

Chapter 5

RESULTS

5.0 Water Towers for Different Percentages of Filling

Table 5.1.1 indicate the base shear values on 200 m³ tank for different wind speeds (38,47,53.5) and different filling conditions.

It clearly shows that base shear values due to the wind loads were very much lower than the base shear values due to the earthquake loads.

Further it shows in earthquake analysis using spring mass model, base shear values of 25% and 50% water filling conditions are less than the tank empty condition for 200 m³ tank only.

Capacity 200 m³

Table 5.1.1

Base shear

% fill	100%	75%	50%	0%
EQ - medium soil	201	172	150	155
wind sp.38.0 ms ⁻¹	52	52	52	52
wind sp.47.0 ms ⁻¹	77	77	77	77
wind sp.53.5 ms ⁻¹	98	98	98	98



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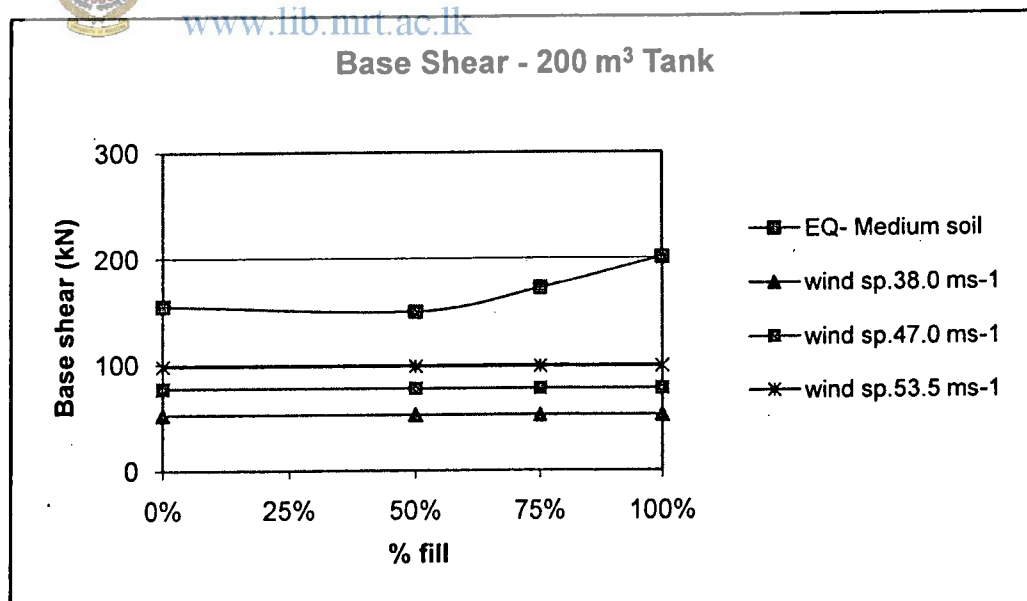


Fig. 5.1.1 Base shear with different water fillings

Table 5.1.2 indicate the base moment values on 200 m³ tank for different wind speeds (38,47,53.5), different soil conditions and different filling conditions.

It clearly shows that base moment values due to the wind loads were very much lower than the base moment values due to the earthquake loads.

Further it shows base moment values of 25% and 50% water filling conditions are less than the tank empty condition for 200 m³ tank

Table 5.1.2

Moment at the base

% fill	100%	75%	50%	0%
EQ - medium soil	3859	3279	2855	2931
wind sp.38.0 ms ⁻¹	736	736	736	736
wind sp.47.0 ms ⁻¹	1088	1088	1088	1088
wind sp.53.5 ms ⁻¹	1385	1385	1385	1385

