.70	2.95	0.5	0.052	0.057	4.75
1.47	415.76	7.10	48.42	34.03	0.020	0.0120	6	1.9	3.07	1.70	7.07	1.0	0.056	0.060	5.04
1.49	262.69	8.14	49.22	34.59	0.020	0.0120	4	3.8	3.42	1.70	4.47	0.5	0.054	0.058	4.83
1.51	539.17	9.93	49.99	35.13	0.020	0.0120	8	2.0	2.98	1.69	9.10	1.5	0.058	0.062	5.16
1.54	359.91	12.13	50.74	35.66	0.020	0.0121	5	3.9	3.30	1.67	6.03	1.0	0.055	0.059	4.92
1.56	341.98	12.55	51.53	36.22	0.020	0.0121	5	4.3	3.35	1.66	5.68	1.0	0.055	0.059	4.87
1.58	521.94	12.76	52.30	36.76	0.020	0.0122	8	2.7	3.07	1.65	8.61	1.5	0.057	0.062	5.07

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo'} (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
1.61	698.44	10.00	53.08	37.30	0.020	0.0122	11	1.5	2.82	1.64	11.44	2.0	0.060	0.064	5.26
1.63	737.05	17.58	53.82	37.83	0.020	0.0123	11	2.6	2.92	1.63	11.98	2.0	0.060	0.065	5.29
1.65	721.20	16.48	54.46	38.28	0.020	0.0123	11	2.5	2.92	1.62	11.66	2.0	0.060	0.064	5.25
1.67	608.81	12.34	55.29	38.86	0.020	0.0123	9	2.2	2.97	1.60	9.77	1.5	0.058	0.063	5.09
1.69	437.13	14.41	55.93	39.31	0.020	0.0124	6	3.8	3.23	1.59	6.97	1.0	0.056	0.060	4.87
1.72	1121.78	15.31	56.75	39.89	0.020	0.0124	17	1.4	2.63	1.58	17.76	3.0	0.065	0.070	5.64
1.74	1224.52	18.89	57.47	40.39	0.020	0.0125	18	1.6	2.63	1.57	19.27	3.0	0.066	0.071	5.73
1.76	1139.02	22.61	58.17	40.88	0.021	0.0125	17	2.1	2.72	1.56	17.81	3.0	0.065	0.070	5.60
1.78	1377.58	21.72	58.84	41.35	0.021	0.0125	21	1.6	2.59	1.56	21.42	3.5	0.068	0.073	5.85
1.81	1168.67	26.89	59.66	41.93	0.021	0.0126	17	2.4	2.75	1.54	18.05	3.0	0.065	0.070	5.58
1.83	1107.30	27.79	60.33	42.40	0.021	0.0126	16	2.7	2.80	1.54	17.01	3.0	0.064	0.069	5.49
1.85	1150.74	25.23	61.07	42.92	0.021	0.0127	17	2.3	2.75	1.53	17.56	3.0	0.065	0.070	5.51
1.87	814.97	22.68	61.77	43.41	0.021	0.0127	11	3.0	2.95	1.52	12.37	2.0	0.060	0.065	5.13
1.89	1003.88	22.41	62.49	43.92	0.021	0.0127	14	2.4	2.81	1.51	15.15	2.5	0.063	0.068	5.31
1.91	1117.65	22.34	63.16	44.39	0.021	0.0128	16	2.1	2.75	1.50	16.78	3.0	0.064	0.069	5.41
1.94	783.25	21.17	64.00	44.98	0.021	0.0128	11	2.9	2.97	1.49	11.68	2.0	0.060	0.065	5.03
1.97	607.43	19.79	64.90	45.62	0.021	0.0129	8	3.6	3.12	1.48	8.99	1.5	0.057	0.062	4.82
1.99	581.92	18.82	65.68	46.16	0.021	0.0129	8	3.6	3.14	1.47	8.57	1.5	0.057	0.062	4.78
2.02	581.92	16.48	66.60	46.81	0.021	0.0130	8	3.2	3.11	1.46	8.51	1.5	0.057	0.062	4.75
2.04	682.59	12.41	67.50	47.44	0.021	0.0130	9	2.0	2.94	1.45	9.91	1.5	0.058	0.063	4.83
2.07	737.05	15.03	68.30	48.00	0.021	0.0131	10	2.2	2.94	1.44	10.64	2.0	0.059	0.064	4.86
2.10	696.37	16.82	69.40	48.78	0.022	0.0131	9	2.7	3.01	1.43	9.97	1.5	0.058	0.063	4.79
2.13	503.32	16.13	70.28	49.39	0.022	0.0132	6	3.7	3.22	1.42	7.16	1.0	0.056	0.060	4.58
2.15	634.32	14.96	70.87	49.81	0.022	0.0132	8	2.7	3.05	1.42	8.99	1.5	0.057	0.062	4.70
2.16	606.05	14.34	71.36	50.15	0.022	0.0133	8	2.7	3.07	1.41	8.56	1.5	0.057	0.062	4.66
2.18	469.54	13.86	71.85	50.50	0.022	0.0133	6	3.5	3.24	1.41	6.61	1.0	0.056	0.060	4.51
2.19	522.63	12.41	72.41	50.89	0.022	0.0133	6	2.8	3.14	1.40	7.33	1.0	0.056	0.061	4.55
2.21	331.64	12.69	73.03	51.33	0.022	0.0134	4	4.9	3.48	1.40	4.63	1.0	0.054	0.058	4.36
2.23	359.22	9.31	73.62	51.74	0.022	0.0134	4	3.3	3.35	1.39	4.99	1.0	0.054	0.058	4.37
2.25	287.51	9.31	74.32	52.23	0.022	0.0134	3	4.4	3.53	1.38	3.98	0.5	0.053	0.058	4.29
2.27	275.10	7.65	74.93	52.66	0.022	0.0135	3	3.8	3.53	1.38	3.79	0.5	0.053	0.057	4.26
2.29	197.88	7.45	75.50	53.06	0.022	0.0135	2	6.1	3.81	1.37	2.72	0.5	0.052	0.056	4.18
2.30	341.29	7.65	76.06	53.46	0.022	0.0135	4	2.9	3.36	1.37	4.67	1.0	0.054	0.058	4.30
2.32	202.71	9.45	76.71	53.91	0.022	0.0136	2	7.5	3.85	1.36	2.76	0.5	0.052	0.056	4.16
2.34	359.22	11.24	77.40	54.40	0.022	0.0136	4	4.0	3.41	1.36	4.87	1.0	0.054	0.058	4.29
2.36	139.27	12.27	77.89	54.74	0.022	0.0136	1	20.0	4.35	1.35	1.88	0.5	0.052	0.056	4.08
2.38	167.54	12.89	78.43	55.12	0.022	0.0137	1	14.5	4.14	1.35	2.26	0.5	0.052	0.056	4.10
2.39	164.79	12.89	78.76	55.36	0.022	0.0137	1	15.0	4.16	1.34	2.21	0.5	0.052	0.056	4.09

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
2.40	184.78	11.24	79.23	55.68	0.023	0.0137	1	10.6	4.01	1.34	2.48	0.5	0.052	0.056	4.10
2.42	233.04	9.10	79.82	56.10	0.023	0.0138	2	5.9	3.74	1.34	3.11	0.5	0.053	0.057	4.13
2.43	328.19	10.34	80.36	56.48	0.023	0.0138	3	4.2	3.48	1.33	4.37	0.5	0.054	0.058	4.20
2.46	292.34	10.00	81.10	57.00	0.023	0.0138	3	4.7	3.57	1.32	3.87	0.5	0.053	0.057	4.15
2.48	240.63	10.82	81.85	57.53	0.023	0.0139	2	6.8	3.76	1.32	3.17	0.5	0.053	0.057	4.09
2.52	149.62	9.10	83.29	58.54	0.023	0.0140	1	13.7	4.25	1.31	1.96	0.5	0.052	0.056	3.99
2.56	228.22	10.48	84.55	59.42	0.023	0.0141	2	7.3	3.82	1.30	2.96	0.5	0.052	0.057	4.03
2.60	105.49	8.83	85.86	60.35	0.023	0.0141	0	45.0	4.98	1.29	1.36	0.0	0.051	0.055	3.91
2.62	133.07	8.89	86.61	60.87	0.023	0.0142	1	19.1	4.46	1.28	1.71	0.5	0.051	0.056	3.92
2.65	295.10	9.31	87.35	61.39	0.023	0.0142	3	4.5	3.58	1.28	3.77	0.5	0.053	0.057	4.03
2.67	405.41	10.07	88.10	61.92	0.023	0.0143	4	3.2	3.34	1.27	5.15	1.0	0.054	0.059	4.11
2.69	315.78	11.45	88.69	62.33	0.023	0.0143	3	5.0	3.57	1.27	4.00	0.5	0.053	0.058	4.02
2.71	379.21	11.03	89.41	62.84	0.024	0.0144	4	3.8	3.42	1.26	4.78	1.0	0.054	0.058	4.06
2.73	491.60	11.72	90.08	63.31	0.024	0.0144	5	2.9	3.24	1.26	6.18	1.0	0.055	0.060	4.14
2.75	499.18	13.44	90.85	63.85	0.024	0.0145	5	3.3	3.26	1.25	6.25	1.0	0.055	0.060	4.13
2.77	619.15	13.72	91.47	64.29	0.024	0.0145	7	2.6	3.12	1.25	7.72	1.5	0.056	0.061	4.21
2.79	450.92	13.72	92.14	64.76	0.024	0.0145	4	3.8	3.35	1.24	5.60	1.0	0.055	0.059	4.06
2.81	476.43	13.79	92.83	65.24	0.024	0.0146	5	3.6	3.31	1.24	5.90	1.0	0.055	0.059	4.07
2.83	623.98	16.20	93.40	65.64	0.024	0.0146	7	3.1	3.15	1.23	7.70	1.5	0.056	0.061	4.17
2.85	570.20	16.48	94.09	66.13	0.024	0.0147	6	3.5	3.22	1.23	7.01	1.0	0.056	0.060	4.11
2.87	623.98	11.72	94.81	66.63	0.024	0.0147	6	2.2	3.08	1.23	7.64	1.5	0.056	0.061	4.14
2.89	540.55	10.89	95.50	67.12	0.024	0.0148	5	2.4	3.17	1.22	6.60	1.0	0.055	0.060	4.06
2.91	767.39	12.20	96.20	67.61	0.024	0.0148	8	1.8	2.96	1.22	9.33	1.5	0.058	0.062	4.22
2.94	723.95	13.79	96.95	68.13	0.024	0.0148	8	2.2	3.02	1.21	8.77	1.5	0.057	0.062	4.17
2.96	476.43	13.10	97.59	68.59	0.024	0.0149	5	3.5	3.31	1.21	5.75	1.0	0.055	0.059	3.97
2.98	460.57	12.34	98.21	69.02	0.025	0.0149	4	3.4	3.33	1.20	5.54	1.0	0.055	0.059	3.95
2.99	557.79	12.00	98.72	69.38	0.025	0.0150	6	2.6	3.18	1.20	6.70	1.0	0.056	0.060	4.01
3.01	540.55	13.44	99.39	69.85	0.025	0.0150	5	3.0	3.23	1.20	6.47	1.0	0.055	0.060	3.98
3.03	471.60	14.34	100.03	70.30	0.025	0.0151	4	3.9	3.35	1.19	5.62	1.0	0.055	0.059	3.92
3.05	394.38	14.89	100.70	70.77	0.025	0.0151	3	5.1	3.50	1.19	4.69	1.0	0.054	0.058	3.86
3.07	431.61	15.51	101.50	71.33	0.025	0.0152	4	4.7	3.44	1.18	5.11	1.0	0.054	0.059	3.87
3.10	601.23	16.00	102.47	72.02	0.025	0.0152	6	3.2	3.21	1.18	7.08	1.0	0.056	0.060	3.97
3.12	593.64	15.72	103.09	72.45	0.025	0.0153	6	3.2	3.21	1.17	6.97	1.0	0.056	0.060	3.95
3.14	621.91	14.48	103.55	72.78	0.025	0.0153	6	2.8	3.16	1.17	7.29	1.0	0.056	0.061	3.96
3.15	580.54	14.62	104.12	73.18	0.025	0.0153	6	3.1	3.21	1.17	6.79	1.0	0.056	0.060	3.92
3.17	616.40	16.00	104.69	73.57	0.025	0.0154	6	3.1	3.19	1.17	7.19	1.0	0.056	0.060	3.93
3.19	488.15	17.24	105.20	73.94	0.025	0.0154	4	4.5	3.39	1.16	5.68	1.0	0.055	0.059	3.84
3.20	475.05	18.06	105.77	74.33	0.025	0.0154	4	4.9	3.42	1.16	5.51	1.0	0.055	0.059	3.82

