

## Method of Test for Calculating Percent Reclaimed Asphalt Pavement (RAP) in the Mix

---

### 1. Scope:

This test is for calculating the percent Reclaimed Asphalt Pavement (RAP) in the mix as a percent of the total aggregate.

### 2. Apparatus:

NONE

### 3. Procedure:

#### Weigh Ticket Entries

3.1 Record the total tons of hot mix produced for the day from the tickets (**A**) (nearest 0.01 ton).

3.2 Record the Moisture in the mix percentage from the most recent one tested (**B**) (nearest 0.1 percent). (DOT-35)

3.3 Calculate the Moisture in the mix in tons (**C**) (nearest 0.01 ton):

$$C = \frac{A \times \left(\frac{B}{100}\right)}{\left[1 + \left(\frac{B}{100}\right)\right]}$$

3.4 Calculate the Total dry amount of hot mix produced for the day in tons (**D**) (nearest 0.01 ton).

$$D = A - C$$

3.5 Record the Added binder percentage by cutoff from the DOT-89 (**E**) (nearest 0.01 percent).

3.6 Calculate the Total amount of added binder in tons (**F**) (nearest 0.01 ton):

$$F = A \times \left(\frac{E}{100}\right)$$

3.7 Record the Added lime percentage by cutoff from the DOT-33Q (**G**) (nearest 0.01 percent).

3.8 Calculate the Total amount of added lime in tons (**H**) (nearest 0.01 ton):

$$H = A \times \left(\frac{G}{100}\right)$$

- 3.9 Calculate the Total dry Virgin MA and RAP from tickets and cutoffs in tons (**I**) (nearest 0.01 ton):

$$I = D - (F + H)$$

Weigh Bridge Entries

- 3.10 Record the Weight of Virgin MA from weight bridge totalizer in tons. This should be the wet amount of aggregate not including the hydrated lime going into the dryer drum (**J**) (nearest 0.01 ton).
- 3.11 Record the Percent moisture in Virgin MA (Average of QC tests for the day) (**K**) (nearest 0.1 percent). (DOT-69)
- 3.12 Calculate the Weight of water in Virgin MA in tons (**L**) (nearest 0.01 ton):

$$L = \frac{J \times \left(\frac{K}{100}\right)}{\left[1 + \left(\frac{K}{100}\right)\right]}$$

- 3.13 Calculate the Weight of dry Virgin MA in tons (**M**) (nearest 0.01 ton):

$$M = J - L$$

- 3.14 Record the Weight of RAP from weigh bridge totalizer in tons (**N**) (nearest 0.01 ton).
- 3.15 Record the Percent moisture in the RAP from most recent test for moisture in the RAP material (DOT-35) (**O**) (nearest 0.1 percent).
- 3.16 Calculate the Weight of water in the RAP mixture in tons (**P**) (nearest 0.01 ton):

$$P = \frac{N \times \left(\frac{O}{100}\right)}{\left[1 + \left(\frac{O}{100}\right)\right]}$$

- 3.17 Calculate the Weight of dry RAP from weigh bridge totalizer in tons (**Q**) (nearest 0.01 ton):

$$Q = N - P$$

- 3.18 Calculate the Total dry Virgin MA and RAP from weigh bridges in tons (**R**):

$$R = M + Q$$

RAP percentages

- 3.19 Calculate the Percentage of RAP based on weigh bridges (**S**) (nearest 0.01 percent):

$$S = \left(\frac{Q}{R}\right) \times 100$$

- 3.20 Calculate the Percentage of RAP based on weigh tickets (**T**) (nearest 0.01 percent):

$$T = \left(\frac{Q}{I}\right) \times 100$$

- 3.21 Calculate the % Difference between scale tickets and weigh bridges (**U**) (nearest 0.01 percent):

$$U = \left(\frac{I - R}{I}\right) \times 100$$

**4. Report:**

- 4.1 Record all data and findings on test report (DOT-93) and the percent RAP by test (**S**) to the nearest whole percent on line at top of (DOT-93) test report.

**5. References:**

DOT-33Q  
DOT-89  
DOT-93

Sample ID 2242952

**Percent Reclaimed Asphalt Pavement (RAP) in  
the Mix as Percent of Total Aggregate**

DOT-93  
9-15

File # \_\_\_\_\_ REPORT # 8  
 PROJECT PH 0066(00)15 COUNTY Aurora, Ziebach PCN B015  
 DATE 10/25/2016 INSPECTOR Tester, One CONTRACTOR Roads, Inc  
 Per Cent RAP Desired 15-25 Per Cent RAP by Test 21 MATERIAL TYPE Q3R

WEIGH TICKET ENTRIES

A.	Total of hot mix produced by tickets (tons)	545.95
B.	Moisture in the mix percentage (most recent one tested)	0.10
C.	Moisture in the mix (tons)	0.55
D.	Total dry amount of hot mix produced for the day (tons)	545.4
E.	Added binder percentage by cutoff (DOT-89)	4.94
F.	Total amount of added binder (tons)	26.97
G.	Added lime percentage by cutoff (DOT-33Q)	1.03
H.	Total amount of added lime (tons)	5.62
I.	Total dry Virgin MA and RAP from tickets & cutoffs (tons)	512.81

WEIGH BRIDGE ENTRIES

J.	Weight of Virgin MA from weight bridge totalizer (tons)	434.13
K.	Percent moisture in Virgin MA	3.30
L.	Weight of water in Virgin MA (tons)	13.87
M.	Weight of dry Virgin MA (tons)	420.26
N.	Weight of RAP from weigh bridge totalizer (tons)	113.22
O.	Percent moisture in RAP	0.70
P.	Weight of water in the RAP mixture (tons)	0.79
Q.	Weight of dry RAP from weigh bridge totalizer (tons)	112.43
R.	Total dry Virgin MA and RAP from weigh bridges (tons)	532.69

RAP PERCENTAGES

S.	Percentage of RAP based on weigh bridges	21.11
T.	Percentage of RAP based on weigh tickets	21.92
U.	% difference between scale tickets and weigh bridges	-3.88