

Lampiran 13 Pemeriksaan Keausan Agregat Clereng (*Abrasi Test*)

LABORATORIUM JALAN RAYA
JURUSAN TEKNIK SIPIL
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
UNIVERSITAS ISLAM INDONESIA



Jl. Kaliurang KM 14,4 Kampus Terpadu UII, Gedung Moh. Natsir,
Telp. (0274) 896440, Fax. 895330 Yogyakarta

**PEMERIKSAAN KEAUSAN AGREGAT BOYONG
(ABRASI TEST)**

Sumber : Sungai Boyong, Sleman
Tanggal Uji : 2017

| No | Jenis gradasi | | F | |
|----|---------------------------------|------------------|------------------|---------|
| | Saringan | | Benda uji (gram) | |
| | Lolos | Tertahan | I | II |
| 1 | 72,2 mm (3'') | 63,5 mm (2,5'') | | |
| 2 | 63,5 mm (2,5'') | 50,8 mm (2'') | | |
| 3 | 50,8 mm (2'') | 37,5 mm (1,5'') | | |
| 4 | 37,5 mm (1,5'') | 25,4 mm (1'') | | |
| 5 | 25,4 mm (1'') | 19 mm (3/4'') | | |
| 6 | 19 mm (3/4'') | 12,5 mm (0,5'') | 2500 gr | 2500 gr |
| 7 | 12,5 mm (0,5'') | 09,5 mm (3/8'') | 2500 gr | 2500 gr |
| 8 | 09,5 mm (3/8'') | 06,3 mm (1/4'') | | |
| 9 | 06,3 mm (1/4'') | 04,75 mm (No. 4) | | |
| 10 | 04,75 mm (No. 4) | 02,36 mm (No. 8) | | |
| 11 | JUMLAH BENDA UJI (A) | | 5000 gr | 5000 gr |
| 12 | JUMLAH TERTAHAN DI SIEVE 12 (B) | | 3582 gr | 3671 gr |
| 13 | KEAUSAN = (A-B)/A X 100 | | 28,36 % | 26,58 % |
| 14 | Rata-rata keausan | | 27,47 % | |

Mengetahui
Dosen Pembimbing

Ir. Subarkah, M.T.

Penguji

Dian Noer Anggita
12511035

Lampiran 14 Pemeriksaan Keausan Agregat Clereng (*Abrasi Test*)

LABORATORIUM JALAN RAYA
JURUSAN TEKNIK SIPIL
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
UNIVERSITAS ISLAM INDONESIA



Jl. Kaliurang KM 14,4 Kampus Terpadu UII, Gedung Moh. Natsir,
Telp. (0274) 896440, Fax. 895330 Yogyakarta

**PEMERIKSAAN KEAUSAN AGREGAT CLERENG
(*ABRASI TEST*)**

Sumber : Clereng, Kulonprogo
Tanggal Uji : 2017

| No | Jenis gradasi | | F | |
|----|---------------------------------|------------------|------------------|---------|
| | Saringan | | Benda uji (gram) | |
| | Lolos | Tertahan | I | II |
| 1 | 72,2 mm (3'') | 63,5 mm (2,5'') | | |
| 2 | 63,5 mm (2,5'') | 50,8 mm (2'') | | |
| 3 | 50,8 mm (2'') | 37,5 mm (1,5'') | | |
| 4 | 37,5 mm (1,5'') | 25,4 mm (1'') | | |
| 5 | 25,4 mm (1'') | 19 mm (3/4'') | | |
| 6 | 19 mm (3/4'') | 12,5 mm (0,5'') | 2500 gr | 2500 gr |
| 7 | 12,5 mm (0,5'') | 09,5 mm (3/8'') | 2500 gr | 2500 gr |
| 8 | 09,5 mm (3/8'') | 06,3 mm (1/4'') | | |
| 9 | 06,3 mm (1/4'') | 04,75 mm (No. 4) | | |
| 10 | 04,75 mm (No. 4) | 02,36 mm (No. 8) | | |
| 11 | JUMLAH BENDA UJI (A) | | 5000 gr | 5000 gr |
| 12 | JUMLAH TERTAHAN DI SIEVE 12 (B) | | 3983 gr | 3769 gr |
| 13 | KEAUSAN = (A-B)/A X 100 | | 20,34 % | 24,62 % |
| 14 | Rata-rata keausan | | 22,48 % | |

Mengetahui
Dosen Pembimbing

Ir. Subarkah, M.T.

