CYCLIC DMT TESTS

This document presents the results obtained by a number of cyclic DMT tests performed at Genova Harbour (Italy) on 10^{th} – 11^{th} November 2015. The cyclic tests have been executed as additional tests during a normal SDMT investigation. The results of the "normal" SDMT investigation are presented in the SDMT Report, while the results of the cyclic tests are presented in this document.

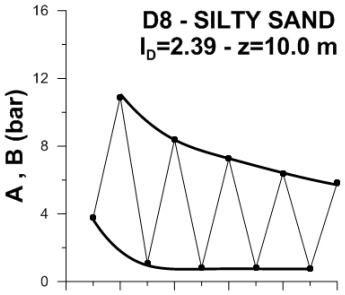
The cyclic tests have been executed at several depths, at random. They consist in obtaining, in addition to the usual A and B pressure readings, other pairs of A and B values, by repeating several times the expansion of the membrane. The aim of this study is to have first indications on the decay of A and B with the number of cycles.

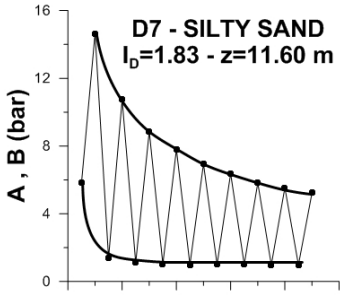
On the y –axis of the following graphs the A and B readings are plotted in bar unit of measure. Each diagram is for a given test depth, soil type and Material Index I_D. In particular two soil types were involved in these initial cyclic tests: silty sand and silty clay. The Table summarizes the A and B readings.

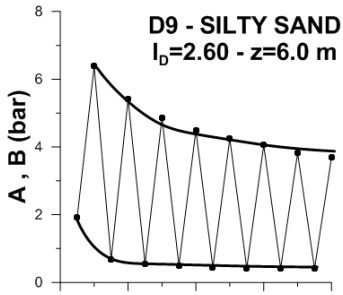
Due to the preliminary scope of these tests, it is not important to take the exact time of each individual reading. The first A reading is taken a few seconds after reaching the test depth, the subsequent B reading is taken approximately 15 seconds later. Then approximately 5 seconds are needed to deflate to zero pressure. Then 15 sec from zero to A, 15 sec to B etc.

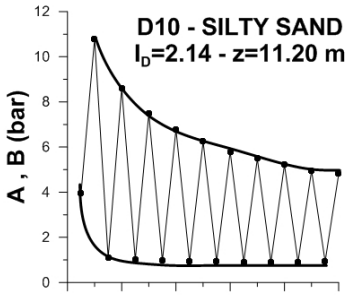
Trends that can be noted - from these results - are :

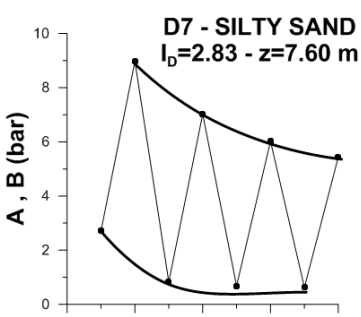
- The decay of A and B in sand appears higher than in clay.
- Especially in sand, the stabilization of the A-reading occurs after very few cycles. B takes a little longer to stabilize. In clay the stabilization of both A and B takes a little longer.
- There is no need of 20 or 100 or 1000 cycles to reach stabilization. Stabilization occurs quite soon.

