

CONTRACT REQUIREMENTS – MEASURE UP TO QUALITY

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Nov. 11, 2008**

CONTRACT REQUIREMENTS MEASURE UP TO QUALITY

- **CONTRACT DOCUMENTS**
- **MATERIALS**
- **NEW SPECIFICATIONS**

CONTRACT DOCUMENTS

- the legally binding written agreement between the DOTD and the Contractor setting forth obligations for the performance of work for a specific project.

What to do?

When to do it?

How to do it?

How to pay for it?

CONTRACT

BLUE BOOK

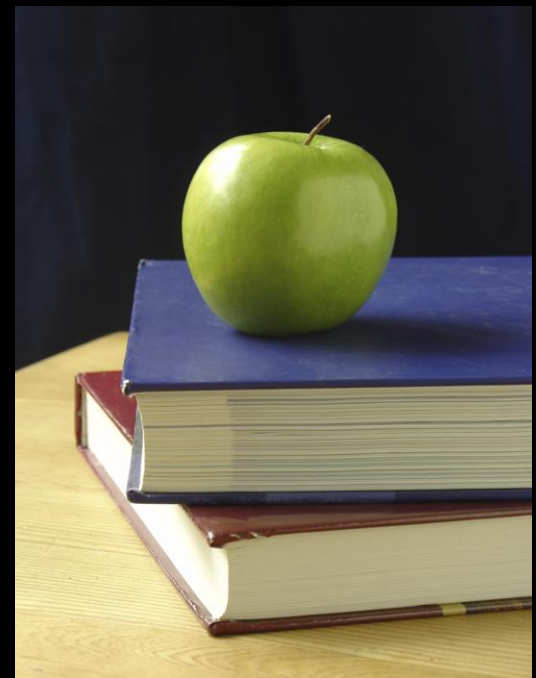
**SUPPLEMENTAL
SPECS**

**SPECIAL
PROVISIONS**



STANDARD SPECIFICATIONS

- 2006 EDITION of the LOUISIANA STANDARD SPECIFICATIONS for ROADS and BRIDGES
- “BLUE BOOK”



CONTRACT

BLUE BOOK

**SUPPLEMENTAL
SPECS**

**SPECIAL
PROVISIONS**

**MATERIALS
SAMPLING
MANUAL**

**TEST
PROCEDURES
MANUAL**

**QUALITY
ASSURANCE
MANUALS**



CONTRACT

BLUE BOOK

**SUPPLEMENTAL
SPECS**

**SPECIAL
PROVISIONS**

**MAT'LS
SAMPLING
MANUAL**

**TEST
PROCEDURES**

QA MANUALS

**QUALIFIED
PRODUCTS
LIST**

**ENGINEERING
AND
DIRECTIVES
STANDARDS
MANUAL**



CONTRACT

BLUE BOOK

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RD

Quality Assurance

- **Quality Control AND Acceptance**
- **Inspection**
- **Certification of equipment, processes, labs**
- **Qualification of technicians**
- **Documentation**
- **Verification sampling and testing**
- **Independent Assurance**

QUALITY CONTROL

- Sampling, testing and inspection
- by the contractor
- for the purpose of making adjustments in operations
- such as mixing, proportioning, temperature control, moisture content, density, etc. at a rate sufficient to ensure that the work conforms to contract requirements or specifications.

ACCEPTANCE

- the process of sampling, testing and inspection
- to determine the degree of compliance with the specifications
- for acceptance of materials and/or the contractor's work.
- Pass/Fail or Pay Adjustment

VERIFICATION

- Sampling and testing
- for verifying correct and accurate procedures and equipment
- for verifying material quality
- non-verifying results may warrant investigation and additional acceptance sampling and testing as required by the engineer.

INDEPENDENT ASSURANCE

- Sampling and testing
- for making an independent random check on the reliability of results obtained in acceptance sampling and testing.
- IA testing is required on projects that are on the National Hwy Systems (NHS)
- required by the FHWA

MATERIALS SAMPLING MANUAL MSM

- arranged by Contract Item #
- the purpose
- method of sampling
- minimum frequency of sampling
- sample quantity (size)
- certificate requirements
- distribution of documentation.

**SECTION 302 CLASS II BASE COURSE
(cont'd)**

MATERIAL	REF.	PURP.	SAMPL ED BY	MIN. FREQ.	MIN. QUANT.	CER T.	SMALL QUAN TITY	TYPIC AL HANDL ING TIME	REMARKS
	TESTED BY		METH OD		CONTAIN ER	DIST R.			
AGGREGAT E BASES (cont'd)	302.01 302.02 302.08 Contract or	Quality Control	Contract or S 101	*	----	----	----	----	*Must test sufficient to ensure materials being delivered meet specification requirements.
	302.02 Dist. Lab	Design*	Proj. Engr. S 101	1/source	6 full sample sacks	----	----	4 days	(QPL 2) *For moisture-density relationship
	302.02 Dist. Lab	IA	Dist. Lab S 101						SEE INDEPENDENT ASSURANCE PROGRAM § 701.

MATERIAL

REF.

**TESTED
BY**

**AGGREGATE
BASES**

**Stone or
Crushed Slag**

**302.01
Contractor**

PURPOSE

**SAMPLED
BY**

**MIN.
FREQ.**

MIN. QUANT.

METHOD

CONTAINER

Quality
Control

Contractor
S 101

*

Design*

Proj. Engr.
S 101

1/source

6 full sample
sacks

CERT. SMALL TYPICAL
QUANTITY HANDLING
TY TIME

REMARKS

DISTR.

