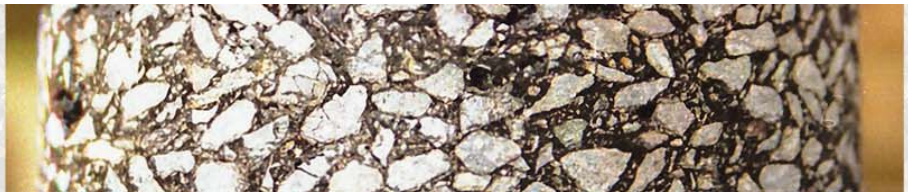
1ST INTERNATIONAL CONFERENCE ON
Stone Matrix Asphalt



NAPA NATIONAL ASPHALT PAVEMENT ASSOCIATION IN PARTNERSHIP WITH
ASPHALT INSTITUTE
AAPT
TRB Transportation Research Board
U.S. TIRE MANUFACTURERS ASSOCIATION

Best Practices: Construction

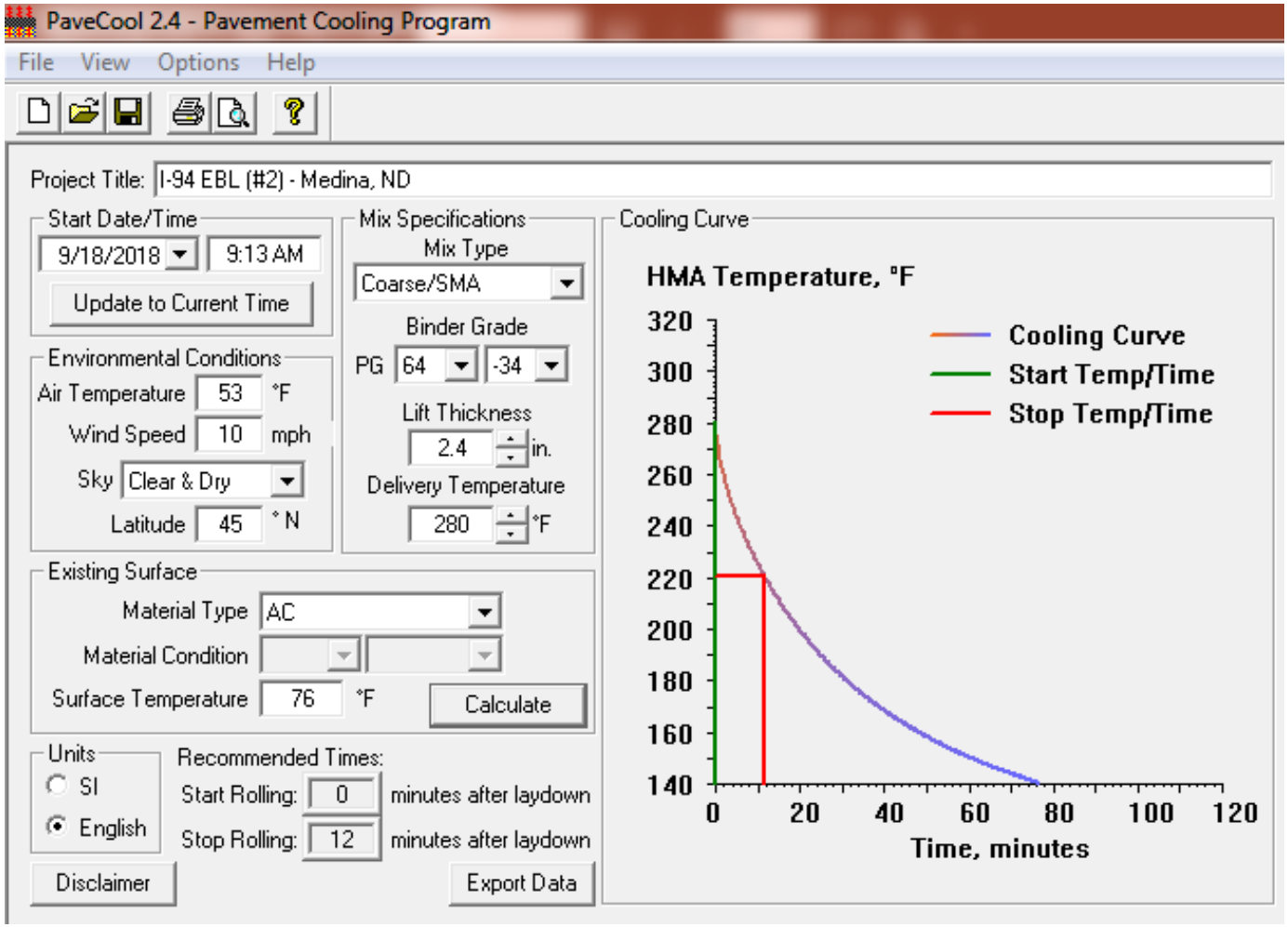
Placement and Compaction of SMA

Presented by: Todd Mansell, Caterpillar

Temperature! Temperature! Temperature!