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
3.22	352.32	19.10	106.36	74.75	0.025	0.0155	3	7.8	3.68	1.16	4.08	0.5	0.053	0.058	3.72
3.24	375.08	19.17	106.92	75.15	0.025	0.0155	3	7.1	3.63	1.15	4.33	0.5	0.054	0.058	3.73
3.25	361.98	17.24	107.39	75.47	0.026	0.0156	3	6.8	3.64	1.15	4.17	0.5	0.053	0.058	3.71
3.27	346.12	13.72	108.05	75.94	0.026	0.0156	3	5.8	3.62	1.15	3.97	0.5	0.053	0.058	3.69
3.29	357.15	12.07	108.67	76.38	0.026	0.0156	3	4.9	3.57	1.14	4.09	0.5	0.053	0.058	3.69
3.31	359.22	12.55	109.31	76.83	0.026	0.0157	3	5.0	3.57	1.14	4.10	0.5	0.053	0.058	3.68
3.33	377.15	12.96	109.93	77.26	0.026	0.0157	3	4.9	3.54	1.14	4.29	0.5	0.054	0.058	3.68
3.35	318.54	13.10	110.52	77.68	0.026	0.0158	2	6.3	3.70	1.13	3.61	0.5	0.053	0.057	3.63
3.37	384.73	13.86	111.17	78.13	0.026	0.0158	3	5.1	3.55	1.13	4.35	0.5	0.054	0.058	3.66
3.39	415.76	12.55	111.83	78.60	0.026	0.0159	3	4.1	3.46	1.13	4.69	1.0	0.054	0.058	3.67
3.41	418.51	11.45	112.43	79.01	0.026	0.0159	3	3.7	3.44	1.12	4.71	1.0	0.054	0.058	3.66
3.43	408.17	12.48	113.09	79.48	0.026	0.0160	3	4.2	3.48	1.12	4.58	1.0	0.054	0.058	3.64
3.44	367.49	14.75	113.69	79.90	0.026	0.0160	3	5.8	3.61	1.12	4.11	0.5	0.053	0.058	3.61
3.46	379.90	15.93	114.28	80.32	0.026	0.0160	3	6.0	3.60	1.12	4.24	0.5	0.054	0.058	3.60
3.48	349.57	15.72	115.02	80.84	0.026	0.0161	3	6.7	3.68	1.11	3.89	0.5	0.053	0.057	3.57
3.51	395.76	13.51	115.74	81.35	0.026	0.0161	3	4.8	3.53	1.11	4.39	0.5	0.054	0.058	3.59
3.53	428.86	10.89	116.44	81.83	0.027	0.0162	3	3.5	3.42	1.11	4.74	1.0	0.054	0.058	3.60
3.55	428.86	11.58	117.05	82.27	0.027	0.0162	3	3.7	3.44	1.10	4.73	1.0	0.054	0.058	3.59
3.57	372.32	13.51	117.80	82.79	0.027	0.0163	3	5.3	3.59	1.10	4.09	0.5	0.053	0.058	3.54
3.59	366.80	13.44	118.47	83.26	0.027	0.0163	3	5.4	3.61	1.10	4.02	0.5	0.053	0.058	3.53
3.61	384.73	11.10	119.16	83.75	0.027	0.0164	3	4.2	3.53	1.09	4.20	0.5	0.054	0.058	3.53
3.63	384.73	11.38	119.78	84.18	0.027	0.0164	3	4.3	3.53	1.09	4.19	0.5	0.053	0.058	3.51
3.65	395.76	12.27	120.37	84.60	0.027	0.0165	3	4.5	3.53	1.09	4.30	0.5	0.054	0.058	3.51
3.66	354.39	12.89	120.94	85.00	0.027	0.0165	3	5.5	3.64	1.08	3.84	0.5	0.053	0.057	3.48
3.68	346.12	12.27	121.50	85.39	0.027	0.0166	2	5.5	3.65	1.08	3.75	0.5	0.053	0.057	3.46
3.70	390.25	11.31	122.09	85.81	0.027	0.0166	3	4.2	3.53	1.08	4.21	0.5	0.054	0.058	3.48
3.72	403.35	11.45	122.69	86.23	0.027	0.0167	3	4.1	3.51	1.08	4.34	0.5	0.054	0.058	3.48
3.74	344.05	11.58	123.38	86.71	0.027	0.0167	2	5.2	3.65	1.07	3.69	0.5	0.053	0.057	3.43
3.76	338.53	10.14	124.02	87.17	0.027	0.0168	2	4.7	3.64	1.07	3.63	0.5	0.053	0.057	3.42
3.78	333.71	9.79	124.61	87.58	0.028	0.0168	2	4.7	3.65	1.07	3.57	0.5	0.053	0.057	3.41
3.79	330.95	11.65	125.23	88.01	0.028	0.0168	2	5.7	3.70	1.07	3.53	0.5	0.053	0.057	3.40
3.82	353.70	13.03	125.95	88.52	0.028	0.0169	2	5.7	3.67	1.06	3.76	0.5	0.053	0.057	3.40
3.84	300.61	12.96	126.62	88.99	0.028	0.0169	2	7.4	3.83	1.06	3.19	0.5	0.053	0.057	3.36
3.86	277.17	14.00	127.26	89.44	0.028	0.0170	2	9.3	3.94	1.06	2.93	0.5	0.052	0.057	3.33
3.88	623.98	14.41	127.98	89.95	0.028	0.0170	5	2.9	3.23	1.05	6.58	1.0	0.055	0.060	3.51
3.90	1130.06	14.55	128.65	90.42	0.028	0.0171	11	1.5	2.81	1.05	11.88	2.0	0.060	0.065	3.78
3.92	1296.91	15.38	129.32	90.89	0.028	0.0171	12	1.3	2.73	1.05	13.60	2.5	0.061	0.066	3.86
3.94	1240.37	16.34	130.04	91.39	0.028	0.0172	12	1.5	2.78	1.05	12.97	2.0	0.061	0.066	3.82

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
3.96	1068.00	18.06	130.66	91.83	0.028	0.0173	10	1.9	2.90	1.04	11.15	2.0	0.059	0.064	3.71
3.98	908.73	20.20	131.35	92.32	0.028	0.0173	8	2.6	3.04	1.04	9.46	1.5	0.058	0.063	3.61
4.00	677.76	21.03	132.05	92.80	0.028	0.0174	6	3.9	3.26	1.04	7.04	1.0	0.056	0.060	3.48
4.02	597.78	22.41	132.74	93.29	0.029	0.0174	5	4.8	3.38	1.04	6.19	1.0	0.055	0.060	3.42
4.04	539.17	18.62	133.51	93.83	0.029	0.0175	4	4.6	3.41	1.03	5.57	1.0	0.055	0.059	3.38
4.06	572.27	15.31	134.08	94.23	0.029	0.0175	5	3.5	3.32	1.03	5.90	1.0	0.055	0.059	3.39
4.08	711.54	14.96	134.75	94.70	0.029	0.0176	6	2.6	3.15	1.03	7.31	1.0	0.056	0.061	3.45
4.12	872.88	21.86	135.90	95.52	0.029	0.0177	8	3.0	3.10	1.02	8.93	1.5	0.057	0.062	3.51
4.14	616.40	27.10	136.60	96.00	0.029	0.0177	5	5.6	3.41	1.02	6.29	1.0	0.055	0.060	3.37
4.16	508.15	28.96	137.29	96.49	0.029	0.0178	4	7.8	3.58	1.02	5.17	1.0	0.054	0.059	3.30
4.18	554.34	28.20	137.99	96.98	0.029	0.0178	4	6.8	3.51	1.02	5.63	1.0	0.055	0.059	3.31
4.20	502.63	24.48	138.73	97.50	0.029	0.0179	4	6.7	3.55	1.01	5.09	1.0	0.054	0.059	3.28
4.23	448.85	20.55	139.55	98.08	0.029	0.0179	3	6.6	3.61	1.01	4.53	1.0	0.054	0.058	3.24
4.25	341.29	18.34	140.35	98.64	0.030	0.0180	2	9.1	3.84	1.01	3.44	0.5	0.053	0.057	3.17
4.28	333.71	17.44	141.12	99.18	0.030	0.0181	2	9.1	3.86	1.00	3.35	0.5	0.053	0.057	3.15
4.30	359.22	13.17	142.05	99.83	0.030	0.0181	2	6.1	3.72	1.00	3.60	0.5	0.053	0.057	3.15
4.33	870.12	17.79	143.08	100.56	0.030	0.0182	7	2.4	3.07	1.00	8.68	1.5	0.057	0.062	3.39
4.37	790.83	25.10	144.21	101.35	0.030	0.0183	6	3.9	3.22	0.99	7.86	1.5	0.057	0.061	3.33
4.40	464.71	25.92	145.29	102.11	0.030	0.0184	3	8.1	3.65	0.99	4.60	1.0	0.054	0.058	3.16
4.43	420.58	26.06	146.29	102.82	0.030	0.0185	3	9.5	3.75	0.99	4.15	0.5	0.053	0.058	3.12
4.47	350.95	20.89	147.40	103.59	0.030	0.0186	2	10.3	3.88	0.98	3.45	0.5	0.053	0.057	3.07
4.50	302.68	18.13	148.45	104.33	0.031	0.0187	2	11.8	4.01	0.98	2.96	0.5	0.052	0.057	3.03
4.53	313.02	17.44	149.56	105.11	0.031	0.0188	2	10.7	3.97	0.98	3.05	0.5	0.053	0.057	3.02
4.56	320.61	18.00	150.53	105.80	0.031	0.0188	2	10.6	3.95	0.97	3.12	0.5	0.053	0.057	3.01
4.59	388.87	16.62	151.54	106.50	0.031	0.0189	2	7.0	3.73	0.97	3.77	0.5	0.053	0.057	3.03
4.62	381.28	17.17	152.54	107.21	0.031	0.0190	2	7.5	3.76	0.97	3.68	0.5	0.053	0.057	3.01
4.65	386.80	17.17	153.42	107.82	0.031	0.0191	2	7.4	3.75	0.96	3.73	0.5	0.053	0.057	3.00
4.68	374.39	17.37	154.39	108.51	0.031	0.0192	2	7.9	3.79	0.96	3.59	0.5	0.053	0.057	2.99
4.71	399.90	16.75	155.32	109.16	0.032	0.0193	2	6.9	3.72	0.96	3.83	0.5	0.053	0.057	2.98
4.73	397.83	18.06	156.30	109.85	0.032	0.0193	2	7.5	3.75	0.95	3.80	0.5	0.053	0.057	2.97
4.76	359.22	18.75	157.20	110.48	0.032	0.0194	2	9.3	3.86	0.95	3.42	0.5	0.053	0.057	2.94
4.79	338.53	19.31	158.07	111.09	0.032	0.0195	2	10.7	3.94	0.95	3.21	0.5	0.053	0.057	2.92
4.82	389.56	20.89	159.00	111.74	0.032	0.0196	2	9.1	3.81	0.95	3.69	0.5	0.053	0.057	2.93
4.85	466.78	18.00	160.00	112.45	0.032	0.0197	3	5.9	3.61	0.94	4.40	0.5	0.054	0.058	2.95
4.88	515.73	16.13	160.95	113.12	0.032	0.0197	3	4.5	3.49	0.94	4.85	1.0	0.054	0.058	2.96
4.90	574.34	18.20	161.85	113.75	0.033	0.0198	4	4.4	3.43	0.94	5.39	1.0	0.054	0.059	2.97
4.92	477.12	17.79	162.54	114.24	0.033	0.0199	3	5.7	3.59	0.94	4.46	0.5	0.054	0.058	2.92
4.94	410.24	18.41	162.98	114.55	0.033	0.0199	2	7.4	3.75	0.93	3.83	0.5	0.053	0.057	2.88

