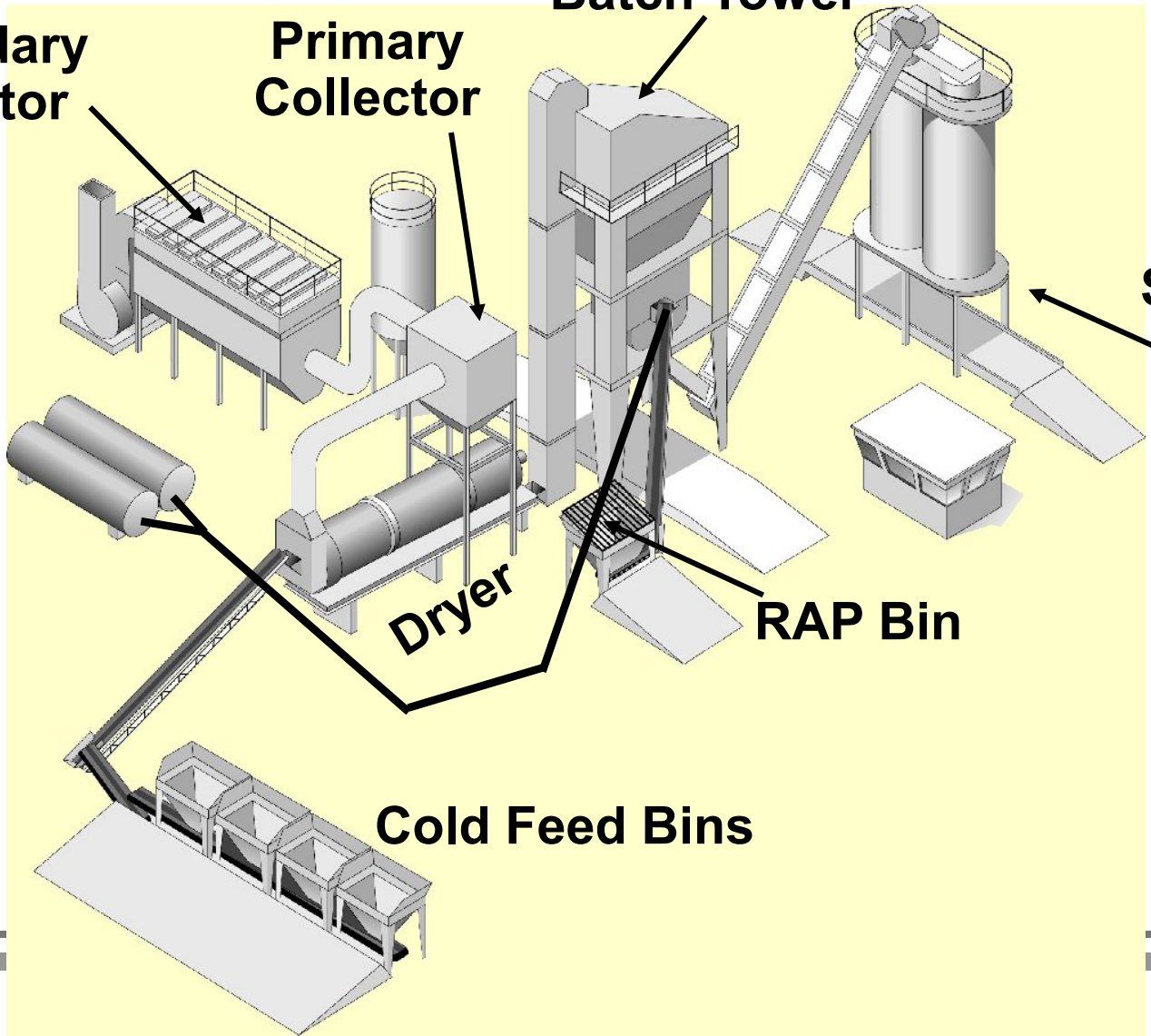
HOT-MIX
ASPHALT
OVERLAY

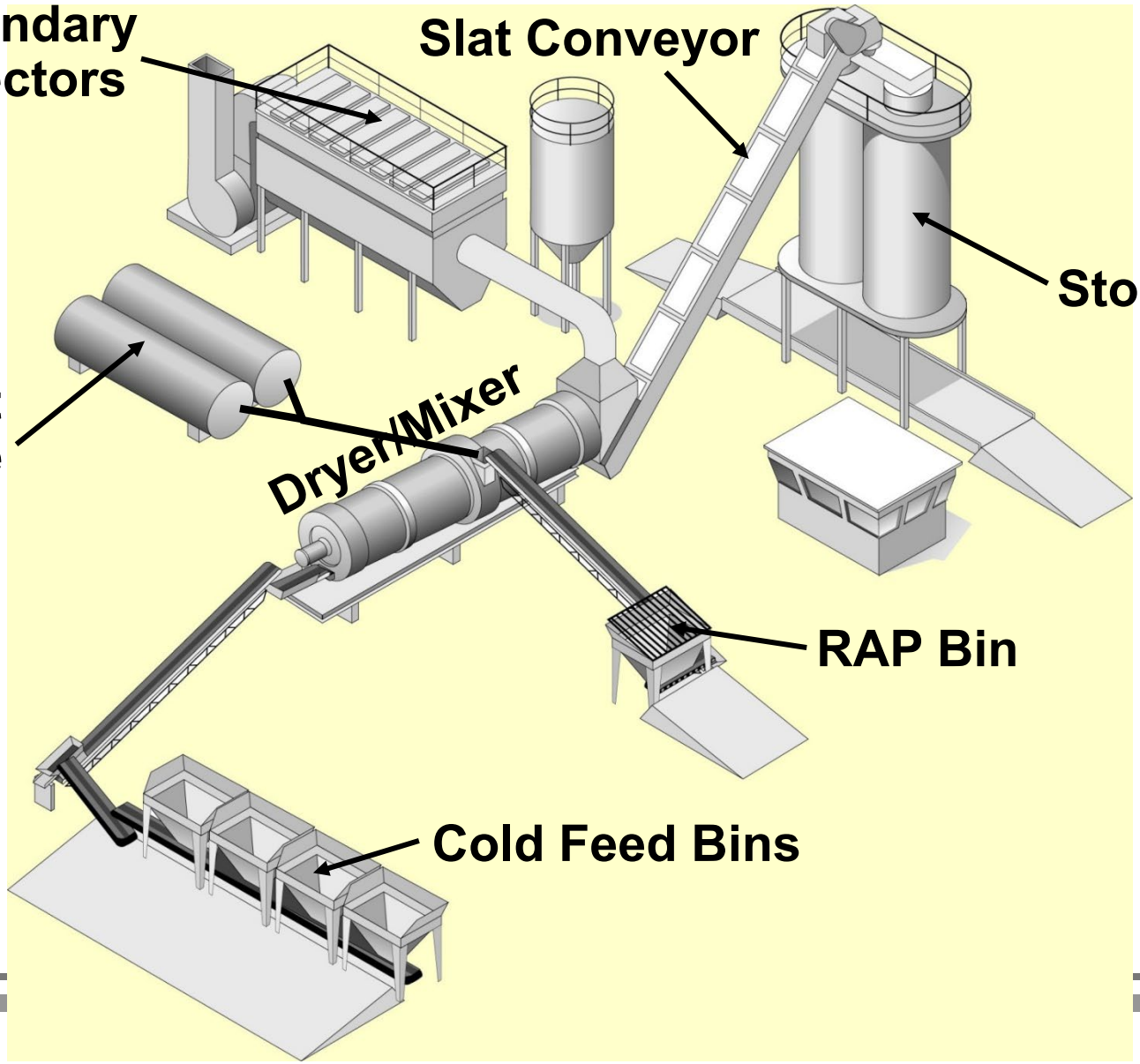
Types of Overlay

- Functional overlay (≤ 1.5 in.)
  - Preserves existing pavement
- Structural overlay (≥ 2 in.)
  - Increases the structural integrity
  - Requires thickness design

Batch Plant


Batch Tower
Secondary Collector
Primary Collector
Storage Silos
Asphalt Storage Tanks
Dryer
RAP Bin
Cold Feed Bins

Drum-Mix Plant



HMA Delivery

Single Unit Truck

Semi-Trailer

Double Trailer

Methods of Discharge

End Dump

Bottom (Billy) Dump

Live Bottom (horizontal discharge)

