



Quality Management

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World's Largest Day Care Centers





What is

Quality?



Philip Crosby

**Quality is meeting
Customer Requirements.**

Project Phase 1

Enthusiasm

Project Phase 2

Disillusionment

Project Phase 3

Panic

Project Phase 4

**Search
for the
Guilty**

Project Phase 5

Punishment
of the Innocent

Project Phase 6

Praise and Honors

for the

Non-Participants

Purpose

Establish a QC system for Hot Mix Asphalt which will assure a high probability of compliance with specifications.



Objectives of a Quality Management System

- **Produce a quality product**
- **Assure that the final product meets job specification**
- **Satisfy the customer's needs, as economically as possible**

Quality Control

QC ensures production of uniform materials that meet required specifications through periodic inspection and testing.

QC is producer's responsibility!

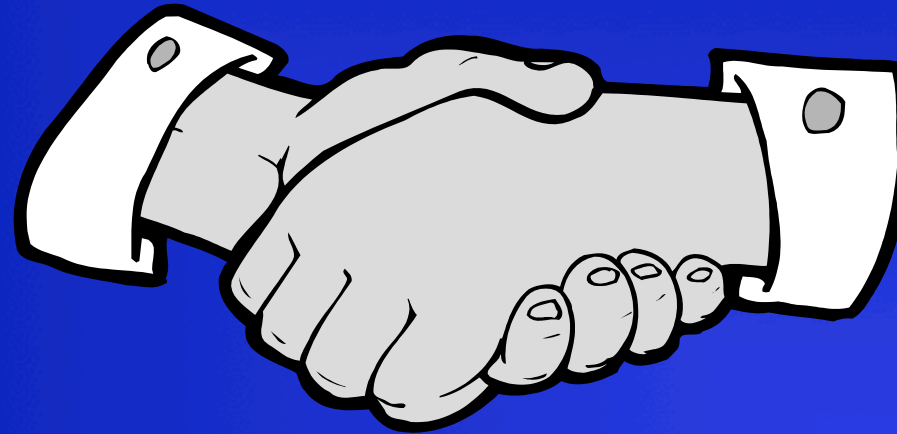
Quality Assurance

- QA assures owner that producer's test results are accurate
- Random sampling and testing are at greater intervals than producer's

QA is buyer's responsibility!



Credibility



You can believe me!

Contractor QC

- **Aggregate gradation**
- **Asphalt content**
- **Volumetric analysis**
- **In-place density**

Agency QA

Random production and in-place acceptance testing by the owner is similar to contractor testing, plus measurements of:

- Thickness
- Smoothness
- Overall profile and workmanship

QC / QA

- **Documentation**
 - Day to day results
 - Problems with incoming products
 - Adjustments made to trend towards JMF
 - Others

QC / QA

- **Criteria for action**
 - **Specification tolerances**
 - **Timely response for adjustments**
 - **Adjusted job mix formula**

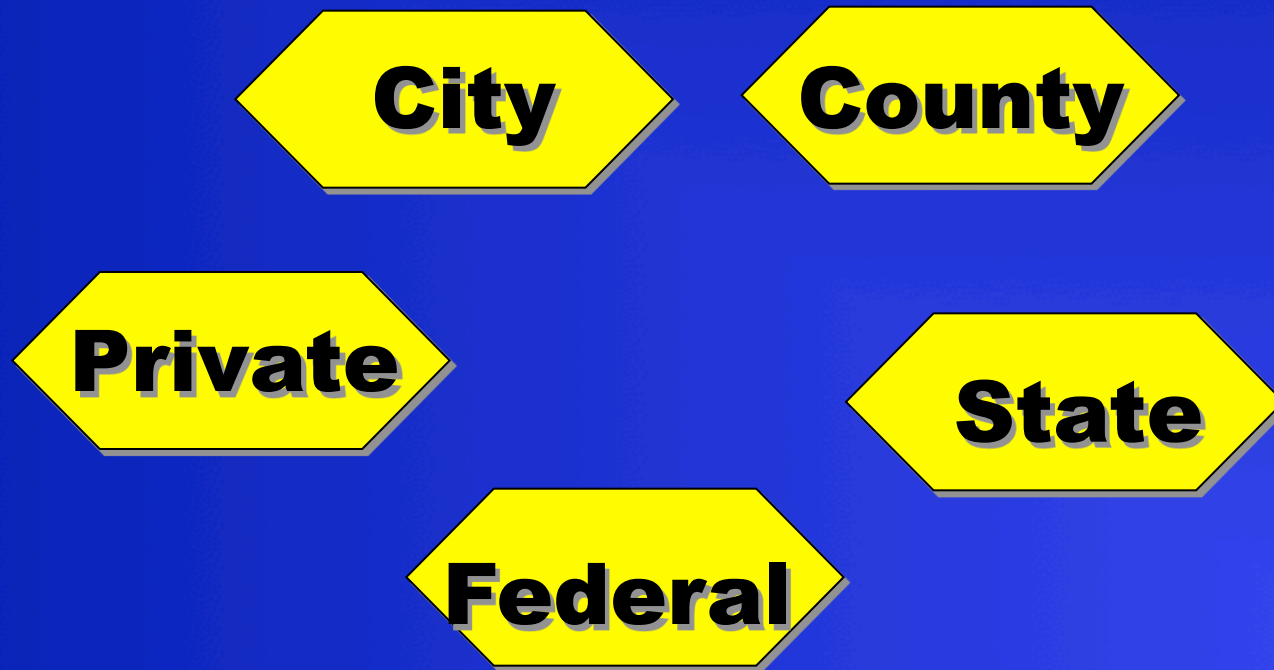
A multi-lane highway with traffic, used as a background for text. The road is filled with cars in both directions. There are green overhead signs and a speed limit sign on the right side. The sky is overcast.

