



Faulty of Engineering and Technology

Civil Engineering Department

Construction Materials Laboratory

ENCE215

Experiment :

" Asphalt Tests : Marshall test "

Instructors :

Dr. Khalil Qatu

Eng. Nasser

Done by : Mohammad Al-Swaity " 1181136 "

Date of performing the experiment : 12/8/2020

Date of submitting the experiment : 21/8/2020







Introduction :

The Marshall method of asphalt mix design is widely practiced in construction materials laboratories to select and proportion aggregate and asphalt materials for pavement construction.

Purpose :

To obtain optimum binder content for the type of aggregate mix used and the expected traffic intensity .

Materials and Equipment's :

Equipment	The name of it :	Equipment	The name of it :
 Figure 1	Laboratory Bench Mixer	 Figure 2	Molds
 Figure 3	Hand Compaction Hammer	 Figure 4	Finger Guard and Paper Disks
 Figure 5	Thermostatically controlled oven	 Figure 6	Balance

" Table 1 "

Procedure :

1. Three samples of coarse aggregate, fine aggregate and the filler material were proportioned so to fulfill the requirements of the relevant standards.
2. The 1128 gr of aggregate proportions were blended and dried in oven at a temperature of 110C.
3. The compaction would assembly and rammer were cleaned and kept pre-heated to a temperature of 100C to 145C.
4. A 6% of the aggregate weight was calculated, and the result was used as bitumen weight; the bitumen was heated to at temperature of 121C to 138C and added to the hot aggregate mixture.
5. After that the bitumen was added to the aggregate mixture, the sample was mixed using blinder machine.
6. Then the sample was mixed again by heated mixing hand; to make sure that the bitumen covers the wholesample.
7. The mixture was placed in the marshal apparatus in an oiled mould and a piece of filter paper was fitted in the bottom of the mould, and then a 75 times free fallings was made from top to bottom.
8. The mold was inverted again and another 75 times of free falling were made on the other side of the sample.
9. With collar on the bottom, the base was removed and the sample was extracted to push it out the extractor.
10. The same procedure was repeated on the other two samples.
11. Then the three samples were put oven.
12. The specimen is measured and weighed in air and water (for volume determination).
13. The specimen is then marked and stored for stability and flow measurements.

Data and Calculations :

Specimen #	1
Binder %	4.5 %
Mass in air W (gm)	1200 gm
Mass of bitumen (gm)	54 gm
Dial gauge reading (S)	309
Dial gauge reading(F)	2

Results and Conclusion :

To judge the way Marshall asphalt concrete mixtures must be prepared the specimen for each percentage of bitumen is made and determine the appropriate rate of bitumen between these mixtures in terms of density, stability, and flow and the proportion of the blanks.