MILITARY INSTITUTE OF SCIENCE AND TECHNOLOGY (MIST)
Department of Civil Engineering
Geotechnical Engineering Laboratory

PERMEABILITY TEST (Constant head)

Tested on & by		**Specific gravity of soil,G_s**			
Project name		**Water content of soil, ω**			
Location		**Permeameter diameter, D**			
Boring No		**Level of water within the manometer tube connected to the gland**	**H_1 (lower gland) =**	**H2 (Middle gland) =**	**H3 (upper gland) =**
Sample No					
Visual classification of soil		**Sample length (distance of the gland points from the base of permeameter)**	**L_1 =**	**L_2 =**	**L_3 =**
		Hydraulic gradient	**$i_1 = \frac{H_1 - H_2}{L_1 - L_2}$ =**	**$i_2 = \frac{H_2 - H_3}{L_2 - L_3}$ =**	**$i_2 = \frac{H_3 - H_1}{L_3 - L_1}$ =**
		Average hydraulic gradient, i			

Group No	**Temp. (˚C)**	**Amount of water collected ,Q (cm^3)**	**Collection of time, t (sec.)**	**Permeability at T ˚C, $K_T = \frac{Q}{iAt}$ (cm/sec)**	**Viscosity ratio, $\frac{\eta_T}{\eta_{20}}$**	**Permeability at 20 ˚C, K_{20} (cm/sec) = $K_T * \frac{\eta_T}{\eta_{20}}$**	**Void Ratio, e**	**e^3**	**$\frac{e^3}{(1+e)}$**	**$\frac{e^3}{(1+e)}$**

Table: Viscosity Correction Factor of Water $= \eta_T / \eta_{20}$

°C	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
10	1.3012	1.2976	1.2940	1.2903	1.2867	1.2831	1.2795	1.2759	1.2722	1.2686
11	1.2650	1.2615	1.2580	1.2545	1.2510	1.2476	1.2441	1.2406	1.2371	1.2336
12	1.2301	1.2268	1.2234	1.2201	1.2168	1.2135	1.2101	1.2068	1.2035	1.2001
13	1.1968	1.1936	1.1905	1.1873	1.1841	1.1810	1.1777	1.1746	1.1714	1.1683
14	1.1651	1.1621	1.1590	1.1560	1.1529	1.1499	1.1469	1.1438	1.1408	1.1377
15	1.1347	1.1318	1.1289	1.1260	1.1231	1.1202	1.1172	1.1143	1.1114	1.1085
16	1.1056	1.1028	1.0999	1.0971	1.0943	1.0915	1.0887	1.0859	1.0803	1.0802
17	1.0774	1.0747	1.0720	1.0693	1.0667	1.0640	1.0613	1.0586	1.0560	1.0533
18	1.0507	1.0480	1.0454	1.0429	1.0403	1.0377	1.0351	1.0325	1.0300	1.0274
19	1.0248	1.0223	1.0198	1.0174	1.0149	1.0124	1.0099	1.0074	1.0050	1.0025
20	1.0000	0.9976	0.9952	0.9928	0.9904	0.9881	0.9857	0.9833	0.9809	0.9785
21	0.9761	0.9738	0.9715	0.9692	0.9669	0.9646	0.9623	0.9600	0.9577	0.9554
22	0.9531	0.9509	0.9487	0.9465	0.9443	0.9421	0.9399	0.9377	0.9355	0.9333
23	0.9311	0.9290	0.9268	0.9247	0.9225	0.9204	0.9183	0.9161	0.9140	0.9118
24	0.9097	0.9077	0.9056	0.9036	0.9015	0.8995	0.8975	0.8954	0.8934	0.8913
25	0.8893	0.8873	0.8853	0.8833	0.8813	0.8794	0.8774	0.8754	0.8734	0.8714
26	0.8694	0.8675	0.8656	0.8636	0.8617	0.8598	0.8579	0.8560	0.8540	0.8521
27	0.8502	0.8484	0.8465	0.8447	0.8428	0.8410	0.8392	0.8373	0.8355	0.8336
28	0.8318	0.8300	0.8282	0.8264	0.8246	0.8229	0.8211	0.8193	0.8175	0.8157
29	0.8139	0.8122	0.8105	0.8087	0.8070	0.8053	0.8036	0.8019	0.8001	0.7984
30	0.7967	0.7950	0.7934	0.7917	0.7901	0.7884	0.7867	0.7851	0.7834	0.7818
31	0.7801	0.7785	0.7769	0.7753	0.7737	0.7721	0.7705	0.7689	0.7673	0.7657
32	0.7641	0.7626	0.7610	0.7595	0.7579	0.7564	0.7548	0.7533	0.7517	0.7502
33	0.7486	0.7471	0.7456	0.7440	0.7425	0.7410	0.7395	0.7380	0.7364	0.7349
34	0.7334	0.7320	0.7305	0.7291	0.7276	0.7262	0.7247	0.7233	0.7218	0.7204
35	0.7189	0.7175	0.7161	0.7147	0.7133	0.7120	0.7106	0.7092	0.7078	0.7064

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PERMEABILITY TEST (Variable / falling head)

Group No	Room Temp. (T˚C)	Sample Length, L (cm)	Initial Head, H_0(cm)	Final Head, H_1(cm)	Head falling time, t (sec)	Permeability at T ˚c, $K_T = 2.3\frac{aL}{At}\log_{10}\frac{H_0}{H_1}$ (cm/sec)	Viscosity ratio, $\frac{\eta_T}{\eta_{20}}$	Permeability at 20 ˚c, K_{20} (cm/sec)	Void ratio, e	e^3	$\frac{e^3}{(1+e)}$	$\frac{e^3}{(1+e)}$