



Florida Department of
TRANSPORTATION

Asphalt Acceptance

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Quick Summary...

- Payment based on Contractor's Quality Control test data that has been validated by the Department
- FDOT runs verification tests at a lesser frequency to validate the QC results
- Payment is based on density on the roadway and air voids, binder content and gradation at the plant.
 - Uses Percent Within Limits (PWL) statistically based specifications

FC-5 only uses binder content and gradation



Basics

- Standard Lot size is 4000 tons
 - Contractor has the option to use 2000 tons
- Four sublots per Lot
- Plant Lot & Roadway Lot are the same
- Engineer establishes sampling points
 - One “set” per sublot
 - Random basis
 - Directs Contractor when to sample
- Contractor does all the sampling

FC-5 Lot sizes are always
2000 tons

Basic Terms

- QC = Quality Control = Contractor
- VT = Verification Technician = FDOT
- IV = Independent Verification = FDOT District Materials
- RT = Resolution Testing = FDOT District Materials

Process Control (PC) samples are used by the Contractor to control their process and are not used directly in the acceptance process

Typical 1000-ton Sublot...

Composed of 50 truckloads (20 tons each)



Random Numbers Generated in MAC



Materials Acceptance and Certification System

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No Sample Selected

Go To Sample

Random Sublot Data

Contract Number: E51F3 Width: 12
Project ID: 445301-1-52-01 Date Generated: 3/21/2025
LOT: 10 Generated By: Jim Musselman
Intended LOT Size: 4000 Plant Number: A0703 - Ajax Paving Industries of Florida, LLC - Odessa, FL
Mix Design: SPM 22-20694A (Asphalt)

Plant Sample Random Numbers

Sublot	Tonnage	Truck Load, Load Number, Ticket Number
1	137	
2	1895	
3	2663	
4	3887	

Verification Sublot: 2

Random Sublot Data

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Intended LOT Size: 4000 Plant Number: A0703 - Ajax Paving Industries of Florida, LLC - Odessa, FL
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Roadway Density Core Random Numbers

Sublot	Core ID	Tonnage	Offset (ft)	Lane	Station No./Lift # of #
1	1	3	3		
	2	248	4		
	3	541	2		
	4	783	10		
	5	974	9		
2	1	1155	3		
	2	1339	7		
	3	1474	1		
	4	1722	1		
	5	1887	8		
3	1	2116	2		



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Random Sample Numbers by Sublot