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
4.95	453.68	19.44	163.55	114.94	0.033	0.0200	3	6.7	3.66	0.93	4.23	0.5	0.054	0.058	2.89
4.97	418.51	19.99	163.91	115.20	0.033	0.0200	2	7.9	3.75	0.93	3.90	0.5	0.053	0.058	2.88
4.99	443.34	20.75	164.65	115.72	0.033	0.0201	3	7.4	3.70	0.93	4.12	0.5	0.053	0.058	2.88
5.01	335.78	20.96	165.53	116.34	0.033	0.0201	2	12.3	4.01	0.93	3.11	0.5	0.053	0.057	2.82
5.04	499.87	19.31	166.32	116.90	0.033	0.0202	3	5.8	3.58	0.92	4.62	1.0	0.054	0.058	2.88
5.06	1125.23	21.03	167.17	117.49	0.033	0.0203	9	2.2	2.97	0.92	10.38	1.5	0.059	0.063	3.12
5.09	2000.18	25.30	167.89	118.00	0.033	0.0204	17	1.4	2.62	0.92	18.41	3.0	0.065	0.071	3.47
5.10	2275.28	27.99	168.43	118.38	0.033	0.0204	19	1.3	2.56	0.92	20.91	3.5	0.067	0.073	3.57
5.12	2404.22	30.20	168.95	118.74	0.034	0.0205	21	1.4	2.55	0.92	22.06	3.5	0.068	0.074	3.61
5.13	2471.79	33.99	169.44	119.08	0.034	0.0205	21	1.5	2.56	0.92	22.65	4.0	0.069	0.074	3.63
5.15	2515.22	37.58	169.92	119.43	0.034	0.0205	21	1.6	2.57	0.92	23.02	4.0	0.069	0.075	3.64
5.16	2637.26	40.33	170.44	119.79	0.034	0.0206	23	1.6	2.56	0.91	24.10	4.0	0.070	0.076	3.68
5.18	2766.19	40.27	171.13	120.27	0.034	0.0207	24	1.6	2.53	0.91	25.22	4.0	0.071	0.077	3.71
5.21	2995.79	39.78	171.85	120.78	0.034	0.0207	26	1.4	2.47	0.91	27.26	4.5	0.073	0.079	3.79
5.23	3545.31	39.51	172.57	121.29	0.034	0.0208	31	1.2	2.37	0.91	32.19	5.5	0.077	0.083	3.99
5.25	3905.21	39.58	173.24	121.76	0.034	0.0209	34	1.1	2.31	0.91	35.39	6.0	0.079	0.086	4.12
5.27	4023.12	40.27	174.04	122.32	0.034	0.0209	35	1.0	2.29	0.90	36.38	6.0	0.080	0.087	4.14
5.29	4129.99	45.44	174.73	122.81	0.034	0.0210	36	1.1	2.31	0.90	37.27	6.0	0.081	0.088	4.17
5.32	4364.41	49.02	175.48	123.33	0.035	0.0211	38	1.2	2.29	0.90	39.30	6.5	0.083	0.089	4.24
5.36	4305.80	48.88	176.87	124.31	0.035	0.0212	37	1.2	2.30	0.90	38.62	6.5	0.082	0.089	4.19
5.39	4368.55	51.64	177.92	125.05	0.035	0.0213	37	1.2	2.31	0.89	39.07	6.5	0.083	0.089	4.19
5.41	4750.52	51.64	178.72	125.61	0.035	0.0214	41	1.1	2.25	0.89	42.39	7.0	0.085	0.092	4.31
5.44	4987.70	50.47	179.59	126.22	0.035	0.0214	43	1.0	2.22	0.89	44.40	7.5	0.087	0.094	4.38
5.46	5106.98	49.71	180.39	126.78	0.035	0.0215	44	1.0	2.20	0.89	45.36	7.5	0.088	0.095	4.40
5.49	5140.76	49.64	181.21	127.36	0.035	0.0216	44	1.0	2.20	0.89	45.55	7.5	0.088	0.095	4.40
5.51	5064.23	51.92	182.01	127.92	0.036	0.0217	43	1.1	2.22	0.88	44.78	7.5	0.087	0.094	4.35
5.53	5171.79	51.30	182.70	128.41	0.036	0.0217	44	1.0	2.20	0.88	45.64	7.5	0.088	0.095	4.37
5.56	5360.02	50.47	183.53	128.99	0.036	0.0218	46	1.0	2.18	0.88	47.19	8.0	0.089	0.096	4.42
5.58	5441.38	50.95	184.27	129.51	0.036	0.0219	46	1.0	2.17	0.88	47.81	8.0	0.090	0.097	4.43
5.61	5509.63	51.78	185.15	130.12	0.036	0.0220	47	1.0	2.17	0.88	48.30	8.0	0.090	0.097	4.43
5.63	5557.21	52.88	185.94	130.69	0.036	0.0221	47	1.0	2.17	0.87	48.61	8.0	0.090	0.098	4.43
5.66	5526.87	54.12	186.84	131.32	0.036	0.0222	47	1.0	2.18	0.87	48.23	8.0	0.090	0.097	4.40
5.69	5377.25	54.19	187.69	131.91	0.036	0.0222	45	1.0	2.20	0.87	46.82	8.0	0.089	0.096	4.32
5.71	5059.40	53.02	188.57	132.53	0.037	0.0223	42	1.1	2.23	0.87	43.95	7.5	0.087	0.094	4.19
5.74	4647.78	52.40	189.36	133.09	0.037	0.0224	39	1.2	2.28	0.87	40.29	6.5	0.084	0.090	4.03
5.76	4231.34	54.12	190.19	133.67	0.037	0.0225	35	1.3	2.35	0.86	36.60	6.0	0.080	0.087	3.87
5.79	3588.05	55.37	191.06	134.28	0.037	0.0226	29	1.6	2.46	0.86	30.96	5.0	0.076	0.082	3.63
5.82	2611.75	51.57	191.99	134.93	0.037	0.0227	21	2.1	2.65	0.86	22.48	3.5	0.069	0.074	3.28

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo'} (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
5.84	1894.69	42.06	192.84	135.53	0.037	0.0227	15	2.5	2.81	0.86	16.28	2.5	0.064	0.069	3.02
5.87	1687.85	34.96	193.79	136.20	0.037	0.0228	13	2.3	2.85	0.86	14.46	2.5	0.062	0.067	2.93
5.90	1869.87	26.68	194.74	136.87	0.038	0.0229	14	1.6	2.72	0.85	15.98	2.5	0.063	0.068	2.98
5.93	2784.12	25.37	195.74	137.57	0.038	0.0230	22	1.0	2.45	0.85	23.74	4.0	0.070	0.075	3.27
5.96	2867.55	28.41	196.80	138.31	0.038	0.0232	23	1.1	2.45	0.85	24.38	4.0	0.070	0.076	3.28
6.00	2709.66	30.41	197.90	139.09	0.038	0.0233	21	1.2	2.51	0.85	22.98	4.0	0.069	0.075	3.21
6.03	2528.32	31.44	198.96	139.83	0.038	0.0234	20	1.3	2.56	0.85	21.38	3.5	0.068	0.073	3.13
6.06	2455.93	32.54	200.06	140.61	0.039	0.0235	19	1.4	2.59	0.84	20.71	3.5	0.067	0.073	3.09
6.15	2061.55	27.23	203.17	142.79	0.039	0.0238	16	1.5	2.67	0.84	17.25	3.0	0.064	0.070	2.92
6.20	1745.07	26.20	204.56	143.77	0.039	0.0240	13	1.7	2.77	0.83	14.55	2.5	0.062	0.067	2.80
6.23	1547.88	23.58	205.77	144.62	0.040	0.0241	11	1.8	2.83	0.83	12.87	2.0	0.061	0.066	2.72
6.27	1465.15	22.68	206.85	145.38	0.040	0.0242	10	1.8	2.86	0.83	12.15	2.0	0.060	0.065	2.68
6.30	1469.97	23.65	208.01	146.19	0.040	0.0243	10	1.9	2.87	0.83	12.16	2.0	0.060	0.065	2.67
6.34	1367.24	21.72	209.19	147.02	0.040	0.0245	10	1.9	2.90	0.82	11.28	2.0	0.059	0.064	2.62
6.37	2093.26	20.82	210.27	147.78	0.040	0.0246	15	1.1	2.61	0.82	17.22	3.0	0.064	0.069	2.83
6.40	2324.24	26.20	211.35	148.54	0.041	0.0247	17	1.2	2.59	0.82	19.07	3.0	0.066	0.071	2.88
6.43	2273.91	31.16	212.41	149.28	0.041	0.0248	17	1.5	2.64	0.82	18.61	3.0	0.066	0.071	2.85
6.46	2069.82	36.68	213.41	149.99	0.041	0.0249	15	2.0	2.75	0.82	16.90	3.0	0.064	0.069	2.78
6.49	1992.60	36.75	214.39	150.67	0.041	0.0250	14	2.1	2.77	0.81	16.23	2.5	0.064	0.069	2.74
6.52	2199.44	33.16	215.21	151.25	0.041	0.0251	16	1.7	2.68	0.81	17.88	3.0	0.065	0.070	2.79
6.54	2373.88	29.51	216.01	151.81	0.041	0.0252	18	1.4	2.61	0.81	19.27	3.0	0.066	0.071	2.83
6.57	2690.35	28.27	216.73	152.32	0.042	0.0253	20	1.1	2.52	0.81	21.80	3.5	0.068	0.074	2.91
6.59	2953.04	29.10	217.63	152.95	0.042	0.0254	22	1.1	2.46	0.81	23.88	4.0	0.070	0.075	2.97
6.62	2962.70	31.58	218.53	153.58	0.042	0.0255	22	1.2	2.48	0.81	23.91	4.0	0.070	0.076	2.96
6.64	2978.55	35.92	219.32	154.14	0.042	0.0256	22	1.3	2.51	0.81	23.99	4.0	0.070	0.076	2.95
6.67	3064.05	39.44	220.02	154.63	0.042	0.0257	23	1.4	2.51	0.80	24.64	4.0	0.071	0.076	2.97
6.69	3086.11	43.09	220.76	155.16	0.042	0.0258	23	1.5	2.53	0.80	24.78	4.0	0.071	0.076	2.96
6.71	2978.55	43.64	221.56	155.72	0.042	0.0259	22	1.6	2.56	0.80	23.87	4.0	0.070	0.075	2.92
6.74	2961.32	46.33	222.36	156.28	0.043	0.0259	22	1.7	2.58	0.80	23.69	4.0	0.070	0.075	2.90
6.76	2742.06	49.99	223.13	156.82	0.043	0.0260	20	2.0	2.65	0.80	21.90	3.5	0.068	0.074	2.83
6.78	2335.27	53.30	223.77	157.27	0.043	0.0261	17	2.5	2.77	0.80	18.62	3.0	0.066	0.071	2.71
6.80	1843.67	53.02	224.59	157.85	0.043	0.0262	13	3.3	2.93	0.80	14.67	2.5	0.062	0.067	2.56
6.83	1393.44	50.26	225.37	158.39	0.043	0.0263	9	4.3	3.11	0.79	11.07	2.0	0.059	0.064	2.43
6.85	1114.89	44.20	226.11	158.91	0.043	0.0264	7	5.0	3.25	0.79	8.84	1.5	0.057	0.062	2.35
6.88	901.15	33.30	226.96	159.51	0.043	0.0265	5	4.9	3.34	0.79	7.14	1.0	0.056	0.060	2.28
6.90	978.37	27.44	227.76	160.07	0.044	0.0266	6	3.7	3.23	0.79	7.73	1.5	0.056	0.061	2.29
6.92	1851.25	27.65	228.53	160.61	0.044	0.0267	13	1.7	2.77	0.79	14.61	2.5	0.062	0.067	2.52
6.95	2220.82	30.20	229.33	161.17	0.044	0.0268	16	1.5	2.67	0.79	17.49	3.0	0.065	0.070	2.61

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
6.97	2121.53	32.06	230.12	161.73	0.044	0.0269	15	1.7	2.72	0.79	16.68	3.0	0.064	0.069	2.57
7.00	1965.02	34.34	231.00	162.35	0.044	0.0270	14	2.0	2.79	0.78	15.42	2.5	0.063	0.068	2.52
7.02	1926.41	32.89	231.87	162.96	0.044	0.0271	13	1.9	2.79	0.78	15.09	2.5	0.063	0.068	2.50
7.05	1972.60	29.58	232.80	163.61	0.045	0.0272	14	1.7	2.75	0.78	15.42	2.5	0.063	0.068	2.50
7.08	1931.23	30.06	233.65	164.21	0.045	0.0273	13	1.8	2.77	0.78	15.07	2.5	0.063	0.068	2.48
7.09	1395.51	30.61	234.03	164.48	0.045	0.0273	9	2.6	3.00	0.78	10.88	2.0	0.059	0.064	2.33
7.10	1827.81	33.23	234.52	164.82	0.045	0.0274	12	2.1	2.83	0.78	14.24	2.5	0.062	0.067	2.44
7.12	1565.81	34.75	235.03	165.19	0.045	0.0274	10	2.6	2.95	0.78	12.18	2.0	0.060	0.065	2.37
7.14	1241.06	35.23	235.65	165.62	0.045	0.0275	8	3.5	3.12	0.78	9.64	1.5	0.058	0.063	2.28
7.16	924.59	30.75	236.27	166.05	0.045	0.0276	5	4.5	3.32	0.78	7.18	1.0	0.056	0.060	2.19
7.18	708.10	25.51	236.94	166.52	0.045	0.0277	4	5.4	3.50	0.77	5.49	1.0	0.055	0.059	2.13
7.20	677.07	20.89	237.66	167.03	0.046	0.0278	3	4.8	3.50	0.77	5.24	1.0	0.054	0.059	2.11
7.23	545.38	16.89	238.56	167.66	0.046	0.0279	2	5.5	3.66	0.77	4.21	0.5	0.054	0.058	2.07
7.25	473.67	15.79	239.28	168.17	0.046	0.0280	2	6.7	3.81	0.77	3.65	0.5	0.053	0.057	2.05
7.27	687.41	15.51	240.10	168.75	0.046	0.0281	3	3.5	3.42	0.77	5.29	1.0	0.054	0.059	2.09
7.30	2598.65	18.75	240.82	169.25	0.046	0.0282	18	0.8	2.48	0.77	19.97	3.5	0.067	0.072	2.56
7.32	2999.93	23.03	241.62	169.81	0.046	0.0283	21	0.8	2.43	0.77	23.02	4.0	0.069	0.075	2.64
7.34	2442.83	26.41	242.26	170.26	0.047	0.0283	17	1.2	2.59	0.77	18.72	3.0	0.066	0.071	2.50
7.36	2020.87	31.30	243.11	170.86	0.047	0.0285	14	1.8	2.76	0.77	15.46	2.5	0.063	0.068	2.39
7.39	1911.24	31.92	243.88	171.40	0.047	0.0286	13	1.9	2.80	0.76	14.60	2.5	0.062	0.067	2.35
7.41	1952.61	31.37	244.68	171.96	0.047	0.0287	13	1.8	2.78	0.76	14.89	2.5	0.062	0.067	2.35
7.43	1928.48	31.65	245.42	172.49	0.047	0.0287	13	1.9	2.80	0.76	14.68	2.5	0.062	0.067	2.34
7.46	2024.31	32.61	246.19	173.03	0.047	0.0288	14	1.8	2.77	0.76	15.39	2.5	0.063	0.068	2.35
7.48	2099.47	33.72	247.04	173.63	0.048	0.0290	14	1.8	2.75	0.76	15.93	2.5	0.063	0.068	2.36
7.51	2062.92	34.68	247.87	174.20	0.048	0.0291	14	1.9	2.77	0.76	15.63	2.5	0.063	0.068	2.34
7.53	2038.79	35.51	248.71	174.80	0.048	0.0292	14	2.0	2.79	0.76	15.42	2.5	0.063	0.068	2.33
7.56	1993.29	36.82	249.54	175.38	0.048	0.0293	13	2.1	2.81	0.76	15.05	2.5	0.063	0.068	2.31
7.58	1827.81	37.03	250.33	175.94	0.048	0.0294	12	2.3	2.87	0.75	13.78	2.5	0.061	0.066	2.26
7.61	1740.94	37.03	251.11	176.48	0.048	0.0295	11	2.5	2.91	0.75	13.10	2.0	0.061	0.066	2.23
7.63	1576.15	38.06	251.90	177.04	0.049	0.0296	10	2.9	2.99	0.75	11.85	2.0	0.060	0.065	2.19
7.65	1447.22	38.06	252.67	177.58	0.049	0.0297	9	3.2	3.05	0.75	10.86	2.0	0.059	0.064	2.15
7.68	1276.92	36.06	253.50	178.16	0.049	0.0298	8	3.5	3.13	0.75	9.57	1.5	0.058	0.063	2.10
7.70	1061.11	34.61	254.32	178.74	0.049	0.0299	6	4.3	3.27	0.75	7.94	1.5	0.057	0.061	2.04
7.73	945.28	32.89	255.12	179.30	0.049	0.0300	5	4.8	3.35	0.75	7.06	1.0	0.056	0.060	2.01
7.75	898.39	27.44	255.99	179.92	0.049	0.0301	5	4.3	3.35	0.75	6.70	1.0	0.056	0.060	1.99
7.78	890.81	22.20	256.79	180.48	0.050	0.0302	5	3.5	3.31	0.74	6.63	1.0	0.056	0.060	1.98
7.80	952.86	18.13	257.51	180.98	0.050	0.0303	5	2.6	3.21	0.74	7.08	1.0	0.056	0.060	1.99
7.82	754.29	14.27	258.23	181.49	0.050	0.0304	4	2.9	3.35	0.74	5.60	1.0	0.055	0.059	1.94