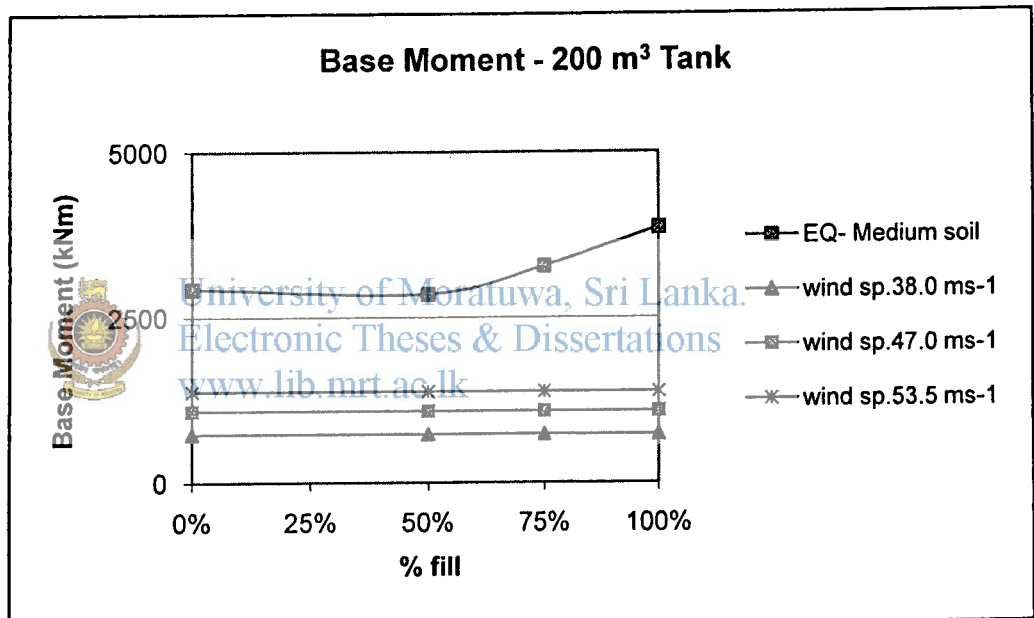


Fig. 5.1.2 Base moment with different water fillings

Table 5.1.3 and Fig. 5.1.3 indicate the base shear values on 300 m³ tank for different wind speeds (38,47,53.5) and different filling conditions.

It clearly shows that base shear values due to the wind loads were lower than the base shear values due to the earthquake loads except tank empty condition.

Capacity 300 m³

Table 5.1.3

Base shear

% fill	100%	75%	50%	0%
EQ - medium soil	181	167	154	143
wind sp.38.0 ms ⁻¹	81	81	81	81
wind sp.47.0 ms ⁻¹	120	120	120	120
wind sp.53.5 ms ⁻¹	153	153	153	153

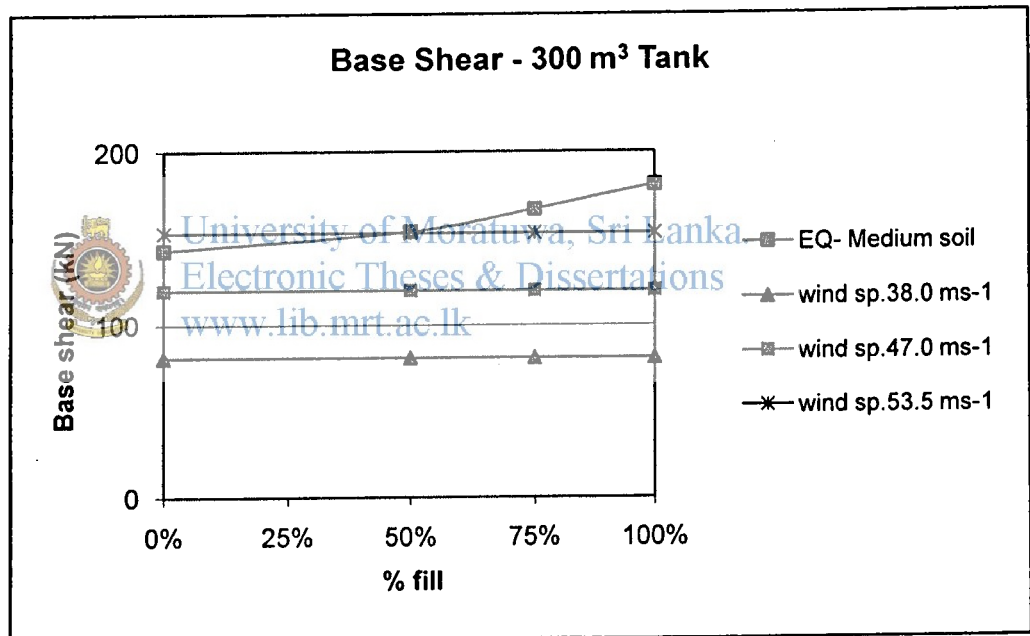


Fig. 5.1.3 Base shear for different water fillings

Table 5.1.4 indicate the base moment values on 300 m³ tank for different wind speeds (38,47,53.5) and different filling conditions.