Penguji

Dian Noer Anggita
12511035

Lampiran 15 Hasil Pengujian Marshall Variasi 1 (0% Boyong : 100% Clereng)



LABORATORIUM JALAN RAYA
JURUSAN TEKNIK SIPIL
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
UNIVERSITAS ISLAM INDONESIA

Jl. Kalurang KM 14, 4 Kampus Terpadu Uli, Gedung Moh. Nasrif, Telp. (0274) 636472, 636440, Fax. 635330 Yogyakarta



SIFAT CAMPURAN ASPAL DENGAN METODE MARSHALL

Tanggal Pengujian : 19 Juni 2017
Tipe Campuran : AC - BC
: Agregat Kasar Boyong 0%

Dikerjakan Oleh : Dian Noer Anggita Arum
Diperiksa Oleh : Ir. Subarkah, M.T.

| Sampel | t (cm) | a (%) | b (%) | c (gram) | d (gram) | e (gram) | f (gram) | g (Densitas) | h | i | k | l | m | n | o | p | q | r | MIQ |
|--------|--------|-------|-------|----------|----------|----------|----------|--------------|-------|--------|-------|--------|--------|-------|-------|---------|---------|-------|---------|
| 1 | 6.50 | 4.71 | 4.50 | 1102.01 | 1173.33 | 1173.33 | 622.72 | 2.237 | 2.353 | 0.000 | 5.032 | 14.032 | 60.074 | 5.002 | 65.00 | 1205.50 | 1305.03 | 2.900 | 427.275 |
| 2 | 6.73 | 4.71 | 4.50 | 1173.86 | 1197.33 | 1197.33 | 639.16 | 2.232 | 2.366 | 0.736 | 6.669 | 16.394 | 63.242 | 5.669 | 71.00 | 1492.16 | 1312.84 | 1.160 | 111.329 |
| 3 | 6.98 | 4.71 | 4.50 | 1198.83 | 1178.79 | 1178.79 | 653.80 | 2.226 | 2.365 | 0.748 | 6.629 | 16.278 | 63.800 | 5.529 | 67.00 | 1478.21 | 1207.25 | 2.400 | 503.021 |
| VI | 6.57 | 5.26 | 5.00 | 1177.39 | 1183.90 | 1183.90 | 658.79 | 2.242 | 2.339 | 10.916 | 4.154 | 15.070 | 72.437 | 4.154 | 66.00 | 1406.89 | 1288.24 | 2.17 | 630.58 |
| 1 | 6.66 | 5.26 | 5.00 | 1180.87 | 1187.17 | 1187.17 | 663.25 | 2.254 | 2.339 | 10.973 | 3.652 | 11.625 | 75.029 | 3.652 | 74.00 | 1577.42 | 1408.90 | 2.420 | 588.239 |
| 2 | 6.48 | 5.26 | 5.00 | 1191.86 | 1201.78 | 1201.78 | 669.05 | 2.237 | 2.339 | 10.892 | 4.364 | 15.256 | 71.397 | 4.364 | 70.00 | 1492.16 | 1399.37 | 2.450 | 571.173 |
| VI | 6.63 | 6.82 | 6.50 | 1187.61 | 1193.26 | 1193.26 | 667.15 | 2.24 | 2.374 | 12.089 | 2.807 | 14.346 | 60.667 | 2.807 | 70.00 | 1492.16 | 1342.34 | 2.30 | 590.53 |
| 1 | 6.50 | 6.82 | 6.50 | 1190.30 | 1190.30 | 1190.30 | 661.50 | 2.236 | 2.364 | 11.067 | 3.035 | 15.003 | 75.720 | 3.035 | 73.00 | 1550.11 | 1420.51 | 2.500 | 602.216 |
| 2 | 6.60 | 6.82 | 6.50 | 1192.51 | 1190.80 | 1190.80 | 664.95 | 2.249 | 2.324 | 12.043 | 2.226 | 15.269 | 78.973 | 2.226 | 71.00 | 1517.47 | 1373.60 | 2.200 | 551.547 |
| VI | 6.50 | 6.38 | 6.00 | 1175.63 | 1180.26 | 1180.26 | 659.05 | 2.255 | 2.308 | 13.177 | 2.292 | 15.469 | 65.181 | 2.292 | 67.00 | 1428.21 | 1333.63 | 2.87 | 429.251 |
| 1 | 6.66 | 6.38 | 6.00 | 1175.21 | 1180.27 | 1180.27 | 659.34 | 2.256 | 2.308 | 13.180 | 2.266 | 15.446 | 65.328 | 2.266 | 60.00 | 1278.99 | 1142.03 | 2.900 | 527.97 |
| 2 | 6.72 | 6.38 | 6.00 | 1191.89 | 1201.84 | 1201.84 | 660.92 | 2.203 | 2.308 | 12.873 | 4.542 | 17.415 | 73.918 | 4.542 | 65.00 | 1385.58 | 1219.22 | 2.630 | 453.892 |
| VI | 6.43 | 6.38 | 6.50 | 1170.40 | 1176.75 | 1176.75 | 662.75 | 2.281 | 2.293 | 14.440 | 0.506 | 14.346 | 36.619 | 0.506 | 70.00 | 1492.16 | 1421.35 | 2.88 | 430.82 |
