## 334 SUPERPAVE ASPHALT CONCRETE.

(REV 7-1-15) (FA 7-2-15) (1-16)

SUBARTICLE 334-8.2.3.1 is deleted and the following substituted:

**334-8.2.3.1 Percent Within Limits:** The percent within limits (PWL) and Pay Factors for the LOT will be calculated as described below. Variables used in the calculations are as follows:

x = individual test value (sublot)

n = number of tests (sublots)

s = sample standard deviation

Σ(x2) = summation of squares of individual test values

(Σx)2 = summation of individual test values squared

QU = upper quality index

USL = upper specification limit (target value plus upper specification limit from Table 334‑8)

QL = lower quality index

LSL = lower specification limit (target value minus lower specification limit from Table 334‑8)

PU = estimated percentage below the USL

PL = estimated percentage above the LSL

1. Calculate the arithmetic mean of the test values:



2. Calculate the sample standard deviation (s):



3. Calculate the upper quality index (QU):



4. Calculate the lower quality index (QL):



5. From Table 334‑9, determine the percentage of work below the USL (PU).

6. From Table 334‑9, determine percentage of work above the LSL (PL) Note: If USL or LSL is not specified; percentages within (USL or LSL) will be 100.

7. If QU or QL is a negative number, then calculate the percent within limits for QU or QL as follows: enter Table 334‑9 with the positive value of QU or QL and obtain the corresponding percent within limits for the proper sample size. Subtract this number from 100.00. The resulting number is the value to be used in the next step (Step 8) for the calculation of quality level.

8. Calculate the percent within limits (PWL) = (PU+ PL) ‑ 100

9. Calculate the Pay Factor (PF) for each quality characteristic using the equation given in 334‑8.2.3.2.

| Table 334-8  Specification Limits | |
| --- | --- |
| Quality Characteristic | Specification Limits |
| Passing No. 8 sieve ( percent) | Target ± 3.1 |
| Passing No. 200 sieve (percent) | Target ± 1.0 |
| Asphalt Content (percent) | Target ± 0.40 |
| Air Voids (percent) | 4.00 ± 1.20 |
| Density, vibratory mode (percent of Gmm): | 93.00 + 2.00, - 1.20 |
| Density, static mode (1) (percent of Gmm) | 92.00 + 3.00, - 1.50 (1) |
| (1) No vibratory mode in the vertical direction will be allowed. Other vibratory modes will be allowed, if approved by the Engineer. | |

| Table 334-9  Percent Within Limits | | | | |
| --- | --- | --- | --- | --- |
| Quality Index | Percent within Limits for Selected Sample Size | | | |
| n = 3 | n = 4 | n = 5 | n = 6 |
| 0.00 | 50.00 | 50.00 | 50.00 | 50.00 |
| 0.05 | 51.38 | 51.67 | 51.78 | 51.84 |
| 0.10 | 52.76 | 53.33 | 53.56 | 53.67 |
| 0.15 | 54.15 | 55.00 | 55.33 | 55.50 |
| 0.20 | 55.54 | 56.67 | 57.10 | 57.32 |
|  | | | | |
| 0.25 | 56.95 | 58.33 | 58.87 | 59.14 |
| 0.30 | 58.37 | 60.00 | 60.63 | 60.94 |
| 0.35 | 59.80 | 61.67 | 62.38 | 62.73 |
| 0.40 | 61.26 | 63.33 | 64.12 | 64.51 |
| 0.45 | 62.74 | 65.00 | 65.84 | 66.27 |
|  | | | | |
| 0.50 | 64.25 | 66.67 | 67.56 | 68.00 |
| 0.55 | 65.80 | 68.33 | 69.26 | 69.72 |
| 0.60 | 67.39 | 70.00 | 70.95 | 71.41 |
| 0.65 | 69.03 | 71.67 | 72.61 | 73.08 |
| 0.70 | 70.73 | 73.33 | 74.26 | 74.71 |
|  | | | | |
| 0.75 | 72.50 | 75.00 | 75.89 | 76.32 |
| 0.80 | 74.36 | 76.67 | 77.49 | 77.89 |
| 0.85 | 76.33 | 78.33 | 79.07 | 79.43 |
| 0.90 | 78.45 | 80.00 | 80.62 | 80.93 |
| 0.95 | 80.75 | 81.67 | 82.14 | 82.39 |
|  | | | | |
| 1.00 | 83.33 | 83.33 | 83.64 | 83.80 |
| 1.05 | 86.34 | 85.00 | 85.09 | 85.18 |
| 1.10 | 90.16 | 86.67 | 86.52 | 86.50 |
| 1.15 | 97.13 | 88.33 | 87.90 | 87.78 |
| 1.20 | 100.00 | 90.00 | 89.24 | 89.01 |
|  | | | | |
| 1.25 | 100.00 | 91.67 | 90.54 | 90.19 |
| 1.30 | 100.00 | 93.33 | 91.79 | 91.31 |
| 1.35 | 100.00 | 95.00 | 92.98 | 92.37 |
| 1.40 | 100.00 | 96.67 | 94.12 | 93.37 |
| 1.45 | 100.00 | 98.33 | 95.19 | 94.32 |
|  | | | | |
| 1.50 | 100.00 | 100.00 | 96.20 | 95.19 |
| 1.55 | 100.00 | 100.00 | 97.13 | 96.00 |
| 1.60 | 100.00 | 100.00 | 97.97 | 96.75 |
| 1.65 | 100.00 | 100.00 | 98.72 | 97.42 |
| 1.70 | 100.00 | 100.00 | 99.34 | 98.02 |
|  | | | | |
| 1.75 | 100.00 | 100.00 | 99.81 | 98.55 |
| 1.80 | 100.00 | 100.00 | 100.00 | 98.99 |
| 1.85 | 100.00 | 100.00 | 100.00 | 99.36 |
| 1.90 | 100.00 | 100.00 | 100.00 | 99.65 |
| 1.95 | 100.00 | 100.00 | 100.00 | 99.85 |
|  | | | | |
| 2.00 | 100.00 | 100.00 | 100.00 | 99.97 |
| 2.05 | 100.00 | 100.00 | 100.00 | 100.00 |
| 2.10 | 100.00 | 100.00 | 100.00 | 100.00 |
| 2.15 | 100.00 | 100.00 | 100.00 | 100.00 |
| 2.20 | 100.00 | 100.00 | 100.00 | 100.00 |
|  | | | | |
| 2.25 | 100.00 | 100.00 | 100.00 | 100.00 |
| 2.30 | 100.00 | 100.00 | 100.00 | 100.00 |
| 2.35 | 100.00 | 100.00 | 100.00 | 100.00 |
| 2.40 | 100.00 | 100.00 | 100.00 | 100.00 |
| 2.45 | 100.00 | 100.00 | 100.00 | 100.00 |
|  | | | | |
| 2.50 | 100.00 | 100.00 | 100.00 | 100.00 |
| 2.55 | 100.00 | 100.00 | 100.00 | 100.00 |
| 2.60 | 100.00 | 100.00 | 100.00 | 100.00 |
| 2.65 | 100.00 | 100.00 | 100.00 | 100.00 |