



USE OF PROFILE DATA TO DETECT CONCRETE PAVING PROBLEMS

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Concrete Paving

- Profile each day's paving as soon as concrete can support a lightweight profiler.
- Problems in the paving process can be detected from profile data.
- Repetitive features in pavement can be easily detected from profile data.

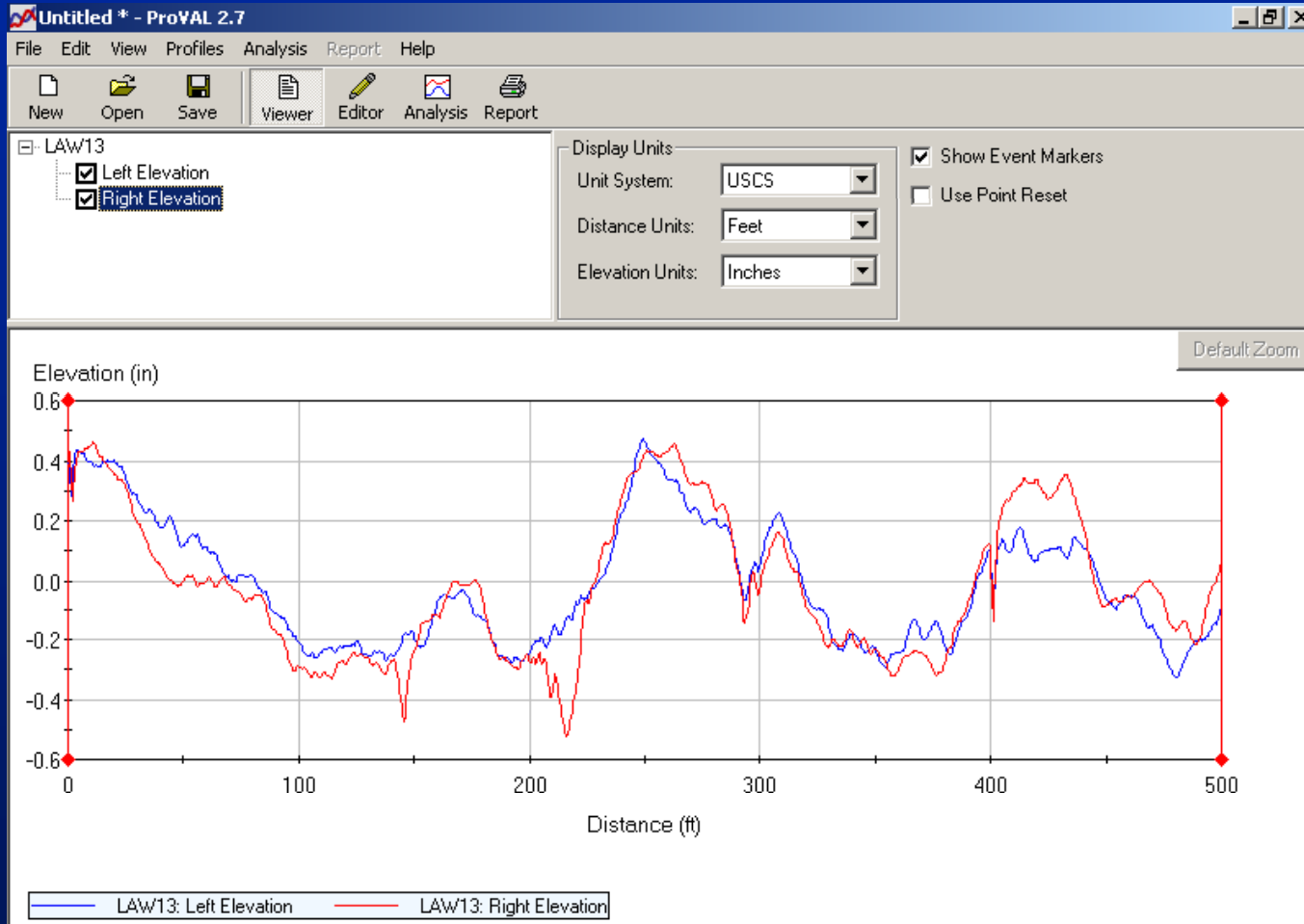


Concrete Paving

- If you until the project is completed to profile, entire project will be affected if there is a paving problem.
- Detecting and correcting problems will avoid costly grinding and avoid paying penalties.