| 1 | 6.53 | 6.38 | 6.50 | 1180.34 | 1191.87 | 1191.87 | 660.21 | 2.201 | 2.293 | 14.240 | 1.949 | 16.034 | 66.503 | 1.949 | 69.00 | 1207.68 | 1162.72 | 2.850 | 439.73 |
| 2 | 6.93 | 6.38 | 6.50 | 1196.20 | 1202.33 | 1202.33 | 669.64 | 2.195 | 2.293 | 13.831 | 1.697 | 16.639 | 71.660 | 1.697 | 71.00 | 980.66 | 933.99 | 2.600 | 250.174 |
| VI | 6.50 | 6.38 | 6.50 | 1175.63 | 1180.26 | 1180.26 | 659.05 | 2.26 | 2.308 | 13.177 | 2.292 | 15.469 | 65.181 | 2.292 | 67.00 | 1428.21 | 1333.63 | 2.87 | 430.82 |
| 1 | 6.66 | 6.38 | 6.50 | 1175.21 | 1180.27 | 1180.27 | 659.34 | 2.256 | 2.308 | 13.180 | 2.266 | 15.446 | 65.328 | 2.266 | 60.00 | 1278.99 | 1142.03 | 2.900 | 453.892 |
| 2 | 6.72 | 6.38 | 6.50 | 1191.89 | 1201.84 | 1201.84 | 660.92 | 2.203 | 2.308 | 12.873 | 4.542 | 17.415 | 73.918 | 4.542 | 65.00 | 1385.58 | 1219.22 | 2.630 | 368.338 |
| VI | 6.43 | 6.38 | 6.50 | 1170.40 | 1176.75 | 1176.75 | 662.75 | 2.281 | 2.293 | 14.440 | 0.506 | 14.346 | 36.619 | 0.506 | 70.00 | 1492.16 | 1421.35 | 2.88 | 430.82 |
| 1 | 6.53 | 6.38 | 6.50 | 1180.34 | 1191.87 | 1191.87 | 660.21 | 2.201 | 2.293 | 14.240 | 1.949 | 16.034 | 66.503 | 1.949 | 69.00 | 1207.68 | 1162.72 | 2.850 | 453.892 |
| 2 | 6.93 | 6.38 | 6.50 | 1196.20 | 1202.33 | 1202.33 | 669.64 | 2.195 | 2.293 | 13.831 | 1.697 | 16.639 | 71.660 | 1.697 | 71.00 | 980.66 | 933.99 | 2.600 | 250.174 |
| VI | 6.50 | 6.38 | 6.50 | 1175.63 | 1180.26 | 1180.26 | 659.05 | 2.26 | 2.308 | 13.177 | 2.292 | 15.469 | 65.181 | 2.292 | 67.00 | 1428.21 | 1333.63 | 2.87 | 430.82 |
| 1 | 6.66 | 6.38 | 6.50 | 1175.21 | 1180.27 | 1180.27 | 659.34 | 2.256 | 2.308 | 13.180 | 2.266 | 15.446 | 65.328 | 2.266 | 60.00 | 1278.99 | 1142.03 | 2.900 | 453.892 |
| 2 | 6.72 | 6.38 | 6.50 | 1191.89 | 1201.84 | 1201.84 | 660.92 | 2.203 | 2.308 | 12.873 | 4.542 | 17.415 | 73.918 | 4.542 | 65.00 | 1385.58 | 1219.22 | 2.630 | 368.338 |
| VI | 6.43 | 6.38 | 6.50 | 1170.40 | 1176.75 | 1176.75 | 662.75 | 2.281 | 2.293 | 14.440 | 0.506 | 14.346 | 36.619 | 0.506 | 70.00 | 1492.16 | 1421.35 | 2.88 | 430.82 |
| 1 | 6.53 | 6.38 | 6.50 | 1180.34 | 1191.87 | 1191.87 | 660.21 | 2.201 | 2.293 | 14.240 | 1.949 | 16.034 | 66.503 | 1.949 | 69.00 | 1207.68 | 1162.72 | 2.850 | 453.892 |
| 2 | 6.93 | 6.38 | 6.50 | 1196.20 | 1202.33 | 1202.33 | 669.64 | 2.195 | 2.293 | 13.831 | 1.697 | 16.639 | 71.660 | 1.697 | 71.00 | 980.66 | 933.99 | 2.600 | 250.174 |
| VI | 6.50 | 6.38 | 6.50 | 1175.63 | 1180.26 | 1180.26 | 659.05 | 2.26 | 2.308 | 13.177 | 2.292 | 15.469 | 65.181 | 2.292 | 67.00 | 1428.21 | 1333.63 | 2.87 | 430.82 |
| 1 | 6.66 | 6.38 | 6.50 | 1175.21 | 1180.27 | 1180.27 | 659.34 | 2.256 | 2.308 | 13.180 | 2.266 | 15.446 | 65.328 | 2.266 | 60.00 | 1278.99 | 1142.03 | 2.900 | 453.892 |
| 2 | 6.72 | 6.38 | 6.50 | 1191.89 | 1201.84 | 1201.84 | 660.92 | 2.203 | 2.308 | 12.873 | 4.542 | 17.415 | 73.918 | 4.542 | 65.00 | 1385.58 | 1219.22 | 2.630 | 368.338 |
| VI | 6.43 | 6.38 | 6.50 | 1170.40 | 1176.75 | 1176.75 | 662.75 | 2.281 | 2.293 | 14.440 | 0.506 | 14.346 | 36.619 | 0.506 | 70.00 | 1492.16 | 1421.35 | 2.88 | 430.82 |