Theory is when we know everything but nothing works.

Practice is when everything works but we don't know why.

Some people combine theory and practice - Nothing works and they don't know why.

Multiple Specifications A Problem



Testing Standards

AASHTO

- DOT's/Local Agencies
– \pm 35,000 spec writing agencies in U.S.

ASTM

Objectives of a QC System

- **Increase efficiency and Production**
- **Reduce operating costs**
- **Adjust to changing conditions**

Control of HMA

Factor: AC – Variation from JMF

Status	Action Point	Action
Green	$\pm 0.15\%$	Normal Ops
Yellow	± 0.16 to 0.25%	QC \leftrightarrow Tower
Red	± 0.26 to 0.39%	QC \leftrightarrow Tower Resample Tower \leftrightarrow Mgmt
Shutdown	$\pm 0.40\%$	Same as Red

An aerial photograph of a winding asphalt road through a wooded area. A large yellow arrow points downwards from the top of the image towards the bottom. The text "Managing Quality" is overlaid in the upper half, and "Superior Performance" is overlaid in the lower half.

Managing Quality

Superior Performance

Quality

- **How does quality affect our business?**

Quality

- **Tangibles_**
 - Time spent doing work first time
 - Time spent to meet with owners to solve problem of poor quality
 - Time spent to complete rework
 - Cost associated with rework in future pricing
 - Incentives and disincentives

Quality

- Intangibles

- Poor name in industry
- Lose trust of owner
- Owners find more fault with our work
- Morale decreases, hiring is difficult.
- Nobody wants to be on a losing team.

Rework is 100% preventable!

Quality

Is there time to perform high quality work and meet production requirements?

Why we must have quality!

- *Poor quality and rework are costly*
- *We all want to do a job we are proud of*
- *Find reason, not fault*



Safety



- **How does Safety relate to quality and production?**
 - **We all go home in the same condition**
 - **We have people well trained to execute our plan**



Safety



- **How does Safety relate to quality and production?**
 - **Accidents are costly and time consuming**
 - **How much does one accident cost?**
 - **Retraining = Employee turnover leads to rework and slower production**
 - **All costs go back into our pricing (Bidding and Material Sales)**

Quality



Quality

- **How does quality affect our business?**

Quality

Rework Example

- \$500.00 in rework
- \$1000.00 dollar job with 10% margin
- The most profit we could capture is \$100.00
- What's the big deal?

Quality

How much revenue do we have to generate to overcome this \$500.00 rework?

Quality

- Actual Effect of \$500.00 Rework.
- We have to do an additional *\$5000.00* in revenue at the same 10% margin to just break to break even, *\$0.00* profit
- *\$10,000.00* of revenue with a 15% margin to turn a profit
- *\$10,000.00* revenue for *\$500.00* in rework cost?
- Can we really afford to have rework?

Why we must have quality!

\$500 = \$10,000.00

Quality

- *Poor quality work costs money that is drawn from the same pool*
- *Each one of us is responsible for ensuring we do high quality work safely*

Poor Quality:

- How much does it really cost?
- Paving Crew Hourly Costs
 - Labor
 - Equipment
 - Trucking (10)
 - Plant

Cost of Poor Quality

- **Paving Crew Hourly Costs**
 - Labor = \$275.00
 - Equipment = \$305.00
 - Trucking (10 Units) = \$750.00
 - Plant (1500 Tons Day) = \$1200.00

How much does it really cost?

- **Paving Crew Hourly Costs**

- Labor

- Equipment

- Trucking (10 Units)

- Plant

- » *Per Hour = \$2,530.00*

- » *Per 10 Hour Day = \$25,300.00*

- » *Per Minute = \$42.00*

Who is responsible to make this happen?

»Construction Crews

»Estimating

»Plants

»EHS

»Lab

»Supervisors

We all are!

Who is responsible to make this happen?



Quality Program

- **Expectations**
- **Training**
- **Responsibility**
- **Accountability**

- **Quality is everybody's job!**

Teamwork





Quality Management

It's not a cost...

It's a commitment





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