Loading HMA in the Paver

Material Transfer Vehicle

Windrow Elevator

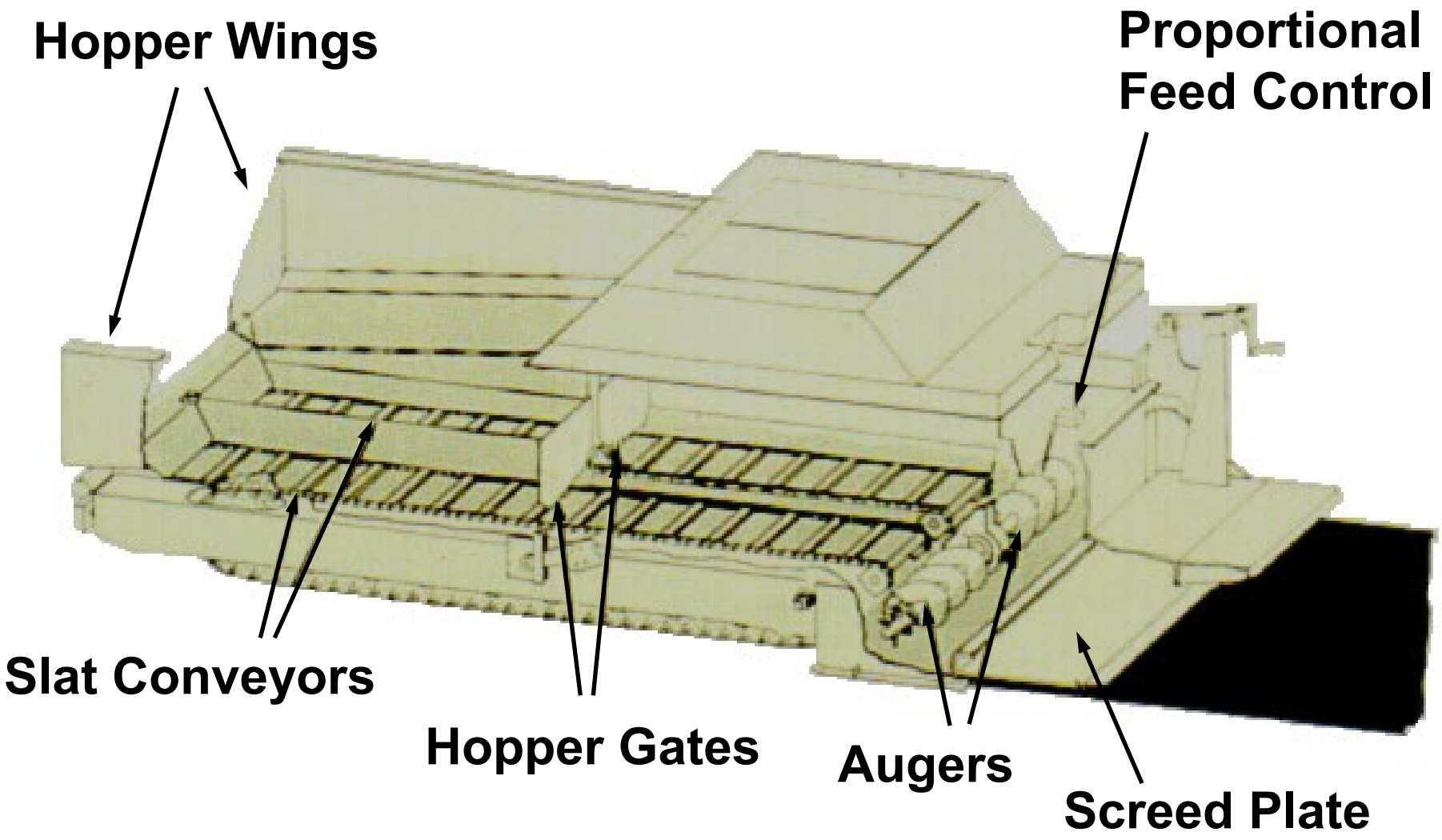

Tack Coat

HMA Placement

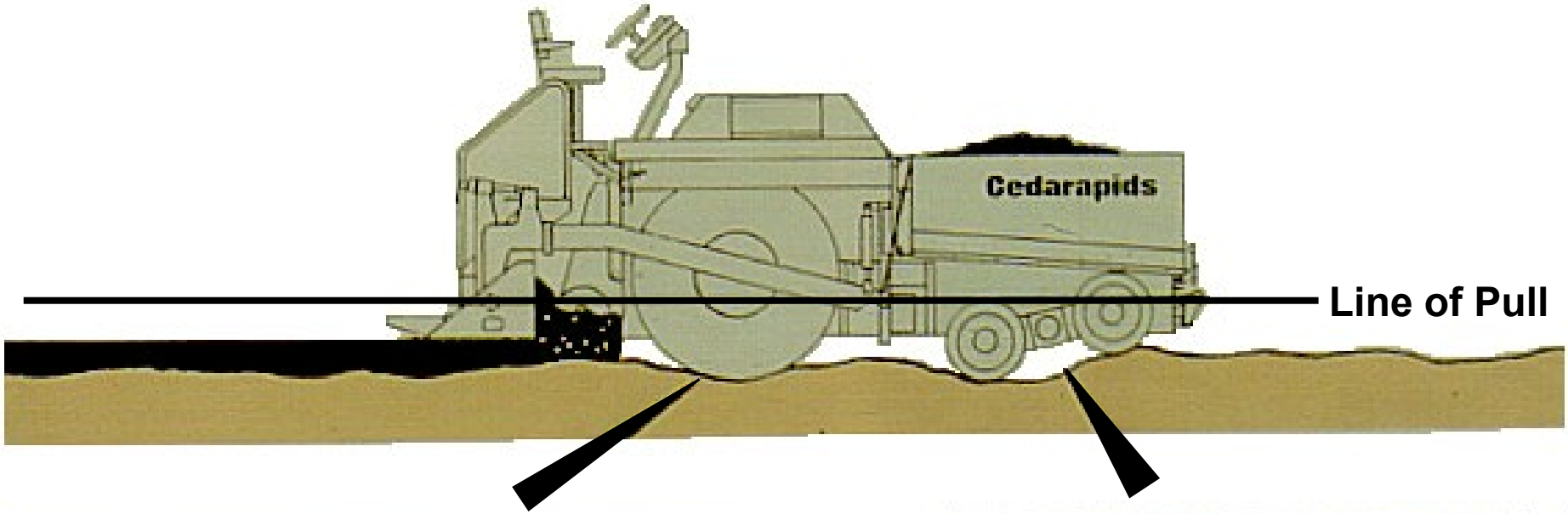
Rubber Tired Paver

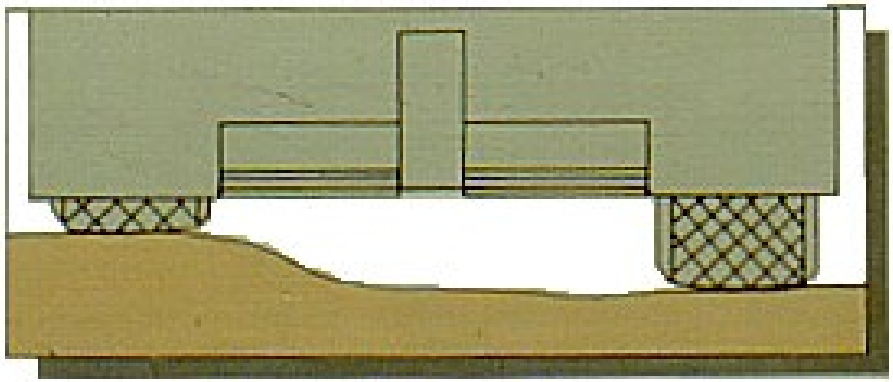
Crawler Track Paver

Material Flow

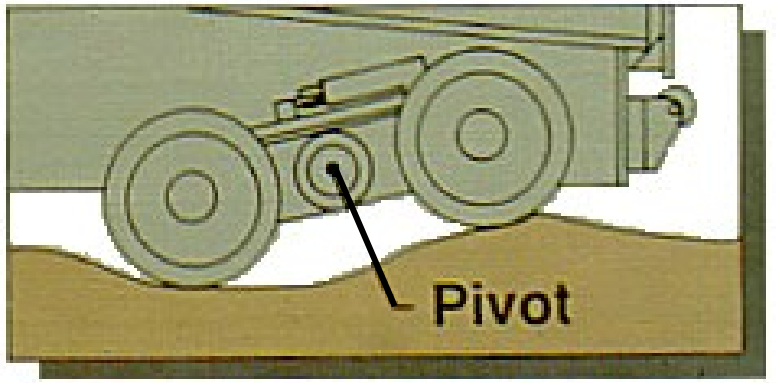