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo'} (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
7.85	519.87	14.69	259.08	182.08	0.050	0.0305	2	5.6	3.74	0.74	3.85	0.5	0.053	0.057	1.88
7.87	331.64	14.96	259.77	182.57	0.050	0.0306	1	20.8	4.52	0.74	2.45	0.5	0.052	0.056	1.83
7.94	1936.06	25.44	262.21	184.29	0.051	0.0310	12	1.5	2.76	0.74	14.26	2.5	0.062	0.067	2.16
7.97	2942.01	32.75	263.01	184.85	0.051	0.0311	20	1.2	2.54	0.74	21.64	3.5	0.068	0.073	2.36
7.99	3200.57	40.13	263.89	185.46	0.051	0.0312	22	1.4	2.53	0.73	23.50	4.0	0.070	0.075	2.41
8.02	3418.44	42.47	264.79	186.10	0.051	0.0313	23	1.3	2.50	0.73	25.06	4.0	0.071	0.077	2.44
8.05	3642.52	41.02	265.69	186.73	0.052	0.0315	25	1.2	2.45	0.73	26.66	4.5	0.072	0.078	2.48
8.08	3470.15	39.99	266.61	187.38	0.052	0.0316	23	1.2	2.48	0.73	25.35	4.0	0.071	0.077	2.43
8.09	3010.96	39.23	267.02	187.67	0.052	0.0316	20	1.4	2.57	0.73	21.98	3.5	0.068	0.074	2.33
8.10	3059.91	39.37	267.36	187.90	0.052	0.0317	20	1.4	2.56	0.73	22.32	3.5	0.069	0.074	2.34
8.11	2913.05	39.44	267.77	188.19	0.052	0.0318	19	1.5	2.59	0.73	21.23	3.5	0.068	0.073	2.30
8.13	2671.05	39.16	268.26	188.54	0.052	0.0318	17	1.6	2.65	0.73	19.45	3.0	0.066	0.072	2.25
8.14	2506.95	38.96	268.64	188.81	0.052	0.0319	16	1.7	2.69	0.73	18.24	3.0	0.065	0.070	2.21
8.16	2391.12	38.82	269.24	189.22	0.052	0.0320	15	1.8	2.72	0.73	17.38	3.0	0.064	0.070	2.18
8.18	2173.93	39.16	269.90	189.69	0.053	0.0321	14	2.1	2.79	0.73	15.78	2.5	0.063	0.068	2.13
8.20	2019.49	37.92	270.62	190.20	0.053	0.0322	13	2.2	2.83	0.73	14.64	2.5	0.062	0.067	2.09
8.22	1836.77	36.89	271.40	190.74	0.053	0.0323	11	2.4	2.89	0.72	13.30	2.0	0.061	0.066	2.04
8.24	1570.64	37.16	272.09	191.23	0.053	0.0324	9	2.9	3.01	0.72	11.36	2.0	0.059	0.064	1.98
8.26	1447.22	36.34	272.68	191.64	0.053	0.0325	8	3.1	3.06	0.72	10.45	1.5	0.059	0.063	1.95
8.28	1223.14	34.68	273.35	192.11	0.053	0.0325	7	3.7	3.18	0.72	8.82	1.5	0.057	0.062	1.90
8.31	957.69	34.06	274.25	192.75	0.054	0.0327	5	5.0	3.38	0.72	6.90	1.0	0.056	0.060	1.84
8.34	862.54	36.27	275.20	193.42	0.054	0.0328	4	6.2	3.48	0.72	6.20	1.0	0.055	0.060	1.82
8.36	726.02	33.72	276.02	193.99	0.054	0.0329	3	7.5	3.63	0.72	5.21	1.0	0.054	0.059	1.78
8.39	419.20	28.20	276.80	194.54	0.054	0.0331	1	19.8	4.28	0.72	3.01	0.5	0.053	0.057	1.72
8.43	344.74	22.34	278.34	195.62	0.055	0.0333	0	33.6	4.68	0.71	2.46	0.5	0.052	0.056	1.69
8.45	932.18	23.37	279.08	196.14	0.055	0.0334	5	3.6	3.32	0.71	6.66	1.0	0.056	0.060	1.80
8.48	1236.24	30.48	279.83	196.67	0.055	0.0335	7	3.2	3.15	0.71	8.82	1.5	0.057	0.062	1.85
8.50	1132.82	37.92	280.60	197.21	0.055	0.0336	6	4.4	3.27	0.71	8.07	1.5	0.057	0.061	1.82
8.53	813.59	42.13	281.50	197.84	0.055	0.0338	4	7.9	3.59	0.71	5.78	1.0	0.055	0.059	1.75
8.55	452.99	39.23	282.14	198.30	0.056	0.0338	1	23.0	4.26	0.71	3.22	0.5	0.053	0.057	1.68
8.57	375.77	31.58	282.97	198.87	0.056	0.0340	1	34.0	4.57	0.71	2.66	0.5	0.052	0.056	1.66
8.71	893.57	24.06	287.39	201.98	0.057	0.0346	4	4.0	3.37	0.70	6.29	1.0	0.055	0.060	1.72
8.73	1460.32	34.68	288.24	202.58	0.057	0.0348	8	3.0	3.06	0.70	10.26	1.5	0.059	0.063	1.82
8.76	1452.73	43.44	289.14	203.21	0.057	0.0349	8	3.7	3.12	0.70	10.19	1.5	0.058	0.063	1.81
8.79	1287.95	37.09	290.14	203.92	0.058	0.0351	7	3.7	3.18	0.70	9.02	1.5	0.058	0.062	1.77
8.82	1375.51	30.82	291.09	204.59	0.058	0.0352	8	2.8	3.08	0.70	9.62	1.5	0.058	0.063	1.78
8.85	1911.24	28.34	292.07	205.27	0.058	0.0354	11	1.8	2.83	0.70	13.34	2.0	0.061	0.066	1.87
8.88	1877.45	31.30	293.15	206.03	0.058	0.0355	11	2.0	2.86	0.70	13.08	2.0	0.061	0.066	1.85

Depth (m)	q_c (kPa)	f_s (kPa)	σ_{v0} (kPa)	σ_{v0}' (kPa)	r_d	CSR	Q	F	I_c	C_Q	q_{c1N}	$N_{1,60}$	$CRR_{7.5}$	CRR_{Mw}	F.S. (Mw)
8.92	1745.76	42.89	294.33	206.86	0.059	0.0357	10	3.0	2.99	0.70	12.14	2.0	0.060	0.065	1.82
8.95	1290.71	45.57	295.46	207.66	0.059	0.0359	7	4.6	3.23	0.69	8.96	1.5	0.057	0.062	1.73

Analyses of CPT Data
Impoundment at Dike 1 - Laronde Mine

CPT No.	S1
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Soil Data	
Dry unit weight, γ_d (kN/m ³):	23.2
Void ratio, e:	0.64
Depth to groundwater (m):	0.0
Soil type factor, n_s :	0.50

Earthquake Data	
Moment Magnitude, M_w :	7.5
PGA on rock:	1.432g
PGA on ground surface:	0.023g
Magnitude Scaling Factor, MSF:	1.00

CPT/SPT Conversion	
$q_{c1N}/(N_1)_{60}$:	6.0
where: q_{c1N} (unitless)	
$(N_1)_{60}$ in blows per 300 mm	
Average $(N_1)_{60}$:	2.12

Analysis

Depth (m)	q_c (kPa)	f_s (kPa)	σ_{vo} (kPa)	σ_{vo}' (kPa)	r_d	CSR	Q	F	I_c	C_Q	q_{c1N}	$N_{1,60}$	$CRR_{7.5}$	CRR_{Mw}	F.S. (M_w)
<i>DATA</i>	<i>DATA</i>	<i>DATA</i>	<i>CALC</i>	<i>CALC</i>	<i>CALC</i>	<i>(1)</i>	<i>(15)</i>	<i>(16)</i>	<i>(14)</i>	<i>(13)</i>	<i>(12)</i>	<i>Calc</i>	<i>(11)</i>	<i>CALC</i>	<i>(23)</i>
0.09	2455.24	24.55	3.06	2.15	0.016	0.0212	167	1.0	1.74	1.70	41.74	28.0	0.085	0.085	3.99
0.15	917.01	27.65	4.83	3.40	0.016	0.0214	49	3.0	2.46	1.70	15.59	8.5	0.063	0.063	2.94
0.18	433.68	18.34	6.09	4.28	0.016	0.0215	21	4.3	2.84	1.70	7.37	3.5	0.056	0.056	2.61
0.21	313.71	14.75	6.87	4.83	0.016	0.0216	14	4.8	3.00	1.70	5.33	2.5	0.054	0.054	2.52
0.23	336.47	11.86	7.64	5.37	0.016	0.0217	14	3.6	2.92	1.70	5.72	2.5	0.055	0.055	2.53
0.25	326.81	11.24	8.28	5.82	0.016	0.0217	13	3.5	2.94	1.70	5.56	2.5	0.055	0.055	2.51
0.27	273.03	11.31	8.97	6.31	0.016	0.0218	11	4.3	3.07	1.70	4.64	2.0	0.054	0.054	2.47
0.29	326.81	11.31	9.72	6.83	0.017	0.0219	12	3.6	2.97	1.70	5.56	2.0	0.055	0.055	2.50
0.32	471.60	9.86	10.54	7.41	0.017	0.0220	17	2.1	2.72	1.70	8.02	3.0	0.057	0.057	2.58
0.35	688.10	10.89	11.55	8.11	0.017	0.0221	24	1.6	2.53	1.70	11.70	4.0	0.060	0.060	2.71
0.37	754.29	10.96	12.27	8.62	0.017	0.0221	25	1.5	2.49	1.70	12.82	4.5	0.061	0.061	2.74
0.39	632.25	11.72	12.88	9.05	0.017	0.0222	21	1.9	2.63	1.70	10.75	3.5	0.059	0.059	2.66
0.41	484.01	10.89	13.58	9.54	0.017	0.0223	15	2.3	2.78	1.70	8.23	2.5	0.057	0.057	2.55
0.44	460.57	8.96	14.37	10.10	0.017	0.0223	14	2.0	2.78	1.70	7.83	2.5	0.057	0.057	2.53
0.46	361.98	7.79	15.17	10.66	0.017	0.0224	11	2.2	2.91	1.70	6.15	2.0	0.055	0.055	2.46
0.48	338.53	8.00	15.97	11.22	0.017	0.0225	10	2.5	2.96	1.70	5.76	1.5	0.055	0.055	2.43
0.51	262.69	8.89	16.77	11.78	0.017	0.0226	7	3.6	3.16	1.70	4.47	1.5	0.054	0.054	2.38
0.53	279.93	8.20	17.64	12.40	0.017	0.0227	7	3.1	3.11	1.70	4.76	1.5	0.054	0.054	2.38
0.56	475.74	8.62	18.44	12.96	0.017	0.0228	13	1.9	2.80	1.70	8.09	2.0	0.057	0.057	2.49
0.58	662.59	9.72	19.16	13.46	0.017	0.0228	18	1.5	2.63	1.70	11.26	3.0	0.059	0.059	2.60
0.61	863.23	9.72	20.01	14.06	0.017	0.0229	22	1.2	2.48	1.70	14.67	4.0	0.062	0.062	2.72
0.63	761.88	9.58	20.83	14.64	0.017	0.0230	19	1.3	2.56	1.70	12.95	3.5	0.061	0.061	2.64
0.66	848.06	8.89	21.68	15.24	0.017	0.0231	21	1.1	2.48	1.70	14.42	3.5	0.062	0.062	2.69
0.68	802.55	8.34	22.47	15.80	0.017	0.0232	20	1.1	2.51	1.70	13.64	3.5	0.061	0.061	2.65
0.70	794.97	8.41	23.27	16.36	0.018	0.0232	19	1.1	2.52	1.70	13.51	3.5	0.061	0.061	2.63
0.73	703.27	8.20	24.12	16.95	0.018	0.0233	16	1.2	2.60	1.70	11.96	3.0	0.060	0.060	2.57