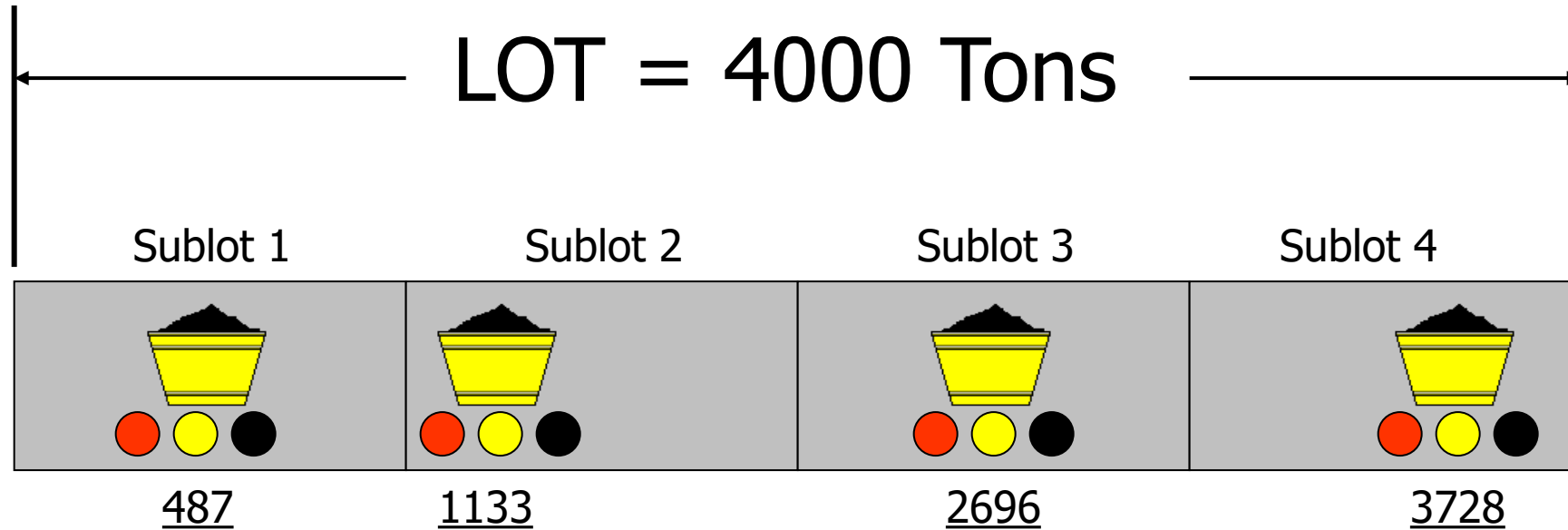
Lot 1, subplot 1

Plant	
Tons/sublot:	1000
QC Samples	
Sublot	(tons)
1	487
2	1133
3	2696
4	3728
Verification Sublot	3



Density Cores				
CORE ID#			(tons)	Offset (ft)
1	- 1	- 1	107	10
1	- 1	- 2	387	10
1	- 1	- 3	473	8
1	- 1	- 4	714	1
1	- 1	- 5	973	3
1	- 2	- 1	1171	11
1	- 2	- 2	1368	11
1	- 2	- 3	1421	9
1	- 2	- 4	1678	3
1	- 2	- 5	1881	2
1	- 3	- 1	2051	2
1	- 3	- 2	2332	3
1	- 3	- 3	2553	10
1	- 3	- 4	2754	6
1	- 3	- 5	2876	5
1	- 4	- 1	3022	8
1	- 4	- 2	3347	6
1	- 4	- 3	3423	4
1	- 4	- 4	3649	3
1	- 4	- 5	3836	7