- Compact while hot!
- Stay close to paver
- SMA is open-textured, cools quicker

PaveCool



- 12 minutes from 280°F to 220°F (surface)
- 305°F to 285°F (internal)

Temperature: End dumps/windrow/MTV

- Keep windrows short
- MTV can help with uniform temperatures
- Keep tarps on trucks

Good tarp

Poor tarping

Roller types and settings…

- **Static steel drum**
  - **high PLI**
- **Vibratory steel drum**
  - **low amplitude, high frequency**
  - **oscillation**
- **Pneumatic tire**
  - **should not be used**

Compacting with steel drums

- Should I use vibration?
- Careful not to break aggregate
- How do I avoid breaking aggregate?

Get on, get off !!

- It's easy to over-roll SMA and damage the mat using vibration
  - It's also more efficient to use vibration
- Watch for 'drum bounce'
- Watch for white surface

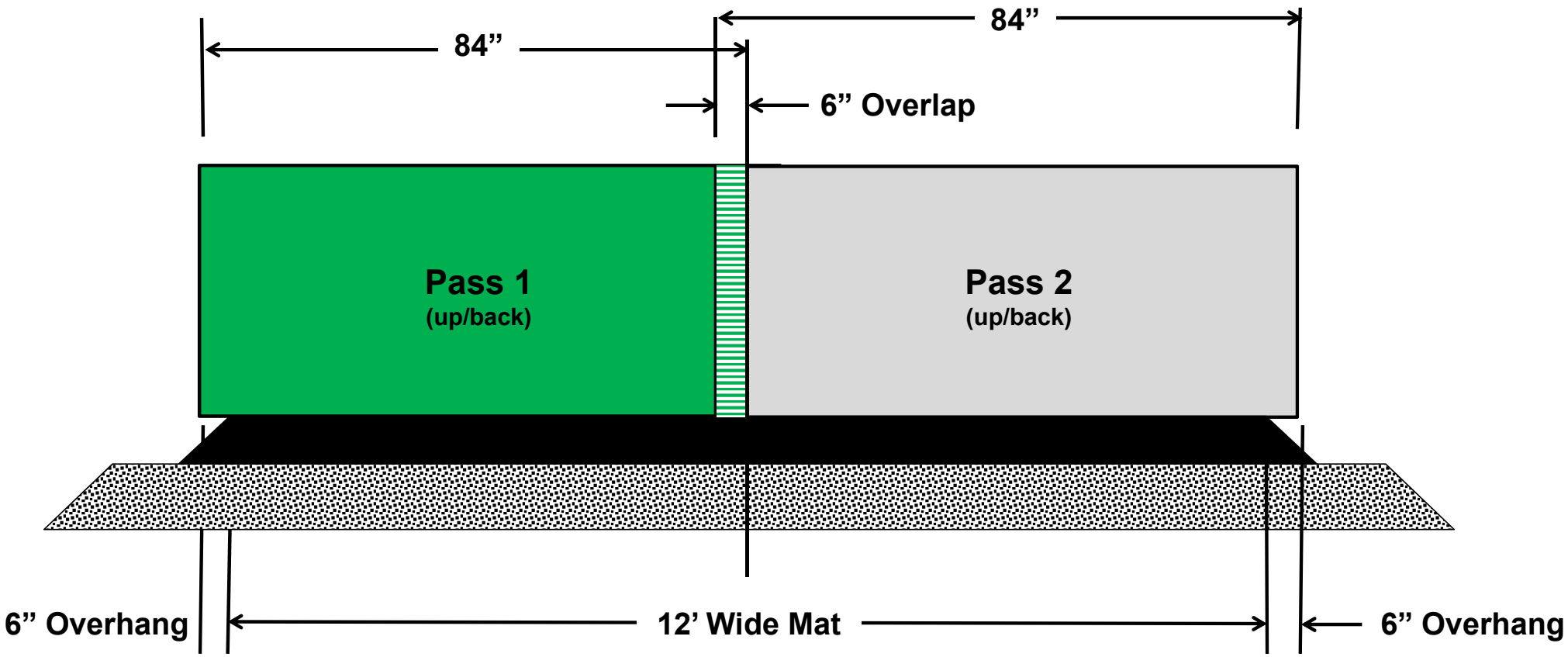
Recommendations:

- Static steel on thinner lifts with rigid base support
- Use vibration on thicker lifts, less rigid base
  - use vibration whenever possible where it doesn't fracture aggregate
  - the only way to know is to try!!
  - highly temperature dependent
- Oscillation may work in any position
  - less risk of damaging/fracturing aggregates
  - more risk of not achieving density
- Pneumatic tire should not be used due to pickup on the tires

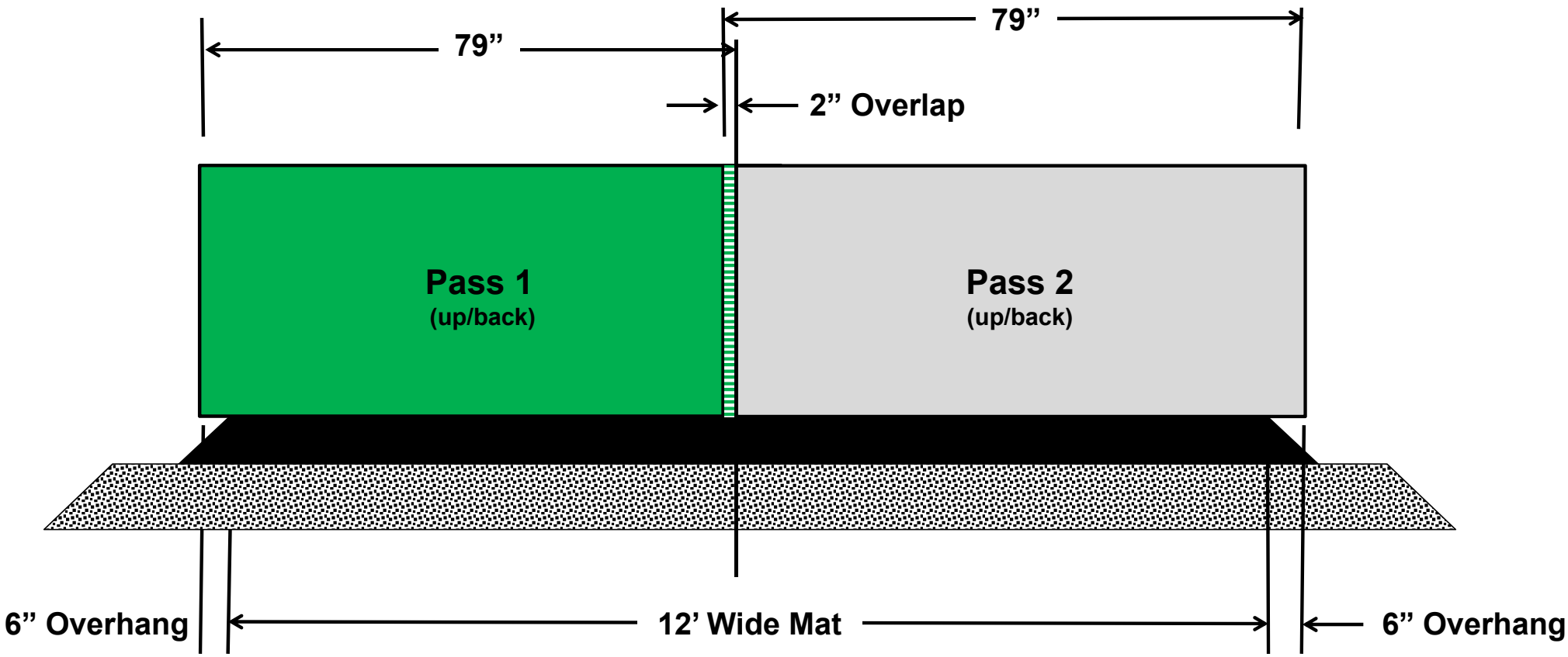
Typical rolling patterns

- 12’ with 84” drum
- 12’ with 79” drum
- 12’ with 67” drum
- Make odd pass back on the wheel path

