

Troubleshooting Guide

This guide provides information to assist maintenance personnel with troubleshooting problems associated with placing any of the thin HMA overlays. ✓s indicate causes related to paver. Xs indicate other problems to be investigated.

Note that some specifications described in the following content may not be the same as the specifications followed by your agency. Always check with your State agency's standards and specifications when using these guidelines.

Sections

- Guide
- Problems and Solutions

Guide

Cause	Problem																
	Wavy Surface - Short Waves/ Ripples	Wavy Surface - Long Waves	Tearing of Mat - Full Width	Tearing of Mat - Center Streak	Tearing of Mat - Outside Streaks	Mat Texture - Non-Uniform	Screed Marks	Screed Not Responding To Correction	Auger Shadows	Poor Pre-Compaction	Poor Longitudinal Joint	Poor Transverse Joint	Transverse Cracking (Checking)	Mat Shoving Under Roller	Bleeding or Fat Spots in Mat	Roller Marks	Poor Mix Compaction
Fluctuating Head of Material	✓	✓				✓					✓						
Feeder Screws Overloaded	✓	✓				✓		✓									
Finisher Speed Too Fast	✓				✓												

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	Wavy Surface - Short Waves/ Ripples	Wavy Surface - Long Waves	Tearing of Mat - Full Width	Tearing of Mat - Center Streak	Tearing of Mat - Outside Streaks	Mat Texture - Non-Uniform	Screed Marks	Screed Not Responding To Correction	Auger Shadows	Poor Pre-Compaction	Poor Longitudinal Joint	Poor Transverse Joint	Transverse Cracking (Checking)	Mat Shoving Under Roller	Bleeding or Fat Spots in Mat	Roller Marks	Poor Mix Compaction
Too Much Lead Crown in Screed					✓												
Too Little Lead Crown in Screed				✓													
Overcorrecting Thickness Control Screws	✓										✓						
Excessive Play in Screed Mechanical Connection	✓	✓					✓	✓				✓					
Screed Riding on Lift Cylinders	✓	✓				✓		✓		✓	✓	✓					
Screed Plates Worn Out or Warped			✓	✓	✓	✓											
Screed Plates Not Tight	✓					✓		✓				✓					
Cold Screed			✓	✓	✓	✓											
Moldboard on Strikeoff Too Low					✓												
Feeder Gates Set Incorrectly		✓		✓	✓												
Kicker Screws Worn Out or Mounted Incorrectly				✓													

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Incorrect Nulling of Screed												✓					
Screed Starting Blocks Too Short												✓					
Screed Extensions Installed Incorrectly					✓	✓											
Vibrators Running Too Slow						✓			✓								
Grade Control Mounted Incorrectly	✓	✓					✓				✓						
Grade Control Hunting (Sensitivity Too High)	✓										✓						
Grade Control Wand Bouncing on Reference	✓										✓						
Grade Reference Inadequate	✓	✓															
Sitting Long Period Between Loads		✓				✓											

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Improper Joint Overlap											✓						
Improper Mat Thickness for Max. Aggregate Size			X			X		X		X							
Trucks Bumping Finisher		X					X										
Truck Holding Brakes		X					X										
Improper Base Preparation	X	X				X			X			X	X		X	X	X
Improper Rolling Operation	X										X	X	X	X		X	X
Reversing or Turning Too Fast of Rollers		X											X		X	X	X
Parking Roller on Hot Mat		X													X	X	X
Improper Mix Design (Aggregate)	X		X			X		X				X	X	X			X
Improper Mix Design (Asphalt)	X		X			X		X				X	X	X			X
Mix Segregation	X	X	X			X		X									
Moisture in Mix			X									X	X	X			X
Variation of Mix Temperature	X	X	X			X		X				X	X	X	X	X	X
Cold Mix Temperature			X	X	X	X		X		X	X	X					X

Note: Often, a problem can be caused by more than one item, therefore, it is important that each cause listed is eliminated to assure solving the problem.

Problems and Solutions

Problem	Causes and Solutions
<p>Surface Waves</p>	<p style="text-align: center;">CAUSES</p> <ul style="list-style-type: none"> • A fluctuating head of material in front of the paver screed causing it to rise and fall usually causes surface waves. • Worn or badly set screeds can cause surface waves. • A mix that is too stiff or that has cooled too much before compaction will cause surface waves. • Long waves can be caused by adjusting the screed too often and not allowing an adjustment to fully take effect before changing it again. • Dump trucks bumping the paver when delivering a load of mix can cause long waves. <p style="text-align: center;">SOLUTIONS</p> <ul style="list-style-type: none"> • The solution for avoiding surface waves is to control the material amount, temperature, and screed correctly. • Pave continuously with a pick-up machine where possible.
<p>Wash Boarding</p>	<p style="text-align: center;">CAUSES</p> <ul style="list-style-type: none"> • Wash boarding is caused by improper use of vibratory rollers, either in amplitude setting or in speed of roller. <p style="text-align: center;">SOLUTIONS</p> <ul style="list-style-type: none"> • Use higher roller amplitudes for thicker layers and lower amplitudes for thinner layers. • Slow down the roller.