How Can you Analyze Profile Data?



ProVAL

www.roadprofile.com

It is FREE!!



STRINGLINE SAG

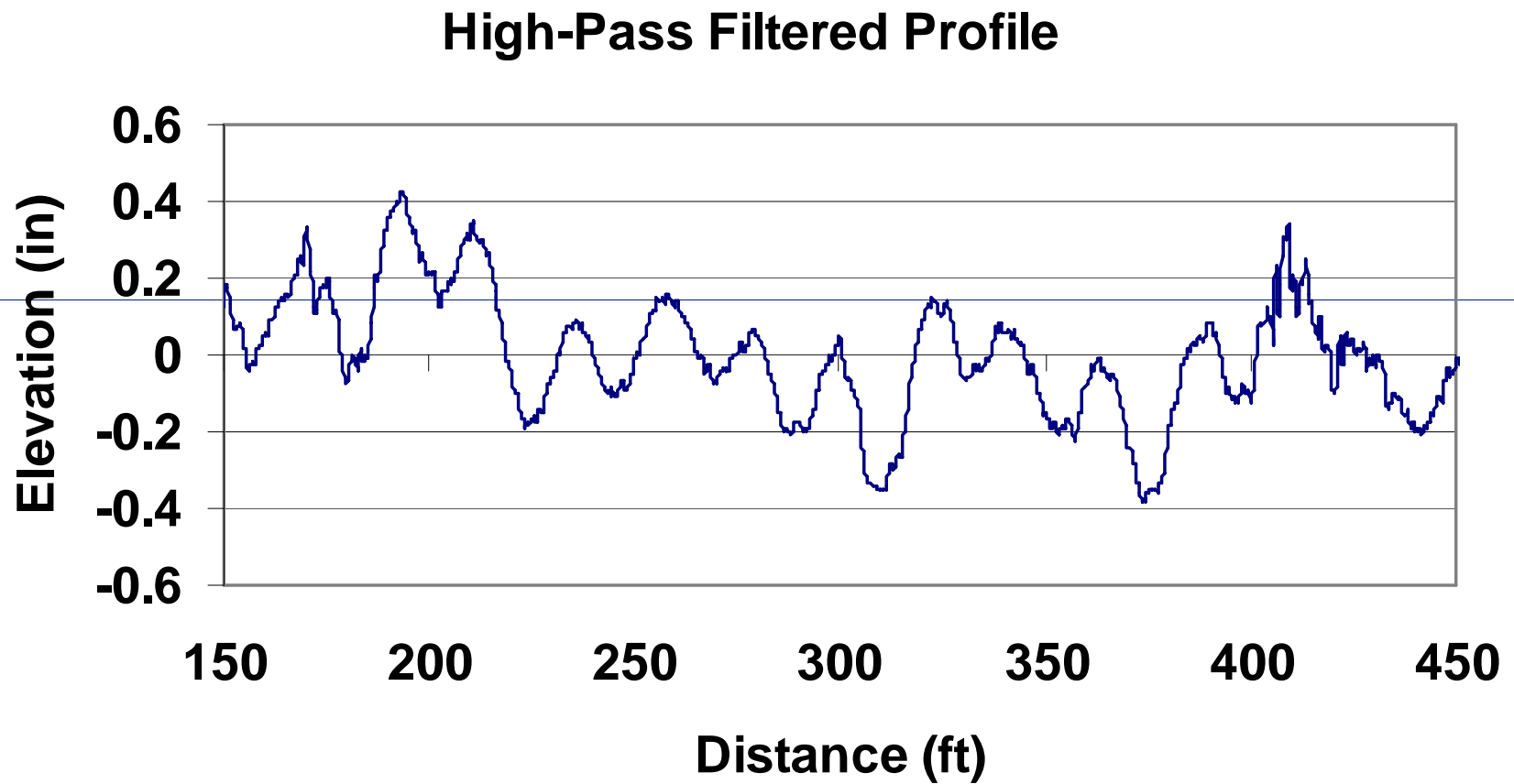