QC Testing at Plant

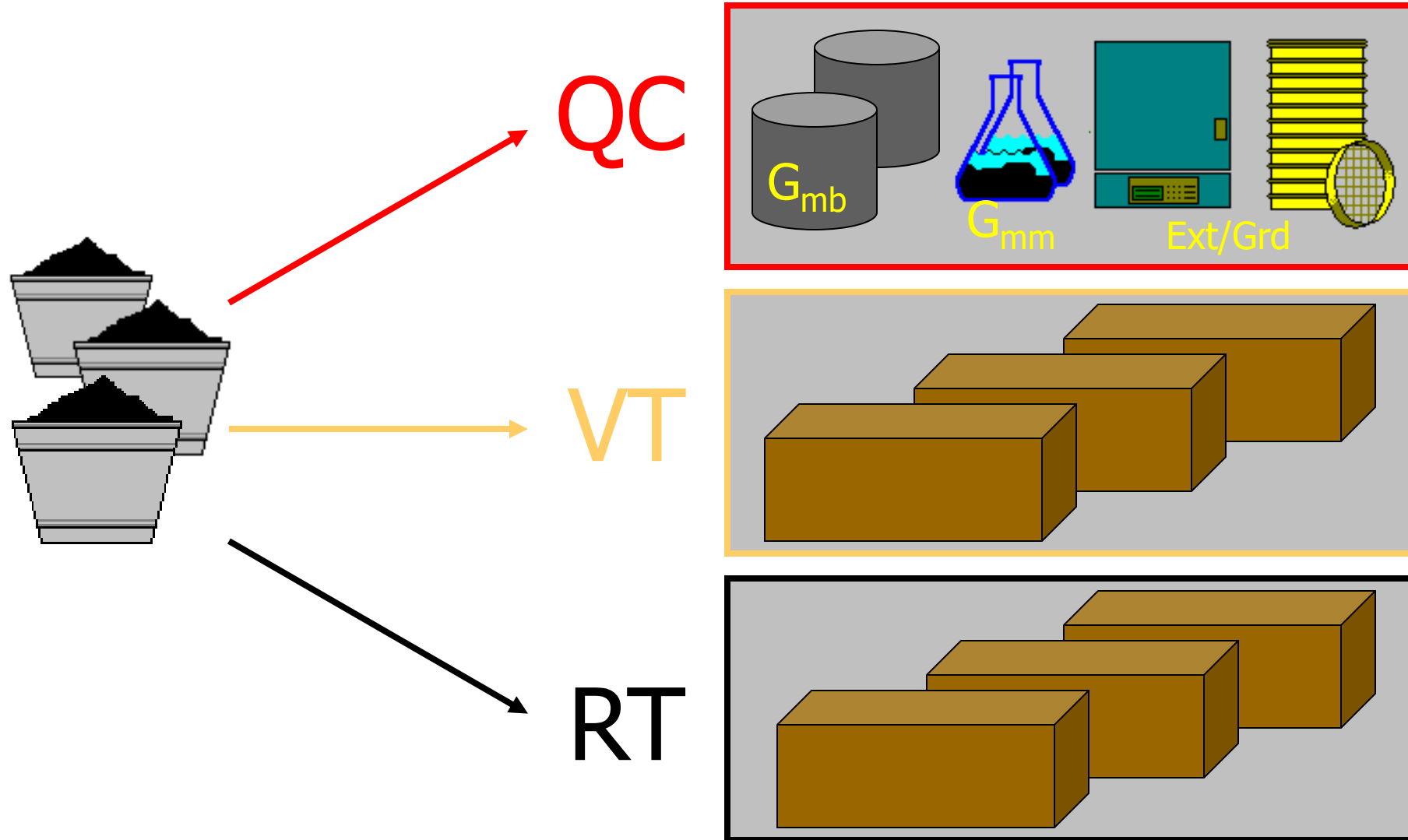


QC randomly tests one per subplot.

VT randomly tests one split per lot.

RT splits are held until lot is verified.

Sample Splits

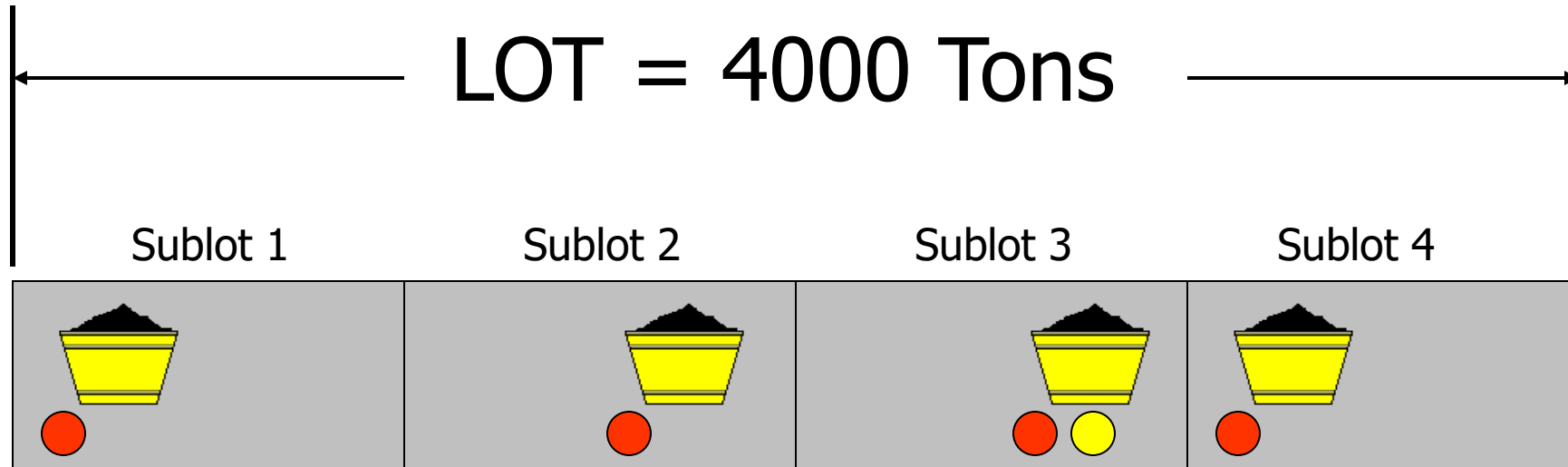




Verification Testing (VT)

- At completion of each Lot
- Randomly selected subplot (from MAC)
 - Split from QC sample
- Use Table 334-7 (Test method precision statement) for comparison
 - Embedded in MAC
- If everything compares favorably...
 - Calculate pay based on QC results
- If not....samples go to Resolution testing
 - District Materials Office

Verification Testing



QC tests one per sublot.
VT randomly tests one split per lot.