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo'} (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
0.76	837.72	8.41	24.94	17.53	0.018	0.0234	19	1.0	2.51	1.70	14.24	3.5	0.062	0.062	2.64
0.78	855.64	8.76	25.66	18.04	0.018	0.0235	20	1.1	2.51	1.70	14.55	3.5	0.062	0.062	2.64
0.80	883.91	8.89	26.46	18.60	0.018	0.0236	20	1.0	2.50	1.70	15.03	3.5	0.063	0.063	2.65
0.83	1001.12	9.03	27.33	19.21	0.018	0.0237	22	0.9	2.43	1.70	17.02	4.0	0.064	0.064	2.71
0.85	906.67	9.86	28.18	19.81	0.018	0.0238	20	1.1	2.52	1.70	15.41	3.5	0.063	0.063	2.64
0.88	786.70	11.24	29.06	20.42	0.018	0.0239	17	1.5	2.64	1.70	13.37	3.0	0.061	0.061	2.56
0.91	636.39	11.24	29.88	21.00	0.018	0.0239	13	1.9	2.78	1.70	10.82	2.5	0.059	0.059	2.46
0.93	417.82	10.27	30.76	21.62	0.018	0.0240	8	2.7	3.03	1.70	7.10	1.5	0.056	0.056	2.33
0.96	381.28	4.83	31.58	22.19	0.018	0.0241	7	1.4	2.93	1.70	6.48	1.5	0.055	0.055	2.30
0.98	282.69	7.10	32.48	22.83	0.018	0.0242	5	2.8	3.22	1.70	4.81	1.0	0.054	0.054	2.23
1.01	254.42	9.51	33.38	23.46	0.018	0.0243	5	4.3	3.37	1.70	4.33	1.0	0.054	0.054	2.20
1.04	231.67	9.45	34.25	24.07	0.018	0.0244	4	4.8	3.44	1.70	3.94	1.0	0.053	0.053	2.18
1.07	152.38	7.10	35.44	24.90	0.019	0.0245	2	6.1	3.69	1.70	2.59	0.5	0.052	0.052	2.13
1.09	349.57	6.14	35.92	25.25	0.019	0.0246	6	2.0	3.07	1.70	5.94	1.0	0.055	0.055	2.23
1.10	485.39	8.96	36.44	25.61	0.019	0.0247	9	2.0	2.94	1.70	8.25	1.5	0.057	0.057	2.31
1.11	372.32	10.14	36.77	25.84	0.019	0.0247	7	3.0	3.15	1.70	6.33	1.0	0.055	0.055	2.24
1.13	580.54	10.62	37.26	26.19	0.019	0.0247	11	2.0	2.87	1.70	9.87	2.0	0.058	0.058	2.35
1.15	465.40	9.17	37.90	26.64	0.019	0.0248	8	2.1	2.99	1.70	7.91	1.5	0.057	0.057	2.28
1.16	250.28	10.48	38.42	27.00	0.019	0.0249	4	4.9	3.44	1.70	4.25	1.0	0.054	0.054	2.15
1.18	283.38	12.00	38.91	27.34	0.019	0.0249	5	4.9	3.39	1.70	4.82	1.0	0.054	0.054	2.17
1.20	450.23	7.65	39.50	27.76	0.019	0.0250	8	1.9	2.98	1.70	7.65	1.5	0.056	0.056	2.26
1.22	406.79	8.00	40.14	28.21	0.019	0.0251	7	2.2	3.06	1.70	6.92	1.5	0.056	0.056	2.23
1.24	486.77	8.62	40.99	28.81	0.019	0.0252	8	1.9	2.96	1.70	8.28	1.5	0.057	0.057	2.26
1.26	544.69	7.79	41.74	29.33	0.019	0.0252	9	1.5	2.87	1.70	9.26	1.5	0.058	0.058	2.29
1.29	263.38	8.96	42.51	29.87	0.019	0.0253	4	4.1	3.40	1.70	4.48	1.0	0.054	0.054	2.12
1.31	375.77	10.34	43.30	30.43	0.019	0.0254	6	3.1	3.19	1.70	6.39	1.0	0.055	0.055	2.18
1.34	368.87	11.58	44.10	30.99	0.019	0.0255	6	3.6	3.23	1.70	6.27	1.0	0.055	0.055	2.17
1.36	283.38	8.14	44.87	31.54	0.019	0.0256	4	3.4	3.34	1.70	4.82	1.0	0.054	0.054	2.11
1.38	295.79	10.20	45.62	32.06	0.019	0.0257	4	4.1	3.37	1.70	5.03	1.0	0.054	0.054	2.11
1.41	406.10	8.69	46.39	32.60	0.019	0.0258	6	2.4	3.11	1.70	6.90	1.0	0.056	0.056	2.16
1.43	464.71	11.93	47.06	33.07	0.020	0.0258	7	2.9	3.10	1.70	7.90	1.5	0.057	0.057	2.19
1.45	173.75	8.34	47.70	33.53	0.020	0.0259	2	6.6	3.74	1.70	2.95	0.5	0.052	0.052	2.02
1.47	415.76	7.10	48.42	34.03	0.020	0.0260	6	1.9	3.07	1.70	7.07	1.0	0.056	0.056	2.15
1.49	262.69	8.14	49.22	34.59	0.020	0.0261	4	3.8	3.42	1.70	4.47	0.5	0.054	0.054	2.06
1.51	539.17	9.93	49.99	35.13	0.020	0.0262	8	2.0	2.98	1.69	9.10	1.5	0.058	0.058	2.20
1.54	359.91	12.13	50.74	35.66	0.020	0.0263	5	3.9	3.30	1.67	6.03	1.0	0.055	0.055	2.09
1.56	341.98	12.55	51.53	36.22	0.020	0.0264	5	4.3	3.35	1.66	5.68	1.0	0.055	0.055	2.08
1.58	521.94	12.76	52.30	36.76	0.020	0.0265	8	2.7	3.07	1.65	8.61	1.5	0.057	0.057	2.16

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo'} (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
1.61	698.44	10.00	53.08	37.30	0.020	0.0265	11	1.5	2.82	1.64	11.44	2.0	0.060	0.060	2.24
1.63	737.05	17.58	53.82	37.83	0.020	0.0266	11	2.6	2.92	1.63	11.98	2.0	0.060	0.060	2.25
1.65	721.20	16.48	54.46	38.28	0.020	0.0267	11	2.5	2.92	1.62	11.66	2.0	0.060	0.060	2.24
1.67	608.81	12.34	55.29	38.86	0.020	0.0268	9	2.2	2.97	1.60	9.77	1.5	0.058	0.058	2.17
1.69	437.13	14.41	55.93	39.31	0.020	0.0269	6	3.8	3.23	1.59	6.97	1.0	0.056	0.056	2.08
1.72	1121.78	15.31	56.75	39.89	0.020	0.0270	17	1.4	2.63	1.58	17.76	3.0	0.065	0.065	2.40
1.74	1224.52	18.89	57.47	40.39	0.020	0.0271	18	1.6	2.63	1.57	19.27	3.0	0.066	0.066	2.44
1.76	1139.02	22.61	58.17	40.88	0.021	0.0272	17	2.1	2.72	1.56	17.81	3.0	0.065	0.065	2.39
1.78	1377.58	21.72	58.84	41.35	0.021	0.0272	21	1.6	2.59	1.56	21.42	3.5	0.068	0.068	2.49
1.81	1168.67	26.89	59.66	41.93	0.021	0.0273	17	2.4	2.75	1.54	18.05	3.0	0.065	0.065	2.38
1.83	1107.30	27.79	60.33	42.40	0.021	0.0274	16	2.7	2.80	1.54	17.01	3.0	0.064	0.064	2.34
1.85	1150.74	25.23	61.07	42.92	0.021	0.0275	17	2.3	2.75	1.53	17.56	3.0	0.065	0.065	2.35
1.87	814.97	22.68	61.77	43.41	0.021	0.0276	11	3.0	2.95	1.52	12.37	2.0	0.060	0.060	2.19
1.89	1003.88	22.41	62.49	43.92	0.021	0.0277	14	2.4	2.81	1.51	15.15	2.5	0.063	0.063	2.26
1.91	1117.65	22.34	63.16	44.39	0.021	0.0278	16	2.1	2.75	1.50	16.78	3.0	0.064	0.064	2.30
1.94	783.25	21.17	64.00	44.98	0.021	0.0279	11	2.9	2.97	1.49	11.68	2.0	0.060	0.060	2.14
1.97	607.43	19.79	64.90	45.62	0.021	0.0280	8	3.6	3.12	1.48	8.99	1.5	0.057	0.057	2.05
1.99	581.92	18.82	65.68	46.16	0.021	0.0281	8	3.6	3.14	1.47	8.57	1.5	0.057	0.057	2.04
2.02	581.92	16.48	66.60	46.81	0.021	0.0282	8	3.2	3.11	1.46	8.51	1.5	0.057	0.057	2.02
2.04	682.59	12.41	67.50	47.44	0.021	0.0283	9	2.0	2.94	1.45	9.91	1.5	0.058	0.058	2.06
2.07	737.05	15.03	68.30	48.00	0.021	0.0284	10	2.2	2.94	1.44	10.64	2.0	0.059	0.059	2.07
2.10	696.37	16.82	69.40	48.78	0.022	0.0285	9	2.7	3.01	1.43	9.97	1.5	0.058	0.058	2.04
2.13	503.32	16.13	70.28	49.39	0.022	0.0287	6	3.7	3.22	1.42	7.16	1.0	0.056	0.056	1.95
2.15	634.32	14.96	70.87	49.81	0.022	0.0287	8	2.7	3.05	1.42	8.99	1.5	0.057	0.057	2.00
2.16	606.05	14.34	71.36	50.15	0.022	0.0288	8	2.7	3.07	1.41	8.56	1.5	0.057	0.057	1.98
2.18	469.54	13.86	71.85	50.50	0.022	0.0289	6	3.5	3.24	1.41	6.61	1.0	0.056	0.056	1.92
2.19	522.63	12.41	72.41	50.89	0.022	0.0289	6	2.8	3.14	1.40	7.33	1.0	0.056	0.056	1.94
2.21	331.64	12.69	73.03	51.33	0.022	0.0290	4	4.9	3.48	1.40	4.63	1.0	0.054	0.054	1.86
2.23	359.22	9.31	73.62	51.74	0.022	0.0291	4	3.3	3.35	1.39	4.99	1.0	0.054	0.054	1.86
2.25	287.51	9.31	74.32	52.23	0.022	0.0292	3	4.4	3.53	1.38	3.98	0.5	0.053	0.053	1.83
2.27	275.10	7.65	74.93	52.66	0.022	0.0293	3	3.8	3.53	1.38	3.79	0.5	0.053	0.053	1.82
2.29	197.88	7.45	75.50	53.06	0.022	0.0293	2	6.1	3.81	1.37	2.72	0.5	0.052	0.052	1.78
2.30	341.29	7.65	76.06	53.46	0.022	0.0294	4	2.9	3.36	1.37	4.67	1.0	0.054	0.054	1.83
2.32	202.71	9.45	76.71	53.91	0.022	0.0295	2	7.5	3.85	1.36	2.76	0.5	0.052	0.052	1.77
2.34	359.22	11.24	77.40	54.40	0.022	0.0296	4	4.0	3.41	1.36	4.87	1.0	0.054	0.054	1.83
2.36	139.27	12.27	77.89	54.74	0.022	0.0296	1	20.0	4.35	1.35	1.88	0.5	0.052	0.052	1.74
2.38	167.54	12.89	78.43	55.12	0.022	0.0297	1	14.5	4.14	1.35	2.26	0.5	0.052	0.052	1.75
2.39	164.79	12.89	78.76	55.36	0.022	0.0298	1	15.0	4.16	1.34	2.21	0.5	0.052	0.052	1.74