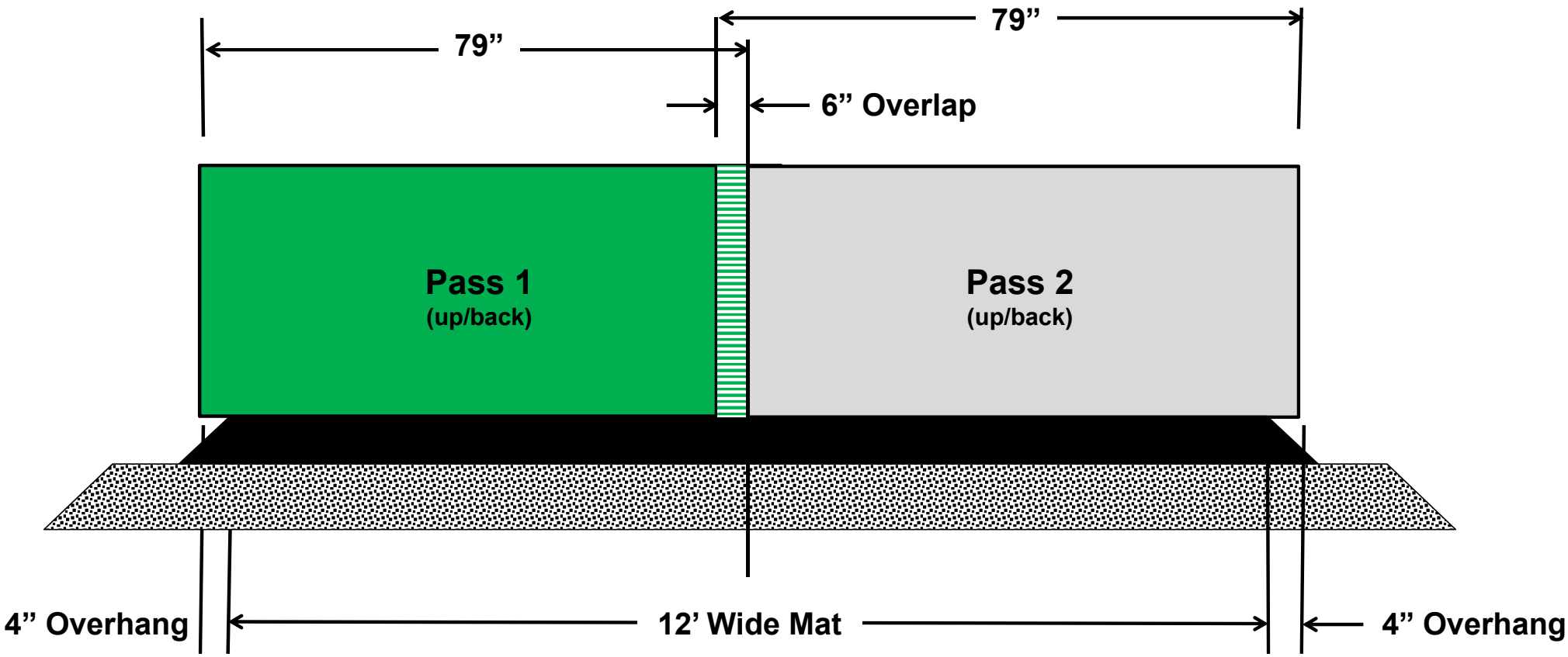
12-Foot Wide Lane: 84” x 2 passes



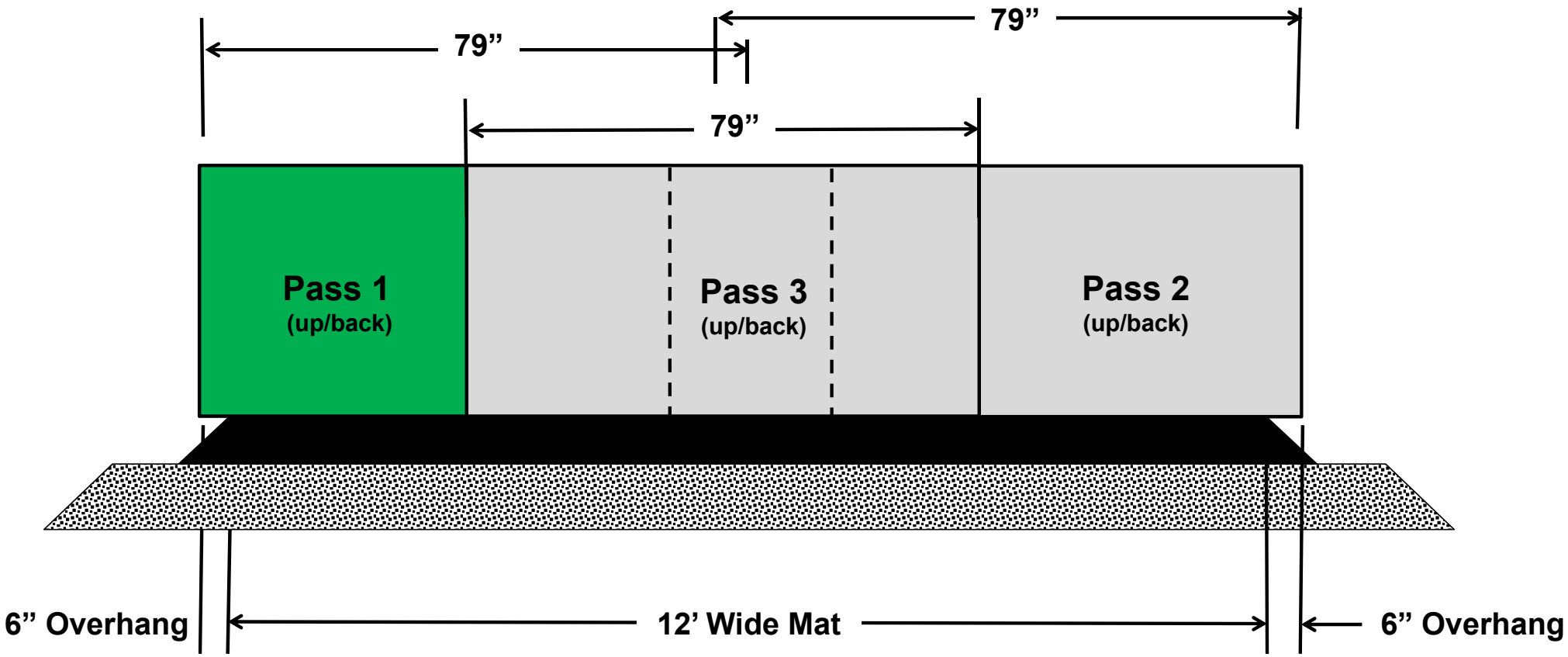
12-Foot Wide Lane: 79” x 2 passes



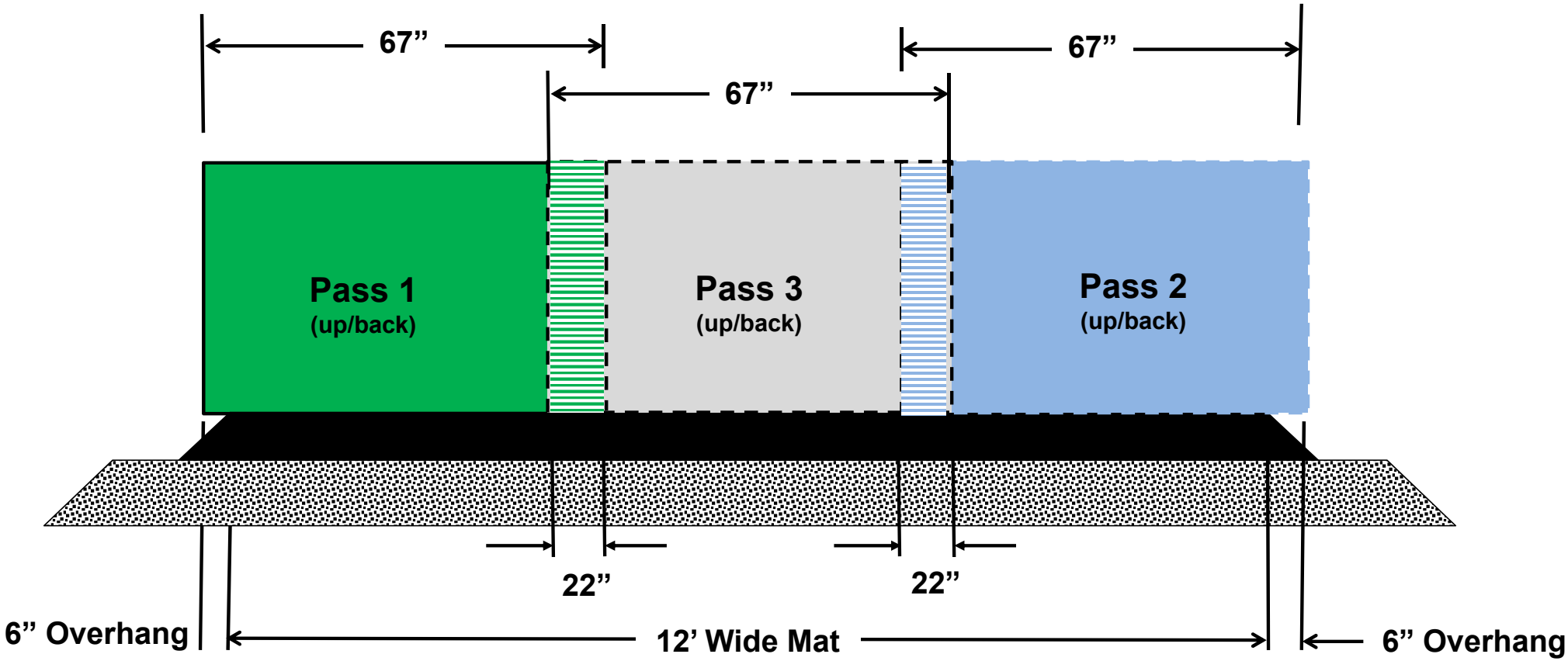
12-Foot Wide Lane: 79” x 2 passes



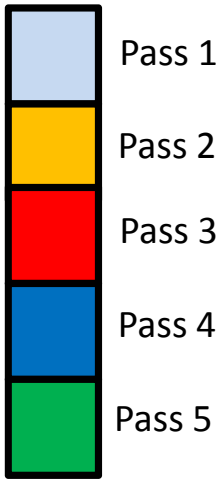
12-Foot Wide Lane: 79” x 3 passes



12-Foot Wide Lane: 67” x 3 passes

