



Pay 4 Performance

D-1 Up Date

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- ***Why PFP & What Is PFP***
- ***Specification Review***
- ***Projects Highlights.***
- ***Data Analysis.***
- ***Observations***
- ***Future Plans***

- ***QC accomplished its intended goal***
- ***Need to improve quality level***
- ***Need to provide for flexibility and reward innovation***
- ***So what can we do and are we ready for it?***

Pay For Performance (PFP) is a Percent Within Limits (PWL) based Specification.

Quality Characteristics are established to measure quality.

Voids, FVMA and Core Density are chosen as the 3 Quality Characteristics in this Specification.

Test results of these characteristics are analyzed statistically by the Quality Level Analysis method to determine the PWL.

The Department test results are used for the analysis.

PFP Special Provision is used in Projects that has a SURFACE mix of 8,000 T or more

Every 8,000 T make one Lot

Every lot is further divided into 10 sub lots

Random numbers are generated by Department materials staff to sample the mix to determine voids, VMA and dust/AC

The mix is sampled at the plant and split by the contractor 3 ways, 2 for Department and one for the contractor

Density is determined by cores, 3 per mile Randomly located by the RE

Pay Factor Distribution

Voids	30%
VMA	30%
Density	40%

Dust/AC
Stepped Disincentive



A photograph of a construction site. In the background, a yellow road roller is parked. Several workers in high-visibility green vests and white hard hats are standing around. The foreground shows a grid of blue rebar for a concrete surface.

In 2009

D-1

18 contracts let

6 Counties

16 projects completed

2 carried over to 2010

Surface Mixture



11 Projects with Mix F

8,600 ton to 30,200 ton

\$ 74 to \$ 90 per ton
(all jobs were bid in 2009)

7 Projects with mix D

8,400 ton to 18,000 ton

\$ 61 to \$ 67 per ton

8 Contractors

1 contractor completed 4 projects

1 contractor completed 3 Projects

5 contractors completed 2 Projects

2 contractors completed 1 Project

Results' Summary

<u># of Projects</u>	<u>Pay Range</u>
4 Project	Above 100%
6 Projects	96.1 100%
2 Projects	92.1 96%
4 Projects	92.0%

Results' Summary

Ave CPF All Projects

Ave Excluding < 92%

96.2%

98.9%

Voids

95.7%

96.3%

VMA

96.0%

99.8%

Density

97.6%

99.4%

Observations

- ***Projects below 97% PF, had a specific issue or cause for the lower PF.***
 - ***Aggregate Issue***
 - ***Plant Operation***
 - ***First Project, Planning???***
 - ***Marginal mix Design***
 - ***This is how we operate under QC/QA***

Observations

Density: Improved

More uniform

**7 of 8 contractors had projects with a
Density Pay Factor above 100%**

SD Range 1.10 to 2.2

Observations

Field VMA: Has not been an issue

**7 of 8 contractors had a project with
a FVMA Pay Factor above 100%**

SD Range 0.31 to 0.96

Observations

Mix Voids: Improved

**6 of 8 contractors had a project with
Voids Pay Factor above 100%**

SD Range 0.48 to 1.30

Challenged Tests:

Mix: 22 tests of 216 tests 10%

1 Contractor 11 of 51 22%

1 Contractor 4 of 41 10%

2 Contractors 3 of 34 9%

3 of 24 13%

1 Contractor 1 of 17 6%

Density: 22 Cores of 640 4%

Testing Mix 1

FPF 98.0
QC(100.0)

Parameter	IDOT	QC	IDOT	QC
N	10	8	10	8
Voids Ave	4.51	4.15	3.94	3.61
Voids SD	1.27	0.67	0.85	0.42
PF	87.0	102.0	99.0	103.0
VMA AVE	14.8	14.6	14.7	14.4
VMA SD 0.96	0.38	0.33	0.67	0.28
PF	96.0	103.0	98.5	103.0
Density Ave	93.6	93.1	93.4	92.8
Density SD	1.4	1.6	1.1	1.3
PF	100.0	95.0	101.5	96.0



Testing Mix 2

FPF 101.3
QC (101.6)

Parameter		IDOT		QC
N		10		14
Voids Ave		3.9		3.9
Voids SD		0.57		.62
PF		103.0		103.0
VMA AVE		14.3		14.3
VMA SD 0.96		0.31		.31
PF		100.5		101.0
Density Ave	60	94.1	60	94.2
Density SD		1.5		1.4
PF		100.5		101.0



Areas to Focus on:

Mix Ingredients:

Aggregate Source Consistency
Stock Piles Management

Plant:

Plant Operation
PDC Equipment (Operation & Consistency)
Number of Mix Switches
Lab Equipment Calibration and Testing

Communication:

Relationship Management & QC
Job Site Placement & Consistency

Proposed Improvements:

- **Density: 0.20 mile Interval**
- **Use 25% for Voids**
25% for VMA
50% for Density

Proposed Improvements:

- **Sample Splitting: Quartering Method**
- **QC Will Split Down Mix to Test Size Samples For All, Department, Third Party and own (one person, one splitter, lessen potential variation)**
- **Round Robin Testing: Monthly of One Mix, 5 Contractors, 3 Consultants, 2 Dept Labs.**

Next Season:

More Projects are Planned (20)

Surface Mixes, 8000 T

**92% Min PF Will be Removed
From SP.**

QUESTIONS