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo'} (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
2.40	184.78	11.24	79.23	55.68	0.023	0.0298	1	10.6	4.01	1.34	2.48	0.5	0.052	0.052	1.75
2.42	233.04	9.10	79.82	56.10	0.023	0.0299	2	5.9	3.74	1.34	3.11	0.5	0.053	0.053	1.76
2.43	328.19	10.34	80.36	56.48	0.023	0.0300	3	4.2	3.48	1.33	4.37	0.5	0.054	0.054	1.79
2.46	292.34	10.00	81.10	57.00	0.023	0.0301	3	4.7	3.57	1.32	3.87	0.5	0.053	0.053	1.77
2.48	240.63	10.82	81.85	57.53	0.023	0.0302	2	6.8	3.76	1.32	3.17	0.5	0.053	0.053	1.74
2.52	149.62	9.10	83.29	58.54	0.023	0.0304	1	13.7	4.25	1.31	1.96	0.5	0.052	0.052	1.70
2.56	228.22	10.48	84.55	59.42	0.023	0.0305	2	7.3	3.82	1.30	2.96	0.5	0.052	0.052	1.72
2.60	105.49	8.83	85.86	60.35	0.023	0.0307	0	45.0	4.98	1.29	1.36	0.0	0.051	0.051	1.66
2.62	133.07	8.89	86.61	60.87	0.023	0.0308	1	19.1	4.46	1.28	1.71	0.5	0.051	0.051	1.67
2.65	295.10	9.31	87.35	61.39	0.023	0.0309	3	4.5	3.58	1.28	3.77	0.5	0.053	0.053	1.72
2.67	405.41	10.07	88.10	61.92	0.023	0.0310	4	3.2	3.34	1.27	5.15	1.0	0.054	0.054	1.75
2.69	315.78	11.45	88.69	62.33	0.023	0.0311	3	5.0	3.57	1.27	4.00	0.5	0.053	0.053	1.71
2.71	379.21	11.03	89.41	62.84	0.024	0.0312	4	3.8	3.42	1.26	4.78	1.0	0.054	0.054	1.73
2.73	491.60	11.72	90.08	63.31	0.024	0.0313	5	2.9	3.24	1.26	6.18	1.0	0.055	0.055	1.76
2.75	499.18	13.44	90.85	63.85	0.024	0.0314	5	3.3	3.26	1.25	6.25	1.0	0.055	0.055	1.76
2.77	619.15	13.72	91.47	64.29	0.024	0.0315	7	2.6	3.12	1.25	7.72	1.5	0.056	0.056	1.79
2.79	450.92	13.72	92.14	64.76	0.024	0.0316	4	3.8	3.35	1.24	5.60	1.0	0.055	0.055	1.73
2.81	476.43	13.79	92.83	65.24	0.024	0.0317	5	3.6	3.31	1.24	5.90	1.0	0.055	0.055	1.73
2.83	623.98	16.20	93.40	65.64	0.024	0.0318	7	3.1	3.15	1.23	7.70	1.5	0.056	0.056	1.78
2.85	570.20	16.48	94.09	66.13	0.024	0.0319	6	3.5	3.22	1.23	7.01	1.0	0.056	0.056	1.75
2.87	623.98	11.72	94.81	66.63	0.024	0.0320	6	2.2	3.08	1.23	7.64	1.5	0.056	0.056	1.76
2.89	540.55	10.89	95.50	67.12	0.024	0.0321	5	2.4	3.17	1.22	6.60	1.0	0.055	0.055	1.73
2.91	767.39	12.20	96.20	67.61	0.024	0.0322	8	1.8	2.96	1.22	9.33	1.5	0.058	0.058	1.80
2.94	723.95	13.79	96.95	68.13	0.024	0.0323	8	2.2	3.02	1.21	8.77	1.5	0.057	0.057	1.78
2.96	476.43	13.10	97.59	68.59	0.024	0.0324	5	3.5	3.31	1.21	5.75	1.0	0.055	0.055	1.69
2.98	460.57	12.34	98.21	69.02	0.025	0.0324	4	3.4	3.33	1.20	5.54	1.0	0.055	0.055	1.68
2.99	557.79	12.00	98.72	69.38	0.025	0.0325	6	2.6	3.18	1.20	6.70	1.0	0.056	0.056	1.71
3.01	540.55	13.44	99.39	69.85	0.025	0.0326	5	3.0	3.23	1.20	6.47	1.0	0.055	0.055	1.70
3.03	471.60	14.34	100.03	70.30	0.025	0.0327	4	3.9	3.35	1.19	5.62	1.0	0.055	0.055	1.67
3.05	394.38	14.89	100.70	70.77	0.025	0.0328	3	5.1	3.50	1.19	4.69	1.0	0.054	0.054	1.64
3.07	431.61	15.51	101.50	71.33	0.025	0.0329	4	4.7	3.44	1.18	5.11	1.0	0.054	0.054	1.65
3.10	601.23	16.00	102.47	72.02	0.025	0.0331	6	3.2	3.21	1.18	7.08	1.0	0.056	0.056	1.69
3.12	593.64	15.72	103.09	72.45	0.025	0.0332	6	3.2	3.21	1.17	6.97	1.0	0.056	0.056	1.68
3.14	621.91	14.48	103.55	72.78	0.025	0.0332	6	2.8	3.16	1.17	7.29	1.0	0.056	0.056	1.69
3.15	580.54	14.62	104.12	73.18	0.025	0.0333	6	3.1	3.21	1.17	6.79	1.0	0.056	0.056	1.67
3.17	616.40	16.00	104.69	73.57	0.025	0.0334	6	3.1	3.19	1.17	7.19	1.0	0.056	0.056	1.68
3.19	488.15	17.24	105.20	73.94	0.025	0.0335	4	4.5	3.39	1.16	5.68	1.0	0.055	0.055	1.63
3.20	475.05	18.06	105.77	74.33	0.025	0.0336	4	4.9	3.42	1.16	5.51	1.0	0.055	0.055	1.63

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
3.22	352.32	19.10	106.36	74.75	0.025	0.0336	3	7.8	3.68	1.16	4.08	0.5	0.053	0.053	1.59
3.24	375.08	19.17	106.92	75.15	0.025	0.0337	3	7.1	3.63	1.15	4.33	0.5	0.054	0.054	1.59
3.25	361.98	17.24	107.39	75.47	0.026	0.0338	3	6.8	3.64	1.15	4.17	0.5	0.053	0.053	1.58
3.27	346.12	13.72	108.05	75.94	0.026	0.0339	3	5.8	3.62	1.15	3.97	0.5	0.053	0.053	1.57
3.29	357.15	12.07	108.67	76.38	0.026	0.0340	3	4.9	3.57	1.14	4.09	0.5	0.053	0.053	1.57
3.31	359.22	12.55	109.31	76.83	0.026	0.0341	3	5.0	3.57	1.14	4.10	0.5	0.053	0.053	1.57
3.33	377.15	12.96	109.93	77.26	0.026	0.0342	3	4.9	3.54	1.14	4.29	0.5	0.054	0.054	1.57
3.35	318.54	13.10	110.52	77.68	0.026	0.0343	2	6.3	3.70	1.13	3.61	0.5	0.053	0.053	1.55
3.37	384.73	13.86	111.17	78.13	0.026	0.0344	3	5.1	3.55	1.13	4.35	0.5	0.054	0.054	1.56
3.39	415.76	12.55	111.83	78.60	0.026	0.0345	3	4.1	3.46	1.13	4.69	1.0	0.054	0.054	1.56
3.41	418.51	11.45	112.43	79.01	0.026	0.0346	3	3.7	3.44	1.12	4.71	1.0	0.054	0.054	1.56
3.43	408.17	12.48	113.09	79.48	0.026	0.0347	3	4.2	3.48	1.12	4.58	1.0	0.054	0.054	1.55
3.44	367.49	14.75	113.69	79.90	0.026	0.0348	3	5.8	3.61	1.12	4.11	0.5	0.053	0.053	1.54
3.46	379.90	15.93	114.28	80.32	0.026	0.0349	3	6.0	3.60	1.12	4.24	0.5	0.054	0.054	1.54
3.48	349.57	15.72	115.02	80.84	0.026	0.0350	3	6.7	3.68	1.11	3.89	0.5	0.053	0.053	1.52
3.51	395.76	13.51	115.74	81.35	0.026	0.0351	3	4.8	3.53	1.11	4.39	0.5	0.054	0.054	1.53
3.53	428.86	10.89	116.44	81.83	0.027	0.0352	3	3.5	3.42	1.11	4.74	1.0	0.054	0.054	1.53
3.55	428.86	11.58	117.05	82.27	0.027	0.0353	3	3.7	3.44	1.10	4.73	1.0	0.054	0.054	1.53
3.57	372.32	13.51	117.80	82.79	0.027	0.0354	3	5.3	3.59	1.10	4.09	0.5	0.053	0.053	1.51
3.59	366.80	13.44	118.47	83.26	0.027	0.0355	3	5.4	3.61	1.10	4.02	0.5	0.053	0.053	1.50
3.61	384.73	11.10	119.16	83.75	0.027	0.0356	3	4.2	3.53	1.09	4.20	0.5	0.054	0.054	1.50
3.63	384.73	11.38	119.78	84.18	0.027	0.0357	3	4.3	3.53	1.09	4.19	0.5	0.053	0.053	1.50
3.65	395.76	12.27	120.37	84.60	0.027	0.0358	3	4.5	3.53	1.09	4.30	0.5	0.054	0.054	1.50
3.66	354.39	12.89	120.94	85.00	0.027	0.0359	3	5.5	3.64	1.08	3.84	0.5	0.053	0.053	1.48
3.68	346.12	12.27	121.50	85.39	0.027	0.0360	2	5.5	3.65	1.08	3.75	0.5	0.053	0.053	1.48
3.70	390.25	11.31	122.09	85.81	0.027	0.0361	3	4.2	3.53	1.08	4.21	0.5	0.054	0.054	1.48
3.72	403.35	11.45	122.69	86.23	0.027	0.0362	3	4.1	3.51	1.08	4.34	0.5	0.054	0.054	1.48
3.74	344.05	11.58	123.38	86.71	0.027	0.0363	2	5.2	3.65	1.07	3.69	0.5	0.053	0.053	1.46
3.76	338.53	10.14	124.02	87.17	0.027	0.0364	2	4.7	3.64	1.07	3.63	0.5	0.053	0.053	1.46
3.78	333.71	9.79	124.61	87.58	0.028	0.0365	2	4.7	3.65	1.07	3.57	0.5	0.053	0.053	1.45
3.79	330.95	11.65	125.23	88.01	0.028	0.0366	2	5.7	3.70	1.07	3.53	0.5	0.053	0.053	1.45
3.82	353.70	13.03	125.95	88.52	0.028	0.0367	2	5.7	3.67	1.06	3.76	0.5	0.053	0.053	1.45
3.84	300.61	12.96	126.62	88.99	0.028	0.0368	2	7.4	3.83	1.06	3.19	0.5	0.053	0.053	1.43
3.86	277.17	14.00	127.26	89.44	0.028	0.0369	2	9.3	3.94	1.06	2.93	0.5	0.052	0.052	1.42
3.88	623.98	14.41	127.98	89.95	0.028	0.0370	5	2.9	3.23	1.05	6.58	1.0	0.055	0.055	1.50
3.90	1130.06	14.55	128.65	90.42	0.028	0.0372	11	1.5	2.81	1.05	11.88	2.0	0.060	0.060	1.61
3.92	1296.91	15.38	129.32	90.89	0.028	0.0373	12	1.3	2.73	1.05	13.60	2.5	0.061	0.061	1.65
3.94	1240.37	16.34	130.04	91.39	0.028	0.0374	12	1.5	2.78	1.05	12.97	2.0	0.061	0.061	1.63

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
3.96	1068.00	18.06	130.66	91.83	0.028	0.0375	10	1.9	2.90	1.04	11.15	2.0	0.059	0.059	1.58
3.98	908.73	20.20	131.35	92.32	0.028	0.0376	8	2.6	3.04	1.04	9.46	1.5	0.058	0.058	1.54
4.00	677.76	21.03	132.05	92.80	0.028	0.0377	6	3.9	3.26	1.04	7.04	1.0	0.056	0.056	1.48
4.02	597.78	22.41	132.74	93.29	0.029	0.0378	5	4.8	3.38	1.04	6.19	1.0	0.055	0.055	1.46
4.04	539.17	18.62	133.51	93.83	0.029	0.0380	4	4.6	3.41	1.03	5.57	1.0	0.055	0.055	1.44
4.06	572.27	15.31	134.08	94.23	0.029	0.0381	5	3.5	3.32	1.03	5.90	1.0	0.055	0.055	1.44
4.08	711.54	14.96	134.75	94.70	0.029	0.0382	6	2.6	3.15	1.03	7.31	1.0	0.056	0.056	1.47
4.12	872.88	21.86	135.90	95.52	0.029	0.0384	8	3.0	3.10	1.02	8.93	1.5	0.057	0.057	1.50
4.14	616.40	27.10	136.60	96.00	0.029	0.0385	5	5.6	3.41	1.02	6.29	1.0	0.055	0.055	1.44
4.16	508.15	28.96	137.29	96.49	0.029	0.0386	4	7.8	3.58	1.02	5.17	1.0	0.054	0.054	1.41
4.18	554.34	28.20	137.99	96.98	0.029	0.0387	4	6.8	3.51	1.02	5.63	1.0	0.055	0.055	1.41
4.20	502.63	24.48	138.73	97.50	0.029	0.0389	4	6.7	3.55	1.01	5.09	1.0	0.054	0.054	1.40
4.23	448.85	20.55	139.55	98.08	0.029	0.0390	3	6.6	3.61	1.01	4.53	1.0	0.054	0.054	1.38
4.25	341.29	18.34	140.35	98.64	0.030	0.0391	2	9.1	3.84	1.01	3.44	0.5	0.053	0.053	1.35
4.28	333.71	17.44	141.12	99.18	0.030	0.0393	2	9.1	3.86	1.00	3.35	0.5	0.053	0.053	1.34
4.30	359.22	13.17	142.05	99.83	0.030	0.0394	2	6.1	3.72	1.00	3.60	0.5	0.053	0.053	1.34
4.33	870.12	17.79	143.08	100.56	0.030	0.0396	7	2.4	3.07	1.00	8.68	1.5	0.057	0.057	1.44
4.37	790.83	25.10	144.21	101.35	0.030	0.0398	6	3.9	3.22	0.99	7.86	1.5	0.057	0.057	1.42
4.40	464.71	25.92	145.29	102.11	0.030	0.0400	3	8.1	3.65	0.99	4.60	1.0	0.054	0.054	1.35
4.43	420.58	26.06	146.29	102.82	0.030	0.0402	3	9.5	3.75	0.99	4.15	0.5	0.053	0.053	1.33
4.47	350.95	20.89	147.40	103.59	0.030	0.0404	2	10.3	3.88	0.98	3.45	0.5	0.053	0.053	1.31
4.50	302.68	18.13	148.45	104.33	0.031	0.0406	2	11.8	4.01	0.98	2.96	0.5	0.052	0.052	1.29
4.53	313.02	17.44	149.56	105.11	0.031	0.0408	2	10.7	3.97	0.98	3.05	0.5	0.053	0.053	1.29
4.56	320.61	18.00	150.53	105.80	0.031	0.0410	2	10.6	3.95	0.97	3.12	0.5	0.053	0.053	1.28
4.59	388.87	16.62	151.54	106.50	0.031	0.0411	2	7.0	3.73	0.97	3.77	0.5	0.053	0.053	1.29
4.62	381.28	17.17	152.54	107.21	0.031	0.0413	2	7.5	3.76	0.97	3.68	0.5	0.053	0.053	1.28
4.65	386.80	17.17	153.42	107.82	0.031	0.0415	2	7.4	3.75	0.96	3.73	0.5	0.053	0.053	1.28
4.68	374.39	17.37	154.39	108.51	0.031	0.0417	2	7.9	3.79	0.96	3.59	0.5	0.053	0.053	1.27
4.71	399.90	16.75	155.32	109.16	0.032	0.0418	2	6.9	3.72	0.96	3.83	0.5	0.053	0.053	1.27
4.73	397.83	18.06	156.30	109.85	0.032	0.0420	2	7.5	3.75	0.95	3.80	0.5	0.053	0.053	1.27
4.76	359.22	18.75	157.20	110.48	0.032	0.0422	2	9.3	3.86	0.95	3.42	0.5	0.053	0.053	1.25
4.79	338.53	19.31	158.07	111.09	0.032	0.0424	2	10.7	3.94	0.95	3.21	0.5	0.053	0.053	1.24
4.82	389.56	20.89	159.00	111.74	0.032	0.0425	2	9.1	3.81	0.95	3.69	0.5	0.053	0.053	1.25
4.85	466.78	18.00	160.00	112.45	0.032	0.0427	3	5.9	3.61	0.94	4.40	0.5	0.054	0.054	1.26
4.88	515.73	16.13	160.95	113.12	0.032	0.0429	3	4.5	3.49	0.94	4.85	1.0	0.054	0.054	1.26
4.90	574.34	18.20	161.85	113.75	0.033	0.0431	4	4.4	3.43	0.94	5.39	1.0	0.054	0.054	1.27
4.92	477.12	17.79	162.54	114.24	0.033	0.0432	3	5.7	3.59	0.94	4.46	0.5	0.054	0.054	1.24
4.94	410.24	18.41	162.98	114.55	0.033	0.0433	2	7.4	3.75	0.93	3.83	0.5	0.053	0.053	1.23