Comparison Criteria

Table 334-7 Between-Laboratory Precision Values	
Property	Maximum Difference
G_{mm}	0.016
G_{mb} (gyratory compacted samples)	0.022
G_{mb} (roadway cores)	0.014
P_b	0.44%
P-200	FM 1-T 030 (Figure 2)
P-8	FM 1-T 030 (Figure 2)

Comparisons are done in MAC

Roadway Acceptance

- Roadway and Plant Lot the same
- Lot size: 4000 tons or 2000 tons
- 6-inch diameter cores
- Five cores per subplot
 - Randomly located - generated by MAC
- Retain QC cores for VT & RT testing

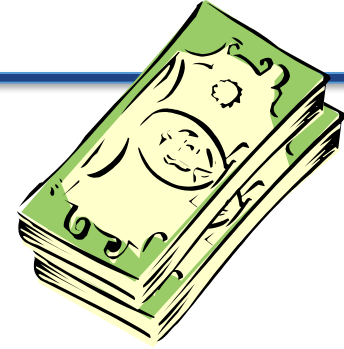


Calculate Payment

- If two or less sublots:
 - Use Small Quantity Pay Table based on average deviations from target
- If three or more sublots:
 - Use the estimated Percent Within Limits (PWL) for the lot
- Calculate Pay Factor for:
 - Density, Air Voids, Binder Content, P_{200} , P_8
 - (FC-5 is different)

MAC does all of this....

Payment



- Pay factor for each characteristic is determined
- Composite Pay factor is based on:
 - 40% Density
 - 25% Air Voids
 - 20% AC Content
 - 10% P_{200}
 - 5% P_8
- Calculations done by MAC

FC-5 calculations are a little different:

- 40% AC Content
- 30% P_4
- 20% $P_{3/8}$
- 10% P_8

Independent Verification Testing

- District Materials Office
- Sampled by Contractor
- Tested by District Lab
- Independent sample
- Uses Master Production Range
 - Go/No go

Master Production Range

Table 334-6
Master Production Range

Characteristic	Tolerance ⁽¹⁾
Asphalt Binder Content (%)	Target ± 0.55
Passing No. 200 Sieve (%)	Target ± 1.50
Air Voids (%)	2.30 – 6.00
Density (minimum % G_{mm}) ⁽²⁾	89.50

(1) Tolerances for sample size of $n = 1$ from the verified mix design

(2) Based on an average of three to five randomly located cores

Defective Material – 334-5.9.5

- Certain failures or low pay factors require further evaluation or must be removed and replaced
 - Includes QC and IV failures
- Low air void failures require an Engineering Analysis Report (EAR)
 - Independent laboratory; signed and sealed by a PE
- High air voids, gradation, binder content and density failures can be delineated
 - Determine the limits of the defective material that may require removal and replacement.

334-5.9.5 Defective Material: Assume responsibility for removing and replacing all defective material placed on the project, at no cost to the Department.

As an exception to the above and upon approval of the Engineer, obtain an engineering analysis in accordance with Section 6 by an independent laboratory (as approved by the Engineer) to determine the disposition of the material. The engineering analysis must be signed and sealed by a Professional Engineer licensed in the State of Florida.

The Engineer may determine that an engineering analysis is not necessary or may perform an engineering analysis to determine the disposition of the material.

Any material that remains in place will be accepted with a CPF as determined by 334-8, or as determined by the Engineer.

If the defective material is due to a failure of high air voids, gradation, asphalt binder content, roadway density, or asphalt binder grade, upon the approval of the Engineer the Contractor may perform delineation tests on roadway cores in lieu of an engineering analysis to determine the limits of the defective material that may require removal and replacement. Prior to any delineation testing, all sampling locations shall be approved by the Engineer. All delineation sampling and testing shall be monitored and verified by the Engineer. For materials that are defective due to low air voids, an engineering analysis is required.

When evaluating defective material by engineering analysis or delineation testing, at a minimum, evaluate all material located between passing QC, PC or IV test results. Any additional PC samples obtained in the same work shift after an IV sample has been obtained shall include enough material for three complete sets of tests (PC, IV and IV check samples) in the event the Contractor requests using the PC test results for engineering analysis or delineation. These additional PC samples must compare with verified IV test results as determined by the comparison process of 334-5.7.1 in order to be used for engineering analysis or delineation.

Exceptions to this requirement shall be approved by the Engineer.

Thank You!

Any Questions?



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