Stringline

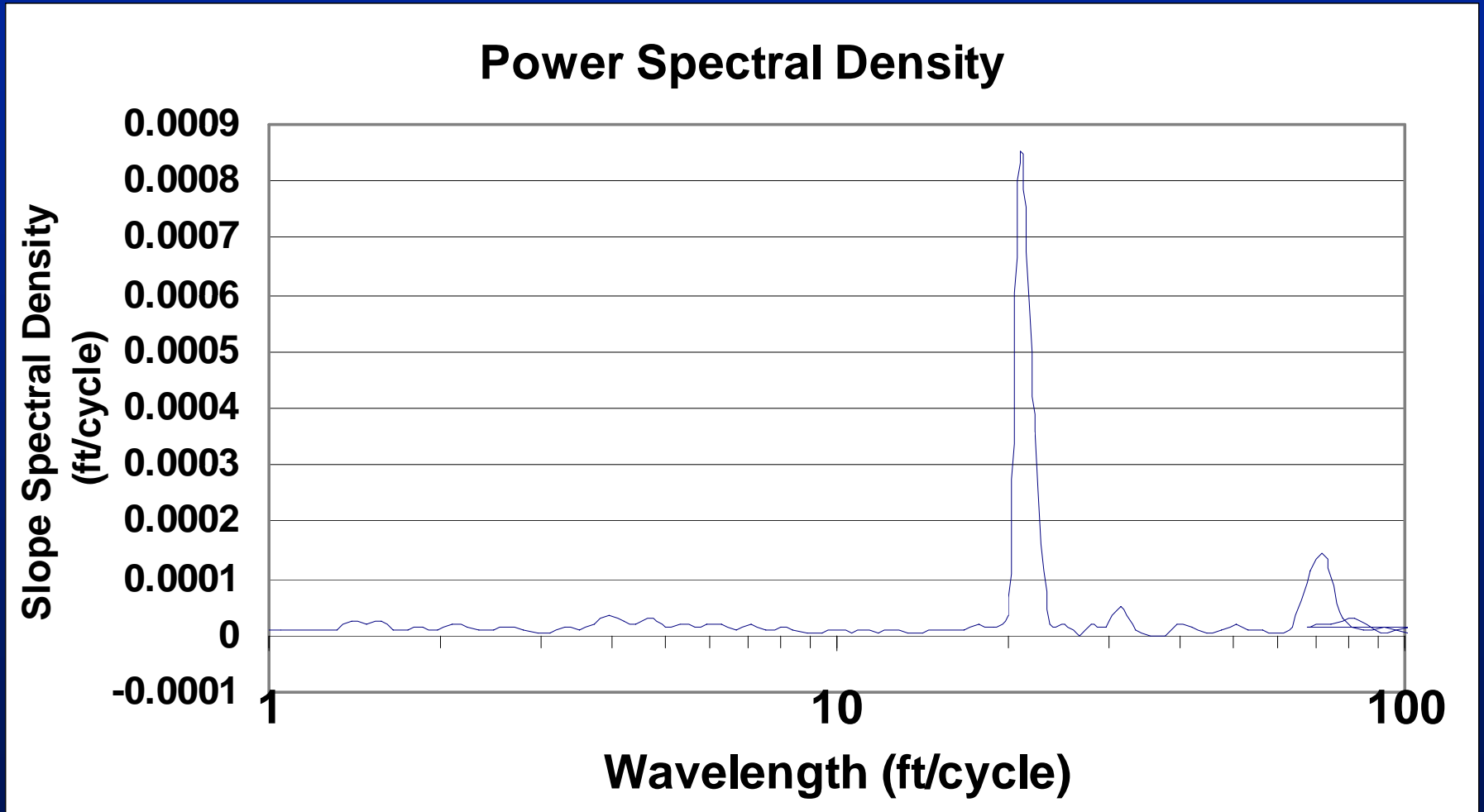
- Paver uses stringline as guidance system.
- Typical stringline support spacing – 25 ft.