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo} ' (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
4.95	453.68	19.44	163.55	114.94	0.033	0.0434	3	6.7	3.66	0.93	4.23	0.5	0.054	0.054	1.23
4.97	418.51	19.99	163.91	115.20	0.033	0.0435	2	7.9	3.75	0.93	3.90	0.5	0.053	0.053	1.23
4.99	443.34	20.75	164.65	115.72	0.033	0.0436	3	7.4	3.70	0.93	4.12	0.5	0.053	0.053	1.23
5.01	335.78	20.96	165.53	116.34	0.033	0.0438	2	12.3	4.01	0.93	3.11	0.5	0.053	0.053	1.20
5.04	499.87	19.31	166.32	116.90	0.033	0.0439	3	5.8	3.58	0.92	4.62	1.0	0.054	0.054	1.23
5.06	1125.23	21.03	167.17	117.49	0.033	0.0441	9	2.2	2.97	0.92	10.38	1.5	0.059	0.059	1.33
5.09	2000.18	25.30	167.89	118.00	0.033	0.0442	17	1.4	2.62	0.92	18.41	3.0	0.065	0.065	1.48
5.10	2275.28	27.99	168.43	118.38	0.033	0.0443	19	1.3	2.56	0.92	20.91	3.5	0.067	0.067	1.52
5.12	2404.22	30.20	168.95	118.74	0.034	0.0445	21	1.4	2.55	0.92	22.06	3.5	0.068	0.068	1.54
5.13	2471.79	33.99	169.44	119.08	0.034	0.0445	21	1.5	2.56	0.92	22.65	4.0	0.069	0.069	1.55
5.15	2515.22	37.58	169.92	119.43	0.034	0.0446	21	1.6	2.57	0.92	23.02	4.0	0.069	0.069	1.55
5.16	2637.26	40.33	170.44	119.79	0.034	0.0447	23	1.6	2.56	0.91	24.10	4.0	0.070	0.070	1.57
5.18	2766.19	40.27	171.13	120.27	0.034	0.0449	24	1.6	2.53	0.91	25.22	4.0	0.071	0.071	1.58
5.21	2995.79	39.78	171.85	120.78	0.034	0.0450	26	1.4	2.47	0.91	27.26	4.5	0.073	0.073	1.61
5.23	3545.31	39.51	172.57	121.29	0.034	0.0452	31	1.2	2.37	0.91	32.19	5.5	0.077	0.077	1.70
5.25	3905.21	39.58	173.24	121.76	0.034	0.0453	34	1.1	2.31	0.91	35.39	6.0	0.079	0.079	1.75
5.27	4023.12	40.27	174.04	122.32	0.034	0.0455	35	1.0	2.29	0.90	36.38	6.0	0.080	0.080	1.77
5.29	4129.99	45.44	174.73	122.81	0.034	0.0456	36	1.1	2.31	0.90	37.27	6.0	0.081	0.081	1.78
5.32	4364.41	49.02	175.48	123.33	0.035	0.0458	38	1.2	2.29	0.90	39.30	6.5	0.083	0.083	1.81
5.36	4305.80	48.88	176.87	124.31	0.035	0.0460	37	1.2	2.30	0.90	38.62	6.5	0.082	0.082	1.78
5.39	4368.55	51.64	177.92	125.05	0.035	0.0463	37	1.2	2.31	0.89	39.07	6.5	0.083	0.083	1.78
5.41	4750.52	51.64	178.72	125.61	0.035	0.0464	41	1.1	2.25	0.89	42.39	7.0	0.085	0.085	1.84
5.44	4987.70	50.47	179.59	126.22	0.035	0.0466	43	1.0	2.22	0.89	44.40	7.5	0.087	0.087	1.87
5.46	5106.98	49.71	180.39	126.78	0.035	0.0468	44	1.0	2.20	0.89	45.36	7.5	0.088	0.088	1.88
5.49	5140.76	49.64	181.21	127.36	0.035	0.0469	44	1.0	2.20	0.89	45.55	7.5	0.088	0.088	1.87
5.51	5064.23	51.92	182.01	127.92	0.036	0.0471	43	1.1	2.22	0.88	44.78	7.5	0.087	0.087	1.85
5.53	5171.79	51.30	182.70	128.41	0.036	0.0473	44	1.0	2.20	0.88	45.64	7.5	0.088	0.088	1.86
5.56	5360.02	50.47	183.53	128.99	0.036	0.0474	46	1.0	2.18	0.88	47.19	8.0	0.089	0.089	1.88
5.58	5441.38	50.95	184.27	129.51	0.036	0.0476	46	1.0	2.17	0.88	47.81	8.0	0.090	0.090	1.89
5.61	5509.63	51.78	185.15	130.12	0.036	0.0478	47	1.0	2.17	0.88	48.30	8.0	0.090	0.090	1.89
5.63	5557.21	52.88	185.94	130.69	0.036	0.0479	47	1.0	2.17	0.87	48.61	8.0	0.090	0.090	1.89
5.66	5526.87	54.12	186.84	131.32	0.036	0.0481	47	1.0	2.18	0.87	48.23	8.0	0.090	0.090	1.87
5.69	5377.25	54.19	187.69	131.91	0.036	0.0483	45	1.0	2.20	0.87	46.82	8.0	0.089	0.089	1.84
5.71	5059.40	53.02	188.57	132.53	0.037	0.0485	42	1.1	2.23	0.87	43.95	7.5	0.087	0.087	1.79
5.74	4647.78	52.40	189.36	133.09	0.037	0.0487	39	1.2	2.28	0.87	40.29	6.5	0.084	0.084	1.72
5.76	4231.34	54.12	190.19	133.67	0.037	0.0489	35	1.3	2.35	0.86	36.60	6.0	0.080	0.080	1.65
5.79	3588.05	55.37	191.06	134.28	0.037	0.0490	29	1.6	2.46	0.86	30.96	5.0	0.076	0.076	1.55
5.82	2611.75	51.57	191.99	134.93	0.037	0.0492	21	2.1	2.65	0.86	22.48	3.5	0.069	0.069	1.40

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo'} (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
5.84	1894.69	42.06	192.84	135.53	0.037	0.0494	15	2.5	2.81	0.86	16.28	2.5	0.064	0.064	1.29
5.87	1687.85	34.96	193.79	136.20	0.037	0.0496	13	2.3	2.85	0.86	14.46	2.5	0.062	0.062	1.25
5.90	1869.87	26.68	194.74	136.87	0.038	0.0499	14	1.6	2.72	0.85	15.98	2.5	0.063	0.063	1.27
5.93	2784.12	25.37	195.74	137.57	0.038	0.0501	22	1.0	2.45	0.85	23.74	4.0	0.070	0.070	1.39
5.96	2867.55	28.41	196.80	138.31	0.038	0.0503	23	1.1	2.45	0.85	24.38	4.0	0.070	0.070	1.40
6.00	2709.66	30.41	197.90	139.09	0.038	0.0506	21	1.2	2.51	0.85	22.98	4.0	0.069	0.069	1.37
6.03	2528.32	31.44	198.96	139.83	0.038	0.0508	20	1.3	2.56	0.85	21.38	3.5	0.068	0.068	1.33
6.06	2455.93	32.54	200.06	140.61	0.039	0.0511	19	1.4	2.59	0.84	20.71	3.5	0.067	0.067	1.32
6.15	2061.55	27.23	203.17	142.79	0.039	0.0518	16	1.5	2.67	0.84	17.25	3.0	0.064	0.064	1.24
6.20	1745.07	26.20	204.56	143.77	0.039	0.0521	13	1.7	2.77	0.83	14.55	2.5	0.062	0.062	1.19
6.23	1547.88	23.58	205.77	144.62	0.040	0.0524	11	1.8	2.83	0.83	12.87	2.0	0.061	0.061	1.16
6.27	1465.15	22.68	206.85	145.38	0.040	0.0526	10	1.8	2.86	0.83	12.15	2.0	0.060	0.060	1.14
6.30	1469.97	23.65	208.01	146.19	0.040	0.0529	10	1.9	2.87	0.83	12.16	2.0	0.060	0.060	1.14
6.34	1367.24	21.72	209.19	147.02	0.040	0.0532	10	1.9	2.90	0.82	11.28	2.0	0.059	0.059	1.12
6.37	2093.26	20.82	210.27	147.78	0.040	0.0534	15	1.1	2.61	0.82	17.22	3.0	0.064	0.064	1.20
6.40	2324.24	26.20	211.35	148.54	0.041	0.0537	17	1.2	2.59	0.82	19.07	3.0	0.066	0.066	1.23
6.43	2273.91	31.16	212.41	149.28	0.041	0.0539	17	1.5	2.64	0.82	18.61	3.0	0.066	0.066	1.21
6.46	2069.82	36.68	213.41	149.99	0.041	0.0542	15	2.0	2.75	0.82	16.90	3.0	0.064	0.064	1.18
6.49	1992.60	36.75	214.39	150.67	0.041	0.0544	14	2.1	2.77	0.81	16.23	2.5	0.064	0.064	1.17
6.52	2199.44	33.16	215.21	151.25	0.041	0.0546	16	1.7	2.68	0.81	17.88	3.0	0.065	0.065	1.19
6.54	2373.88	29.51	216.01	151.81	0.041	0.0548	18	1.4	2.61	0.81	19.27	3.0	0.066	0.066	1.21
6.57	2690.35	28.27	216.73	152.32	0.042	0.0550	20	1.1	2.52	0.81	21.80	3.5	0.068	0.068	1.24
6.59	2953.04	29.10	217.63	152.95	0.042	0.0552	22	1.1	2.46	0.81	23.88	4.0	0.070	0.070	1.27
6.62	2962.70	31.58	218.53	153.58	0.042	0.0554	22	1.2	2.48	0.81	23.91	4.0	0.070	0.070	1.26
6.64	2978.55	35.92	219.32	154.14	0.042	0.0556	22	1.3	2.51	0.81	23.99	4.0	0.070	0.070	1.26
6.67	3064.05	39.44	220.02	154.63	0.042	0.0558	23	1.4	2.51	0.80	24.64	4.0	0.071	0.071	1.26
6.69	3086.11	43.09	220.76	155.16	0.042	0.0560	23	1.5	2.53	0.80	24.78	4.0	0.071	0.071	1.26
6.71	2978.55	43.64	221.56	155.72	0.042	0.0562	22	1.6	2.56	0.80	23.87	4.0	0.070	0.070	1.24
6.74	2961.32	46.33	222.36	156.28	0.043	0.0564	22	1.7	2.58	0.80	23.69	4.0	0.070	0.070	1.24
6.76	2742.06	49.99	223.13	156.82	0.043	0.0566	20	2.0	2.65	0.80	21.90	3.5	0.068	0.068	1.21
6.78	2335.27	53.30	223.77	157.27	0.043	0.0567	17	2.5	2.77	0.80	18.62	3.0	0.066	0.066	1.15
6.80	1843.67	53.02	224.59	157.85	0.043	0.0569	13	3.3	2.93	0.80	14.67	2.5	0.062	0.062	1.09
6.83	1393.44	50.26	225.37	158.39	0.043	0.0571	9	4.3	3.11	0.79	11.07	2.0	0.059	0.059	1.04
6.85	1114.89	44.20	226.11	158.91	0.043	0.0573	7	5.0	3.25	0.79	8.84	1.5	0.057	0.057	1.00
6.88	901.15	33.30	226.96	159.51	0.043	0.0575	5	4.9	3.34	0.79	7.14	1.0	0.056	0.056	0.97
6.90	978.37	27.44	227.76	160.07	0.044	0.0577	6	3.7	3.23	0.79	7.73	1.5	0.056	0.056	0.98
6.92	1851.25	27.65	228.53	160.61	0.044	0.0579	13	1.7	2.77	0.79	14.61	2.5	0.062	0.062	1.07
6.95	2220.82	30.20	229.33	161.17	0.044	0.0581	16	1.5	2.67	0.79	17.49	3.0	0.065	0.065	1.11

