

Determining Pay Factor for
SC-M-400 (QA - 2020)
(Section: 4.2.1.2)
2022

SCDOT
Office of Materials and Research

Example Calculation # 1

Project File No.: 4080335

Mix Type: Surface B

Job Mix No.: C0105

Targets:

Binder: 5.50

Gradation : See critical sieves
based on mix type

Air Voids: 3.25 (validation)

VMA: 15.35 (validation)

Calculation for Binder (AC)

		Target	Absolute Difference
Test 1	5.40	5.50	0.10
Test 2	5.30	5.50	0.20
Test 3	5.71	5.50	0.21
Test 4	5.65	5.50	0.15
Average			0.165
PF for Binder (table 7)			1.00

Calculation for Gradation

Critical Sieves for Surface B
Look at Table 7
3/8"
No. 8

3/8" Sieve	Results	JMF Target	Absolute Difference
Test 1	91.2	90.0	1.20
Test 2	92.3	90.0	2.30
Test 3	91.0	90.0	1.00
Test 4	92.1	90.0	2.10
Average			1.65
PF for 3/8 Sieve			1.05

Calculation for Gradation

Critical Sieves for
Surface B
Look at Table 7
 _____ No.4

No. 4 Sieve Results		JMF Target	Absolute Difference
Test 1	51.9	55.0	3.10
Test 2	55.0	55.0	0.00
Test 3	53.1	55.0	1.90
Test 4	54.8	55.0	0.20
Average			1.30
PF for No. 4 Sieve			1.05

Calculation for Gradation

Critical Sieves for
Surface B
Look at Table 7
 _____ No. 8

No. 8 Sieve Results		JMF Target	Absolute Difference
Test 1	46.8	43.0	3.80
Test 2	44.1	43.0	1.10
Test 3	43.5	43.0	0.50
Test 4	43.1	43.0	0.10
Average			1.38
PF for No. 8 Sieve			1.05

Calculation for Density

**Target Density
> 93.0 to obtain
100% or greater**

Test 1	93.5
Test 2	94.0
Test 3	93.2
Test 4	91.1
Test 5	93.1
Test 6	95.1

**Average of
the cores**

93.33%

**Look up
value in
Table 9**

PF Density

___ = 1.00

Calculating LOT Pay Factor (LPF)

$$LPF = \frac{(PF_{\text{BINDER}}) + (PF_{\text{GRADATION}}) + (PF_{\text{Den}})}{3}$$

Where: LPF = Percent pay factor for the LOT

PF_{ac} = Percent pay factor for binder content

PF_{gradation} = Percent pay factor for gradation (critical sieves)

PF_{Den} = Percent pay factor for in-place density.

Calculating LOT Pay Factor (LPF)

$$\text{LPF} = \frac{(\text{PF}_{\text{BINDER}}) + (\text{PF}_{\text{GRADATION}}) + (\text{PF}_{\text{Den}})}{3}$$

$$\text{LPF} = \frac{(1.00) + (1.05) + (1.00)}{3}$$

$$\text{LPF} = 1.017 \text{ (101.7 \%)}$$

Example Calculation # 2

Project File No.: 4080335

Mix Type: SurfaceD

Job Mix No.: A0285

Targets:

Binder: 6.50

Gradation : See critical sieves
based on mix type

Air Voids: 5.50 (validation)

VMA: 18.75 (validation)

Calculation for Binder (AC)

Target	6.50
Tolerance	0.36
LSL	6.14
USL	6.86

		Target	Absolute Difference
Test 1	6.62	6.50	0.12
Test 2	6.80	6.50	0.30
Test 3	6.99	6.50	0.49
Average			0.303
PF for Binder (table 7)			1.00

Calculation for Gradation

Surface D

Look at Table 7

No. 3/8

No. 4 & No. 8

No. 3/8 Sieve Results		JMF Target	Absolute Difference
Test 1	95.1	98.0	2.90
Test 2	96.3	98.0	1.70
Test 3	95.2	98.0	2.80
Average			2.47
PF for No. 3/8 Sieve			1.00

Calculation for Gradation

Surface D
Look at Table 7
No. 4

No. 4 Sieve Results		JMF Target	Absolute Difference
Test 1	78.3	82.0	3.70
Test 2	88.9	82.0	6.90
Test 3	88.0	82.0	6.00
Average			5.53
PF for No. 4 Sieve			0.95

Calculation for Gradation

Critical Sieves for
Surface D
Look at Table 7
No. 8

No. 8 Sieve Results		JMF Target	Absolute Difference
Test 1	65.9	70.0	4.10
Test 2	64.1	70.0	5.90
Test 3	64.5	70.0	5.55
Average			5.18
PF for No. 8 Sieve			0.90

Calculation for Density

Gauge Shots		Average of the readings
		100.30%
Test 1	101.0	Look up value in Table 10
Test 2	100.5	
Test 3	99.3	PF Density = 1.00
Test 4	100.9	
Test 5	100.5	
Test 6	99.7	

Calculating LOT Pay Factor (LPF)

$$LPF = \frac{(PF_{\text{BINDER}}) + (PF_{\text{GRADATION}}) + (PF_{\text{Den}})}{3}$$

$$LPF = \frac{(1.00) + (0.90) + (1.00)}{3}$$

$$LPF = \frac{(0.90) + (0.90) + (0.90)}{3}$$

$$LPF = 0.90 (90.0\%)$$

Example Calculation # 3

Project File No.: 4080335
Mix Type: Intermediate C
 Full Depth Patching
Job Mix No.: D0199
Targets:
 Binder: 4.90
 Gradation : See critical sieves
 based on mix type
 Air Voids: 3.70 (Validation)
 VMA: 14.85 (Validation)

Calculation for Binder (AC)

Target	4.90
Tolerance	0.43
LSL	4.47
USL	5.33

	Target	Absolute Difference
Test 1 4.52	4.90	0.38
Average		0.38
PF for Binder (table 8)		1.00

Calculation for Gradation

No. 1/2"
No. 4 & No. 8

No. 1/2" Sieve Results		JMF Target	Absolute Difference
Test 1	83.1	88.0	4.90
Average			4.90
PF for No. 1/2 Sieve			1.00

Calculation for Gradation

Critical Sieves for
Intermediate C
Look at Table 8
No. 4

No. 4 Sieve Results		JMF Target	Absolute Difference
Test 1	60.0	55.0	5.00
Average			5.00
PF for No. 4 Sieve			1.00

Calculation for Gradation

**Critical Sieves for
Intermediate C
Look at Table 8
No. 8**

No. 8 Sieve Results	JMF Target	Absolute Difference
Test 1 32.5	37.0	4.50
Average		4.50
PF for No. 8 Sieve		1.00

Calculating LOT Pay Factor (LPF)

$$LPF = \frac{(PF_{\text{BINDER}}) + (PF_{\text{GRADATION}})}{2}$$

$$LPF = \frac{(1.00) + (1.00)}{2}$$

$$LPF = 1.00 \text{ (100.0\%)}$$

The End

Questions?