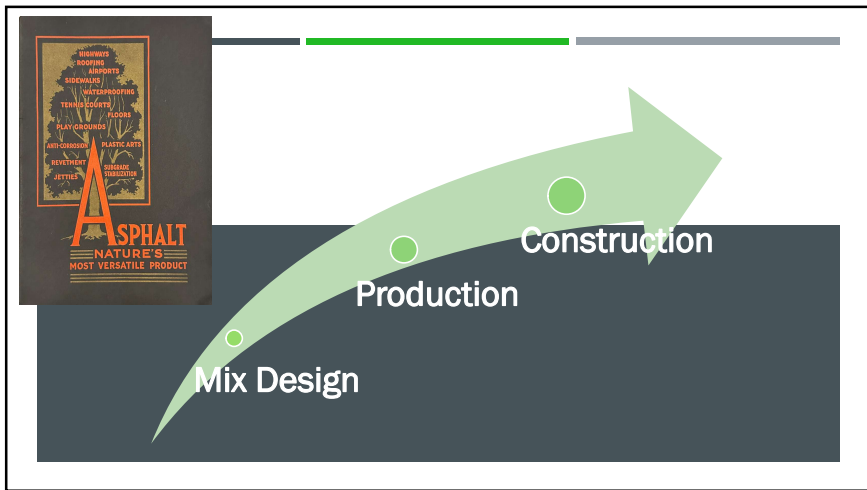
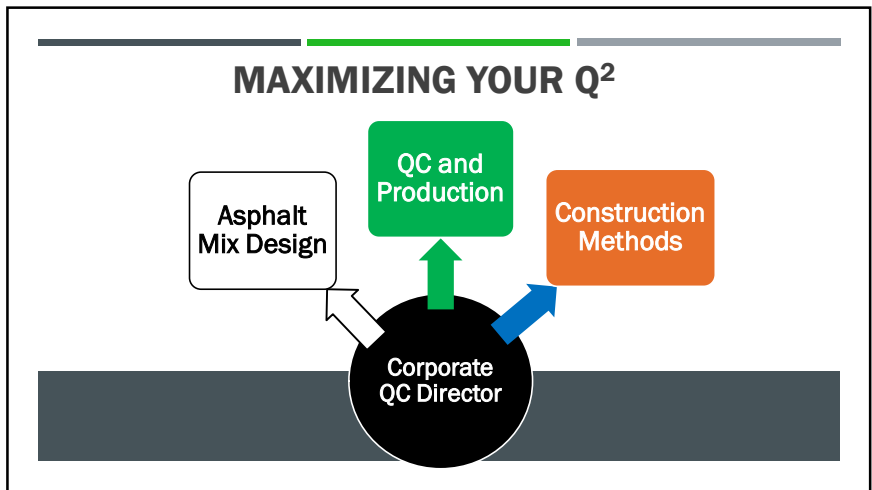




1



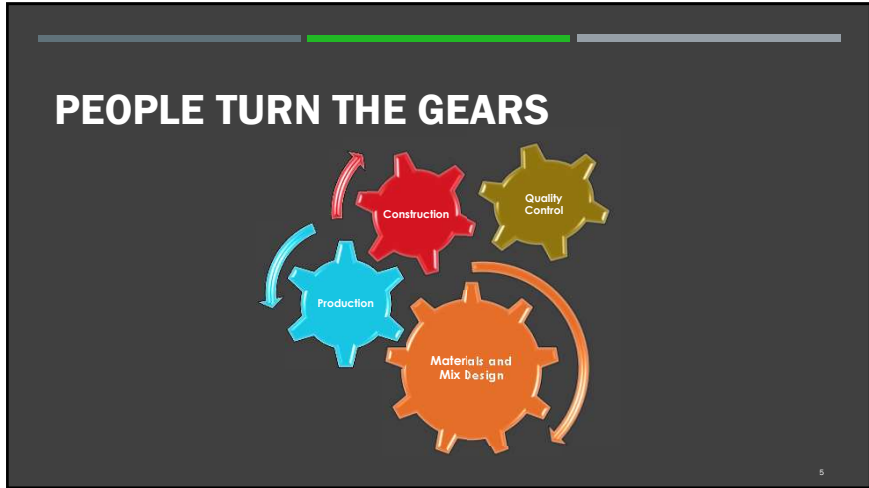
2



3

- PEOPLE: AGENCY & CONTRACTOR**
- Ethics
 - Trust
 - Teamwork
 - Recognition
 - Integrity
 - Training
 - Leadership
 - Communication
- IRREFUTABLE**

4



5

CONTRACTOR 'DRILL DOWN'

Immediate <ul style="list-style-type: none"> ■ QC ■ Plant & Yard ■ Construction ■ Equipment 	Long Term <ul style="list-style-type: none"> ■ Global ■ RAP & RAS Utilization ■ Relationship Building ■ MPT Action Items
--	---