It clearly shows that base moment values due to the wind loads were very much lower than the base moment values due to the earthquake loads.

Table 5.1.4

Moment at the base

% fill	100%	75%	50%	0%
EQ - medium soil	4259	3852	3548	3223
wind sp.38.0 ms ⁻¹	1466	1466	1466	1466
wind sp.47.0 ms ⁻¹	2166	2166	2166	2166
wind sp.53.5 ms ⁻¹	2757	2757	2757	2757

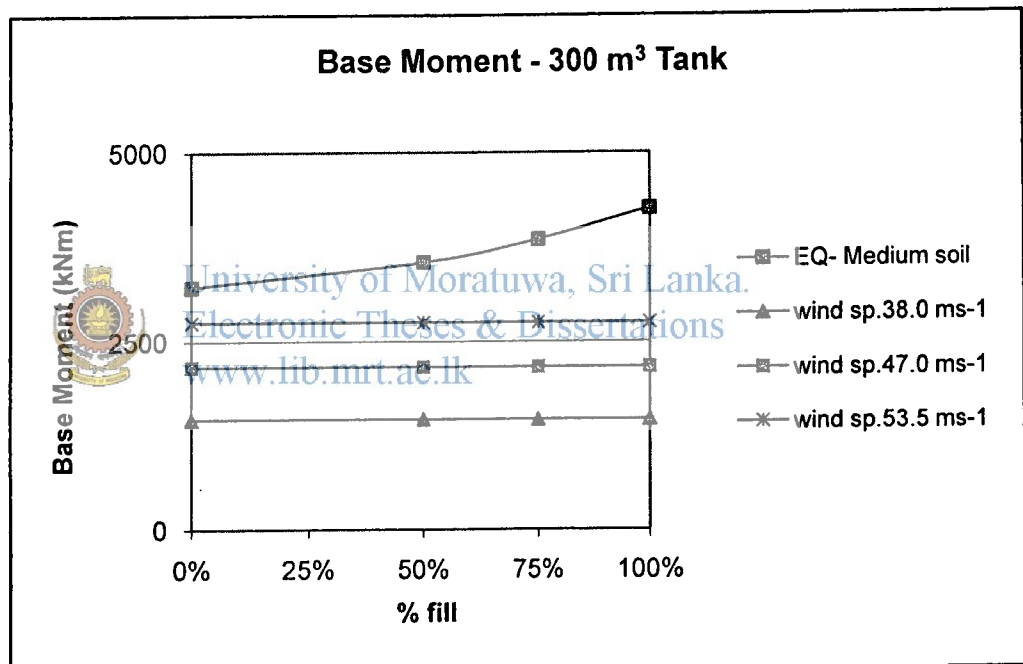


Fig. 5.1.4 Base moment for different water fillings

Fig. 5.1.5 indicate the base shear values on 750 m³ tank for different wind speeds (38,47,53.5) and different filling conditions.

It clearly shows that base shear values due to the wind loads were lower than the base shear values due to the earthquake loads except to tank empty condition.

Capacity 750 m³

Table 5.1.5

Base shear

% fill	100%	75%	50%	0%
EQ - medium soil	426	333	264	209
wind sp.38.0 ms ⁻¹	133	133	133	133
wind sp.47.0 ms ⁻¹	197	197	197	197
wind sp.53.5 ms ⁻¹	250	250	250	250