*Must test sufficient to ensure materials being delivered meet specification requirements.

4 days

(QPL 2)

*For moisture-density relationships.

CERTIFICATES



- CA – Certificate of Analysis
 - Manufacturer test results
- CC – Certificate of Compliance
 - “We promise that we comply with specs.”
- CD – Certificate of Delivery
 - DOTD tested it, and it includes DOTD Lab Number (Not a bill of lading.)

DISTRIBUTION of PAPERWORK

- **Code**
- 1 Project Engineer receives one legible copy, reviews, approves and files for documentation.
- 2 ...
- 3 ...

SAMPLING PLAN

- Project-specific
- Material-specific
- Project Engineer or District Lab Engineer

RANDOM SAMPLING

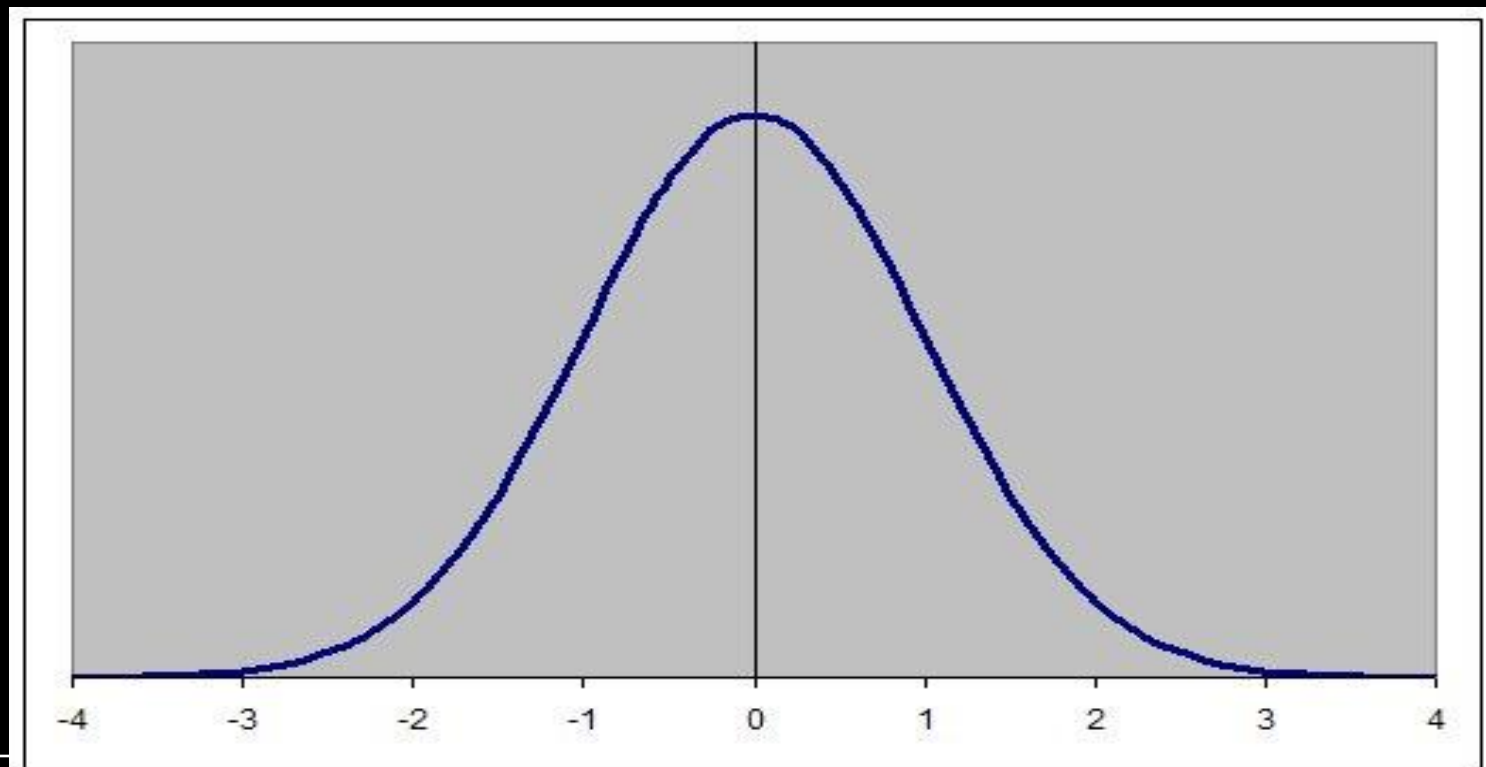
- We can't sample continuously.

- We take a few samples and make assumptions
- For these assumptions to be reasonably valid, we must sample randomly.
- Each choice has an equal chance of being picked