Stringline Sag, $IRI = 150$ in/mi

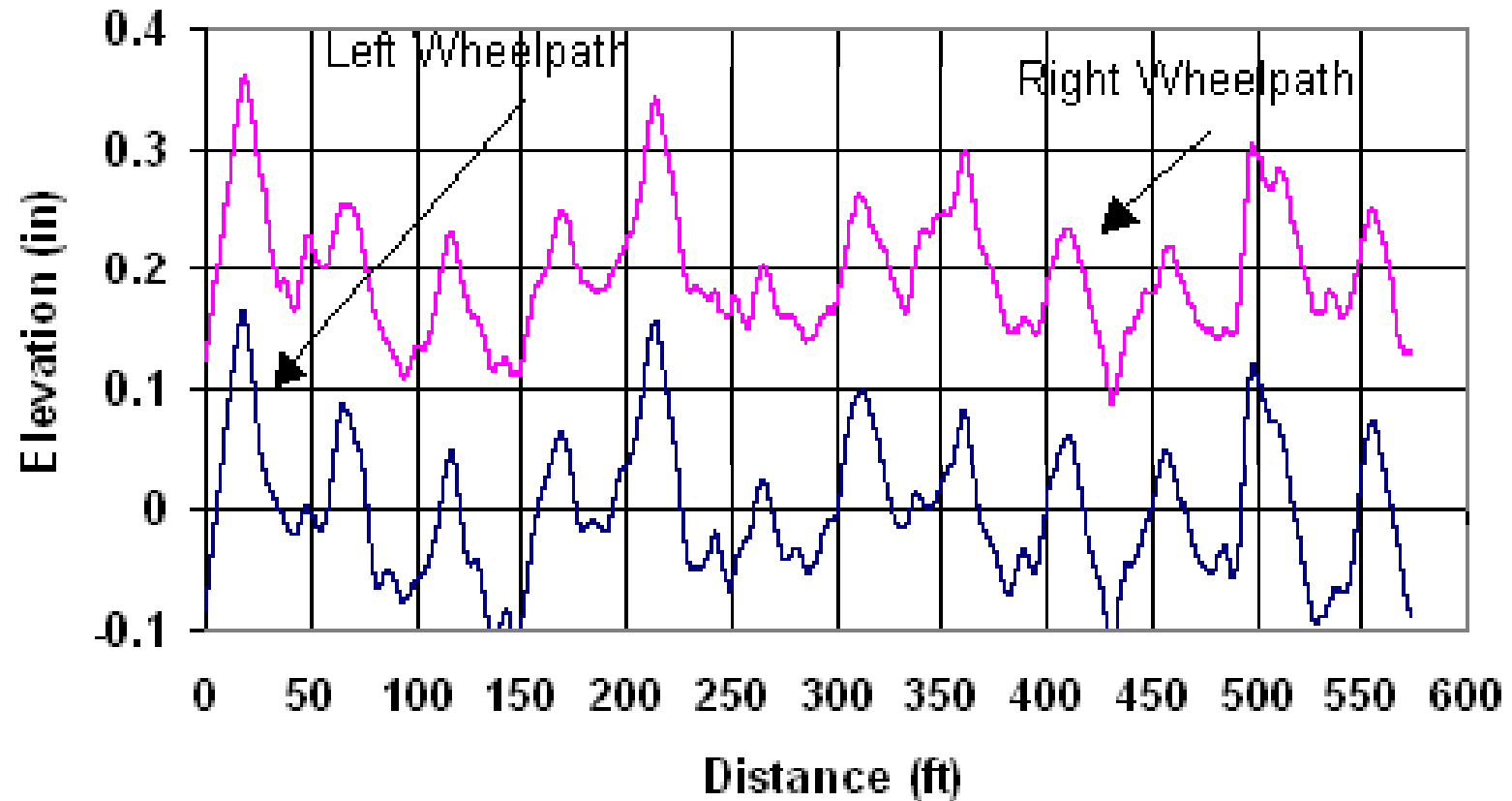


Stringline Sag

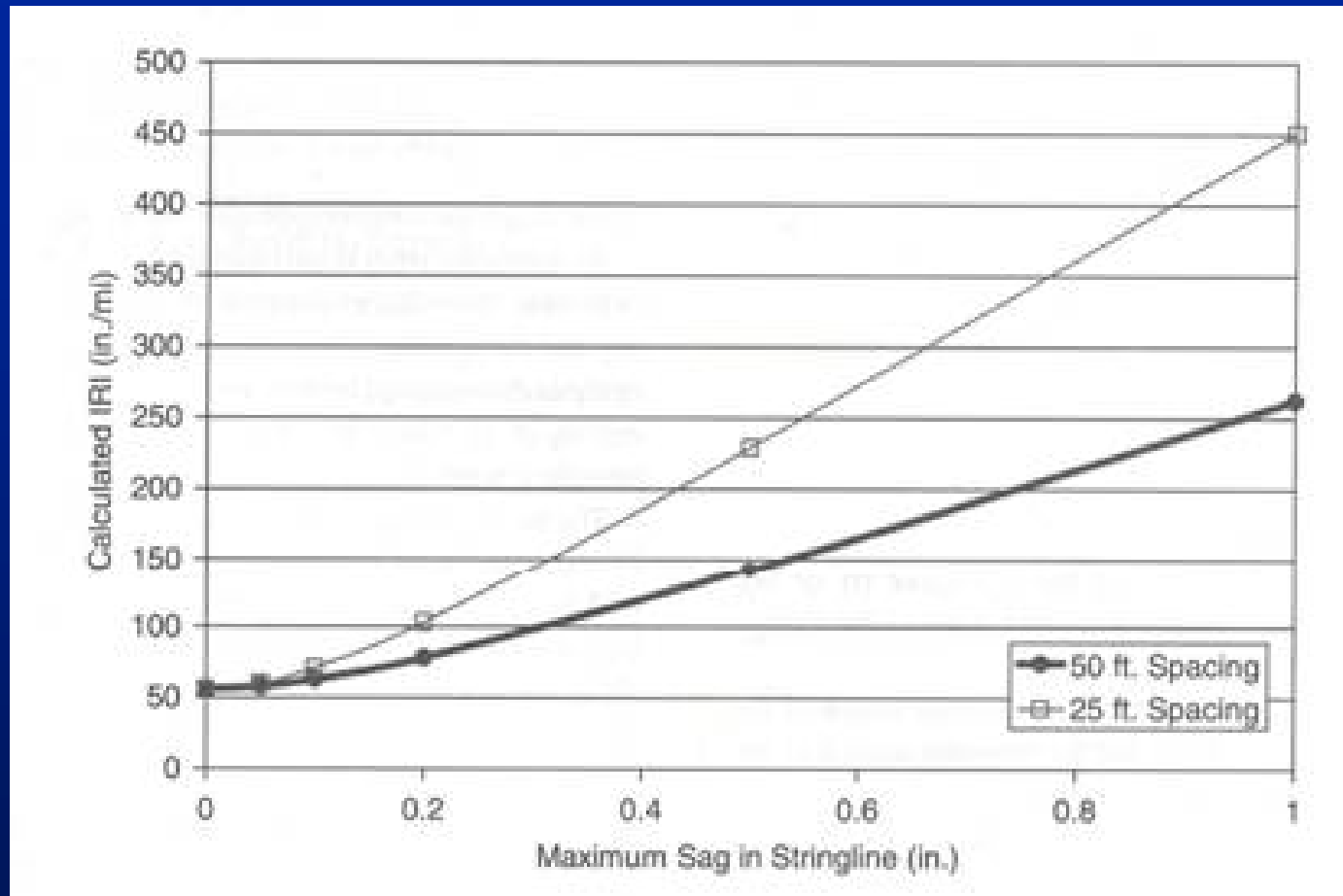


Stringline Sag, Stake Spacing = 50 ft

High-Pass Filtered Profile



How Does Stringline Sag Affect IRI?



Rasmussen et al, TRR 1900

How Do You Correct Stringline Sag?