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo'} (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
6.97	2121.53	32.06	230.12	161.73	0.044	0.0584	15	1.7	2.72	0.79	16.68	3.0	0.064	0.064	1.09
7.00	1965.02	34.34	231.00	162.35	0.044	0.0586	14	2.0	2.79	0.78	15.42	2.5	0.063	0.063	1.07
7.02	1926.41	32.89	231.87	162.96	0.044	0.0588	13	1.9	2.79	0.78	15.09	2.5	0.063	0.063	1.06
7.05	1972.60	29.58	232.80	163.61	0.045	0.0591	14	1.7	2.75	0.78	15.42	2.5	0.063	0.063	1.06
7.08	1931.23	30.06	233.65	164.21	0.045	0.0593	13	1.8	2.77	0.78	15.07	2.5	0.063	0.063	1.06
7.09	1395.51	30.61	234.03	164.48	0.045	0.0594	9	2.6	3.00	0.78	10.88	2.0	0.059	0.059	0.99
7.10	1827.81	33.23	234.52	164.82	0.045	0.0595	12	2.1	2.83	0.78	14.24	2.5	0.062	0.062	1.04
7.12	1565.81	34.75	235.03	165.19	0.045	0.0596	10	2.6	2.95	0.78	12.18	2.0	0.060	0.060	1.01
7.14	1241.06	35.23	235.65	165.62	0.045	0.0598	8	3.5	3.12	0.78	9.64	1.5	0.058	0.058	0.97
7.16	924.59	30.75	236.27	166.05	0.045	0.0600	5	4.5	3.32	0.78	7.18	1.0	0.056	0.056	0.93
7.18	708.10	25.51	236.94	166.52	0.045	0.0602	4	5.4	3.50	0.77	5.49	1.0	0.055	0.055	0.91
7.20	677.07	20.89	237.66	167.03	0.046	0.0603	3	4.8	3.50	0.77	5.24	1.0	0.054	0.054	0.90
7.23	545.38	16.89	238.56	167.66	0.046	0.0606	2	5.5	3.66	0.77	4.21	0.5	0.054	0.054	0.88
7.25	473.67	15.79	239.28	168.17	0.046	0.0608	2	6.7	3.81	0.77	3.65	0.5	0.053	0.053	0.87
7.27	687.41	15.51	240.10	168.75	0.046	0.0610	3	3.5	3.42	0.77	5.29	1.0	0.054	0.054	0.89
7.30	2598.65	18.75	240.82	169.25	0.046	0.0612	18	0.8	2.48	0.77	19.97	3.5	0.067	0.067	1.09
7.32	2999.93	23.03	241.62	169.81	0.046	0.0614	21	0.8	2.43	0.77	23.02	4.0	0.069	0.069	1.13
7.34	2442.83	26.41	242.26	170.26	0.047	0.0616	17	1.2	2.59	0.77	18.72	3.0	0.066	0.066	1.06
7.36	2020.87	31.30	243.11	170.86	0.047	0.0618	14	1.8	2.76	0.77	15.46	2.5	0.063	0.063	1.02
7.39	1911.24	31.92	243.88	171.40	0.047	0.0620	13	1.9	2.80	0.76	14.60	2.5	0.062	0.062	1.00
7.41	1952.61	31.37	244.68	171.96	0.047	0.0623	13	1.8	2.78	0.76	14.89	2.5	0.062	0.062	1.00
7.43	1928.48	31.65	245.42	172.49	0.047	0.0625	13	1.9	2.80	0.76	14.68	2.5	0.062	0.062	1.00
7.46	2024.31	32.61	246.19	173.03	0.047	0.0627	14	1.8	2.77	0.76	15.39	2.5	0.063	0.063	1.00
7.48	2099.47	33.72	247.04	173.63	0.048	0.0629	14	1.8	2.75	0.76	15.93	2.5	0.063	0.063	1.01
7.51	2062.92	34.68	247.87	174.20	0.048	0.0631	14	1.9	2.77	0.76	15.63	2.5	0.063	0.063	1.00
7.53	2038.79	35.51	248.71	174.80	0.048	0.0634	14	2.0	2.79	0.76	15.42	2.5	0.063	0.063	0.99
7.56	1993.29	36.82	249.54	175.38	0.048	0.0636	13	2.1	2.81	0.76	15.05	2.5	0.063	0.063	0.98
7.58	1827.81	37.03	250.33	175.94	0.048	0.0638	12	2.3	2.87	0.75	13.78	2.5	0.061	0.061	0.96
7.61	1740.94	37.03	251.11	176.48	0.048	0.0641	11	2.5	2.91	0.75	13.10	2.0	0.061	0.061	0.95
7.63	1576.15	38.06	251.90	177.04	0.049	0.0643	10	2.9	2.99	0.75	11.85	2.0	0.060	0.060	0.93
7.65	1447.22	38.06	252.67	177.58	0.049	0.0645	9	3.2	3.05	0.75	10.86	2.0	0.059	0.059	0.92
7.68	1276.92	36.06	253.50	178.16	0.049	0.0648	8	3.5	3.13	0.75	9.57	1.5	0.058	0.058	0.90
7.70	1061.11	34.61	254.32	178.74	0.049	0.0650	6	4.3	3.27	0.75	7.94	1.5	0.057	0.057	0.87
7.73	945.28	32.89	255.12	179.30	0.049	0.0652	5	4.8	3.35	0.75	7.06	1.0	0.056	0.056	0.86
7.75	898.39	27.44	255.99	179.92	0.049	0.0655	5	4.3	3.35	0.75	6.70	1.0	0.056	0.056	0.85
7.78	890.81	22.20	256.79	180.48	0.050	0.0657	5	3.5	3.31	0.74	6.63	1.0	0.056	0.056	0.85
7.80	952.86	18.13	257.51	180.98	0.050	0.0659	5	2.6	3.21	0.74	7.08	1.0	0.056	0.056	0.85
7.82	754.29	14.27	258.23	181.49	0.050	0.0661	4	2.9	3.35	0.74	5.60	1.0	0.055	0.055	0.83

Depth (m)	q _c (kPa)	f _s (kPa)	σ _{vo} (kPa)	σ _{vo'} (kPa)	r _d	CSR	Q	F	I _c	C _Q	q _{c1N}	N _{1,60}	CRR _{7.5}	CRR _{Mw}	F.S. (Mw)
7.85	519.87	14.69	259.08	182.08	0.050	0.0664	2	5.6	3.74	0.74	3.85	0.5	0.053	0.053	0.80
7.87	331.64	14.96	259.77	182.57	0.050	0.0666	1	20.8	4.52	0.74	2.45	0.5	0.052	0.052	0.78
7.94	1936.06	25.44	262.21	184.29	0.051	0.0673	12	1.5	2.76	0.74	14.26	2.5	0.062	0.062	0.92
7.97	2942.01	32.75	263.01	184.85	0.051	0.0676	20	1.2	2.54	0.74	21.64	3.5	0.068	0.068	1.01
7.99	3200.57	40.13	263.89	185.46	0.051	0.0678	22	1.4	2.53	0.73	23.50	4.0	0.070	0.070	1.03
8.02	3418.44	42.47	264.79	186.10	0.051	0.0681	23	1.3	2.50	0.73	25.06	4.0	0.071	0.071	1.04
8.05	3642.52	41.02	265.69	186.73	0.052	0.0684	25	1.2	2.45	0.73	26.66	4.5	0.072	0.072	1.06
8.08	3470.15	39.99	266.61	187.38	0.052	0.0686	23	1.2	2.48	0.73	25.35	4.0	0.071	0.071	1.04
8.09	3010.96	39.23	267.02	187.67	0.052	0.0688	20	1.4	2.57	0.73	21.98	3.5	0.068	0.068	0.99
8.10	3059.91	39.37	267.36	187.90	0.052	0.0689	20	1.4	2.56	0.73	22.32	3.5	0.069	0.069	1.00
8.11	2913.05	39.44	267.77	188.19	0.052	0.0690	19	1.5	2.59	0.73	21.23	3.5	0.068	0.068	0.98
8.13	2671.05	39.16	268.26	188.54	0.052	0.0691	17	1.6	2.65	0.73	19.45	3.0	0.066	0.066	0.96
8.14	2506.95	38.96	268.64	188.81	0.052	0.0693	16	1.7	2.69	0.73	18.24	3.0	0.065	0.065	0.94
8.16	2391.12	38.82	269.24	189.22	0.052	0.0694	15	1.8	2.72	0.73	17.38	3.0	0.064	0.064	0.93
8.18	2173.93	39.16	269.90	189.69	0.053	0.0697	14	2.1	2.79	0.73	15.78	2.5	0.063	0.063	0.91
8.20	2019.49	37.92	270.62	190.20	0.053	0.0699	13	2.2	2.83	0.73	14.64	2.5	0.062	0.062	0.89
8.22	1836.77	36.89	271.40	190.74	0.053	0.0701	11	2.4	2.89	0.72	13.30	2.0	0.061	0.061	0.87
8.24	1570.64	37.16	272.09	191.23	0.053	0.0703	9	2.9	3.01	0.72	11.36	2.0	0.059	0.059	0.85
8.26	1447.22	36.34	272.68	191.64	0.053	0.0705	8	3.1	3.06	0.72	10.45	1.5	0.059	0.059	0.83
8.28	1223.14	34.68	273.35	192.11	0.053	0.0707	7	3.7	3.18	0.72	8.82	1.5	0.057	0.057	0.81
8.31	957.69	34.06	274.25	192.75	0.054	0.0710	5	5.0	3.38	0.72	6.90	1.0	0.056	0.056	0.78
8.34	862.54	36.27	275.20	193.42	0.054	0.0713	4	6.2	3.48	0.72	6.20	1.0	0.055	0.055	0.77
8.36	726.02	33.72	276.02	193.99	0.054	0.0716	3	7.5	3.63	0.72	5.21	1.0	0.054	0.054	0.76
8.39	419.20	28.20	276.80	194.54	0.054	0.0718	1	19.8	4.28	0.72	3.01	0.5	0.053	0.053	0.73
8.43	344.74	22.34	278.34	195.62	0.055	0.0723	0	33.6	4.68	0.71	2.46	0.5	0.052	0.052	0.72
8.45	932.18	23.37	279.08	196.14	0.055	0.0726	5	3.6	3.32	0.71	6.66	1.0	0.056	0.056	0.77
8.48	1236.24	30.48	279.83	196.67	0.055	0.0728	7	3.2	3.15	0.71	8.82	1.5	0.057	0.057	0.79
8.50	1132.82	37.92	280.60	197.21	0.055	0.0730	6	4.4	3.27	0.71	8.07	1.5	0.057	0.057	0.78
8.53	813.59	42.13	281.50	197.84	0.055	0.0733	4	7.9	3.59	0.71	5.78	1.0	0.055	0.055	0.75
8.55	452.99	39.23	282.14	198.30	0.056	0.0736	1	23.0	4.26	0.71	3.22	0.5	0.053	0.053	0.72
8.57	375.77	31.58	282.97	198.87	0.056	0.0738	1	34.0	4.57	0.71	2.66	0.5	0.052	0.052	0.71
8.71	893.57	24.06	287.39	201.98	0.057	0.0753	4	4.0	3.37	0.70	6.29	1.0	0.055	0.055	0.73
8.73	1460.32	34.68	288.24	202.58	0.057	0.0756	8	3.0	3.06	0.70	10.26	1.5	0.059	0.059	0.77
8.76	1452.73	43.44	289.14	203.21	0.057	0.0759	8	3.7	3.12	0.70	10.19	1.5	0.058	0.058	0.77
8.79	1287.95	37.09	290.14	203.92	0.058	0.0762	7	3.7	3.18	0.70	9.02	1.5	0.058	0.058	0.75
8.82	1375.51	30.82	291.09	204.59	0.058	0.0765	8	2.8	3.08	0.70	9.62	1.5	0.058	0.058	0.76
8.85	1911.24	28.34	292.07	205.27	0.058	0.0769	11	1.8	2.83	0.70	13.34	2.0	0.061	0.061	0.79
8.88	1877.45	31.30	293.15	206.03	0.058	0.0772	11	2.0	2.86	0.70	13.08	2.0	0.061	0.061	0.79

Depth (m)	q_c (kPa)	f_s (kPa)	σ_{vo} (kPa)	σ_{vo}' (kPa)	r_d	CSR	Q	F	I_c	C_Q	q_{c1N}	$N_{1,60}$	$CRR_{7.5}$	CRR_{Mw}	F.S. (Mw)
8.92	1745.76	42.89	294.33	206.86	0.059	0.0777	10	3.0	2.99	0.70	12.14	2.0	0.060	0.060	0.77
8.95	1290.71	45.57	295.46	207.66	0.059	0.0780	7	4.6	3.23	0.69	8.96	1.5	0.057	0.057	0.74