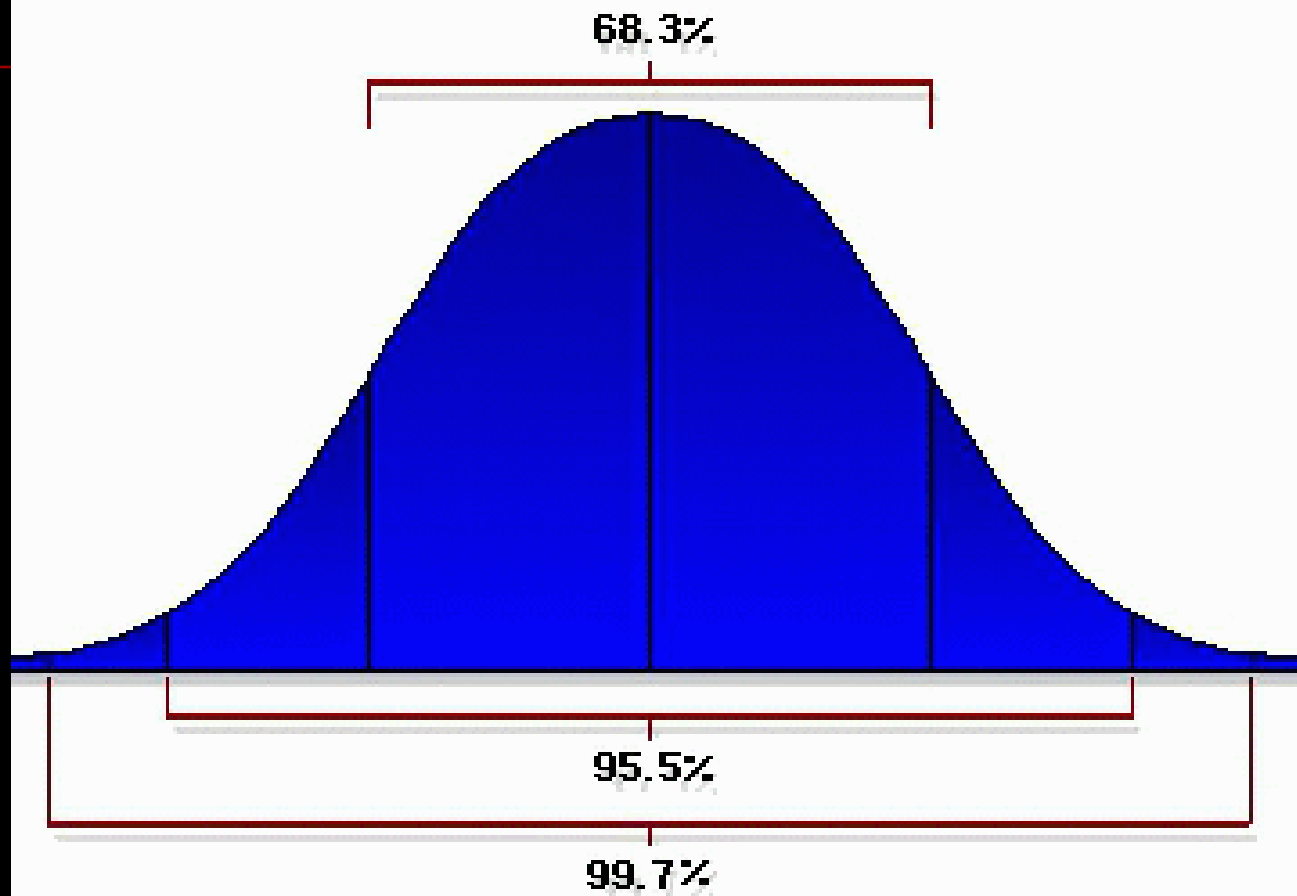


Define Population

Normal Distribution



Standard Deviations



NOT

- 1 SAMPLE =



- Fails? Get another.

RESAMPLING AND RETESTING

- Only when the original material is changed by reworking by adding new material.
- When a sample is not representative, **whether passing or failing.**
- Not to avoid a payment adjustment.

TEST PROCEDURES

- DOTD TEST PROCEDURES, “TR”s
- AASHTO - American Association of State Highway and Transportation Officials
- ASTM - American Society for Testing and Materials

ENGINEERING DIRECTIVES AND STANDARDS MANUAL

“EDSM”

- establishes policies and procedures for DOTD
Design, Construction, and Maintenance

QUALIFIED PRODUCTS LIST, QPL

- a listing of material ***companies*** which have been prequalified by DOTD.
- This does not necessarily eliminate the requirement for testing.
- This means that the company is ***capable*** of producing good material.

COOP and ACCREDITATION

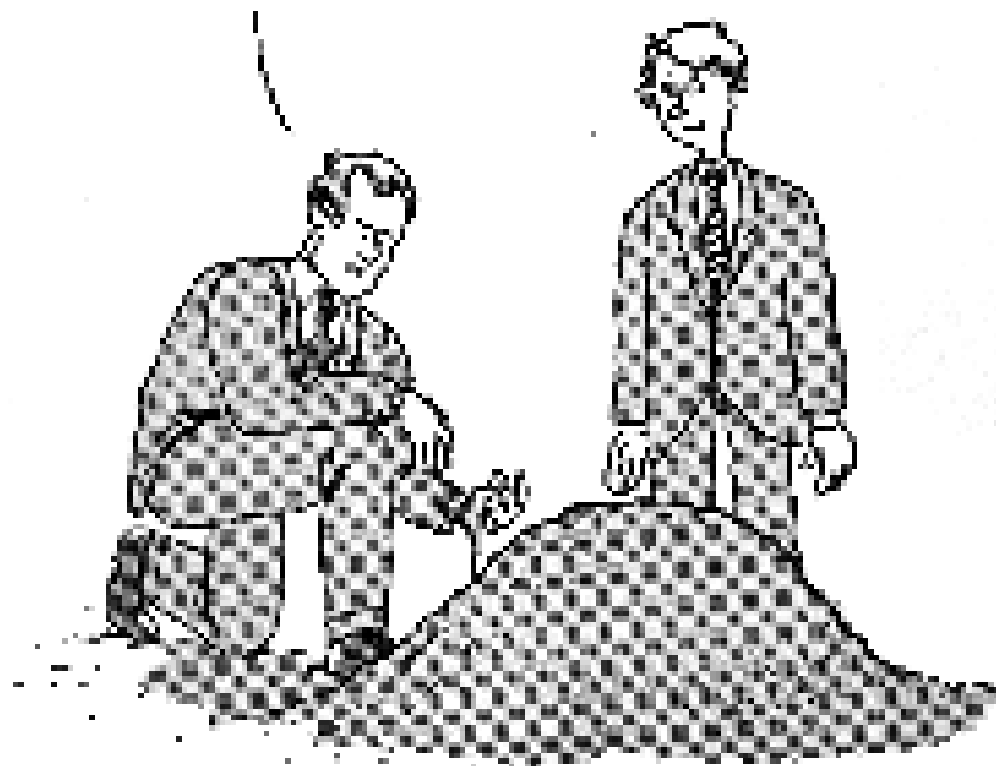
- AASHTO inspects Matlab
- AMRL sends samples to labs around the country
- Matlab technicians inspect District Labs 1/yr.
- Samples are sent to District Labs to test and compare results.

