

**SCHOOL OF CIVIL ENGINEERING
ENGINEERING CAMPUS**

**LISTS OF TESTS AND RATE
HIGHWAY ENGINEERING LABORATORY, SCHOOL OF CIVIL ENGINEERING**

ITEM	TEST	UNIT	RATE / TEST (RM)
TESTS ON AGGREGATES			
1	Particle Size Distribution	No.	100.00
2	Specific Gravity/Water Absorption - Coarse and Fine Aggregate	No.	150.00
3	Clay Lump	No.	100.00
4	Aggregate Crushing Value	No.	300.00
5	Aggregate Ten Percent Fine	No.	300.00
6	Aggregate Impact Value	No.	200.00
7	Los Angeles Abrasion Value Test (ASTM C 131)	No.	200.00
8	Aggregate Flakiness Index (MS 30)	No.	150.00
9	Aggregate Elongation Index	No.	150.00
10	Polishing Stone Value (PSV) – Skid Resistance Test (MS 30)	No.	2000.00
11	Magnesium Sulphate Soundness Test (AASHTO T 104)	No.	1200.00
12	Sand Equivalent Test – Fine Aggregate (ASTM D 2419)	No.	200.00
13	Methylene Blue Index of Clay – Fine Aggregate (Ohio DOT)	No.	300.00
14	Fine Aggregate Angularity (ASTM C 1252)	No.	100.00

**SCHOOL OF CIVIL ENGINEERING
ENGINEERING CAMPUS**

**LISTS OF TESTS AND RATE
HIGHWAY ENGINEERING LABORATORY, SCHOOL OF CIVIL ENGINEERING**

NO.	TEST	UNIT	RATE / TEST (RM)
CONVENTIONAL TESTS ON BINDERS			
1	Penetration at 25° C, 100 g, 5 sec, 0.1 mm (ASTM D 5)	No.	100
2	Softening point, °C (ASTM D 36)	No.	150
3	Loss on heating after TFOT, % (ASTM D 6)	No.	200
4	Drop in penetration after heating after TFOT, % (ASTM D 5)	No.	250
5	Ductility Test, cm (ASTM D 113)	No.	100
6	Flash and Fire Point Test. °C (ASTM D 92)	No.	150
7	Retained Penetration after Thin Film Oven, % (ASTM D 1754 / ASTM D 5)	No.	300
8	Specific Gravity of Bitumen	No.	150
9	Solubility in Trichloroethylene, % (ASTM D 2042)	No.	200
ADVANCED TESTS ON BINDERS			
1	Brookfield Viscosity@ 135° C on original binder as per ASTM D4402	No.	250
2	Stripping Test as per ASTM D1664	No.	200
3	Rolling Thin Film Oven (AASHTO T240) residue	No.	250
4	DSR test on original binder as per AASHTO TP5	No.	300
5	Mass Loss after Rolling Thin Film Oven	No.	250
6	DSR test on RTFOT residue as per AASHTO TP5 (Rutting)	No.	500
7	Brookfield Viscosity@ 135° C after RTFOT	No.	450
8	Pressure Aging Vessel residue (AASHTO PP1) at 100° C	No.	500
9	DSR test on PAV residue as per AASHTO TP5 (Fatigue)	No.	750

**SCHOOL OF CIVIL ENGINEERING
ENGINEERING CAMPUS**

**LISTS OF TESTS AND RATE
HIGHWAY ENGINEERING LABORATORY, SCHOOL OF CIVIL ENGINEERING**

ITEM	TEST	UNIT	RATE / TEST (RM)
CONVENTIONAL TESTS ON BITUMINOUS MIX			
1	Pavement Coring – 100 mm (exclude mobilization)	No.	150.00
2	Pavement Coring – 150 mm (exclude mobilization)	No.	200.00
3	Binder Content Determination via Ignition Method	No.	175.00
4	Marshall Stability and Flow including Density and Air Void (Compacted from loose mix)	Set	450.00
5	Marshall Mix Design	Set	2000.00
6	Thickness only (core sample)	No.	30.00
7	Density and Degree of Compaction (core sample)	No.	50.00
ADVANCED TEST ON BITUMINOUS MIX			
1	Theoretical Maximum Density via Rice Method	No.	200
2	Resilient Modulus @ 25° C	No.	300
3	Indirect Tensile Strength @ 25° C	No.	200
4	Dynamic Creep @ 40° C, 1 hour	No.	400
5	Static Creep @ 40° C, 1 hour	No.	400
6	Beam Fatigue	No.	1500
7	Diametral fatigue	No.	1000
8	Air permeability of Dense Asphalt Sample	No.	150
9	Water permeability of Porous Asphalt Sample	No.	150
10	Rut Depth via Wheel Tracking Machine	No.	1000
11	Kerosene Immersion Test (KIT)	Set	1500
12	Moisture Sensitivity Test	Set	1500
13	Density / Specific Gravity of Compacted Sample Using CoreLok	No.	100
14	Dynamic Modulus using Simple Performance Tester (SPT)	No.	1500
15	Flow Number / Flow Time Using Simple Performance Tester (SPT)	No.	1500

**SCHOOL OF CIVIL ENGINEERING
ENGINEERING CAMPUS**

**LISTS OF TESTS AND RATE
HIGHWAY ENGINEERING LABORATORY, SCHOOL OF CIVIL ENGINEERING**

NO.	TEST	UNIT	RATE / TEST (RM)
BASE, SUBBASE AND SUBGRADE			
1	California Bearing Ratio (CBR) - Unsoaked	No.	300
2	California Bearing Ratio (CBR) - Soaked	No.	330
3	Field Density Test – Sand Cone Replacement Method (exclude mobilization)	No.	150
4	Compaction Test	Set	350
MOBILIZATION FOR FIELD WORK			
1	Below 50km from USM (per trip)	LS	150
2	Up to 150km from USM (per trip)	LS	300
3	Up to 300km from USM (per trip)	LS	500

For further information, please contact:

[Profesor Dr Meor Othman Hamzah – cemeor@usm.my](mailto:cemeor@usm.my); 04 – 599 6210

[Mohd Fouzi Ali – cemfali@usm.my](mailto:cemfali@usm.my); 04 – 599 6244

[Zulhairi Arifin – cezek@usm.my](mailto:cezек@usm.my); 04 – 599 6235