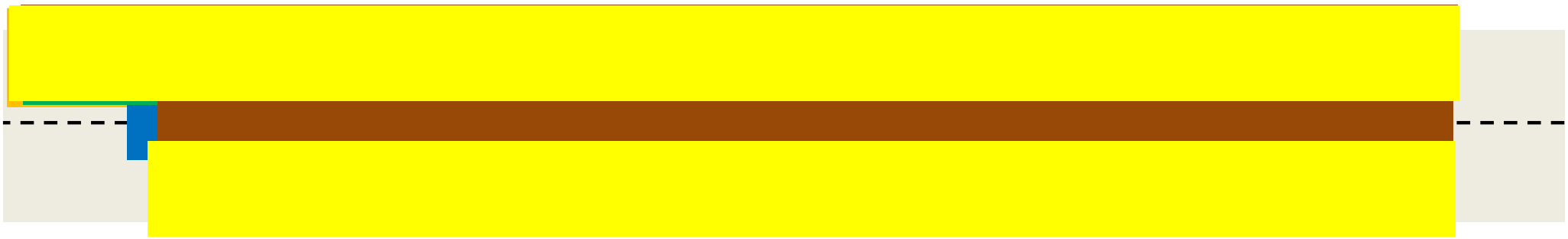


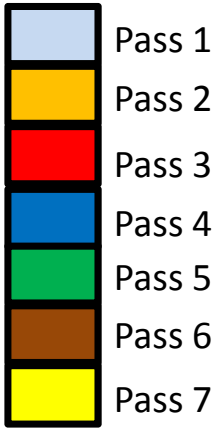
12’ with 84” drum w/ 6” overlap



Paving Direction

12’ with 79” drum w/ 6” overlap





12’ with 79” drum - actual coverage

Coverage 4
Coverage 5

To get same coverage:

- **Take 7-pass pattern with 79” rollers**
- **Takes 5-pass pattern with 84” rollers**
- **Temperature!!!**

Echelon breakdown - no finish required

- Get density while it's hot!
- Sets up quickly
- Often no need for finish rolling with echelon rolling

Mix behind the screed before rollers

- Use screed vibration
- Initial + 0.5 to 3.0%
- What affects optimum screed vibration setting? How do I set it?