| 1 | 6.53 | 6.38 | 6.50 | 1180.34 | 1191.87 | 1191.87 | 660.21 | 2.201 | 2.293 | 14.240 | 1.949 | 16.034 | 66.503 | 1.949 | 69.00 | 1207.68 | 1162.72 | 2.850 | 453.892 |
| 2 | 6.93 | 6.38 | 6.50 | 1196.20 | 1202.33 | 1202.33 | 669.64 | 2.195 | 2.293 | 13.831 | 1.697 | 16.639 | 71.660 | 1.697 | 71.00 | 980.66 | 933.99 | 2.600 | 250.174 |
| VI | 6.50 | 6.38 | 6.50 | 1175.63 | 1180.26 | 1180.26 | 659.05 | 2.26 | 2.308 | 13.177 | 2.292 | 15.469 | 65.181 | 2.292 | 67.00 | 1428.21 | 1333.63 | 2.87 | 430.82 |
| 1 | 6.66 | 6.38 | 6.50 | 1175.21 | 1180.27 | 1180.27 | 659.34 | 2.256 | 2.308 | 13.180 | 2.266 | 15.446 | 65.328 | 2.266 | 60.00 | 1278.99 | 1142.03 | 2.900 | 453.892 |
| 2 | 6.72 | 6.38 | 6.50 | 1191.89 | 1201.84 | 1201.84 | 660.92 | 2.203 | 2.308 | 12.873 | 4.542 | 17.415 | 73.918 | 4.542 | 65.00 | 1385.58 | 1219.22 | 2.630 | 368.338 |
| VI | 6.43 | 6.38 | 6.50 | 1170.40 | 1176.75 | 1176.75 | 662.75 | 2.281 | 2.293 | 14.440 | 0.506 | 14.346 | 36.619 | 0.506 | 70.00 | 1492.16 | 1421.35 | 2.88 | 430.82 |
| 1 | 6.53 | 6.38 | 6.50 | 1180.34 | 1191.87 | 1191.87 | 660.21 | 2.201 | 2.293 | 14.240 | 1.949 | 16.034 | 66.503 | 1.949 | 69.00 | 1207.68 | 1162.72 | 2.850 | 453.892 |
| 2 | 6.93 | 6.38 | 6.50 | 1196.20 | 1202.33 | 1202.33 | 669.64 | 2.195 | 2.293 | 13.831 | 1.697 | 16.639 | 71.660 | 1.697 | 71.00 | 980.66 | 933.99 | 2.600 | 250.174 |
| VI | 6.50 | 6.38 | 6.50 | 1175.63 | 1180.26 | 1180.26 | 659.05 | 2.26 | 2.308 | 13.177 | 2.292 | 15.469 | 65.181 | 2.292 | 67.00 | 1428.21 | 1333.63 | 2.87 | 430.82 |
| 1 | 6.66 | 6.38 | 6.50 | 1175.21 | 1180.27 | 1180.27 | 659.34 | 2.256 | 2.308 | 13.180 | 2.266 | 15.446 | 65.328 | 2.266 | 60.00 | 1278.99 | 1142.03 | 2.900 | 453.892 |
| 2 | 6.72 | 6.38 | 6.50 | 1191.89 | 1201.84 | 1201.84 | 660.92 | 2.203 | 2.308 | 12.873 | 4.542 | 17.415 | 73.918 | 4.542 | 65.00 | 1385.58 | 1219.22 | 2.630 | 368.338 |
| VI | 6.43 | 6.38 | 6.50 | 1170.40 | 1176.75 | 1176.75 | 662.75 | 2.281 | 2.293 | 14.440 | 0.506 | 14.346 | 36.619 | 0.506 | 70.00 | 1492.16 | 1421.35 | 2.88 | 430.82 |
| 1 | 6.53 | 6.38 | 6.50 | 1180.34 | 1191.87 | 1191.87 | 660.21 | 2.201 | 2.293 | 14.240 | 1.949 | 16.034 | 66.503 | 1.949 | 69.00 | 1207.68 | 1162.72 | 2.850 | 453.892 |
| 2 | 6.93 | 6.38 | 6.50 | 1196.20 | 1202.33 | 1202.33 | 669.64 | 2.195 | 2.293 | 13.831 | 1.697 | 16.639 | 71.660 | 1.697 | 71.00 | 980.66 | 933.99 | 2.600 | 250.174 |
| VI | 6.50 | 6.38 | 6.50 | 1175.63 | 1180.26 | 1180.26 | 659.05 | 2.26 | 2.308 | 13.177 | 2.292 | 15.469 | 65.181 | 2.292 | 67.00 | 1428.21 | 1333.63 | 2.87 | 430.82 |
| 1 | 6.66 | 6.38 | 6.50 | 1175.21 | 1180.27 | 1180.27 | 659.34 | 2.256 | 2.308 | 13.180 | 2.266 | 15.446 | 65.328 | 2.266 | 60.00 | 1278.99 | 1142.03 | 2.900 | 453.892 |
| 2 | 6.72 | 6.38 | 6.50 | 1191.89 | 1201.84 | 1201.84 | 660.92 | 2.203 | 2.308 | 12.873 | 4.542 | 17.415 | 73.918 | 4.542 | 65.00 | 1385.58 | 1219.22 | 2.630 | 368.338 |
| VI | 6.43 | 6.38 | 6.50 | 1170.40 | 1176.75 | 1176.75 | 662.75 | 2.281 | 2.293 | 14.440 | 0.506 | 14.346 | 36.619 | 0.506 | 70.00 | 1492.16 | 1421.35 | 2.88 | 430.82 |
| 1 | 6.53 | 6.38 | 6.50 | 1180.34 | 1191.87 | 1191.87 | 660.21 | 2.201 | 2.293 | 14.240 | 1.949 | 16.034 | 66.503 | | | | | | |