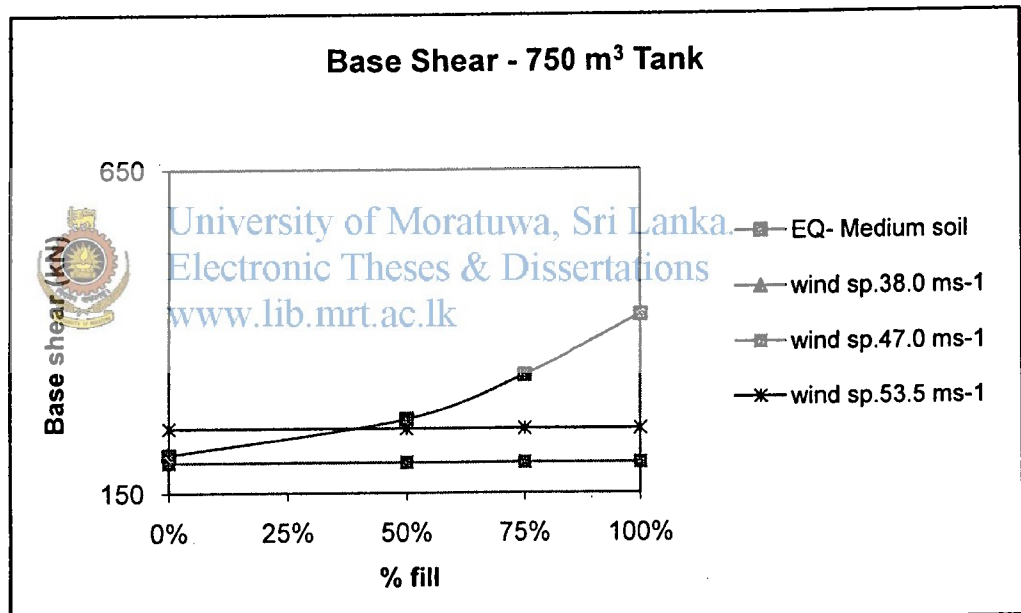


Fig. 5.1.5 Base shear for different water fillings

Table 5.1.6 and Fig. 5.1.6 indicate the base moment values on 750 m³ tank for different wind speeds (38,47,53.5) and different filling conditions.

It clearly shows that base moment values due to the wind loads were very much lower than the base moment values due to the earthquake loads specially in tank full condition.

Further it shows base moment values are almost equal for the tank empty condition and high wind speed zone.

Table 5.1.6

Moment at the base

% fill	100%	75%	50%	0%
EQ - medium soil	10594	8186	6396	4912
wind sp.38.0 ms ⁻¹	2597	2597	2597	2597
wind sp.47.0 ms ⁻¹	3838	3838	3838	3838
wind sp.53.5 ms ⁻¹	4886	4886	4886	4886

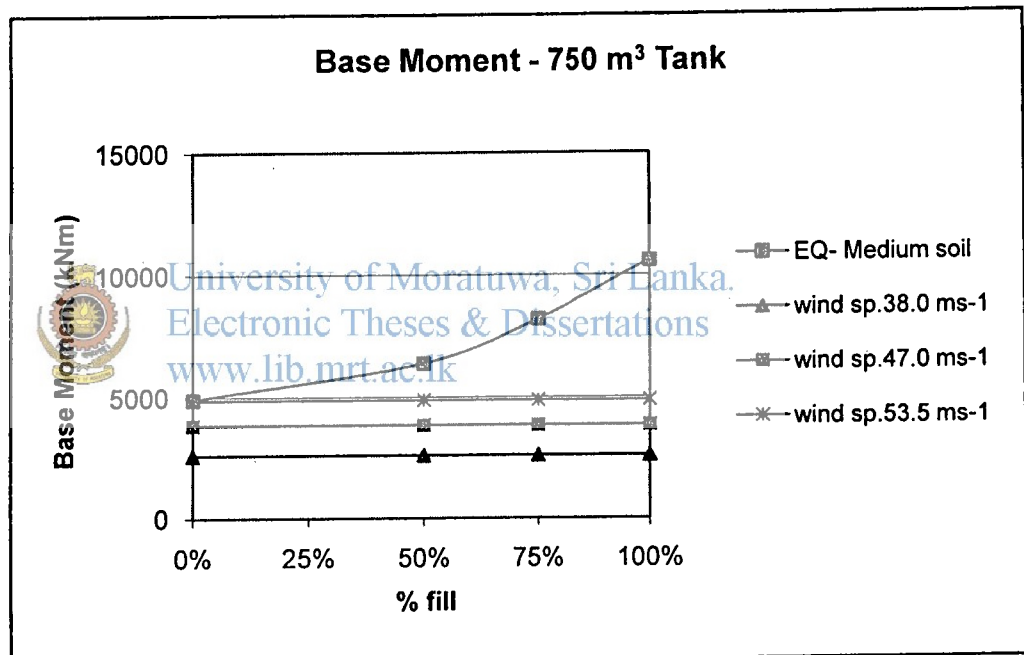


Fig. 5.1.6 Base moment for different water fillings