Self Leveling - Rubber Tired Paver





Rear Drive Tires



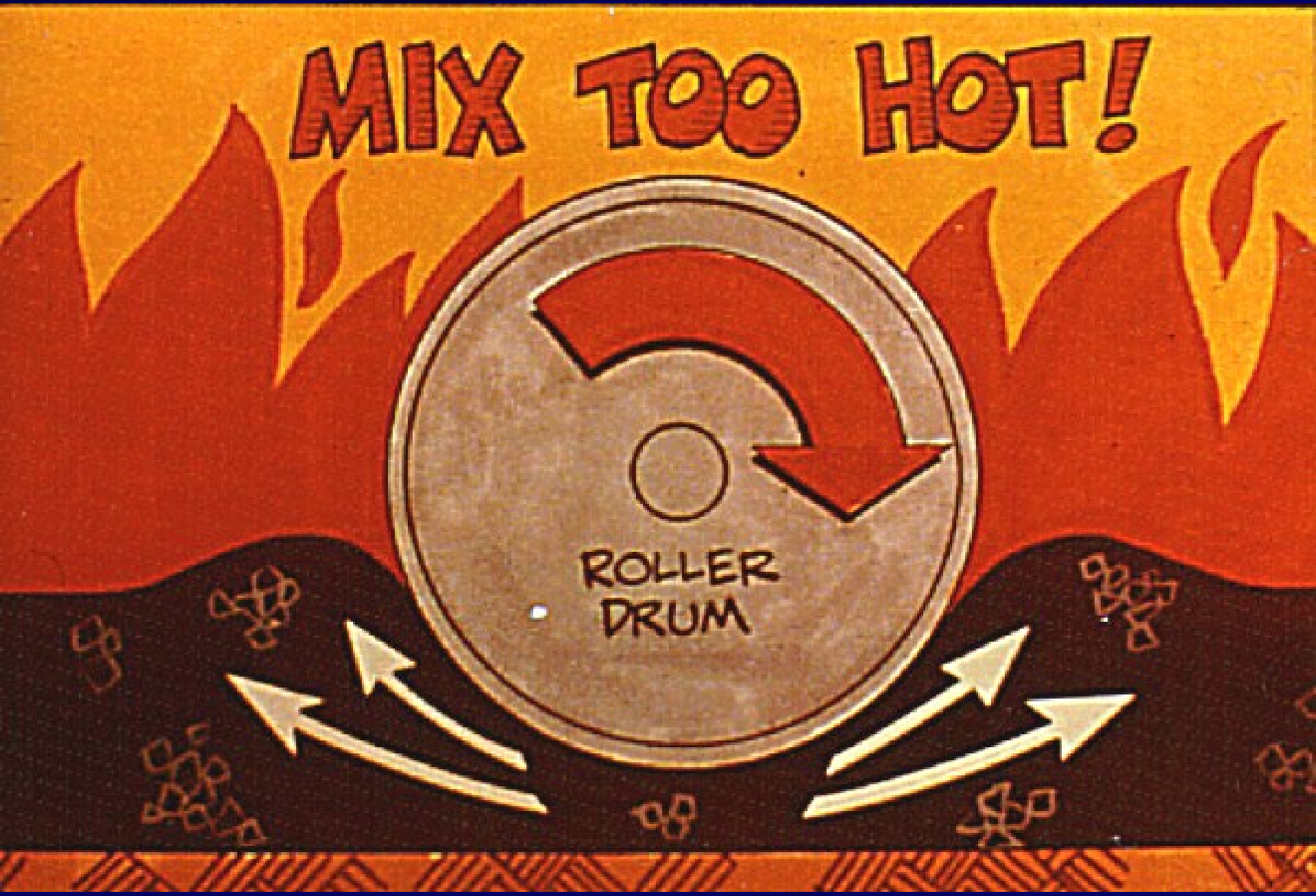
Front Bogie Wheels

Compaction

- Time Available for Compaction (TAC)
  - Time when the mix is at the right temperature range for efficient compaction
- TAC is affected by:
  - Mat thickness
  - Mix temperature
  - Air temperature