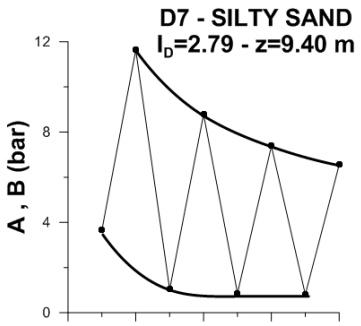


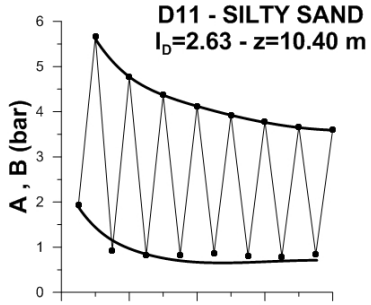


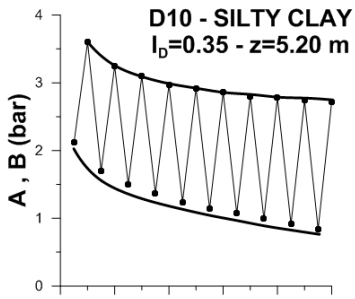


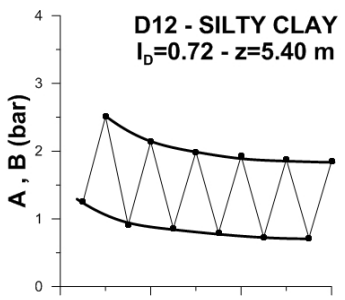


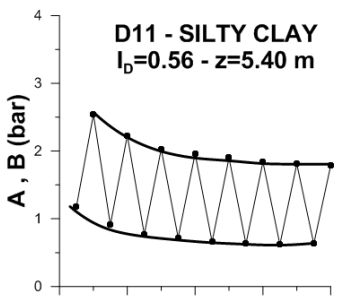












Graphs of the Cyclic DMT Tests

SILTY SAND

D8 z=10.0 m	
SILTY SAND I_D=2.39	
A (bar)	**B (bar)**
3.77	10.90
1.09	8.39
0.81	7.25
0.81	6.40
0.74	5.86

D7 z=11.60 m	
SILTY SAND I_D=1.83	
A (bar)	**B (bar)**
5.81	14.64
1.39	10.74
1.11	8.87
1.03	7.80
0.99	6.95
1.00	6.38
1.01	5.83
0.98	5.54
0.98	5.24

D9 z=6 m	
SILTY SAND I_D=2.60	
A (bar)	**B (bar)**
1.93	6.38
0.68	5.41
0.55	4.86
0.50	4.49
0.44	4.25
0.42	4.05
0.42	3.82
0.41	3.69

D10 z=11.20 m	
SILTY SAND I_D=2.14	
A (bar)	**B (bar)**
3.94	10.79
1.10	8.60
1.00	7.48
0.96	6.78
0.93	6.25
0.93	5.80
0.91	5.49
0.91	5.22
0.91	4.96
0.93	4.81

D7 z=7.60 m	
SILTY SAND I_D=2.83	
A (bar)	**B (bar)**
2.71	8.97
0.83	7.02
0.68	6.02
0.63	5.44

D7 z=9.40 m	
SILTY SAND I_D=2.79	
A (bar)	**B (bar)**
3.65	11.63
1.03	8.78
0.86	7.38
0.81	6.55

D11 z=10.4 m	
SILTY SAND I_D=2.63	
A (bar)	**B (bar)**
1.94	5.66
0.93	4.77
0.82	4.37
0.83	4.12
0.87	3.92
0.81	3.79
0.79	3.67
0.84	3.60

SILTY CLAY

D10 z=5.20 m	
SILTY CLAY I_D=0.35	
A (bar)	**B (bar)**
2.12	3.60
1.70	3.25
1.50	3.10
1.37	2.97
1.24	2.92
1.14	2.86
1.07	2.80
0.99	2.78
0.91	2.74
0.84	2.72

D12 z=5.40 m	
SILTY CLAY I_D=0.72	
A (bar)	**B (bar)**
1.25	2.51
0.91	2.14
0.86	1.99
0.79	1.93
0.73	1.88
0.72	1.85

D11 z=5.40 m	
SILTY CLAY I_D=0.56	
A (bar)	**B (bar)**
1.18	2.54
0.91	2.23
0.77	2.03
0.72	1.96
0.66	1.90
0.63	1.84
0.62	1.81
0.63	1.79