

PAVEMENT CONSTRUCTION

QA PROCEDURES

RIDEABILITY TESTING

CONSTRUCTION PRACTICE

Quality Assurance is not Quality Control

Quality control is Contractors responsibility during construction.

Quality Assurance is ensuring the project is built according to the acceptance criteria established for the contract.

This can be at the supplier's plant, foundry, pre-cast plant, on the project, etc.

QA Procedures

- QA starts with the designers
- Constant reviews during project development
 - Plan reviews, spec reviews
- Carries over to design assistance during construction
- Value Engineering proposals etc.

- DIVISION 900 MATERIALS

- 901 Aggregates: HMA, PCC

- 902 Asphalt: Bituminous Materials, HMA, OGFC / MOGFC, Ultra-Thin Friction Course, SMA, etc

- 903 Concrete: Concrete, Pavement Repair Mixes, HPC, Self-Consolidating materials, Grout, etc

- 904 Precast and Prestressed Concrete

Mix design, verification, composition, control tables, etc in each section for plant acceptance.

Volumetrics, unit weight, strength, yield, permeability, elasticity & recovery from supplier samples.

These tests are performed before and during production.

In the field there are physical requirements for “in place” product: thickness, rideability, strength, compaction.

These are found in the Construction Sections of the Standard Specifications.

Quality Acceptance includes Pay Adjustments (PA) which can have an effect on the budget.

Air Voids PA can add up to 4% to the bid price for Surface Course, other Courses up to 1 % additional.

Ride quality PA can add up to \$100 per lane-mile on an Interstate class highway, \$50 per lane-mile on other roads.

Conversely, in extreme cases a Remove and Replace situation can exist for extremely poor quality workmanship.

Division 400 - Pavements

HMA

HMA Friction Course

Ultra-Thin Friction Course

SMA

Concrete Surface Course

These Sections include materials descriptions, surface preparation, construction requirements, etc.

Here is where you find Air Voids requirements, thickness, rideability; the criteria that are tested after construction.

Division 450 - Concrete Pavement Rehabilitation

Concrete Slab Stabilization, Partial Depth Concrete Pavement Repair, Full Depth Concrete Pavement Repair, Dowel Bars, Diamond Grinding, Sealing Existing Joints.

RIDEABILITY TESTING



“ A dedicated Novell mailbox has been established solely for the purpose of receiving IRI Pavement Rideability testing requests from Resident Engineers.

The email address for surface pavement rideability (IRI) testing is: iri@dot.state.nj.us.

Please note this mailbox is only for those projects with an IRI component in their specifications, it is NOT for requesting Rolling Straight Edge testing, which remains under Materials jurisdiction.

Due to restricted resources and the amount of time needed to conduct multiple testing runs, testing will only be conducted on lanes with the full length of the lane paved. Requests for partial lane testing cannot be acted upon. Please request testing AFTER completion of paving the final riding surface.

The following information will be required in the body of the e-mailed request:

Official project name (also in subject of email request); job code number; Route, direction, Lane(s), MP start & end, number of paving lifts; a copy of the IRI specification for project; Prime contractor; Paving contractor; Date(s) surface pavement was constructed; Surface course mix designation and thickness; Resident Engineer name, e-mail, cell number, office number, etc, and best method/hours for contact.

Once this information is received the project will be scheduled for Rideability testing. Test scheduling is weather dependent, but generally within a few days. You will be notified of the proposed testing date to share with the contractor so they may arrange any necessary traffic control, sweeping of the project and retroreflective tape layout as needed prior to testing. Be sure to notify the contractor of the proposed test date. “

When the project has been paved , the RE will request Ride quality testing through a dedicated IRI mailbox.

Pavement management will contact the RE to schedule this and have retro reflective tape placed to trigger the machine.

Three passes are taken on each paved lane (to be averaged in the office during processing), recording the IRI data, DMI data, digital images (260 per mile), etc.

Data is returned to the Pavement office where it is processed, i.e. changed to a format readable in Excel and PA is calculated.

Specifications are reviewed for any exceptions to PA application and for the formula to be applied.

The digital images are checked for limits of paving, locations of any exceptions (bridge decks or ...)

The processed data is transferred to the PA program and the results of the video review are applied. The program calculates the PA, which is sent to the RE for his review and transmittal to the contractor.





NORTH
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PAY ADJUSTMENTS

Most pay adjustments are large, positive or negative

The good contractors do well, pay attention to good paving practices and earn bonuses (50 to 95% of tested lots in bonus territory)

Other contractors don't fare as well and suffer penalties

Very few projects come in at "zero" pay adjustment

CONTRACTOR	TESTED	PA
A	7/3/2008	-\$32,301
A	9/11/2008	-\$43,349
A	7/31/2008	-\$150,469
A	7/31/2008	-\$20,018
B	8/5/2008	-\$158,358
C	7/11/2008	<u>\$50,147</u>
C	8/13/2008	<u>\$47,390</u>
C	10/31/2008	<u>\$84,833</u>
D	10/10/2008	<u>\$249,903</u>
E	9/12/2008	-\$85,718
E	10/1/2008	<u>\$18,895</u>
E	7/25/2008	<u>\$35,989</u>
E	5/21/2008	<u>\$42,155</u>
E	9/29/2008	<u>\$111,436</u>
F	12/15/2008	<u>\$2,635</u>
G	11/3/2008	<u>\$119,095</u>
G	11/3/2008	-\$644
H	7/30/2008	<u>\$33,270</u>
H	7/30/2008	<u>\$18,647</u>
I	9/19/2008	-\$28,839
I	7/9/2008	<u>\$98,046</u>
J	7/10/2008	-\$123,022
K	6/29/2008	-\$207,258
K	7/26/2008	-\$86,073
K	8/6/2008	-\$26,999
K	6/19/2008	-\$163,186
L	10/15/2008	<u>\$268,769</u>
	TOTAL:	\$51,976

ASIDE FROM THE MONEY...

