

Ribersborg Beach – Malmo/Sweden

2005

Retain sand on an artificial beach in pocket bay condition



Ribersborg Beach after one year with PEM modules

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Ribersborg Beach Malmo-Sweden.

PEM modules Established 27 October 2001

Evaluated October 2001
October 2002
November 2004
November 2005

Customer: Malmö City

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Ribersborg Beach.



Ribersborg Beach, Malmo, Sweden

Ribersborg is the most popular beach in Malmo, Swedens largest town facing Oresund.

The beach 1500 m long and is situated in a Pocket Bay where there is no long shore sediment transport. This artificial beach was constructed years ago, and every year in spring it was necessary to go off shore to bring back the sand that had disappeared.

In October 2001 the PEM system was installed, and only a few months later the beach had widened by several metres.

The PEM modules are placed between 50 and 100 metre along the beach and 10 metre in the row. The modules are 1,75 metre and are placed approx. 25 cm below the sand surface.

All surveys are done by Malmo City .

The survey method is GPS with an accuracy of less than 0,02 metre .

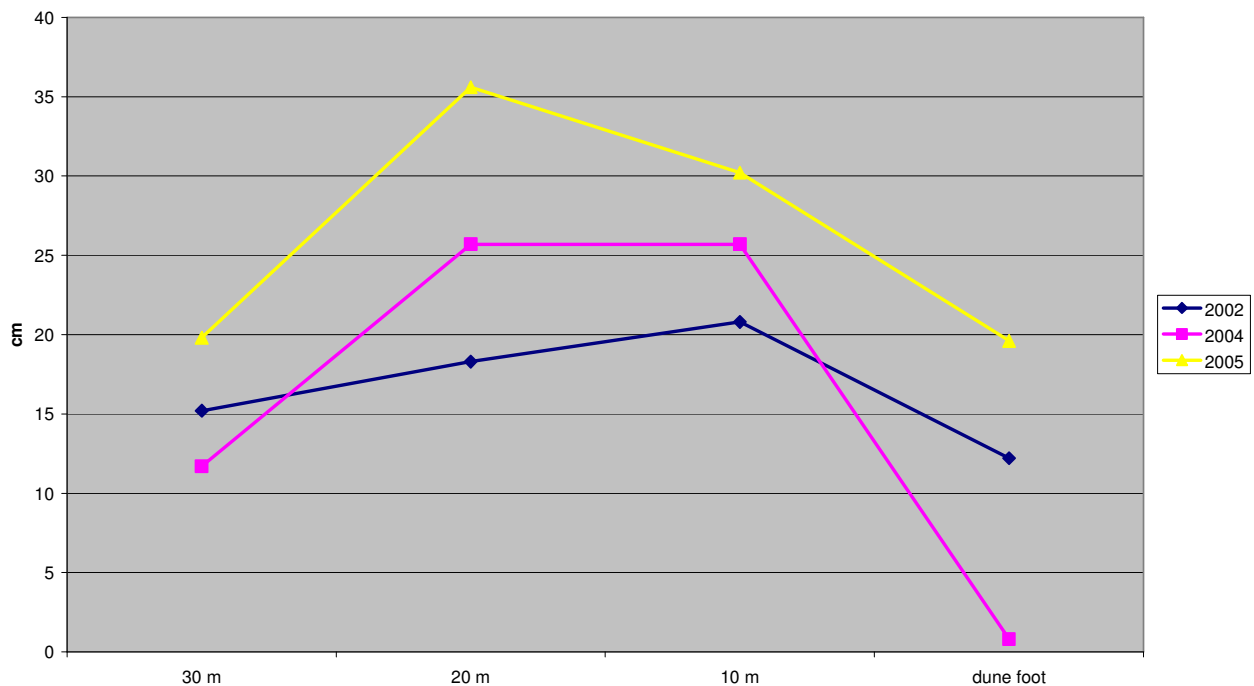


Ribersborg Beach 30 November 2001

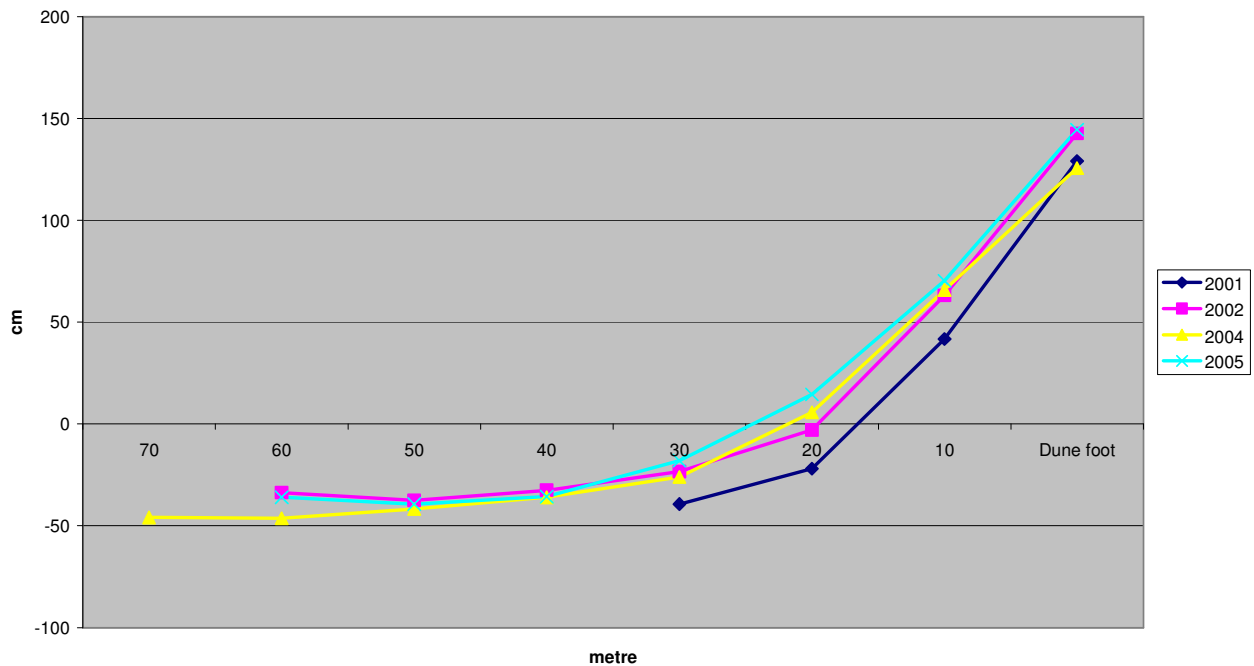
It is clearly seen that there has been an accretion of sand coming from the sea.

When the extra sand in the swash zone has dried it is picked up by the wind and carried further inland. This builds a higher beach and mixes the sand particles so that colour differences disappear.

△ Beach Level development from 2001



Beach Profile Ribersborg Beach Malmo



Status November 2005

All the modules are still covered by sand and are even more submerged as the beach level is higher compared with 2004.

The Beach Width is increased by approx. 3metre since 2004, and are in average 8 metre wider than when installed in 2001.

The running of the PEM system is performing well and as expected in relation to the controlled test sites in Denmark

SIC recommends that the PEM system at Ribersborg Beach will continued in the following years as the results are very satisfying.

Overview of the results in appendix.

Skagen d. 10 November 2005.

