

Table 3.1 - Index Properties of Light Castle and Monterey 0/30 Sand

Index Property	Light Castle Sand	Monterey 0/30 Sand *	ASTM Procedure
$d_{10}$ (mm)	0.25	0.29	ASTM D2487
$d_{30}$ (mm)	0.33	0.37	
$d_{50}$ (mm)	0.41	0.45	
$d_{60}$ (mm)	0.45	0.48	
$C_u$	1.8	1.64	
$C_c$	0.97	1.01	
$\gamma_{d(max)}$ (kN/m <sup>3</sup> )	16.65	16.87	ASTM D4253
$\gamma_{d(min)}$ (kN/m <sup>3</sup> )	13.95	14.29	ASTM D4254
$e_{max}$	0.868	0.817	
$e_{min}$	0.560	0.540	
$G_s$	2.65	2.65	ASTM D854

\* From Porter (1998)

Table 3.2 - Cyclic Triaxial Test Results and Energy Computations

Dr (%)	CSR	cycles (liq)	$\sigma_3'$ (fail) (kPa)	NDE <sub>(fail)</sub>	$\sigma_3'$ (fail) / $\sigma_3'$ (initial) (%)
25	0.12	29.67	19.63	0.00328	17.84
25	0.15	8.53	31.65	0.00245	28.78
25	0.18	3.07	37.51	0.00188	34.10
55	0.16	46.7	12.08	0.00542	10.98
55	0.18	8.63	13.26	0.00299	12.05
55	0.2	3.6	25.44	0.00235	23.12
55	0.22	0.7	99.70	0.00049	90.63

Table 3.3 - Calibration Factors for Instruments Used In Testing

Cone	Calibration Factors					
	Tip (mv/kN)	Sleeve (mv/kN)	U <sub>1</sub> (mv/kPa)	U <sub>2</sub> (mv/kPa)	U <sub>3</sub> (mv/kPa)	a
15-cm <sup>2</sup>	10.3	9.98	0.9492	0.2137	0.1842	0.78
10-cm <sup>2</sup>	0.573	17.04	NA	0.741	NA	0.71

NA = Not Available on Device

Device	Calibration Factor
Kistler Load Cells	2.149 V/kN
Kistler Accelerometer	9.94 mV/g
Celesco Displacement Transducer	0.052 V/cm
LVDT	3.131V/cm

Table 3.4 - Vibration Properties from Tests Using Rotary Turbine Vibrator

Test #	Dr (%)	$\sigma_v'$ (kPa)	$\sigma_h'$ (kPa)	$U_o$ (kPa)	Frequency (Hz)	Force at Load Cell (kN)	Force at Tip (kN)
12/24/99A	53.9	55	32	6.8	125	1.5	1.2
12/24/99B	53.9	55	32	6.8	120	1.4	1.6
12/16/99A	21.9	55	27	6.8	135	1.7	1.3
12/16/99B	21.9	55	27	6.8	135	1.5	1.3
11/18/99A	29.1	35	17.5	6.8	125	1.3	1.2
11/18/99B	29.1	35	17.5	6.8	125	1.6	1.2
11/03/99A	56.3	110	55	6.8	120	1.4	1.6
11/03/99B	56.3	110	55	6.8	120	1.3	1.4
10/04/99A	26.4	51	28	6.8	130	1.1	1.3
10/04/99B	26.4	51	28	6.8	125	1.8	1.2
9/29/99A	21.1	6.8	3.4	6.8	125	1.1	1.2
9/29/99B	21.1	6.8	3.4	6.8	125	2.1	1.2
9/16/99A	55.1	6.8	3.4	6.8	135	1.6	1.3
9/16/99B	55.1	6.8	3.4	6.8	130	1.5	1.3

Mean	127	1.5	1.3
Standard Deviation	5.4	0.27	0.14

Note: All stresses and vibration measurements are at sample center ( $z \sim 0.75m$ )

Table 3.5 - Vibration Properties from Tests Using Counter Rotating Mass Vibrator

Test #	Dr (%)	$\sigma_v'$ (kPa)	$\sigma_h'$ (kPa)	$U_o$ (kPa)	Frequency (Hz)	Force at Load Cell (kN)	Force at Tip (kN)
1/24/00A	56.3	55	27	6.8	15	1.7	1.5
1/24/00B	56.3	55	27	6.8	25	1.8	1.5
1/24/00C	56.3	55	27	6.8	35	1.5	1.4
1/24/00D	56.3	55	27	6.8	45	1.7	1.4
1/24/00E	56.3	55	27	6.8	55	1.3	1.4
3/14/00A	23.8	55	27	6.8	15	1.4	1.2
3/14/00B	23.8	55	27	6.8	25	1.5	1.3
3/14/00C	23.8	55	27	6.8	35	1.2	NA
3/14/00D	23.8	55	27	6.8	45	1.5	1.4
3/14/00E	23.8	55	27	6.8	55	1.5	NA

Mean	--	1.5	1.4
Standard Deviation	--	0.19	0.10

Note: All stresses and vibration measurements are at sample center ( $z \sim 0.75\text{m}$ )  
 NA = Not Available Due to Equipment Errors