MATERIALS

- SOILS
- CONCRETE
- AGGREGATES
- ASPHALT



WE RAN SOME SAMPLES BACK AT
THE LAB... IT'S DIRT ALL RIGHT.



guy
ford

CONCRETE

- New Test Procedures for slump and air



CONCRETE

- Concrete Variability Compatibility
- *As component shipments arrive, the contractor shall verify slump, air content and set time by testing at ambient temperatures.*
- *The contractor shall submit test results to the Department for review each day of paving.*

Concrete

- New source codes for Bayou Ash Fly Ash
 - Units 1 & 2 Unit 3
 - LOI 0.20 1.15

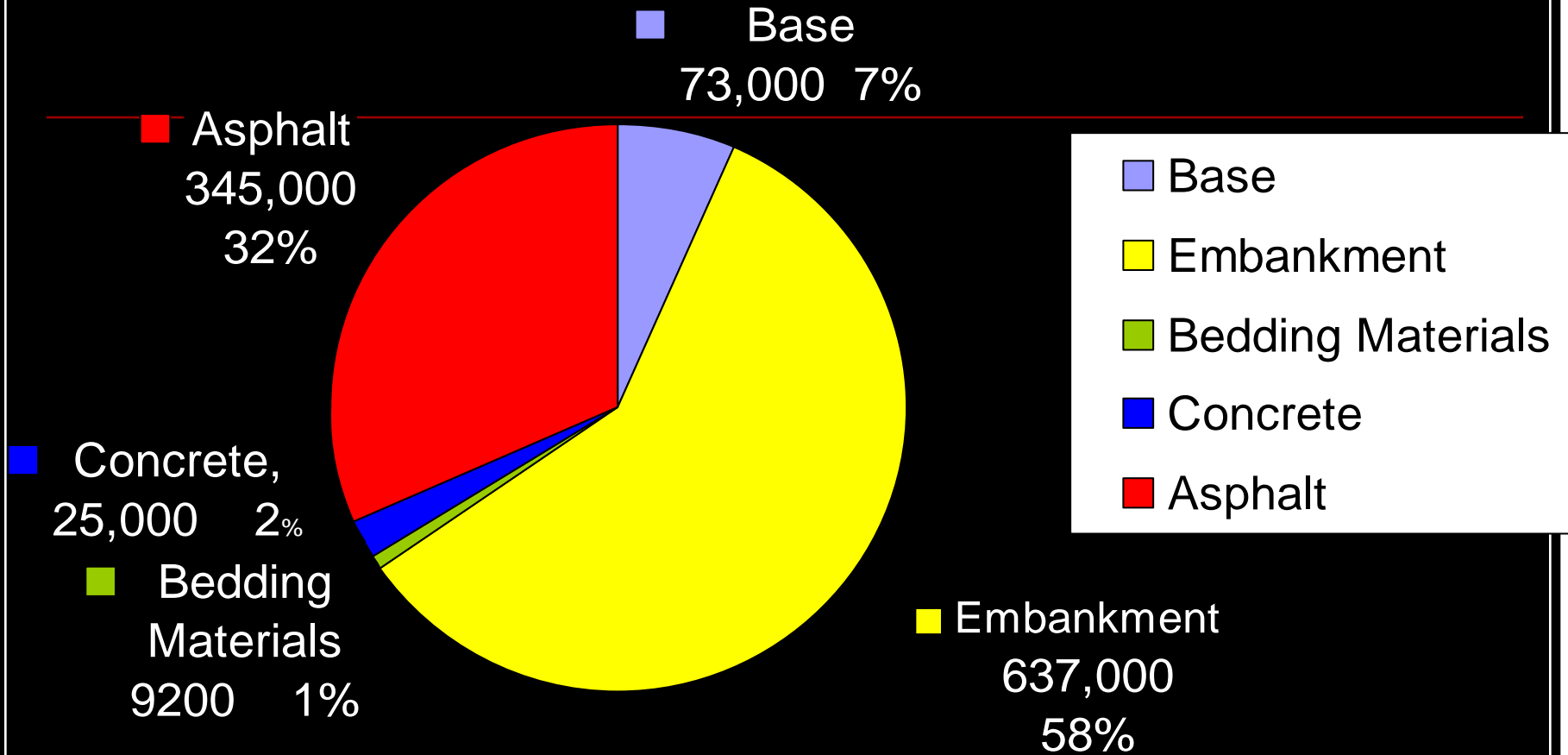
No. of Pass Fail Records Per Test

Fly Ash Test Name	No of Records		
	Pass	Fail	%Fail
FINENESS, % RET ON NO. 325	4929	35	0.7
SPEC GRAV UNIFORM, % VAR. FROM AVG.	3383	96	2.8
FINENESS UNIFORM, % POINTS FROM AVG.	3369	86	2.6
AVAIL. ALK, % @ SODIUM OXIDE	1306	167	0.1
MAGNESIUM OXIDE, %	1774	61	3.4
LOSS ON IGNITION, %	4907	6	0.1