6

Project: Interstate 80
Inspector: Dr. Voids

Problem	Frequency
Varying AC content.	III (Meet w/Ryan)
Low in-place density.	II (Watch Jf.)
High minus #200.	IIII (Design issue)
Segregation.	IIII (Training)
Compromised ride.	II (Spoke w/Pat)

HMA QC FINDINGS

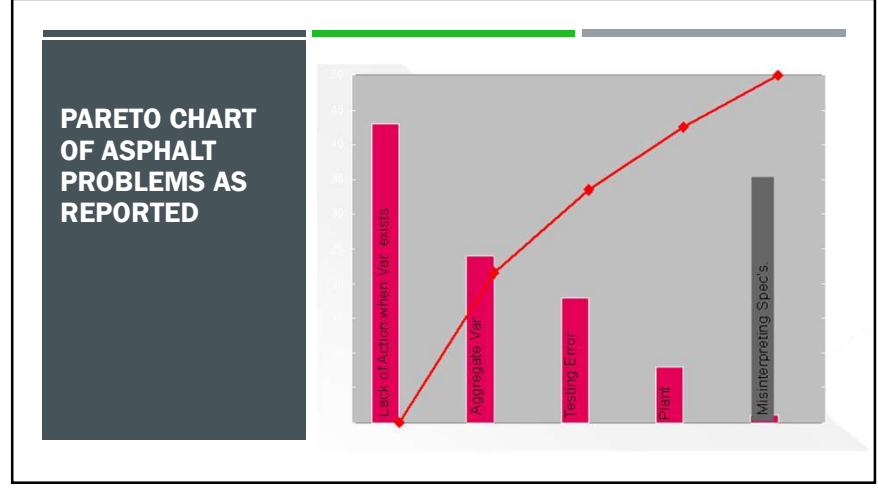
7

- ### MURPHY'S TOP TEN LIST...
- | | |
|--|--------------------------------------|
| 1. Stockpile management | 6. The - tion's |
| 2. RAP use and sizing | 7. Truck inspection |
| 3. Timing on start-up and transition mix | 8. Bad material |
| 4. Temperature throughout (thermodynamics) | 9. Inventory and EOY |
| 5. Gob hopper / batcher | 10. Plant tph required and hot-stops |
- Overarching everything is...
Communication with QC

8



9



10

EFFICIENCY OF OPERATIONS
HMA ECONOMICS 101

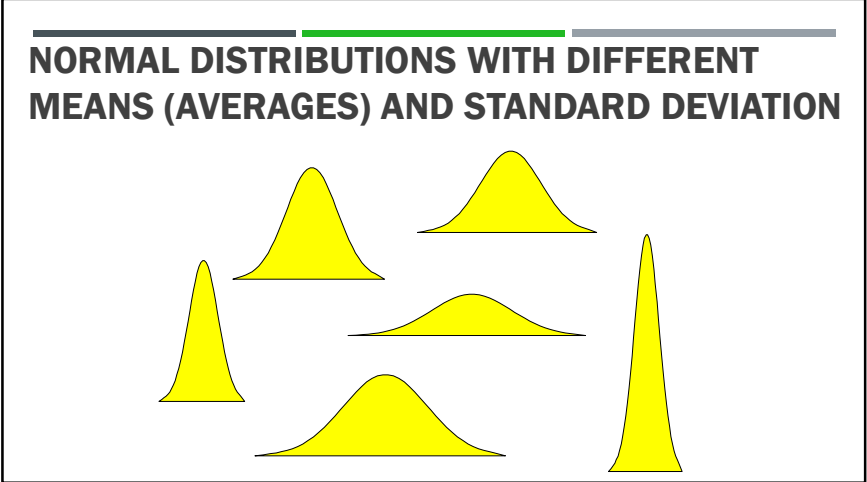
SAVING ON COSTS FOR NOTHING:
IS IT POSSIBLE?