Good contractors are delivering projects well under 50 inches per mile IRI

Many are around 40 inches per mile, some are delivering below 30 on Interstates

Contractors have learned the bonus is attainable and are producing good work

Some contractors are still are not making the effort to achieve the bonus

OTHER STATES

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- Bonus payments are generally capped at \$600 per 0.1 mile by most states; New Jersey pays \$1000 as maximum.
- Most states use 30 or 35 as the top of the range for maximum bonus payment; New Jersey pays maximum at 45.
- Many states require corrective action at IRI = 70; New Jersey has remove and replace at >125.

ANY QUESTIONS?



CONSTRUCTION PRACTICE

Good construction practices can make or break a project.

In a nut shell, it is clean, smooth and steady.

Even speeds without starting and stopping promote a smooth finish and even compaction. Both are key to bonus for the contractor and a good road for us.

Pre Overlay/Inlay – Patching, milling, tack coat, joint sealing

Laydown – MTV, paver

Compaction - Rolling



Proper Patching Technique

Mark area of pavement to be removed – square or rectangle area

Saw cut and remove bound material

Re-compact base material

Apply tack to vertical faces

Place new AC material in appropriate lift thickness













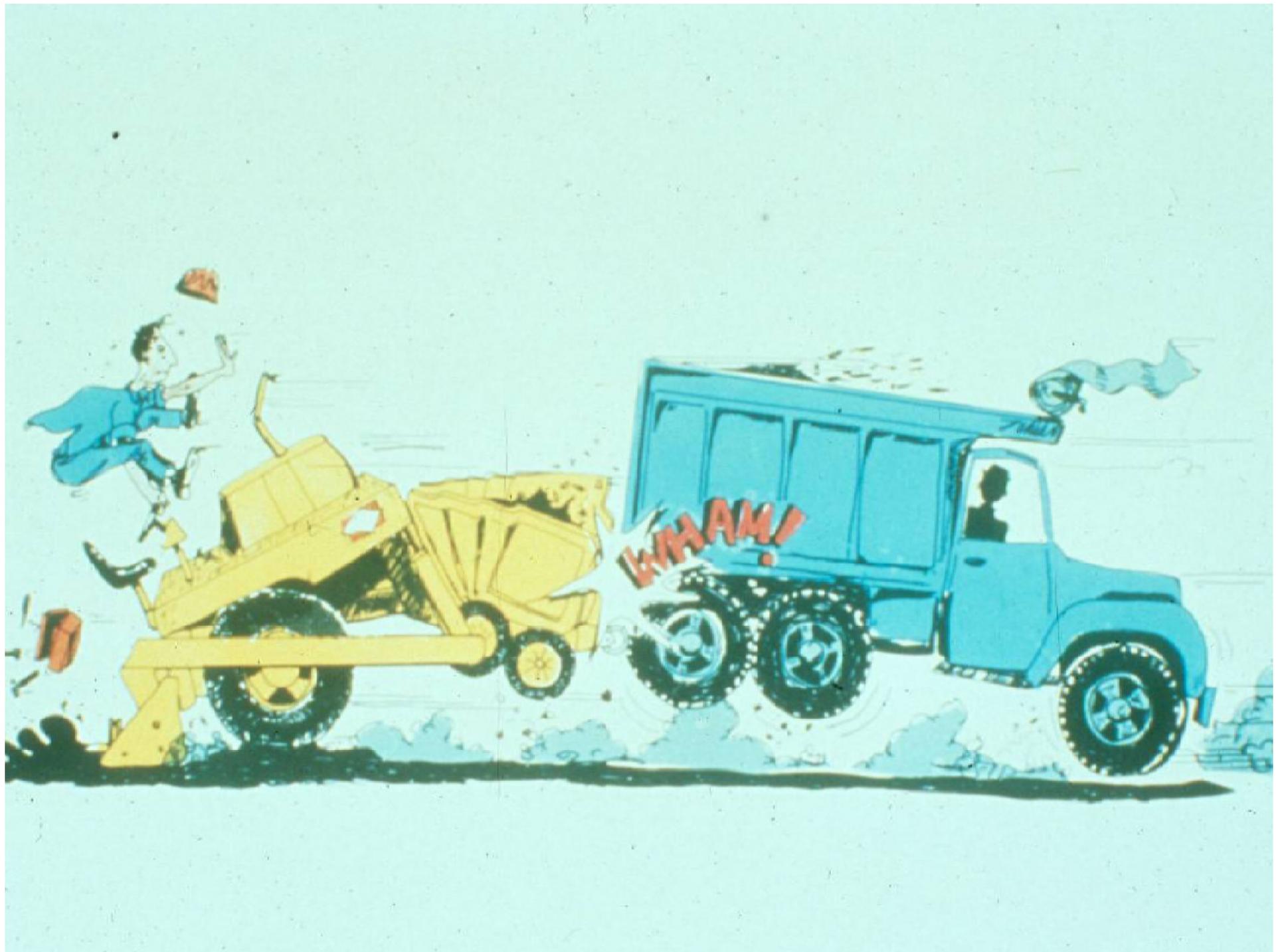




**Straight-Edge
Roller Patterns and
Joint Compaction
Density**



Make sure there is material at cold joint for compaction





Except for the weight of the paver screed, the remaining density is achieved through rollers

Make sure the roller pattern is followed

Make sure the edges and centerline joints are rolled

Mat temperature should determine proximity of roller to paver

Rolling too fast can tear mat and create bumps and dips





Good tarp coverage