- Compaction temperature range: 185-300^{o}F


ROLLER
DRUM
MIX
TOO
COLD!
AGGREGATE PARTICLES
PREVENTED FROM COMPACTING


MIX TOO HOT!
ROLLER
DRUM

Joint Construction

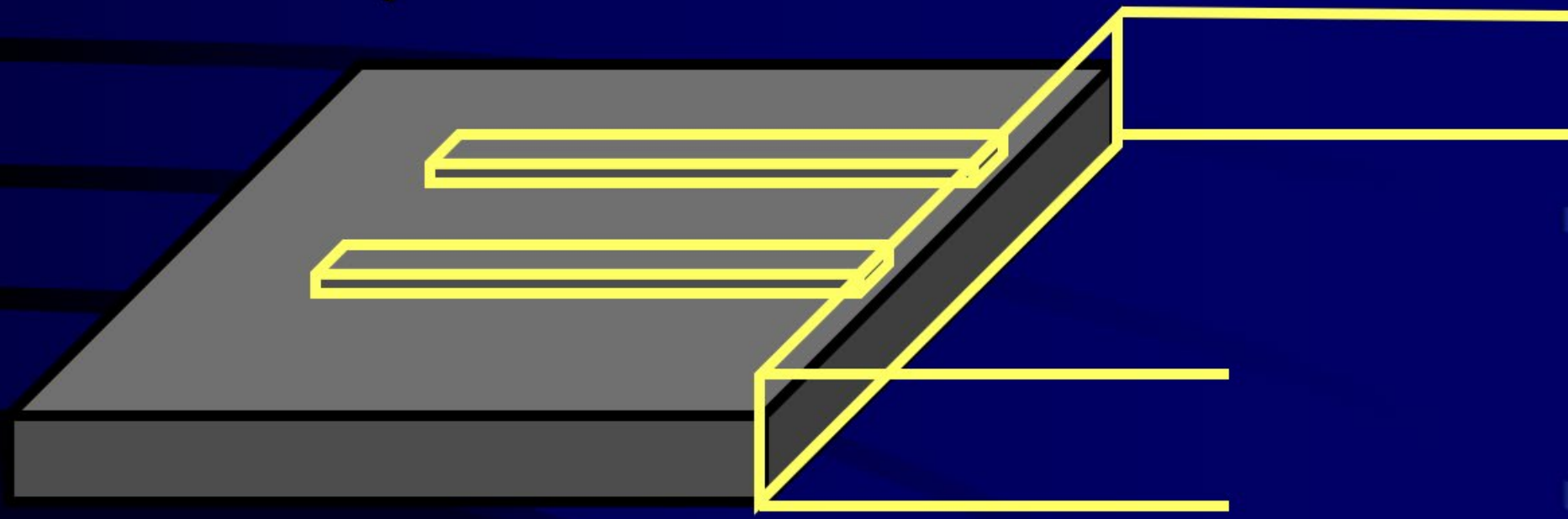
- Types of Joints
  - Transverse joint
  - Longitudinal joint
- Joints cause more problems that any other