11

HOW CONTRACTORS GET PAID TODAY


WARNING
ONE STANDARD DEVIATION AWAY FROM LOSING IT

12




13


PEOPLE



AUDIT

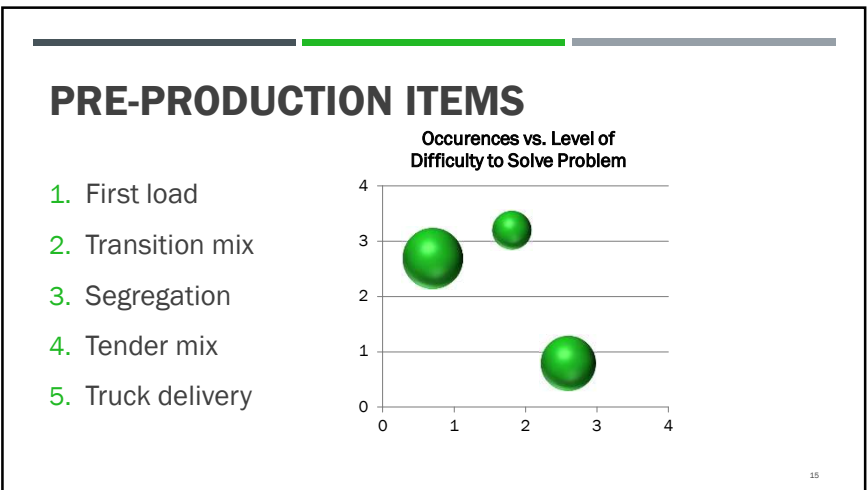


CROSS-TRAIN



MANAGE HOURS

14



15

PROPERTIES OF THE MATERIALS

- Aggregate
- Asphalt Cement
- Mix Properties

16

MATERIALS & MIX DESIGN

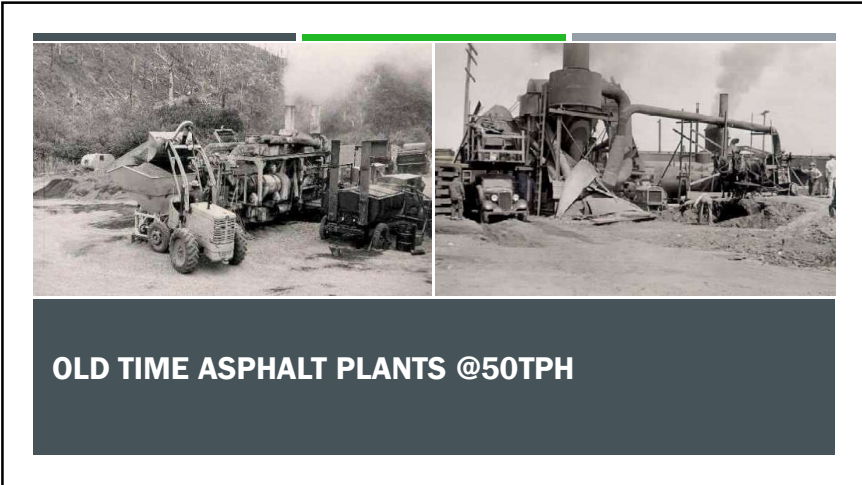
Utilize anticipated increase to the minus #200 (aka dust) during production within your mix design.

Why? Because Dust is the Devil!

17



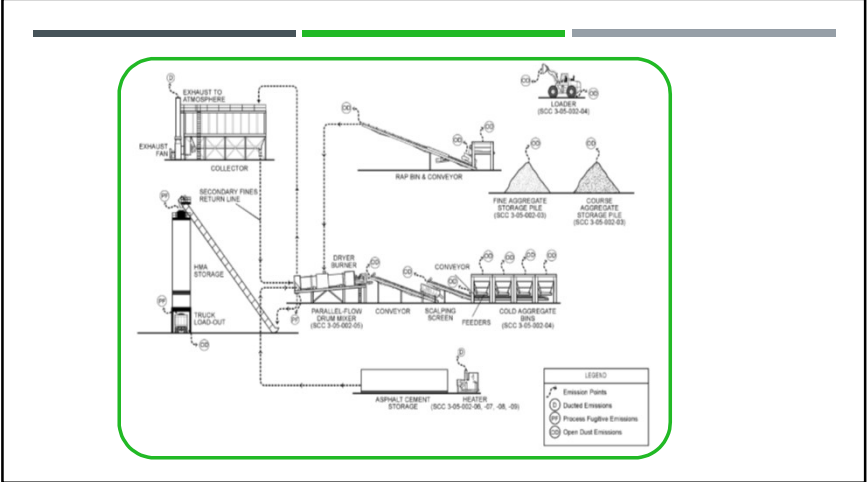
18



19



20



21

PRODUCTION

- Correct products
- Uniform
- Separation
- Consistent
- Uniform
- Workable
- Consistent
- Compactable

ACCEPTABLE

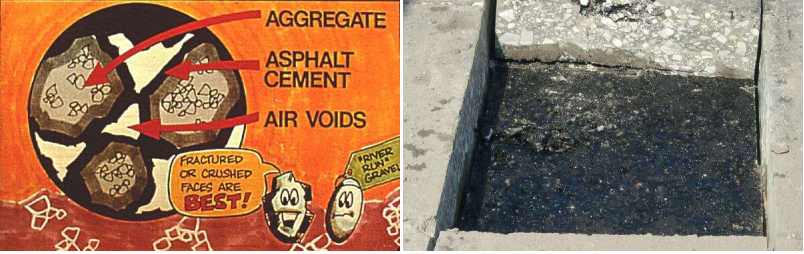
22

BINDER AND COMPACTION V_{be}



- Asphalt binder holds particles together
 - Provides lubrication at high temperatures
 - Provides cohesion at in-service temperatures
- Prevents air and water intrusion into mat