CONCRETE – hot ideas

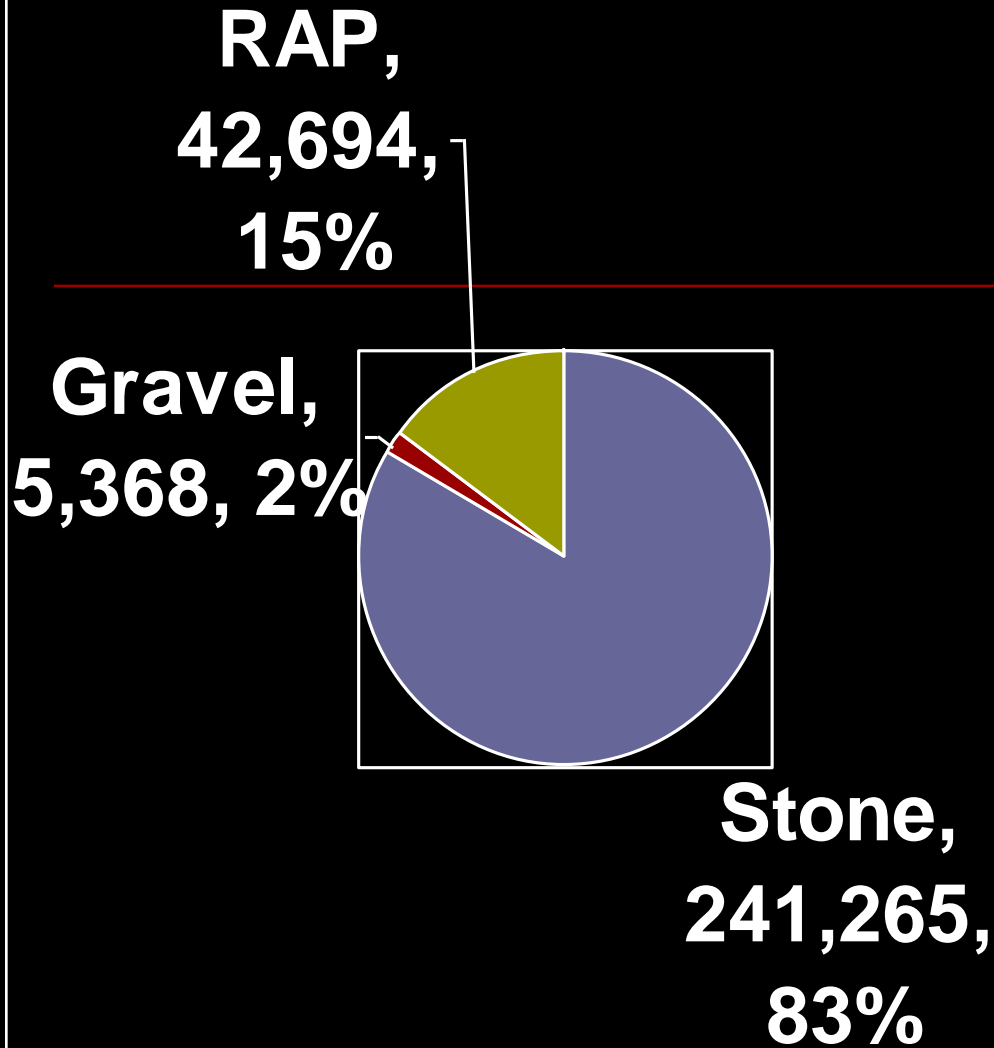
- Field Test for Water Cement Ratio
- Calorimetry- plots heat of hydration
- Smaller cylinders

AGGREGATES



QUANTITY IN CU.YD

ASPHALT AGGREGATES



ASPHALT – new specs

FINISHED

1. New PWL / Surface Tolerance Specs



UNDER CONSTRUCTION

2. Remove Plant Inspector – accept from roadway samples





Voids – new PWL Table

- Easier to get 100% pay.
- Removed incentive.
- Greater penalty when job is going south

VOIDS



Void\$ PWL

(90 AQL)

71 – 100

(was 88 – 99)

61 – 70

51 – 60

< 50

(was <20)

% Pay

100

(was up to 103)

90

80

50 or remove

VALIDATION and QC



71 PWL



Density – new PWL Table

- Easier to get 100% pay
- Max incentive is 102%
- Greater penalty when job is going south

Density



Density PWL (90 AQL)	% Pay
99 - 100	102 (was 105)
81 - 98	100
71 - 80	95
51 - 70 (was 31 - 60)	80
≤ 50	50 or remove

Surface Tolerance



- Harder to get incentive
- No incentive on single-lift category C
- For the surface tolerance incentive for Cat A, with no grinding (except bridge ends), no pay cuts, and < 45 IRI ----- private company or Matlab must measure at the completion of the construction of the project.

Surface Tolerance



Category	103% Pay
A – Interstates, Multi-lift	< 45 (was < 55)
B – 1 or 2 lift overlay over milled, 2 lift over existing	< 55 (was < 65)
C – 1 lift over existing	N/A (was < 75)

Surface Tolerance

- **NOTE:** No requirement for individual wheelpath IRI for Category C projects.