Lampiran 16 Hasil Pengujian Marshall Variasi 2 (25% Boyong : 75% Clereng)



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SIFAT CAMPURAN ASPAL DENGAN METODE MARSHALL

Tanggal Pengujian : 19 Juni 2017
Tipe Campuran : AC - BC
: Agregat Kasar Boyong 25%

Dikerjakan Oleh : Dian Noer Anggita Arrum
Diperiksa Oleh : Ir. Subarkah, M.T.

| Sampel | t (cm) | a (%) | b (%) | c (gram) | d (gram) | e (gram) | f (gram) | g Density | h | i | l | k | VMA (%) | m VFA (%) | n VITM (%) | o | p | Koreksi Tebal | q Stabilitas (kg) | r F _{max} (mm) | MQ (kg/mm) | |
|--------|--------|-------|-------|----------|----------|----------|----------|-----------|-------|--------|--------|-------|---------|-----------|------------|-------|---------|---------------|-------------------|-------------------------|------------|--------|
| 1 | 6.69 | 4.71 | 4.50 | 1181.30 | 1191.08 | 668.01 | 523.07 | 2.258 | 2.355 | 9.896 | 85.995 | 4.110 | 14.005 | 70.656 | 4.110 | 64.00 | 1364.26 | 0.887 | 1209.50 | 2.250 | 537.556 | |
| 2 | 7.16 | 4.71 | 4.50 | 1226.56 | 1242.84 | 672.33 | 570.51 | 2.150 | 2.355 | 9.420 | 81.865 | 8.715 | 18.135 | 51.945 | 8.715 | 63.00 | 1342.94 | 0.827 | 1110.61 | 2.190 | 507.129 | |
| 3 | 7.13 | 4.71 | 4.50 | 1186.57 | 1199.75 | 670.15 | 529.60 | 2.241 | 2.355 | 9.817 | 86.313 | 4.869 | 14.687 | 68.844 | 4.869 | 71.00 | 1517.47 | 0.831 | 1287.65 | 2.550 | 491.196 | |
| 1 | 6.76 | 5.26 | 5.00 | 1179.88 | 1183.54 | 659.66 | 533.88 | 2.210 | 2.339 | 10.760 | 83.712 | 5.529 | 16.288 | 66.057 | 5.529 | 67.00 | 1428.21 | 0.874 | 1248.25 | 2.230 | 559.755 | |
| 2 | 6.66 | 5.26 | 5.00 | 1190.05 | 1198.68 | 664.72 | 533.96 | 2.229 | 2.339 | 10.861 | 84.421 | 4.729 | 15.579 | 69.647 | 4.729 | 72.00 | 1534.79 | 0.893 | 1370.82 | 2.920 | 469.460 | |
| 3 | 6.49 | 5.26 | 5.00 | 1174.32 | 1181.69 | 662.49 | 519.20 | 2.262 | 2.339 | 11.012 | 85.673 | 3.315 | 14.327 | 76.859 | 3.315 | 60.00 | 1278.99 | 0.934 | 1194.93 | 2.520 | 474.178 | |
| 1 | 6.64 | 5.82 | 5.50 | 1190.65 | 1202.82 | 674.75 | 528.07 | 2.255 | 2.324 | 12.075 | 84.956 | 2.969 | 15.044 | 80.263 | 2.969 | 70.00 | 1492.16 | 0.898 | 1339.59 | 2.970 | 451.039 | |
| 2 | 6.93 | 5.82 | 5.50 | 1179.45 | 1193.70 | 660.07 | 533.63 | 2.210 | 2.324 | 11.837 | 83.280 | 4.884 | 16.720 | 70.793 | 4.884 | 66.00 | 1406.89 | 0.851 | 1156.63 | 3.050 | 352.338 | |
| 3 | 6.94 | 5.82 | 5.50 | 1185.47 | 1203.69 | 670.50 | 533.19 | 2.223 | 2.324 | 11.907 | 83.774 | 4.319 | 16.226 | 73.381 | 4.319 | 68.00 | 1449.53 | 0.849 | 1231.16 | 2.410 | 510.655 | |
| 1 | 6.50 | 6.38 | 6.00 | 1169.47 | 1179.77 | 646.63 | 531.14 | 2.202 | 2.308 | 12.864 | 82.023 | 4.813 | 17.477 | 73.604 | 4.813 | 61.00 | 1300.31 | 0.921 | 1187.48 | 3.900 | 342.138 | |
| 2 | 6.57 | 6.38 | 6.00 | 1180.26 | 1181.75 | 650.30 | 531.45 | 2.221 | 2.308 | 12.975 | 83.236 | 3.789 | 16.764 | 77.396 | 3.789 | 59.00 | 1257.68 | 0.952 | 1197.77 | 3.100 | 386.376 | |
| 3 | 6.53 | 6.38 | 6.00 | 1143.96 | 1149.21 | 643.21 | 506.00 | 2.261 | 2.308 | 13.208 | 84.734 | 2.058 | 15.266 | 86.518 | 2.058 | 58.00 | 1236.36 | 0.956 | 1181.96 | 2.450 | 482.433 | |
| 1 | 7.07 | 6.95 | 6.50 | 1257.91 | 1268.82 | 703.82 | 565.00 | 2.226 | 2.293 | 14.091 | 83.001 | 2.908 | 16.999 | 82.891 | 2.908 | 56.00 | 1193.73 | 0.837 | 998.96 | 4.330 | 230.706 | |
| 2 | 6.57 | 6.95 | 6.50 | 1176.37 | 1185.05 | 658.01 | 527.04 | 2.232 | 2.293 | 14.127 | 83.211 | 2.662 | 16.789 | 84.142 | 2.662 | 50.00 | 1065.83 | 0.914 | 974.08 | 2.850 | 341.782 | |
| 3 | 6.53 | 6.95 | 6.50 | 1163.83 | 1173.14 | 651.55 | 521.59 | 2.231 | 2.293 | 14.122 | 83.184 | 2.694 | 16.816 | 83.981 | 2.694 | 57.00 | 1215.04 | 0.926 | 1124.73 | 3.250 | 346.069 | |
| | | | | | | | | | | | | | | | | | | | | | | 306.18 |