Poul Jakobsen

Oct 2001									
		70	60	50	40	30	20	10	Dune foot
0							-29	4	81
50							-43	-2	80
100					-47	-24	-14	26	139
150						-45	-15	14	66
200						-46	-8	32	124
250						-48	-30	24	90
300					-50	-29	-11	39	110
350						-48	-23	45	100
400						-37	-7	59	100
450						-52	-6	40	136
500						-44	2	37	100
600						-41	-7	30	126
700						-44	-28	40	138
800						-34	-32	45	130
900						-33	-21	45	128
1000						-39	-37	45	128
1050						-41	-32	56	145
1100					-38	-18	-19	43	164
1150						-31	-21	37	162
1200						-41	-28	41	128
1250						-32	-33	37	134
1300						-32	-3	55	172
1350						-30	-8	59	175
1400						-32	-28	52	120
1450						-40	-39	59	129
1500						-46	-29	81	140
Oct 2002									
		70	60	50	40	30	20	10	Dune foot
0					-83	-64	-32	13	78
50			-77	-67	-27	1	-3	84	156
100			-68	-40	-12	-17	-6	60	143
150			-67	-49	-21	-17	-2	56	142
200				-69	-50	-23	3	55	124
250			-40	-57	-36	-18	-7	39	119
300		-31	-33	-41	-9	-36	-8	53	134
350		-53	-35	-44	-28	-20	-2	61	112
400		-42	-35	-45	-42	-14	4	56	144
450		-47	-48	-44	-24	-21	0	70	115
500			-50	-44	-41	-31	17	83	152
600		-37	-31	-27		-33	2	59	155
700			-38	-34	-21	-24	18	78	182
800				-34		-6	0	79	138
900			-35	-28	-3	-21	12	81	139

1000		-27	-18	-37	-34	-26	-6	55	141
1050		-32	-28	-26	-27	-17	1	60	145
1100		-36	-18	-20	-30	-20	-4	59	163
1150		-24	-27	-22	-31	-14	-5	53	164
1200		-24	-25	-29	-29	-18	-15	52	131
1250		-23	-26	-32	-29	-15	5	63	133
1300			-31	-16	-28	-22	5	76	130
1350			-27	-21	-26	-20	4	72	149
1400		-41	-42	-33	-32	-16	-8	37	156
1450			-44	-42	-42	-37	-36	64	106
1500				-41	-46	-38	-12	66	113
Oct 2004									
July		70	60	50	40	30	20	10	Dune foot
0						-83	-54	46	119
50					-66	-40	-7	50	163
100			-77	-56	-29	-25	-13	52	147
150		-74	-67	-42	-18	-7	1	63	130
200		-74	-42	-40	-38	-32	2	78	130
250		-57	-54	-71	-49	-31	5	79	116
300		-28	-56	-51	-55	-35	-11	38	104
350		-38	-49	-50	-58	-41	-25	47	107
400		-61	-63	-49	-34	-21	15	77	127
450		-42	-50	-47	-45	-25	17	82	116
500		-56	-43	-39	-29	17	74	112	167
600		-45	-41	-44	-18	10	73	94	131
700		-47	-50	-47	-24	-3	57	89	152
800		-36	-35	-45	-38	-11	11	81	136
900		-44	-40	-28	-36	-36	-3	52	133
1000		-27	-37	-33	-41	-34	-7	56	120
1050		-50	-50	-28	-26	-37	-12	56	125
1100		-39	-38	-35	-37	-27	-3	55	119
1150			-35	-42	-41	-21	10	55	110
1200		-40	-27	-39	-40	-31	-2	50	113
1250			-48	-26	-34	-30	10	51	111
1300		-38	-30	-37	-20	-3	55	98	134
1350		-35	-39	-35	-22	-25	-21	52	97
1400		-41	-38	-32	-25	-25	-15	65	114
1450		-45	-48	-43	-37	-43	-23	66	121
1500			-55	-43	-37	-37	-13	68	124
Oct 2005									
July		70	60	50	40	30	20	10	Dune foot
0				-61	-47	-31	-15	53	147
50					-60	-49	3	52	163
100				-55	-53	-45	-11	58	192
150				-59	-44	-23	-7	65	172