ASPHALT – NEW PLAN

- **Roadway Acceptance**

Pay on core density, surface tolerance

Plant for QC

- **Expert Team**

Visits plants randomly



WHY JOSEPH, YOU'VE SLICED
THE BREAD! THAT'S THE BEST
IDEA SINCE... WELL, IT'S A
VERY GOOD IDEA!



© 1984
GOLD
MINE



Goals for a new plan

- Reduce DOTD staffing levels
- Ensure quality of materials
- Minimize cost
- Minimize risk to contractor
- Ensure fair bidding and competition among contractors



Roadway Acceptance

- Replace plant inspector with expert visiting teams
- Take acceptance samples from roadway
- Loose mix for Gmm (Rice) 1/sublot
- 15 Cores per lot
- Test at District Lab



PILOT PROJECTS – District 08

- SP 009-03-0029, US 71, Jct. LA 1240 - North (6 miles)
- SP 003-03-0038, LA 115, Jct. LA 107 - Rapides PL (5 miles)
- SP 014-06-0040, US 165, Bayou Clear to 5-Lane (7 miles)



Pilot Project Data - Gmm

- 2.489
- 2.480
- 2.483
- 2.495
- 2.498
- 2.481
- 2.484
- 2.488
- 2.495
- 2.476

Rice's Verify



Pilot Project – Gmb of Cores

- 2.293
- 2.258
- 2.289
- 2.293
- 2.303
- 2.316, 2.297, 2.291
- 2.379, 2.304, 2.330
- 2.315, 2.291, 2.332
- 2.332, 2.318, 2.321
- 2.319, 2.398, 2.384

Cores Verify

Expert Team – replaces plant inspector



■ Engineering Tech DCL

- Reviews JMF
- Participates in validation day
- Randomly inspects plants

■ Engineering Tech 5

- Same as Engr Tech DCL with less authority



Roadway Acceptance!

- Samples must be-
 - handled correctly
 - delivered quickly
 - tested quickly
- Openly share with contractor-
 - Testing procedures
 - Test results

Contractor may file a protest if samples are late!

Expert Team Spot Plant Inspection/Verification



- Check and sample Asphalt Cement
- Sample and test Asphalt Mixture
- Check QC documentation
- Check Plant Facilities

Expert Team - Asphalt Cement



- Transport – 1 / visit, send to Matlab
- Working Tank
 - Contractor takes 1/day and holds
 - Inspector takes 1/visit and collects the held samples; we then check for
 - Comparison to held sample – 1 std dev
 - Conformance to specs

Asphalt Cement – Working Tank



---if verification fails

- Increased frequency of testing
- Coring, test for polymer
- Penalty
- Remove and replace

Expert Team – Asphalt Mixture



Parameter	Criteria
Gmm	± 0.015
Voids Gyratory briquette	± 1.0
Gradation % AC	Spec tolerance

Expert Team – QC Documentation



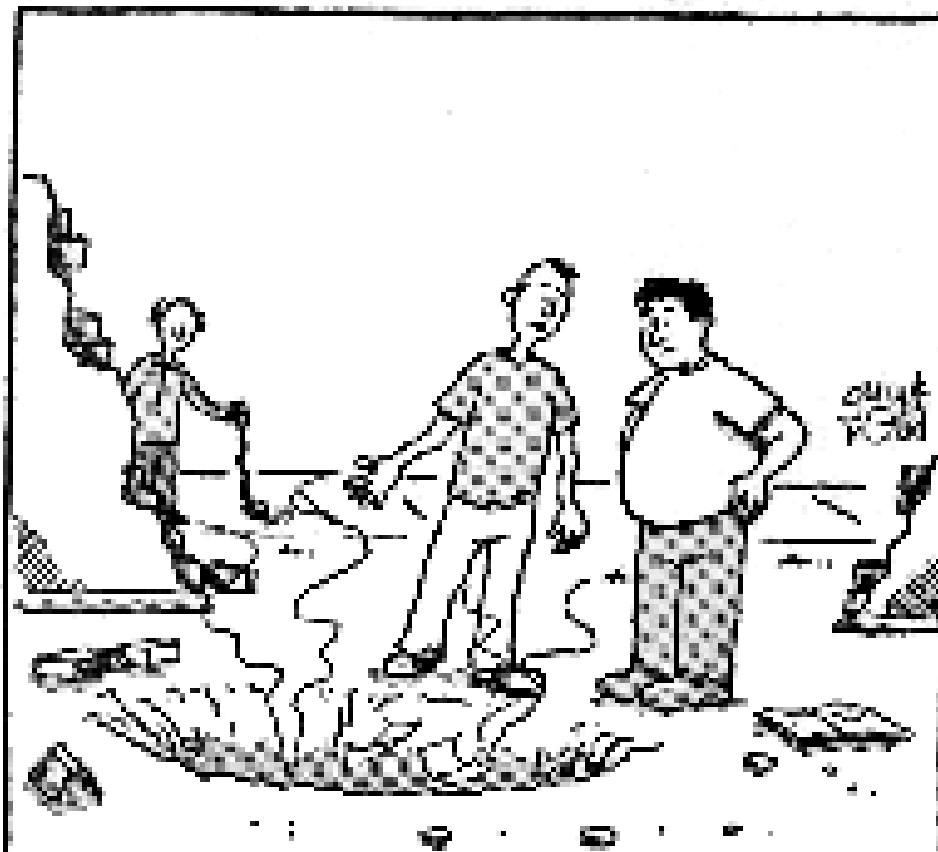
- Check for control charts
- Check for conformance to specs

Expert Team – Plant Equipment



- Plant equipment calibration
- Operation

- 1 warning with probation
- No correction – technician or plant decertified



"THE LAST THING HE SAID WAS 'I'M GOING TO GO
LOOK UP THE WORD "DICTIONARY" IN THE
DICTIONARY' AND THEN THE UNIVERSE KIND OF
COLLAPSED AROUND HIM."