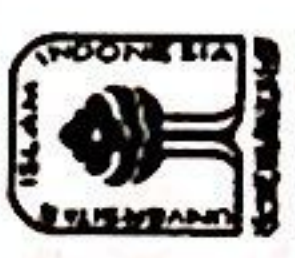
Mengetahui
Dosen Pembimbing

Ir. Subarkah, M.T.

Penguji

Dian Noer Anggita
12511035

Lampiran 17 Hasil Pengujian Marshall Variasi 3 (50% Boyong : 50% Clereng)



LABORATORIUM JALAN RAYA
 JURUSAN TEKNIK SIPIL
 FAKULTAS TEKNIK SIPIL DAN PENENCANAAN
 UNIVERSITAS ISLAM INDONESIA



Jl. Kalitrag KM 14.4 Kampus Terpadu UJI, Gedung Moh. Natsir, Telp. (0274) 898472, 898440, Fax. 8953330 Yogyakarta

SIFAT CAMPURAN ASPAL DENGAN METODE MARSHALL

Tanggal Pengujian : 19 Juni 2017
 Tipe Campuran : AC - BC
 : Agregat Kasar Boyong 50%

Dikerjakan Oleh : Dian Noer Anggita Arrum
 Diperiksa Oleh : Ir. Subarkah, M. T.

