Paver Hopper

Wings can be folded to empty the hopper
Keep it Clean!!!!
Hopper Conveyors

Conveyors independently controlled either manually or by sensors, no flow gates
Augers take the mix from the conveyors at the center and spread it evenly across the face of the screed.
Auger “Kick-Back” Paddles

• The “kick-back” paddles at the center of the augers are used to “tuck” some of the mix under the center gear box
• These paddles are a wear item and must be maintained in order to perform properly
• When worn, they can allow center of mat mixture segregation
Screed Unit

- Strikes off mix to desired thickness and surface qualities
- Provides initial compaction

The most important part of the paving machine!
Screed Heaters

- Heats screed to about 150°C
- Heated screed ensures a more uniform mat surface texture.
- Minimizes mix sticking to the screed plate and causing a rough texture.
- Screed heaters should not be used to raise the temperature of the mix.
Automatic Screed Controls

• Electronic adjustment to screed height using sensing and reference system
• Sensor detects elevation changes, adjusts height of tow point
• Slope (transverse) controls
Mobile Referencing “Ski”
Grade Sensors

Non-Contacting Grade Sensor

Ultrasonic- One or More Transducers
Sonic Averaging Beam
Screed Extensions
Screed Extensions

• Utilize auger extensions to keep it within 18” of the end gate on continuous pulls
Self Leveling Concept

- Rear Drive Tires
- Front Bogie Wheels
- Line of Pull
Main Forces Acting on Screed

1. Speed of Paver
2. Head of Material
3. Angle of Attack
4. Other Forces
   – Pre-compaction
   – Screed Weight
Head of Material

Correct Depth of Mat Maintained

Constant Head of Material Volume

Screed Rises Due to Excess Material Forced Under Nose of Screed

Head of Material Volume Too High

Screed Settles Due to Inadequate Supporting Material

Head of Material Volume Too Low
Correct Head of Material

- Auger Box filled to the top of the auger shaft
- Can’t see the lower half of the auger
- Don’t completely bury the auger
- Keep the level as consistent as possible
Paving Speed + Head of Material = Material Resistance
Plan for “Roll-Down”

Roll-down = 25% of compacted thickness
Look for opportunities to eliminate joints by using “echelon paving” where possible...
Stagger Paving Joints

6 to 12 inches

Surface
Binder
Base
Subgrade

Don’t let the surface layer joint fall in the wheel path!!
Proper Joint Construction

Steer a Straight Line!
Proper Joint Construction

Typical Overlap on Longitudinal Joints

1 to 1-1/2 inches (25-40 mm)

Thickness of Roll-down

Uncompacted Mat

Compacted Mat

Asphalt Institute MS-22
Proper Joint Construction

Mix “Bumped Back” over Joint

Uncompacted Mat

Compacted Mat

Asphalt Institute MS-22
Proper Joint Construction

“Bump” the mix, Don’t “cast” it!
Why Do We Compact?

• Improve Mechanical Stability
• Improve Resistance to Permanent Deformation
• Reduce Moisture Penetration
• Improve Fatigue Resistance
• Reduce Low-Temperature Cracking Potential
• REDUCE AIR VOIDS!
Factors Affecting Compaction?

• Properties of the Materials
  – Aggregates, Asphalt Binder, Mix Properties

• Environmental Variables
  – Lift Thickness, Air & Base Temperature, Mix Temperature, Wind, Solar Flux

• Laydown Site Conditions
  – Lift Thickness to NMAS, Base Support
Aggregate Properties

- Other factors may be an aggregate’s surface texture, or the mixture’s nominal maximum aggregate size.
Asphalt Binder Properties

• Asphalt Binder Grade – Modified?
• Asphalt Content - a mix with too little AC may be stiff and require an increase in compactive effort, whereas a mix with too much AC may shove under the rollers
• Asphalt Binder Temperature - As the temperature of the asphalt binder increases, its viscosity decreases. In general, the lower the viscosity of the AC, the easier it will be to compact a mix.
Mixture Properties

• The mixture type will influence how much compactive effort must be applied to achieve density
  • Surface mix vs Binder/Intermediate mix
  • Fine-graded vs Coarse or Gap-graded
• Modified mixtures will typically require more compactive effort due to the increased stiffness of the asphalt binder.
• Low asphalt content mixtures may require an increase in compactive effort, while high asphalt content mixtures may shove under the rollers.
• As mix temperature decreases, the compactive effort increases