Transverse Joints

- Butt joint (if no traffic allowed)
- Tapered joint (if traffic allowed)
  - Taper is later removed before paving continues

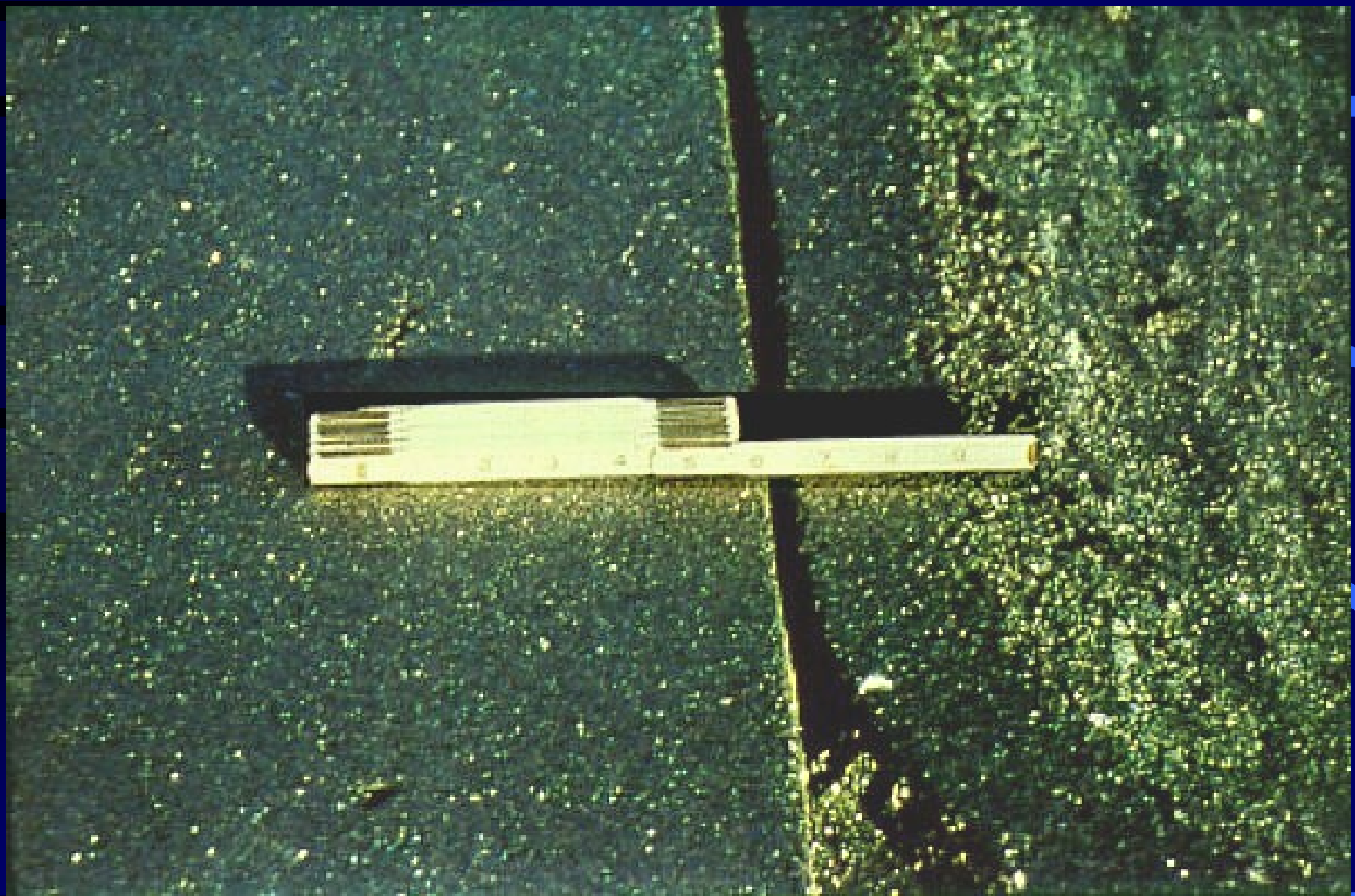
Starting Blocks

A good rule of thumb is to raise the screed 20 percent more than the compacted thickness.