- **Cannot usually do spot grinding.**
- **Entire project will need grinding.**





DOWEL BASKET SPRING-BACK



Dowel Baskets

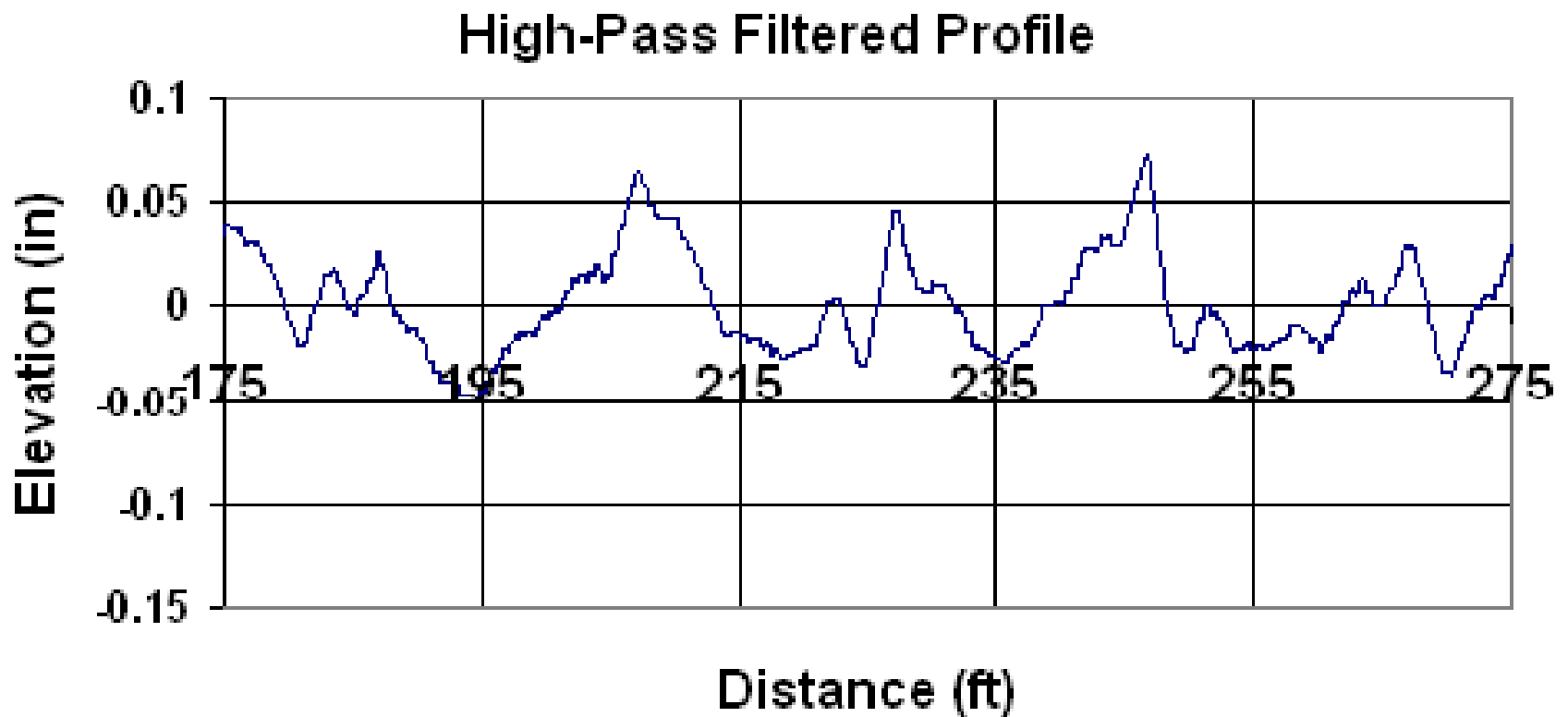


Dowel Basket Spring-Back

- Dowel assembly can deflect when profile pan of slip-form paver passes over basket.
- Then springs back after pan passes and extrusion pressure is released.
- Creates an disturbance on pavement surface.