23



LACK OF DENSIFICATION

24

REDEPLOYING BAD MIX IS ACCEPTABLE



25

CALIBRATION IS KEY: CHANGES TO ANY CALIBRATIONS NEED TO BE RELAYED TO THE QC MANAGER

26

AUDIT YOUR ASPHALT PLANT



- Stockpiles
- Cold Feeds
- Calibrations
- Belt Scales
- Drum Flights
- Burner & Tramp Air
- Primary & Secondary Dust Control
- Storage

27

STOCKPILE MANAGEMENT PLAYS A LOT BIGGER ROLE THAN MOST PEOPLE KNOW

28

AGGREGATE CARRIES THE LOAD

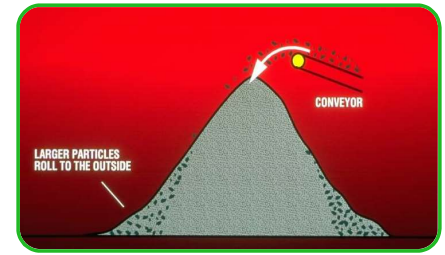


29

AGGREGATE STORAGE

Quality Concerns

- Insufficient quantities
- Poor handling techniques
- Variability in characteristics



Segregation

30

30



GOING UP AND COMING DOWN THE STOCKPILE...


31



MOISTURE. MOISTURE. MOISTURE.

32

1% moisture = 10% Fuel

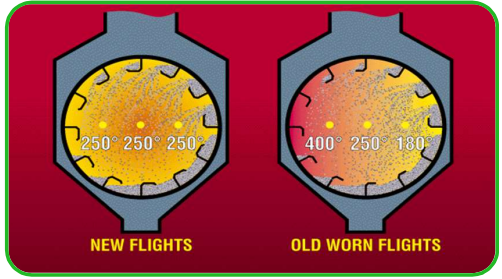


Bumper Sticker In Cab
Shall Read "Bucket Up 2-ft."

↓moisture = ↑Quality

33

HOW WORN FLIGHTS AFFECT TEMPERATURES



NEW FLIGHTS OLD WORN FLIGHTS

TEMPERATURES ACROSS THE INTAKE BREECHING SHOULD BE CONSTANT.

34

PRODUCTION

What Causes Rust?



35

AGGREGATE STORAGE




- Separation
- Grizzly (clump breaker)
- Vibration
- CA then FA

36

RECLAIMED ASPHALT PAVEMENT (RAP)

37

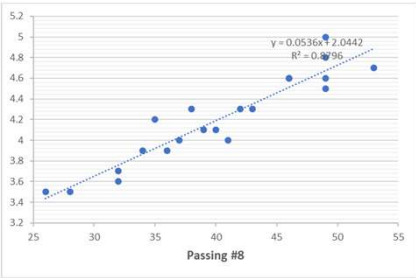
WHAT YOU CRUSH IS WHAT YOU GET



38

RECLAIMED ASPHALT STOCKPILES


Ignition #8	Ignition AC
43	4.3
39	4.1
41	4
38	4.3
53	4.7
49	4.6
49	4.8
49	4.5
32	3.7
40	4.1
46	4.6
32	3.6
34	3.9
35	4.2
36	3.9
46	4.6
26	3.5
37	4
42	4.3
28	3.5
49	5



39

DUST "ALL IN / ALL OUT"

- Design is starting point,
- High dust leads to 'new designs',
- Retrofit is baghouse to silo umbilical with blower.
- Understanding the numbers.



40

PRODUCTION

41

TRANSITION MIX OR BAD ORDERING

My observations from around the nation.

coddiwomple
(kod'ə wɒm pəl) (v.)
 To travel purposefully toward an as-yet-unknown destination.
[ENGLISH SLANG]

42

IT'S OK TO STOP THE PLANT WHEN SOMETHING IS WRONG

43

MULTIPLE SILO INSTALLATIONS

44

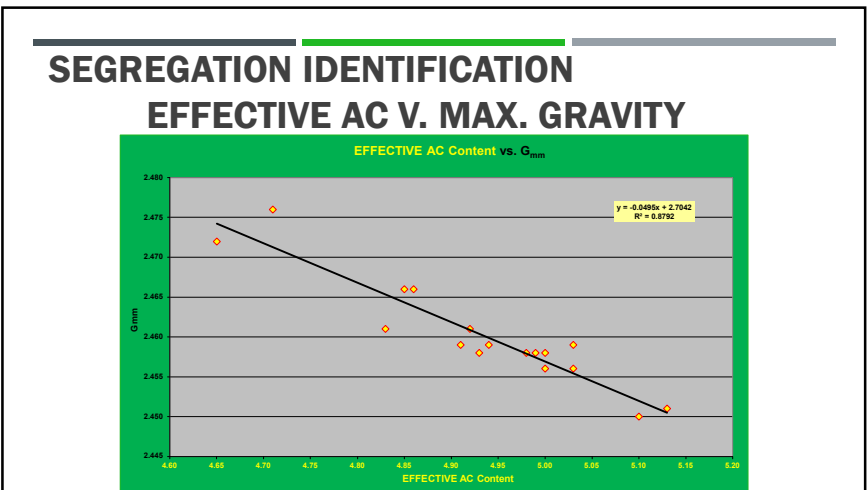
SILO & TRUCK LOADING: RECOGNIZE THE EVIL SPIRIT