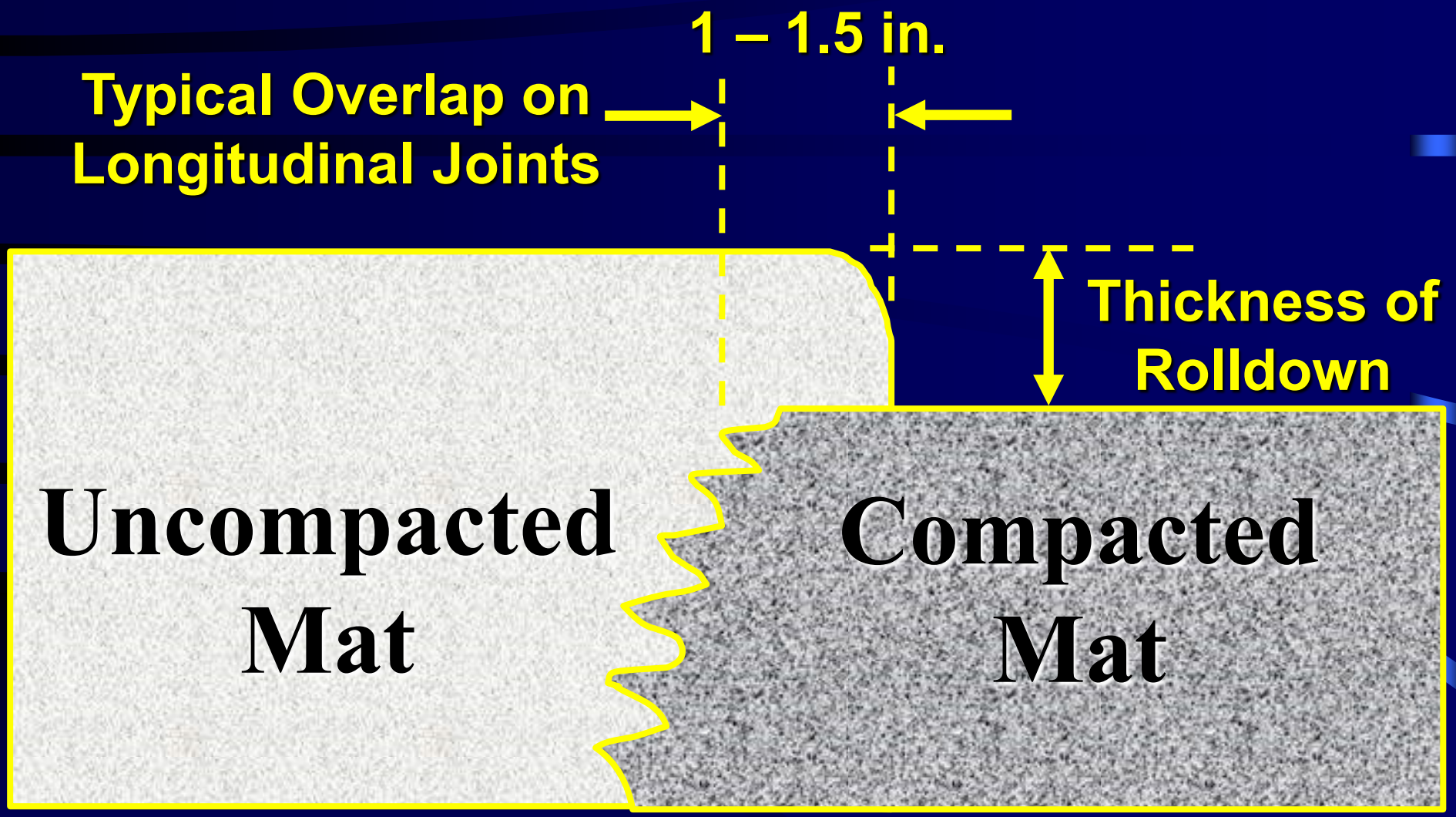


Longitudinal Joints

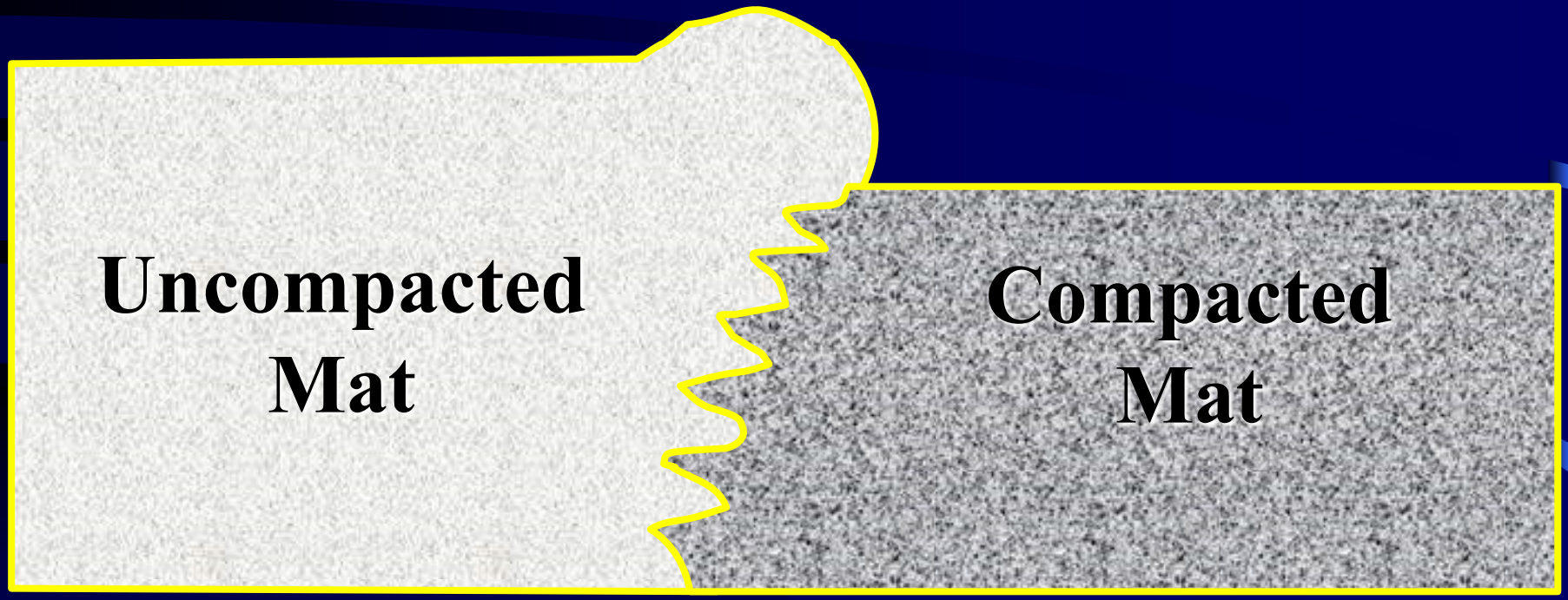
Cutting Back the Joint



Overlapping between Mats


1 – 1.5 in.
Typical Overlap on Longitudinal Joints
Thickness of Rolldown
Uncompacted Mat
Compacted Mat

Mix “Bumped Back” to Joint



“Bumping Back” the Mix to Joint

Don't Rake the Mix

Variations on HMA Overlay

- Polymer modified asphalt
- Ultrathin bonded wearing course (NOVACHIP)
- Asphalt rubber
- Warm mix asphalt
- Fiber-reinforced asphalt concrete (FRAC)