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<p>Tearing</p>	<p style="text-align: center;">CAUSES</p> <ul style="list-style-type: none"> • Poor paver operation, or the mix being too cold and/or too stiff causes tear marks. <p style="text-align: center;">SOLUTIONS</p> <ul style="list-style-type: none"> • Tear marks can be avoided by adjusting the degree of crown and ensuring the mix temperature is correct.
<p>Non-uniform Texture-Segregation</p>	<p style="text-align: center;">CAUSES</p> <ul style="list-style-type: none"> • The mixture separating in the hopper or in transportation causes segregation. • Poor paver set up. • Low mix temperature or poor grading or mix design. • Prone to occur in thin overlays. • Weak base layer. <p style="text-align: center;">SOLUTIONS</p> <ul style="list-style-type: none"> • Ensure thickness is at least twice that of largest stone size. • Mix design is correct, and the paver is properly set up. • Ensure mix temperature is correct.
<p>Screed Marks</p>	<p style="text-align: center;">CAUSES</p> <ul style="list-style-type: none"> • Transverse screed marks occur when the paver stops and starts and longitudinal screed marks occur when extensions are used on the screed. • Poor paver set up or worn or dirty screeds. • Low mix temperature or poor grading or mix design.

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	<p style="text-align: center;">SOLUTIONS</p> <ul style="list-style-type: none"> • Set paver and screed correctly. • Use windrowing to ensure paver does not stop. • Ensure the mix is within specification.
Surface Shadows	<p style="text-align: center;">CAUSES</p> <ul style="list-style-type: none"> • Caused by overloading augers in the paver. • May be caused by low mix temperature or poor grading or mix design. <p style="text-align: center;">SOLUTIONS</p> <ul style="list-style-type: none"> • Adjust the distance between the screed and the tractor of the paver. • Ensure that the level of mix is near the center of the auger shaft. • The augers should NOT be totally covered with mix.

Problem	Causes and Solutions
Roller Checking and Roller Marks	<p style="text-align: center;">CAUSES</p> <ul style="list-style-type: none"> • Deflection under the roller (i.e., mix too hot) or mix design is poor. • Too much asphalt in the mix. • Too much middle size sand in the gradation (1.18-600µm sieve). <p style="text-align: center;">SOLUTIONS</p> <ul style="list-style-type: none"> • Wait until the mix cools further or adjust the mix design.

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<p>Bleeding and Fat Spots</p>	<p style="text-align: center;">CAUSES</p> <ul style="list-style-type: none"> • High mix temperature or poor grading or mix design. • Too much asphalt in the mix or amount of fines too low in the grading. • Mix design not taking the correct traffic level into account. • Moisture in the mix or on the pavement. • Extremely high applications of tack coat. • Existing bleeding surface. <p style="text-align: center;">SOLUTIONS</p> <ul style="list-style-type: none"> • Solve by ensuring aggregates are dry during the mixing process, that pavement is not bleeding, that pavement is dry, and that mix is correctly designed for traffic and aggregate.
<p>Shoving</p>	<p style="text-align: center;">CAUSES</p> <ul style="list-style-type: none"> • Caused by excess asphalt in the mix. • Improper roller operation such as sudden reversal. • Rolling before the mat is stable enough. • Roller going too fast. <p style="text-align: center;">SOLUTIONS</p> <ul style="list-style-type: none"> • Ensure mix is at correct temperature. • Ensure roller is not going too fast. • Check and correct mix design if necessary. • Consider use of modified binders.

<p>Delamination</p>	<p style="text-align: center;">CAUSES</p> <ul style="list-style-type: none"> • Insufficient tack coat. • Mix is too cold during compaction. • Existing surface being too cold for paving. • Dirty surface on which an overlay is being placed. <p style="text-align: center;">SOLUTIONS</p> <ul style="list-style-type: none"> • Ensure paving temperatures are correct. • Ensure the surface is substantially free of debris.
<p>Poor Joints</p>	<p style="text-align: center;">CAUSES</p> <ul style="list-style-type: none"> • Paver operating at different elevations when paving adjacent lanes. • Poor joint practice, especially in compaction of thin layers. <p style="text-align: center;">SOLUTIONS</p> <ul style="list-style-type: none"> • Make sure joints are correctly formed and compacted at the correct temperature.
<p>Raveling</p>	<p style="text-align: center;">CAUSES</p> <ul style="list-style-type: none"> • Insufficient asphalt in the mix. • Poor compaction. <p style="text-align: center;">SOLUTIONS</p> <ul style="list-style-type: none"> • Ensure mix design conforms to the specification. • Ensure compaction is carried out at correct temperatures.