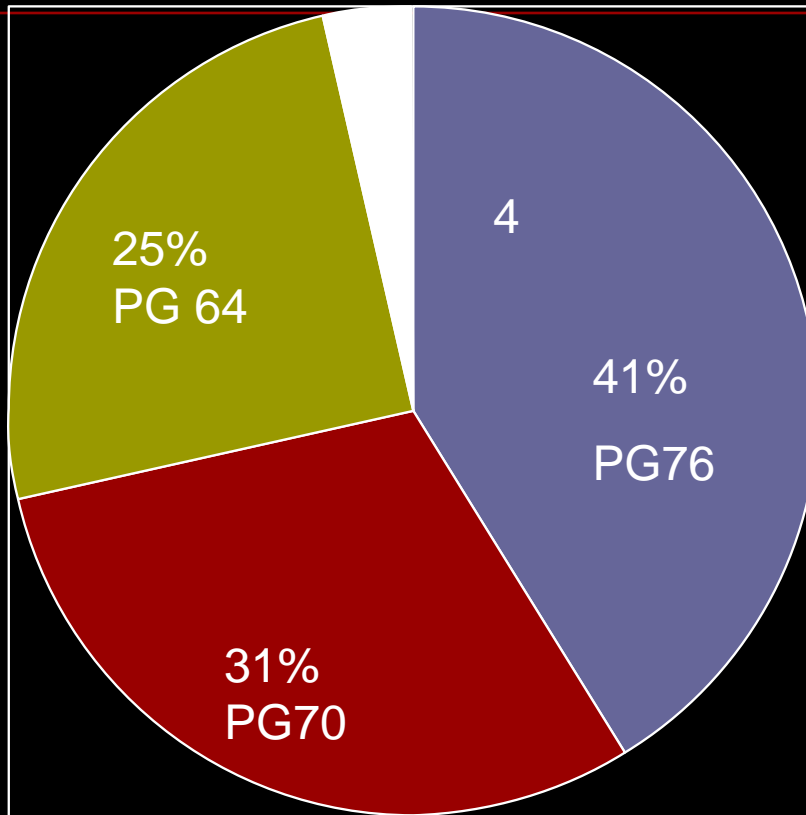
Plant Lab Equipment

- Calibrate plant lab equipment
- HMAC LAB Equipment Manual
- Training to be provided