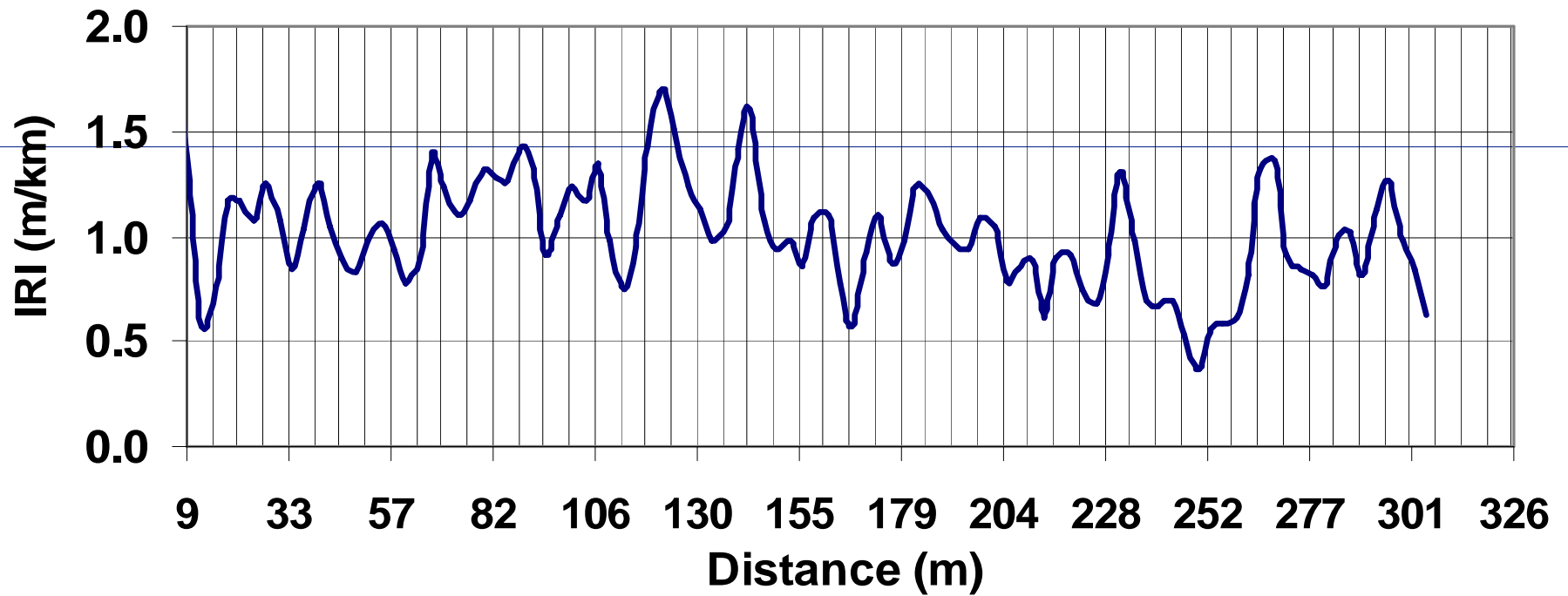


Dowel Spring-Back, Joint Spacing 20 ft



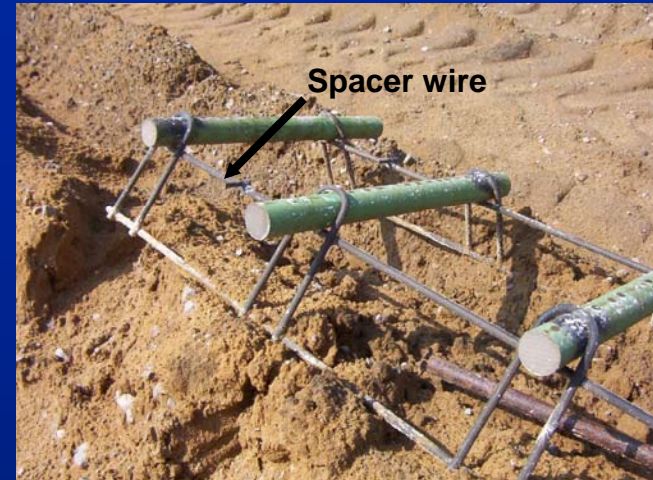
Dowel Spring-Back, Joint Spacing 6-m

Continuous IRI Plot, 6-m Base Length



How Do You Avoid Dowel Basket Spring-Back (ACPA)?