45

ONE TRUCK, ONE OBSERVATION

	Passing #4	Percent AC
Rear	50	5.9
Middle	45	5.4
Front	?	?

46



47

MURPHY RULES

- Look at trends and tendencies of both tests first; G_{mb} and G_{mm} .
- Review AC versus gradation.
- Train, cross-train, and repeat.

QC Manager must be kept in the know

48

KEY ISSUES RELATED TO HAUL TRUCKS

- Types and characteristics of haul trucks
- Methods of heat insulation
- Cleaning
- Truck maintenance



49

HMA DELIVERY

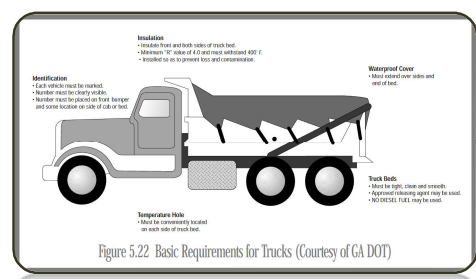
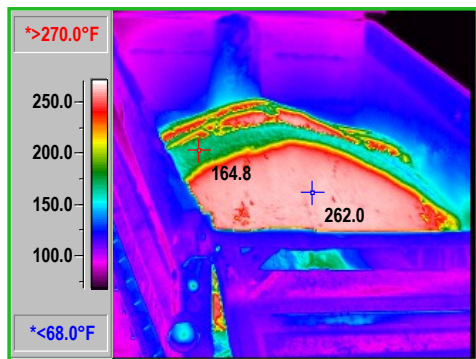


Figure 5.22 Basic Requirements for Trucks (Courtesy of GA DOT)