Ultrathin Bonded Wearing Course (NOVACHIP)

- 3/8 – 3/4 in. thick
- Gap-graded mix
- 5.1-5.5% conventional AC
- Polymer modified tack coat

Spraying Tack Coat

Ultrathin Bonded Wearing Course Texture

Asphalt Rubber

- ¾ - 1” overly on existing pavement
  - Binder
    - 80 % Asphalt
    - 20 % Ground tire rubber
- Gap or open graded aggregate, although dense graded has also been used

Asphalt Rubber

Improve Highway Safety

- Increase driver visibility, reduce standing water, and improve skid resistance

Reduce Highway Noise

Warm Mix Asphalt

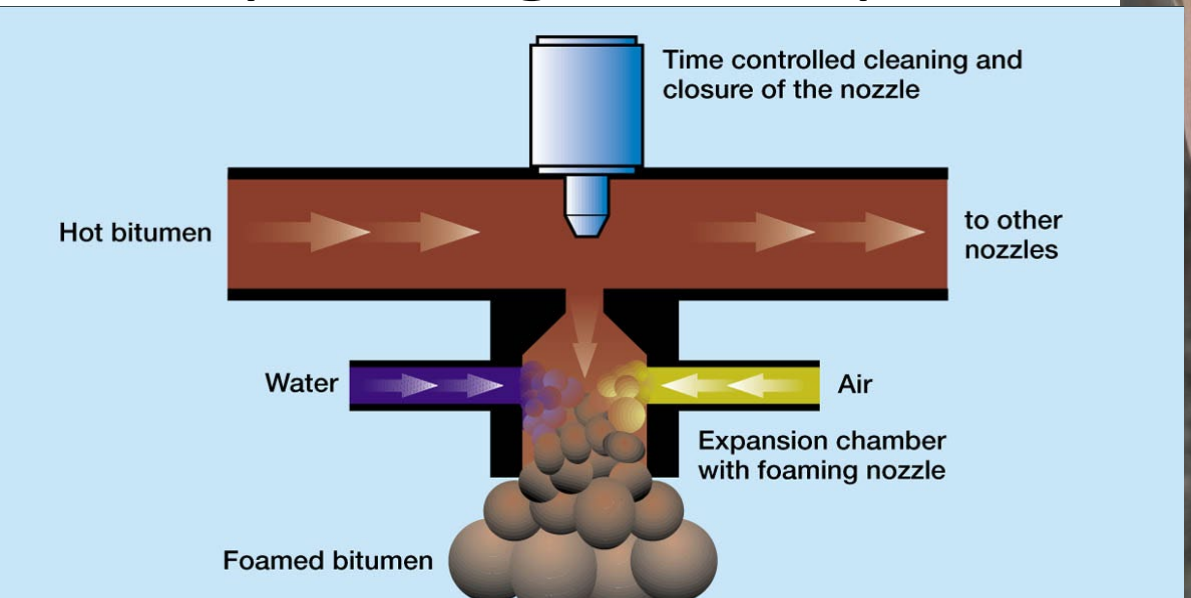
- Less mixing and compaction temps
- Less energy
- Fewer emissions
- Less fumes and odors
- Extended paving season
- Longer haul distances
- WMA will be the norm