| Sampel | t (cm) | a (%) | b (%) | c (gram) | d (gram) | e (gram) | f (gram) | g Density | h | i | k | l | YMA (%) | m VFVA (%) | n VITM (%) | o | p | Koreksi Tebal | q Stabilitas (kg) | r Flow (mm) | MQ (kg/mm) | |
|--------|--------|-------|-------|----------|----------|----------|----------|-----------|-------|--------|--------|-------|---------|------------|------------|-------|---------|---------------|-------------------|-------------|------------|---------|
| 1 | 6.76 | 4.71 | 4.50 | 1170.09 | 101.52 | 651.00 | 530.04 | 2.100 | 2.355 | 0.577 | 03.224 | 7.100 | 10.770 | 57.000 | 7.100 | 67.00 | 1480.21 | 0.073 | 1247.00 | 2.500 | 401.400 | |
| 2 | 6.93 | 4.71 | 4.50 | 1185.63 | 119.74 | 658.54 | 541.20 | 2.191 | 2.355 | 0.599 | 03.419 | 6.982 | 16.581 | 57.891 | 6.982 | 47.00 | 1001.88 | 0.850 | 851.98 | 2.360 | 361.010 | |
| 3 | 6.68 | 4.71 | 4.50 | 1175.53 | 185.69 | 658.44 | 527.26 | 2.230 | 2.355 | 0.769 | 04.896 | 5.335 | 15.104 | 64.681 | 5.335 | 68.00 | 1449.53 | 0.888 | 1287.09 | 2.650 | 485.634 | |
| 1 | 6.77 | 5.26 | 5.00 | 1209.73 | 1221.60 | 665.27 | 556.33 | 2.174 | 2.339 | 10.587 | 02.366 | 7.047 | 17.634 | 60.005 | 7.047 | 64.00 | 1364.26 | 0.871 | 1123.48 | 2.650 | 442.72 | |
| 2 | 6.90 | 5.26 | 5.00 | 1203.99 | 1210.34 | 660.76 | 543.98 | 2.191 | 2.339 | 10.665 | 02.379 | 6.305 | 17.021 | 62.661 | 6.305 | 61.00 | 1300.31 | 0.893 | 1033.67 | 2.700 | 448.178 | |
| 3 | 6.82 | 5.26 | 5.00 | 1185.40 | 1177.58 | 664.35 | 513.23 | 2.271 | 2.339 | 11.055 | 06.011 | 2.934 | 13.989 | 79.028 | 2.934 | 60.00 | 1278.99 | 0.928 | 1186.48 | 2.710 | 437.815 | |
| 1 | 6.70 | 5.82 | 5.50 | 1187.75 | 1198.01 | 661.26 | 536.75 | 2.213 | 2.324 | 11.851 | 03.378 | 4.771 | 16.622 | 71.297 | 4.771 | 64.00 | 1364.26 | 0.884 | 1185.27 | 2.650 | 432.33 | |
| 2 | 6.86 | 5.82 | 5.50 | 1185.08 | 1174.71 | 657.21 | 517.60 | 2.251 | 2.324 | 12.057 | 04.829 | 3.114 | 15.171 | 79.475 | 3.114 | 62.00 | 1321.63 | 0.918 | 1213.25 | 2.800 | 413.205 | |
| 3 | 6.82 | 5.82 | 5.50 | 1194.50 | 1159.34 | 658.70 | 538.23 | 2.209 | 2.324 | 11.630 | 03.231 | 4.939 | 16.769 | 70.544 | 4.939 | 63.00 | 1342.94 | 0.892 | 1107.20 | 3.100 | 371.289 | |
| 1 | 6.68 | 6.38 | 6.00 | 1185.00 | 1190.13 | 662.85 | 527.28 | 2.247 | 2.304 | 13.100 | 04.231 | 2.639 | 15.769 | 81.264 | 2.639 | 62.00 | 1321.63 | 0.888 | 1192.84 | 2.930 | 407.45 | |
| 2 | 6.69 | 6.38 | 6.00 | 1183.43 | 1189.68 | 656.26 | 533.42 | 2.219 | 2.308 | 12.961 | 03.151 | 3.887 | 16.849 | 76.929 | 3.887 | 67.00 | 1428.21 | 0.886 | 1265.21 | 3.650 | 345.634 | |
| 3 | 6.74 | 6.38 | 6.00 | 1192.90 | 1204.57 | 660.20 | 544.37 | 2.191 | 2.308 | 12.802 | 02.131 | 5.067 | 17.869 | 71.645 | 5.067 | 45.00 | 959.24 | 0.876 | 840.30 | 3.750 | 224.090 | |
| 1 | 6.79 | 6.95 | 6.50 | 1189.26 | 1200.09 | 660.03 | 540.06 | 2.202 | 2.293 | 13.937 | 02.095 | 3.968 | 17.905 | 77.28 | 3.968 | 64.00 | 1364.26 | 0.868 | 1132.33 | 3.70 | 235.93 | |
| 2 | 6.92 | 6.95 | 6.50 | 1172.31 | 1192.01 | 654.23 | 523.78 | 2.196 | 2.293 | 12.900 | 01.977 | 4.223 | 16.127 | 76.699 | 4.223 | 74.00 | 724.76 | 0.951 | 1184.26 | 4.170 | 283.996 | |
| 3 | 6.80 | 6.95 | 6.50 | 1190.33 | 1194.63 | 661.21 | 533.42 | 2.232 | 2.293 | 14.123 | 03.191 | 2.685 | 16.809 | 84.025 | 2.685 | 58.00 | 1236.36 | 0.907 | 1121.38 | 4.210 | 149.702 | |
| | | | | | | | | | | | | | | | | | | | | | | 268.361 |
| | | | | | | | | | | | | | | | | | | | | | | 233.38 |

Mengetahui
 Dosen Pembimbing

Ir. Subarkah, M.T.

Penguji

Dian Noer Anggita
 12511035

Lampiran 18 Hasil Pengujian Marshall Variasi 4 (75% Boyong : 25% Ciereng)



LABORATORIUM JALAN RAYA
 JURUSAN TEKNIK SIPIL
 FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
 UNIVERSITAS ISLAM INDONESIA

Jl. Kalitjantung KM 14.4 Kampus Terpadu UII, Gedung Moh. Natsir, Telp. (0274) 898472, 898473, 898474, Fax. 895330 Yogyakarta



SIFAT CAMPURAN ASPAL DENGAN METODE MARSHALL

Tanggal Pengujian : 19 Juni 2017
 Tipe Campuran : AC - BC
 Agregat Kasar Boyong 75%

Dikerjakan Oleh : Dian Noer Anggita Arrum
 Diperiksa Oleh : Ir. Subarkah, M.T.