50

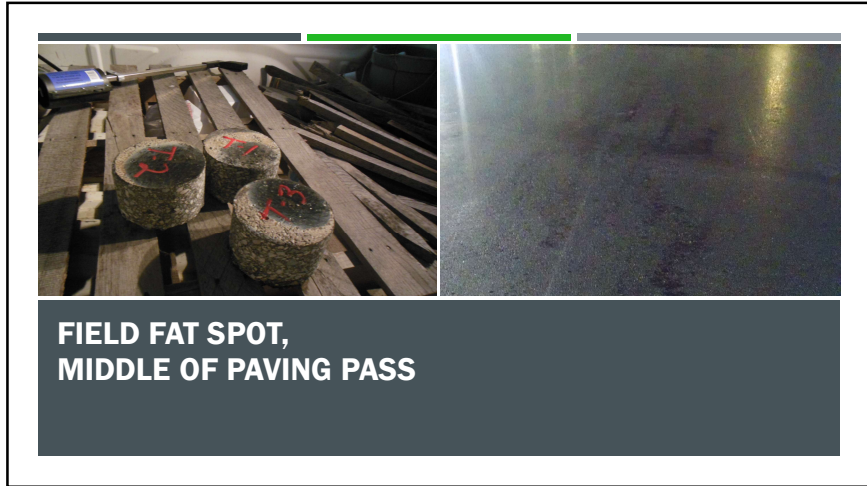
INFRARED PHOTO OF END DUMP



51



52



53

FAT SPOTS IN PAVEMENT

Issue

- Top half AC = 6.1%
- Bottom half AC = 4.8%

Solution: Eliminate steam build up in the MTV and watch release agent

54



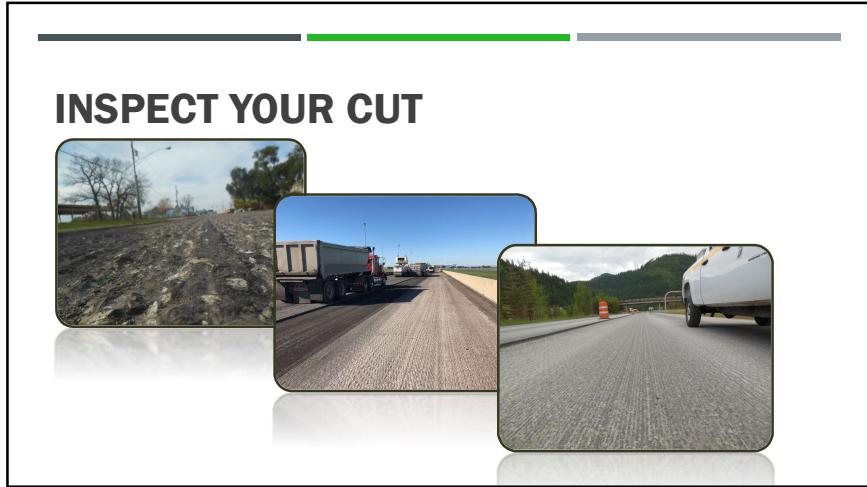
55

COLD MILLING: NOMINAL CUT V. SMOOTHNESS

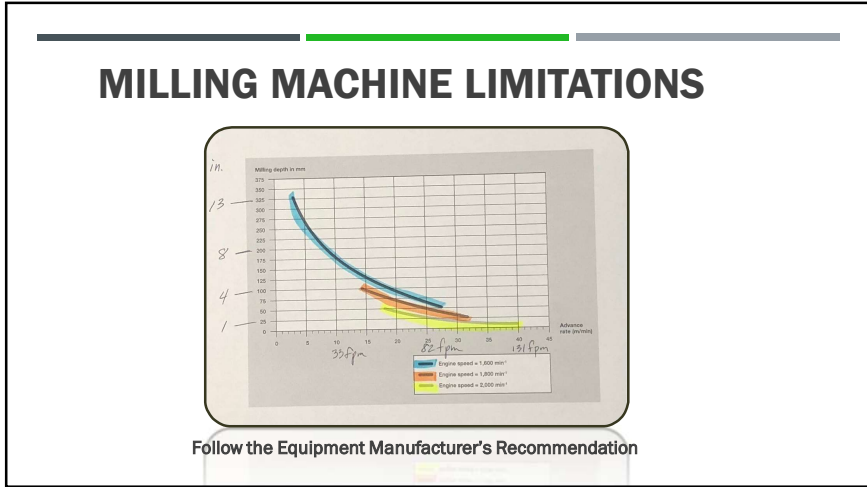
Let'er Ride

Do Not Chase Cut Depth

56



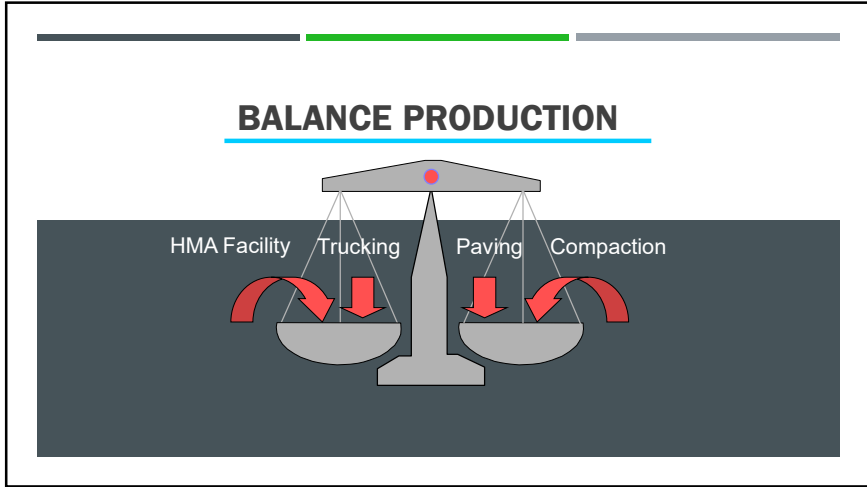
57



58



59



60

**SPEAKING OF THE
IMPORTANCE OF
BALANCE AND
FLEXIBILITY**



61

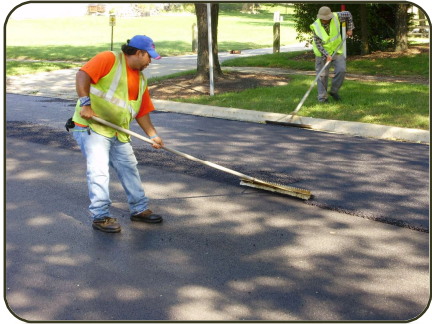
CONSTRUCTION



End Gate Down

62

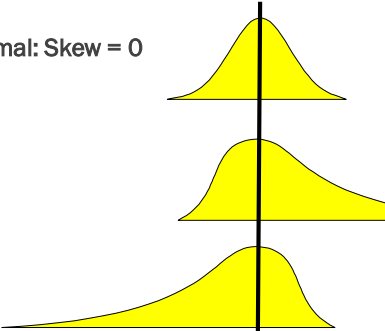
SOURCES OF VARIABILITY - CONSTRUCTION

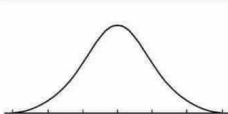


63


SKEW

Normal: Skew = 0





Normal Distribution



Paranormal Distribution

64

CAUSE

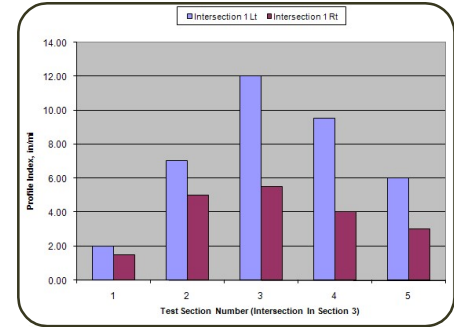


