Paver Principles and Techniques
Fundamentals of Paving

- Pre-project planning
- How the paver works
Project Planning

- Role of the Paver
- To meet specifications for grade, texture & smoothness
Project Planning

- Asphalt tonnage
- Paving width
- Specifications
- Grade Conditions
Project Planning

Asphalt Tonnage

- Hot plant output
- Length of haul
- Traffic conditions
- Number of trucks
Project Planning

Paving Width

- Screed extensions
- Auger extensions
- Mainframe extensions
Project Planning

Specifications

- Sensors
- Levelers
- Mounting hardware
- Position of sensors
Project Planning

Grade Conditions

• Leveling course
• Bumps
• Low spots
• Transitions
E2850
REMIXING TRANSFER VEHICLE
“COMPACTION BASICS”
Understanding The Paver
Understanding the Paver

Keep the paver in good condition

• Scheduled inspection & maintenance
• Follow maintenance guidelines
Understanding The Paver

Extender Angle of Attack

- Fully retract extender
- Extender should have a constant 3 mm (1/8 in) gap across the whole extender. This is the fixed angle of attack between the extender and the main screed plate.
Understanding the Paver

Basic Paver Functions

- Self-leveling
- Material feed
Understanding the Paver

Tractor Self-Leveling

- Screed is free to rise & fall
- Constant line of pull when set up properly
- Smooth surface over irregular grade
Understanding the Paver

Material Feed System

1. Hopper
2. Feeder bars
3. Adjustable height augers
4. Feeder sensors (Not Shown)
Understanding the Paver

Free-Floating Screed

- Screed position determines mat thickness
- Screed position is constant as long as all factors remain constant
Understanding the Paver

Factors Affecting the Screed

- Paving speed
- Head of material
- Screed adjustments
- Mix design
- Mix temperature
- Air temperature
- Grade temperature
Factors Affecting Screed

Constant Speed

- Shear factor is constant
- Depth remains constant
Factors Affecting Screed

Increased Speed

- Shear factor decreases
- Depth decreases
Factors Affecting Screed

Decreased Speed

- Shear factor increases
- Depth increases
- Amount of depth change varies with amount of speed change
- Mix design also affects shear factor
Factors Affecting Screed

![Paver Speed Calculator](image)

### General Inputs
- **Paving Thickness**: 2.00 in, 50.8 mm
- **Paving Width**: 12.00 ft, 3.658 m
- **Material Density Uncompacted**: 140 lbs/ft³, 2243 kg/m³

### Production Rate of Hot Plant

<table>
<thead>
<tr>
<th>Efficiency</th>
<th>ENGLISH UNITS</th>
<th>METRIC UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculated Paving Speed</td>
<td>tons/hr</td>
<td>tonnes/hr</td>
</tr>
<tr>
<td>100%</td>
<td>23.8 ft/min</td>
<td>7.26 m/min</td>
</tr>
<tr>
<td>95%</td>
<td>25.0 ft/min</td>
<td>7.62 m/min</td>
</tr>
<tr>
<td>90%</td>
<td>26.2 ft/min</td>
<td>7.90 m/min</td>
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<tr>
<td>85%</td>
<td>27.4 ft/min</td>
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<td>80%</td>
<td>28.6 ft/min</td>
<td>8.71 m/min</td>
</tr>
<tr>
<td>75%</td>
<td>29.8 ft/min</td>
<td>9.07 m/min</td>
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</tbody>
</table>

### Effective Paving Speed
- **23.8 ft/min**, **7.26 m/min**
Factors Affecting Screed

Real World Paving

- Do not panic
- Stay with the plan
- Get rid of trucks in an orderly fashion
- Establish a uniform trucking pattern
Factors Affecting Screed

Head of Material

- Smooth, continuous movement from hopper to area in front of screed
- Uniform force against face of screed
Factors Affecting Screed

Correct Head of Material

- Half auger level
- Constant resistance
- Constant depth
Factors Affecting Screed

Head of Material Decreased

- Resistance decreased
- Depth decreases
Factors Affecting Screed

Head of Material Increased

- Resistance increased
- Depth increases
Factors Affecting Screed Wide-Width Paving

- Auger extensions
- Mainframe extensions
- Sensor position
Factors Affecting Screed

Controlling Head of Material

- Paving speed
- Flow gate/feeder ratio setting
- Feed sensor
Factors Affecting Screed

**Paving Speed**

- Paving speed constant
- Feeder system set to match paving speed
- Changes in paving speed may require feeder system adjustments
Factors Affecting Screed

Flow Gates Set Properly

- Material level at center of auger chamber at half level
- Material level in center area controls auger speed
Factors Affecting Screed

Conveyor Ratio Set Properly

- Same principle as flow gates
- Adjust material level in center to half auger
Factors Affecting Screed

• Too much material in center
• Affects shear factor
• Depth may change
Factors Affecting Screed

Gates/Ratio Set
Low

- Too little material in center
- Affects shear factor
- Depth may change
Factors Affecting Screed

Feed Sensors

- Mechanical or sonic
- Control level of material on outboard end of augers
- Position Sensor 46 cm (18") from end of augers
Factors Affecting Screed

Sonic Sensor Mounting Distance

- Mounting position at 46 cm (18”)
- Working range of sonic sensor 30 cm (12”) – 81 cm (32”)
Factors Affecting Screed

Sonic Sensor Alignment

- The sensor should be targeted perpendicular to the material face
Factors Affecting Screed

Incorrect Sensor Position

- Aligned incorrectly causes loss of signal
Factors Affecting Screed

Variable Width Paving

- Requires control & judgment
- May require manual over-ride
Factors Affecting Screed

Adjustable Augers

- Adjustable height augers help mat texture
- Help prevent segregation
Factors Affecting Screed

Auger Speed

- Auger speed uniform
- 20-40 rpm
- Auger speed too high or too low can cause stripes in the mat
Factors Affecting Screed

Uneven Head of Material

- Adjust gates/ratio
- Adjust auger speed
- Adjust auger height
- Position of sensors
Screed Adjustments

Strike-off setting

- Affects angle of attack
- Factory setting covers most mix designs
- Coarse mix set lower
- Sandy mix set higher

25.4 mm (1")
Screed Adjustments

- Up: Increased flow
- Down: decreased flow

Strike-off adjustment
Screed Adjustments

Strike-off set too high

- Wear on nose of screed
- Poor mat texture
Screed Adjustments

Strike-off set too low

- Wear on trailing edge of screed
- Open texture in mat
- Erratic screed behavior
Thank You