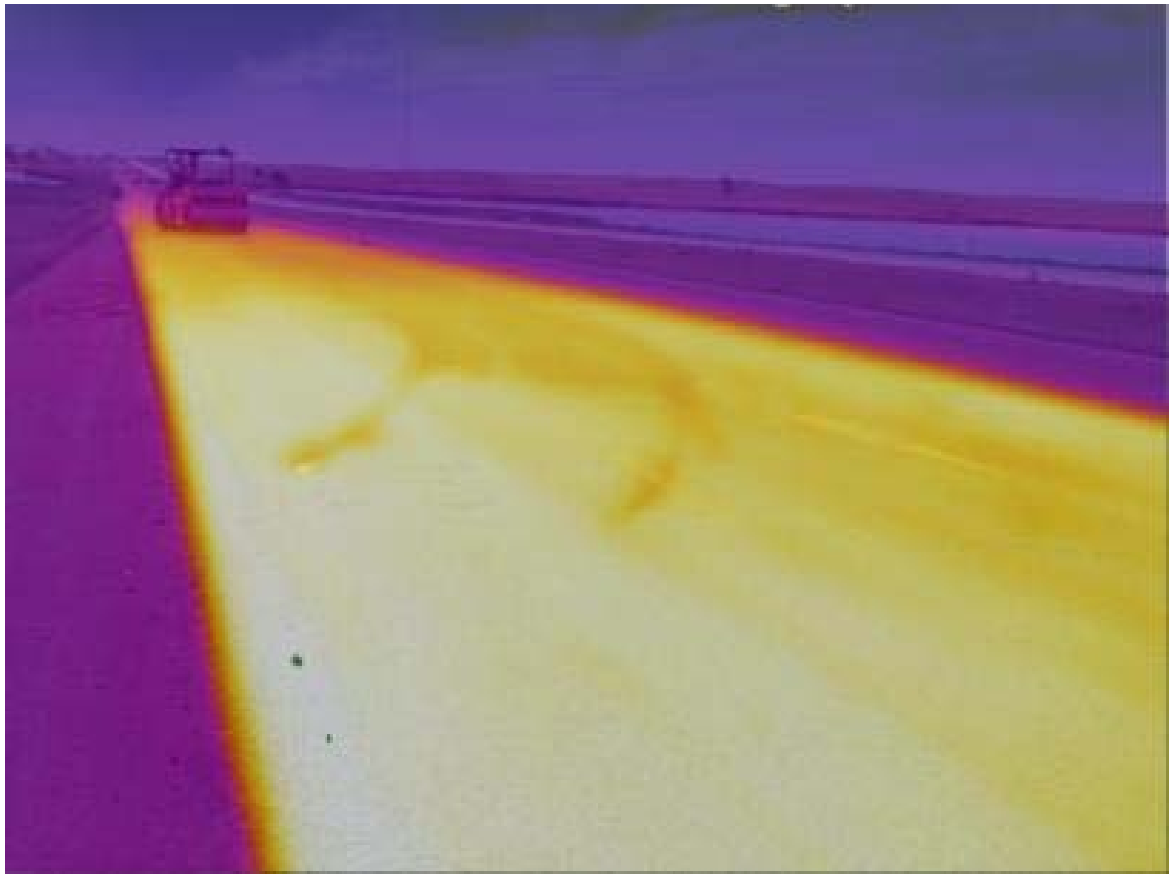
Mix after compaction

- Required density achieved in first 4 vibratory passes
- No finish roller needed in many cases

Rolling tips

- Many SMA mixes are prone to sticking to steel drums
- Imperative that water system is working properly
- Soap/release agent mixture