Pave Returns After Mainline

65

65

EFFECT ON SMOOTHNESS



66

66

CAUSE AND EFFECT



Pave Returns After Mainline

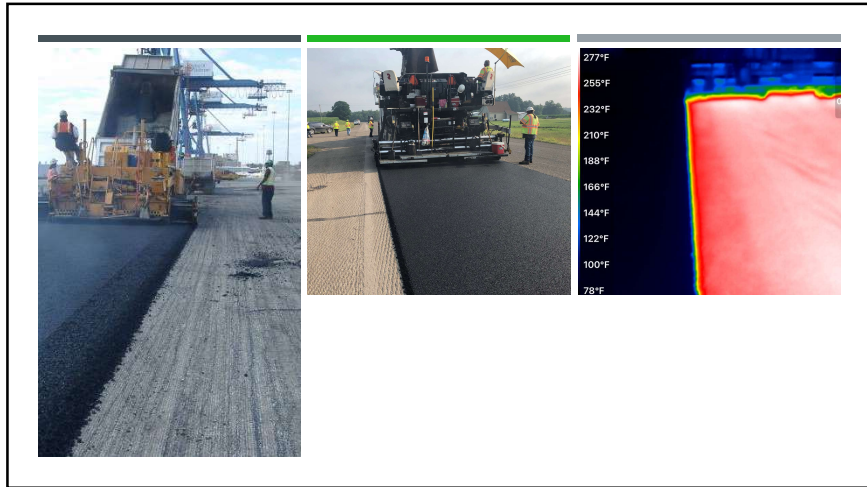
67

67

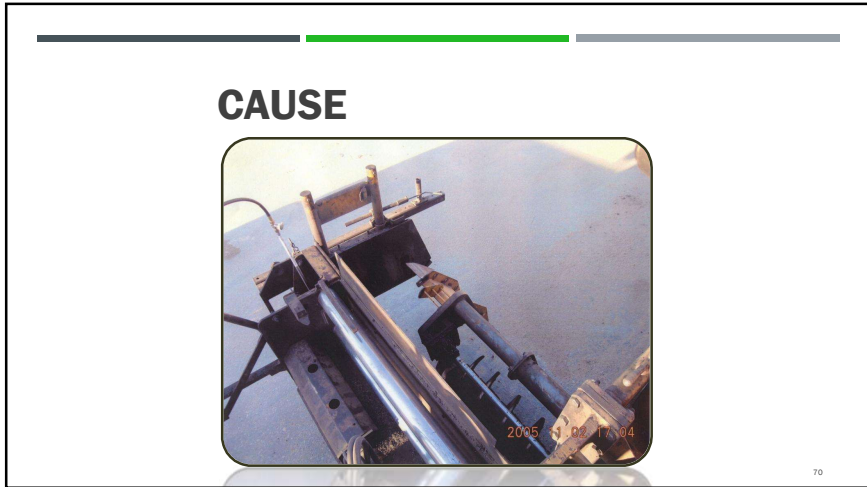
KNOW WHEN TO STOP AND RE-GROUP



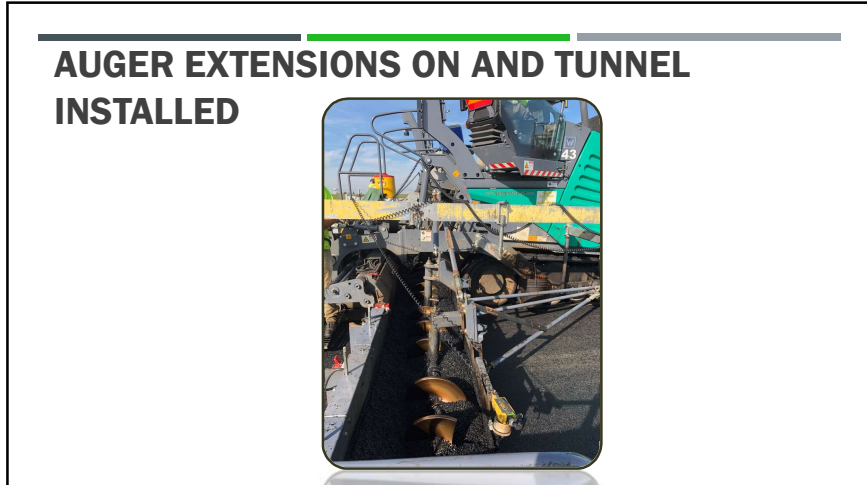
68



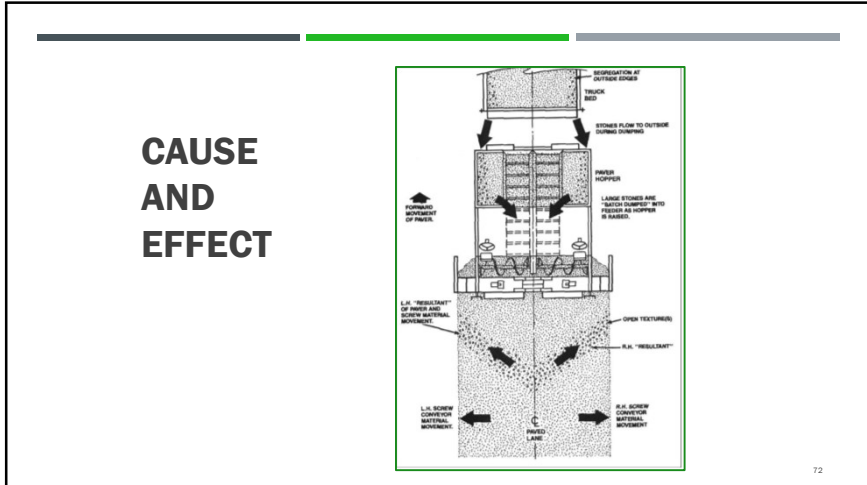
69



70



71



72

CONSIDER HOPPER RETROFIT



73

NEXT GENERATION PAVE-IR



74

QC DENSITY TECHNICIAN



75

COMPACTION PROBLEMS



76

WE ARE HEADED TO HANGING OUT AT THE JOINT



77

77

COMBO ROLLER – UNCONFINED VERSUS CONFINED LONGITUDINAL JOINT



78

78

ELIMINATE JOINTS WHENEVER POSSIBLE



79

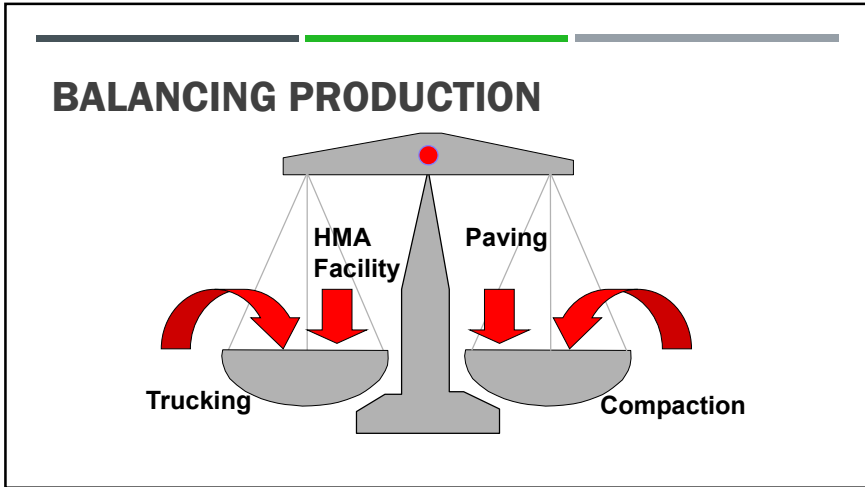
79

NIGHT PAVING



80

80



81



82

BRIDGE SKI'S

- Smoother
- Less 'Cranking of Screw'
- Watch Your Yield

83

MAIN SOLUTION FOR ACHIEVING TOTAL QUALITY MANAGEMENT

- COMMUNICATE
- DEVELOP CHEMISTRY
- ACCOUNTABILITY

84

**QUALITY CONTROL
ALWAYS
COSTS LESS THAN
"REMOVE & REPLACE"**

85



**1. Safety
2. Quality
3. Production**

86

PEOPLE TURN THE GEARS



87


MEASURING ASPHALT SUCCESS

**Take-Away
(aka Deliverables)**

- Understand Risks
- Improve Methods
- Update Technology
- Consider Options
- Develop Future Action Items

88

QUESTIONS?



MURPHY
PAVEMENT
TECHNOLOGY, INC
www.murhypavetech.com

Timothy R. Murphy
cell: 773-874-9800

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**FUTURE AAPT ANNUAL MEETINGS – SEPT 2024
LOEWS HOTEL: CHICAGO, IL**




- Dedicated Task Force
(Prof. Al-Qadi, Prof. Hajj, KBIII, & Murphy from IL)
- Centennial Event @ Shedd Aquarium
- + Yearlong Centennial Celebration
 - AAPT/NAPA Member Reception in DC @ TRB
 - Webinars & Monthly Events on Social Media
 - Expanded Sponsorship & Fundraising Campaign

\$sponsorships Available

90

90