

## LIQUEFACTION SPT ANALYSIS

Input Parameters for Job # **ENG TIPS**      Date **7/26/2011**  
 Peak Ground Acceleration (g) = **0.38** g  
 Earthquake Magnitude, (M) = **8** MW  
 Design GWT Depth (GWT) = **10** ft      Site GWT= **20** ft  
 Average Soil Unit Weight above GWT = **120** pcf  
 Average Soil Unit Weight below GWT = **125** pcf  
 Bore Hole Diameter = **6** inches  
 Correction for Sample Liners = **No**  
 Rod Length Height Stick up = **3.5** ft

### Soil Samples

Sample #	Depth(ft)	SPT N Field	Soil-USCS	Flags	F.C. (%)	Energy Ratio (%)
1	2	10	GP	Unsaturated	15	60
2	5	12	GP	Unsaturated	15	60
3	10	14	GW		15	60
4	15	16	GM		15	60
5	20	20	GC		20	60
6	25	20	SM		30	60
7	30	20	SM		30	60
8	35	20	SM		30	60
9	40	20	SM		30	60
10	50	20	SM		30	60

### Result Set 1

Sample #	Depth(ft)	C <sub>E</sub>	C <sub>B</sub>	C <sub>R</sub>	C <sub>s</sub>	N <sub>60</sub>
1	2	1.00	1.15	.75	1.00	8.63
2	5	1.00	1.15	.80	1.00	11.04
3	10	1.00	1.15	.85	1.00	13.69
4	15	1.00	1.15	.95	1.00	17.48
5	20	1.00	1.15	.95	1.00	21.85
6	25	1.00	1.15	.95	1.00	21.85
7	30	1.00	1.15	1.00	1.00	23.00
8	35	1.00	1.15	1.00	1.00	23.00
9	40	1.00	1.15	1.00	1.00	23.00
10	50	1.00	1.15	1.00	1.00	23.00

### Result Set 3

Sample #	Depth(ft)	$\Delta N$ -Fines	(N <sub>1</sub> ) <sub>60-CS</sub>	Stress Reduc., $r_d$	CSR
1	2	3.26	17.92	1.003	0.248
2	5	3.26	22.03	0.998	0.247
3	10	3.26	20.74	0.989	0.244
4	15	3.26	23.31	0.979	0.292
5	20	4.48	27.56	0.967	0.320
6	25	5.36	27.09	0.954	0.339
7	30	5.36	27.07	0.939	0.350
8	35	5.36	26.05	0.924	0.357
9	40	5.36	25.14	0.908	0.361
10	50	5.36	23.61	0.874	0.361

### Result Set 4

Sample #	Depth(ft)	MSF-Sand	$K\sigma$ -Sand	CRR -M=7.5 & $\sigma_{vc}=1$ atm	CRR	Liq. F.S.
1	2	0.876	1.100	0.18	n.a	n.a
2	5	0.876	1.100	0.23	n.a	n.a
3	10	0.876	1.077	0.22	0.203	0.83
4	15	0.876	1.050	0.25	0.235	0.80
5	20	0.876	1.026	0.37	0.329	1.03
6	25	0.876	0.997	0.35	0.306	0.90
7	30	0.876	0.973	0.35	0.297	0.85
8	35	0.876	0.954	0.32	0.265	0.74
9	40	0.876	0.938	0.29	0.241	0.67
10	50	0.876	0.913	0.26	0.208	0.58

## DYNAMIC SETTLEMENT CALCULATIONS

### Result Set 2

Sample #	Depth(ft)	$\Delta H$ I, ft	Vert. Consol. Strain, $\epsilon_v$	Dyn. Settlem. per layer,in	Accum.Dyn. Settlem.in
1	2	2.00	0.000	0.000	0.000
2	5	3.00	0.000	0.000	0.000
3	10	5.00	0.017	1.013	1.013
4	15	5.00	0.015	0.897	1.910
5	20	5.00	0.007	0.429	2.339
6	25	5.00	0.009	0.568	2.907
7	30	5.00	0.011	0.639	3.546
8	35	5.00	0.015	0.873	4.420
9	40	5.00	0.019	1.132	5.551
10	50	10.00	0.020	2.397	7.948