Warm Mix Asphalt

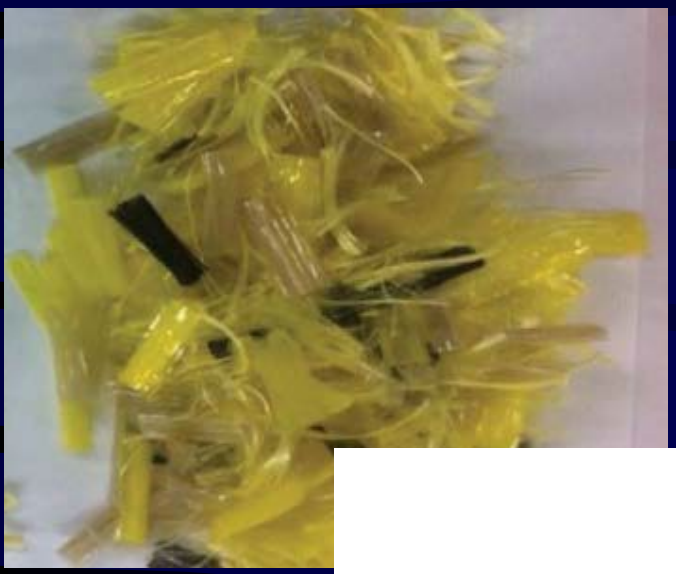
High workability at low temp

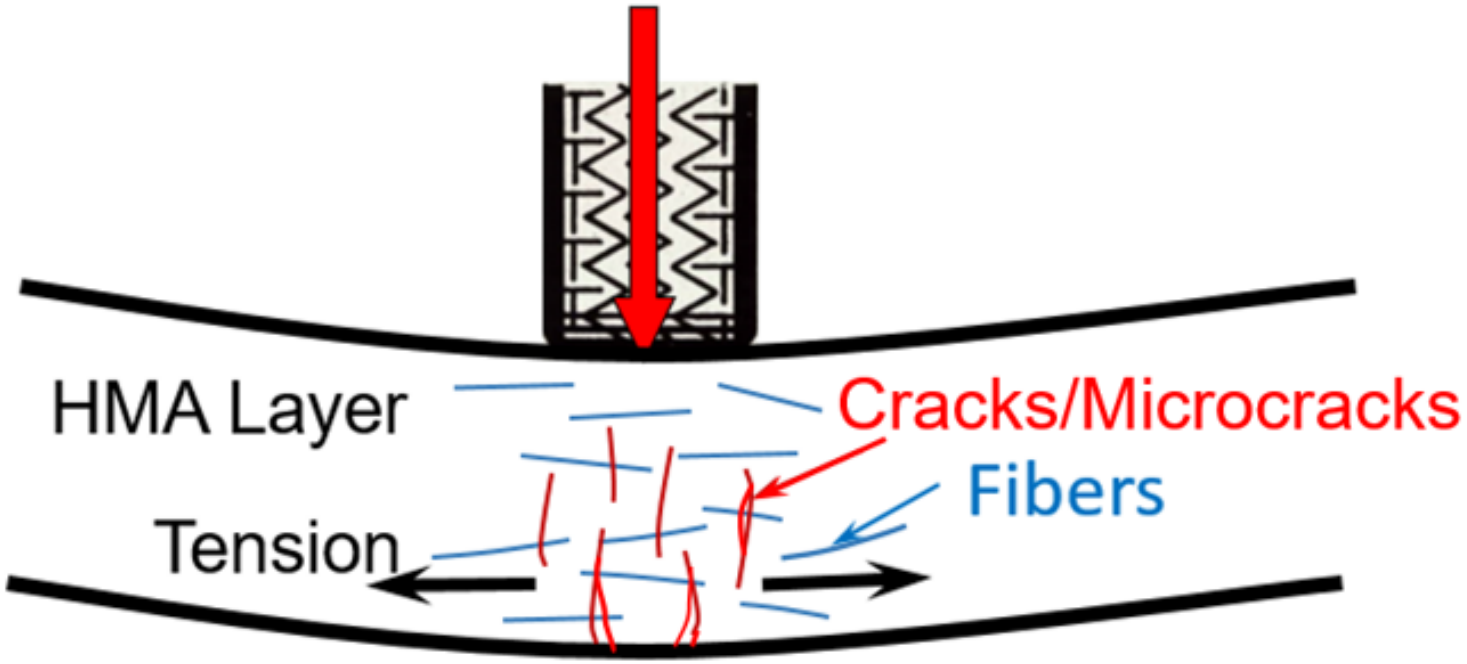
- ***Foaming Processes***
  - Introduce small amounts of water
  - Turns into steam, expanding binder phase

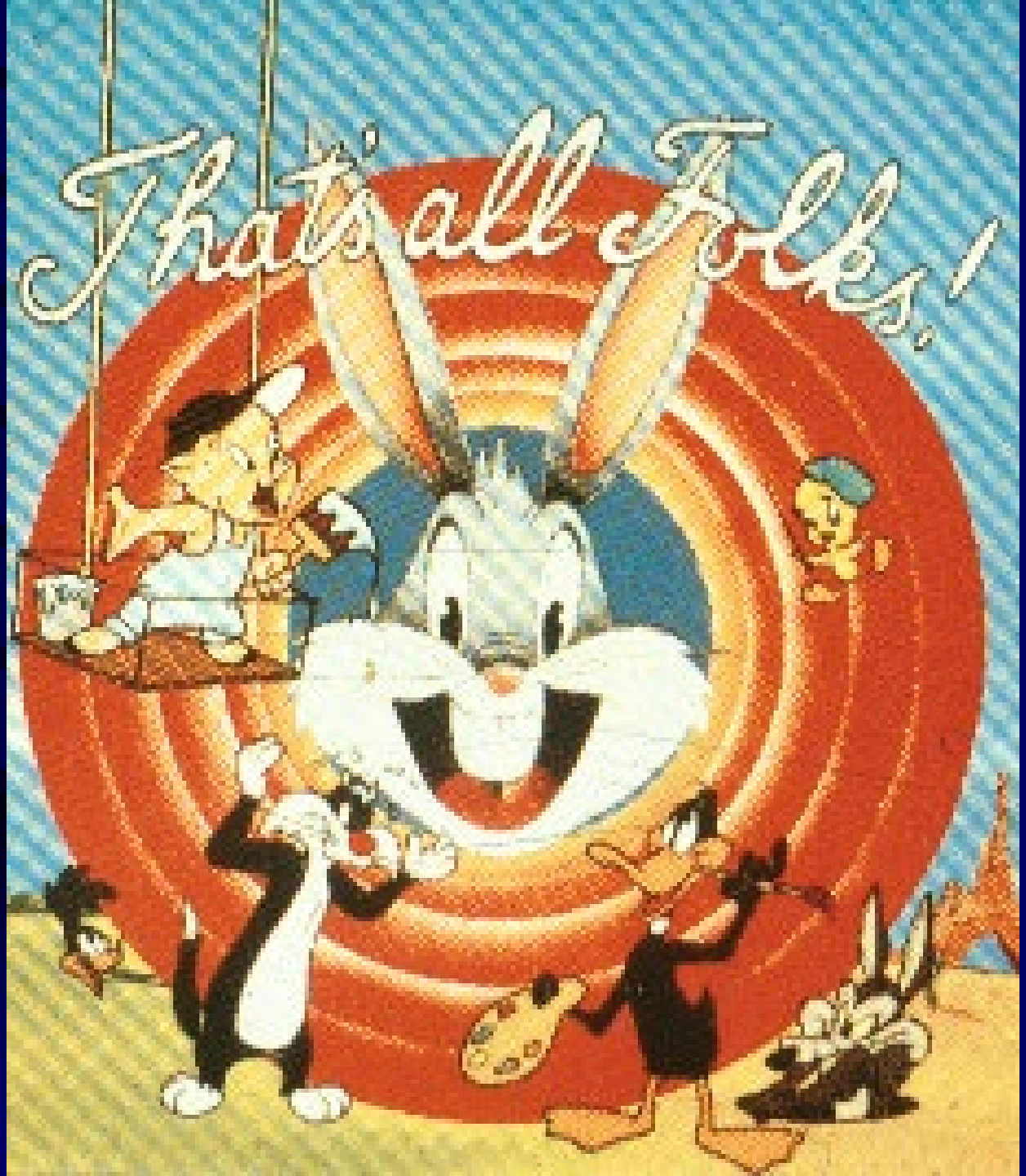
- ***Modifiers***
  - Evotherm
  - Rediset
  - Sasobit



Fiber-Reinforced Asphalt Concrete






That's all Folks!