Rolling tips

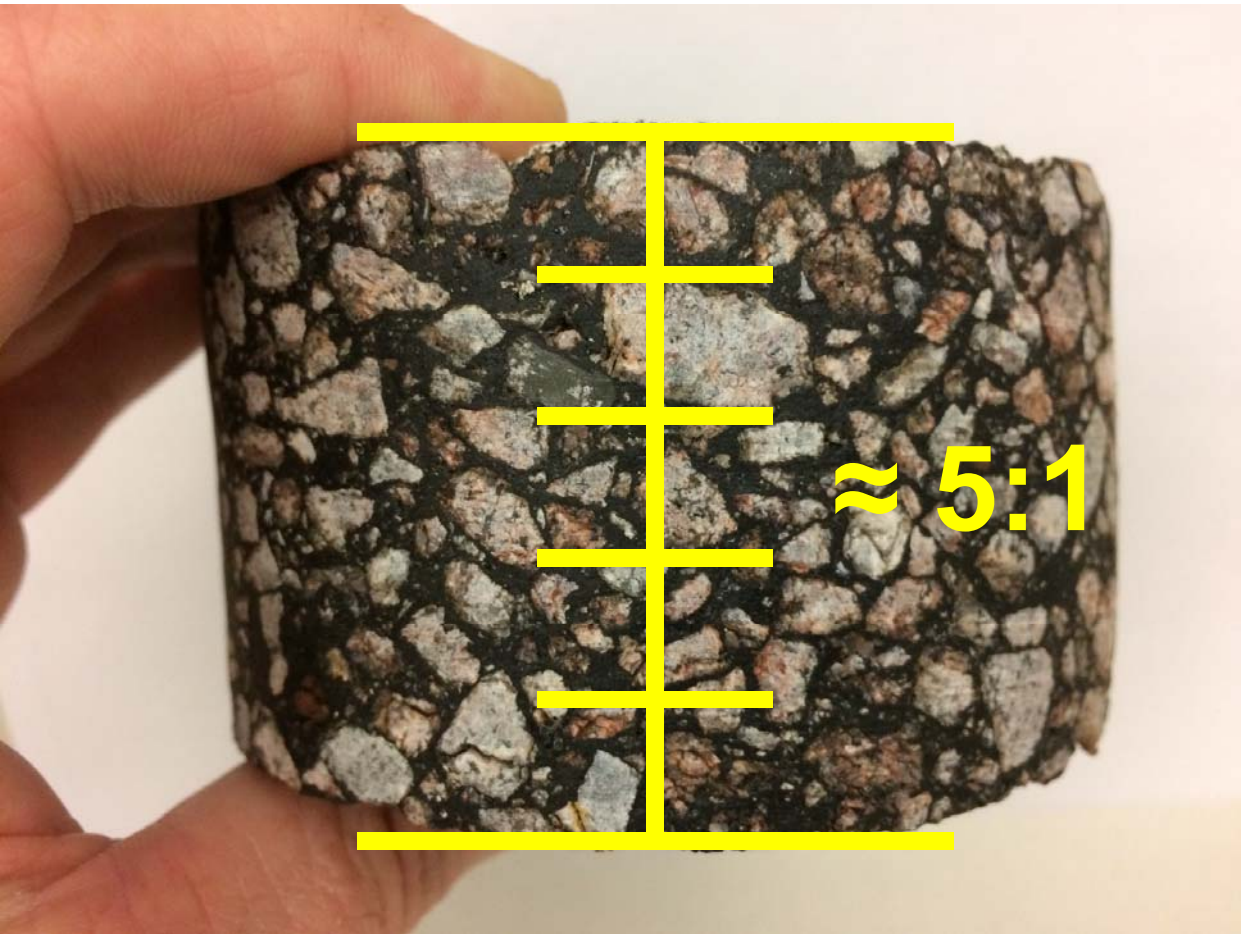


- Don’t park on hot mat
- Water fill on shoulder
- Continuous paving/compaction

Flushing & bleeding, fat spots…

- Several possible causes
  - drain down in silos/trucks
  - uneven distribution of cellulose
  - non-uniform mix temperatures
  - too high mix temperatures
  - unequal dist'n of recycling agent
  - moisture in mix
  - excessive vibration
    - high pre-compaction (tamper)
    - too many roller passes
    - vibratory screed settings

Design and Specification considerations

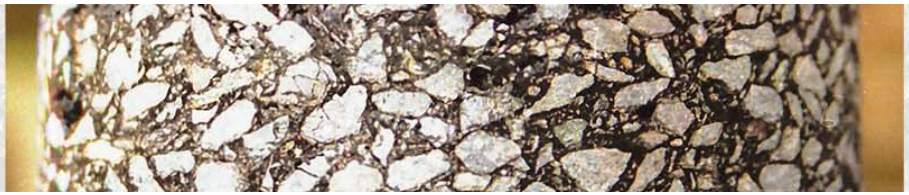


- Lift thickness:NMAS
- NCAT Report 9-27
  - Fine 3:1 or greater
  - Coarse 4:1 or greater
  - SMA 4:1 or greater
- Density Specs
  - minimum 94% ??
  - abolish upper limit??

German process

- Tamper bar screeds
- Slower paving speeds
- Hotter mix temperatures
- Difficult to compare to US

German food needs temperature too!



Thank You for your attention!

Questions?

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