ASPHALT CEMENT

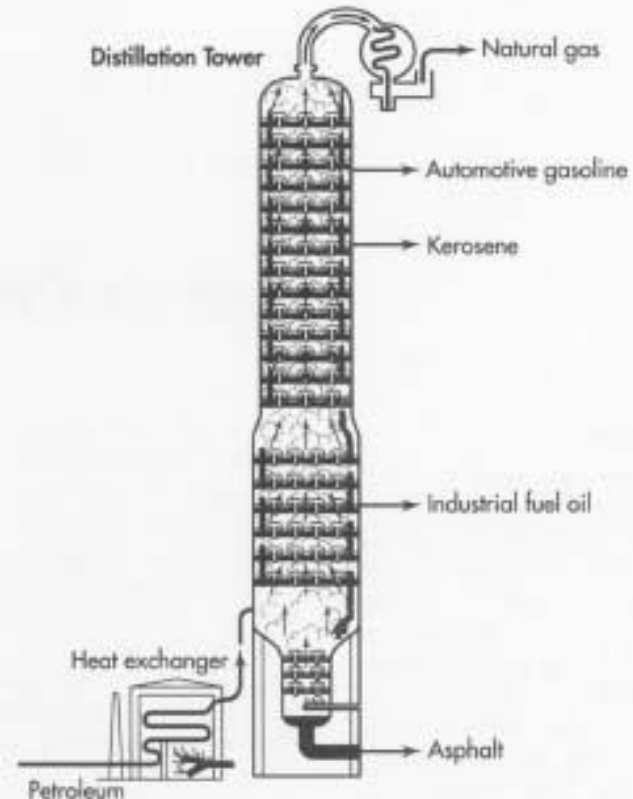


ASPHALT CEMENT BY TYPE



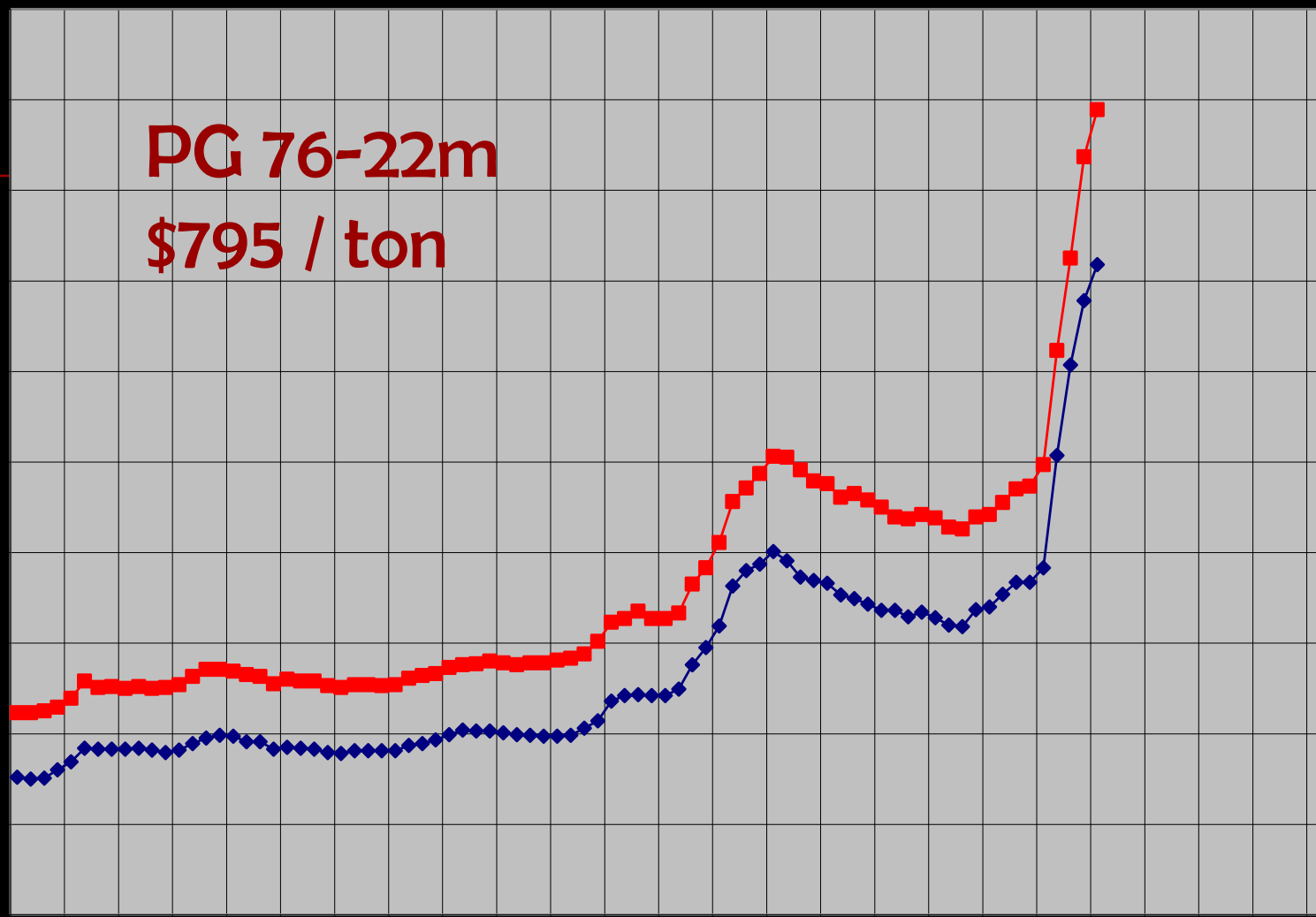
ASPHALT CEMENT

- Prices are skyrocketing!
- Polymer is in short supply.



A fractional distillation tower is used to separate different compounds in petroleum. Asphalt is essentially the heavy residue of the oil refining process.

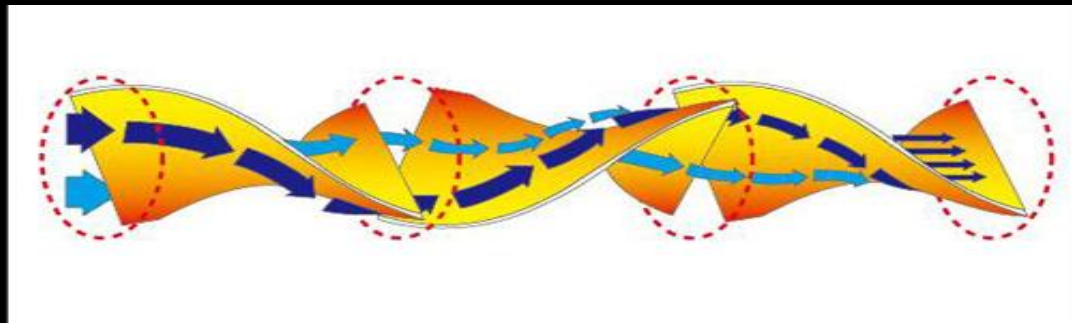
PG 76-22m
\$795 / ton



PG 64-22m
PG 76-22m

Asphalt Cement

- Crumb Rubber – liquid, PG 82-22m
- In-line Injected Latex for PG70-22m



ASPHALT MIX CONTRACTORS

- 37 ASPHALT PLANTS
- 19 ASPHALT CONTRACTORS
- 5 ACTIVE AC SUPPLIERS



ASPHALT MIX – Save \$\$\$

- High RAP
 - Fractionated

- Warm Mix
 - Foamed
 - Additive

- Asphalt Treated Base

ASPHALT MIX

- Higher ADT for Chip Seals
- Thin Lift Overlays
 - OGFC
 - Ultrathin
 - 1" lift of superpave



New Products Committee

- Presentation to Committee
- Assign a coordinator
- Create specialty product, change specs, dismiss

- Bert Wintz, Chair
- Theresa Taylor, Committee Coordinator

Materials Website

- www.dotd.la.gov
- Go to Construction
- Go to Materials

QUALITY MATTERS!

- NEWSLETTER
- www.dotd.la.gov – to Construction – to Materials
- To request, email debikelley@dotd.la.gov