| Sampel | t (cm) | a (%) | b (%) | c (gram) | d (gram) | e (gram) | f (gram) | g Density | h | i | j | k | l VMA (%) | m VFVA (%) | n VITM (%) | o | p | q Koreksi Tebal | r Stabilitas (kg) | s Flow (mm) | t MO (kg/mm) |
|--------|--------|-------|-------|----------|----------|----------|----------|-----------|-------|--------|--------|-------|-----------|------------|------------|-------|---------|-----------------|-------------------|-------------|--------------|
| 1 | 6.09 | 4.71 | 4.50 | 1192.25 | 1203.03 | 655.14 | 540.43 | 2.174 | 2.355 | 0.524 | 02.700 | 7.700 | 17.201 | 55.277 | 7.700 | 53.00 | 1123.70 | 0.006 | 1000.56 | 2.750 | 363.040 |
| 2 | 7.01 | 4.71 | 4.50 | 1180.25 | 1193.41 | 659.23 | 534.18 | 2.209 | 2.355 | 9.681 | 84.131 | 6.187 | 15.869 | 61.008 | 6.187 | 55.00 | 1172.41 | 0.843 | 987.89 | 2.550 | 387.407 |
| 3 | 6.90 | 4.71 | 4.50 | 1190.26 | 1199.17 | 656.08 | 543.09 | 2.192 | 2.355 | 9.603 | 83.453 | 6.944 | 16.547 | 58.035 | 6.944 | 59.00 | 1257.68 | 0.863 | 1073.04 | 2.730 | 393.055 |
| 1 | 6.62 | 5.26 | 5.00 | 1192.16 | 1204.80 | 660.60 | 544.20 | 2.191 | 2.339 | 10.665 | 82.979 | 6.356 | 17.021 | 62.660 | 6.356 | 60.00 | 1278.99 | 0.901 | 1152.91 | 2.840 | 405.953 |
| 2 | 6.66 | 5.26 | 5.00 | 1184.30 | 1193.08 | 664.78 | 528.30 | 2.242 | 2.339 | 10.314 | 84.313 | 4.173 | 15.087 | 72.339 | 4.173 | 59.00 | 1236.36 | 0.892 | 1102.83 | 2.880 | 382.328 |
| 3 | 6.59 | 5.26 | 5.00 | 1212.92 | 1215.53 | 661.71 | 553.82 | 2.190 | 2.339 | 10.663 | 82.957 | 6.380 | 17.043 | 62.564 | 6.380 | 57.00 | 1215.04 | 0.910 | 1105.08 | 2.740 | 403.315 |
| 1 | 6.92 | 5.82 | 5.50 | 1192.29 | 1203.66 | 661.01 | 542.65 | 2.197 | 2.724 | 11.769 | 82.799 | 5.439 | 17.207 | 69.399 | 5.439 | 62.00 | 1221.62 | 0.862 | 1179.82 | 2.140 | 362.634 |
| 2 | 6.78 | 5.82 | 5.50 | 1190.11 | 1201.69 | 657.45 | 544.24 | 2.187 | 2.324 | 11.711 | 82.394 | 5.895 | 17.606 | 66.517 | 5.895 | 60.00 | 1278.99 | 0.869 | 1111.36 | 3.010 | 369.224 |
| 3 | 6.50 | 5.82 | 5.50 | 1170.43 | 1179.45 | 663.22 | 516.23 | 2.267 | 2.324 | 12.142 | 85.428 | 2.430 | 14.272 | 83.327 | 2.430 | 59.00 | 1297.68 | 0.934 | 1174.56 | 3.000 | 383.842 |
| 1 | 6.78 | 6.38 | 6.00 | 1175.23 | 1185.06 | 651.18 | 533.88 | 2.201 | 2.308 | 12.861 | 82.504 | 4.635 | 17.496 | 73.506 | 4.635 | 62.00 | 1321.63 | 0.870 | 1141.99 | 3.07 | 371.92 |
| 2 | 6.64 | 6.38 | 6.00 | 1168.80 | 1176.72 | 656.63 | 520.09 | 2.247 | 2.308 | 13.129 | 81.229 | 2.642 | 16.772 | 82.216 | 2.642 | 62.00 | 1109.16 | 0.922 | 1022.27 | 3.750 | 291.915 |
| 3 | 6.80 | 6.38 | 6.00 | 1190.72 | 1203.35 | 657.92 | 545.43 | 2.183 | 2.308 | 12.754 | 81.821 | 5.425 | 18.179 | 70.160 | 5.425 | 55.00 | 1172.41 | 0.866 | 1015.67 | 3.810 | 266.581 |
| 1 | 6.95 | 6.95 | 6.50 | 1176.21 | 1194.97 | 650.84 | 544.13 | 2.162 | 2.293 | 13.681 | 80.586 | 5.732 | 19.414 | 70.473 | 5.732 | 30.00 | 639.50 | 0.848 | 542.29 | 4.110 | 131.945 |
| 2 | 6.84 | 6.95 | 6.50 | 1179.64 | 1189.86 | 653.32 | 536.54 | 2.199 | 2.293 | 13.915 | 81.965 | 4.120 | 18.035 | 77.156 | 4.120 | 45.00 | 959.24 | 0.859 | 823.81 | 4.100 | 200.328 |
| 3 | 6.65 | 6.95 | 6.50 | 1160.09 | 1169.41 | 647.21 | 522.20 | 2.231 | 2.293 | 14.121 | 83.177 | 2.702 | 18.823 | 83.938 | 2.702 | 80.00 | 1365.08 | 0.895 | 1240.53 | 4.820 | 268.783 |
| | | | | | | | | 2.28 | | | | | 18.89 | 72.19 | 4.18 | | | | 868.88 | 4.28 | 199.88 |

Mengetahui
 Dosen Pembimbing

Ir. Subarkah, M.T.

Penguji

Dian Noer Anggita
 12511035