- Place concrete over basket before paver passes.
- Use a well-graded mix that is easily flowable.
- Fix dowel baskets firmly to base.
- Don't cut spacer wires in dowel basket.
- Use a dowel bar inserter.

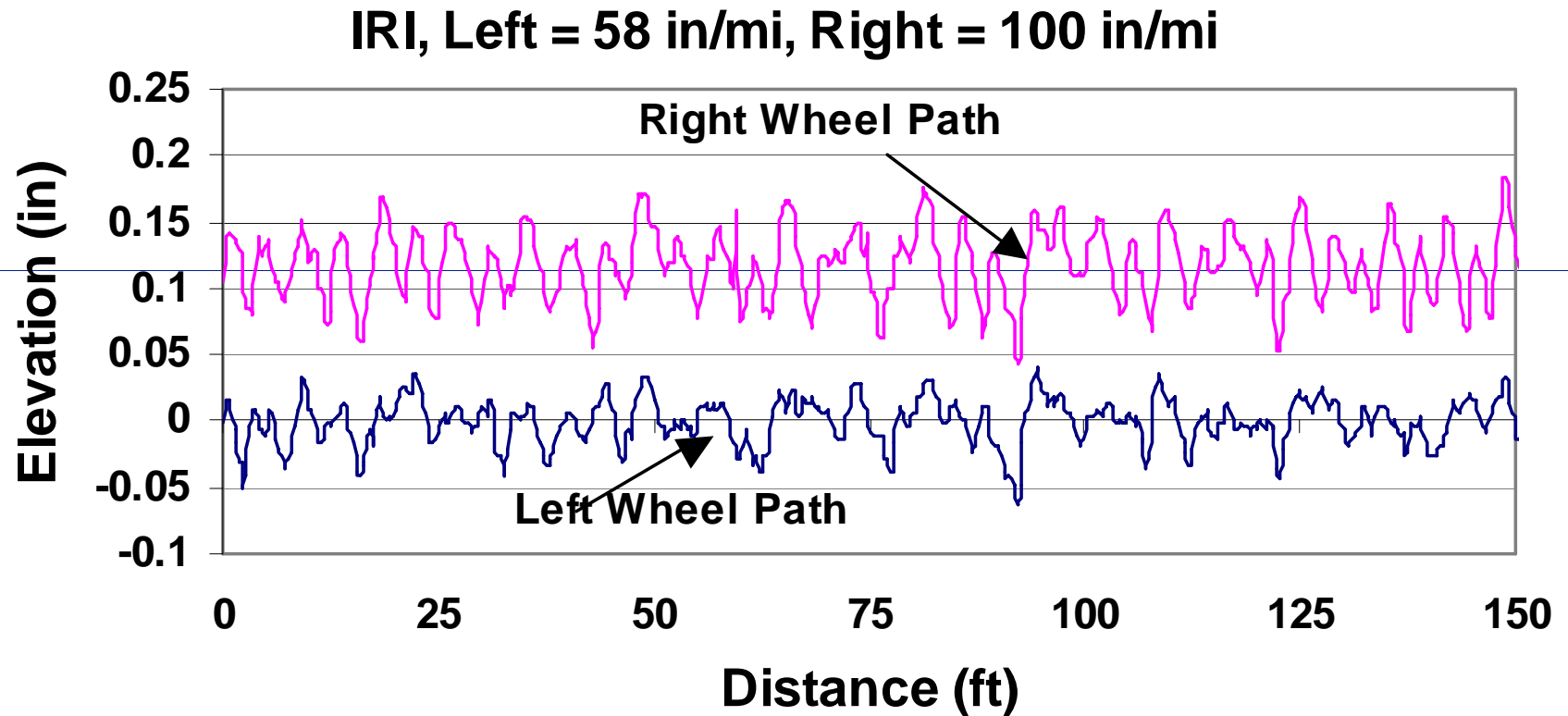




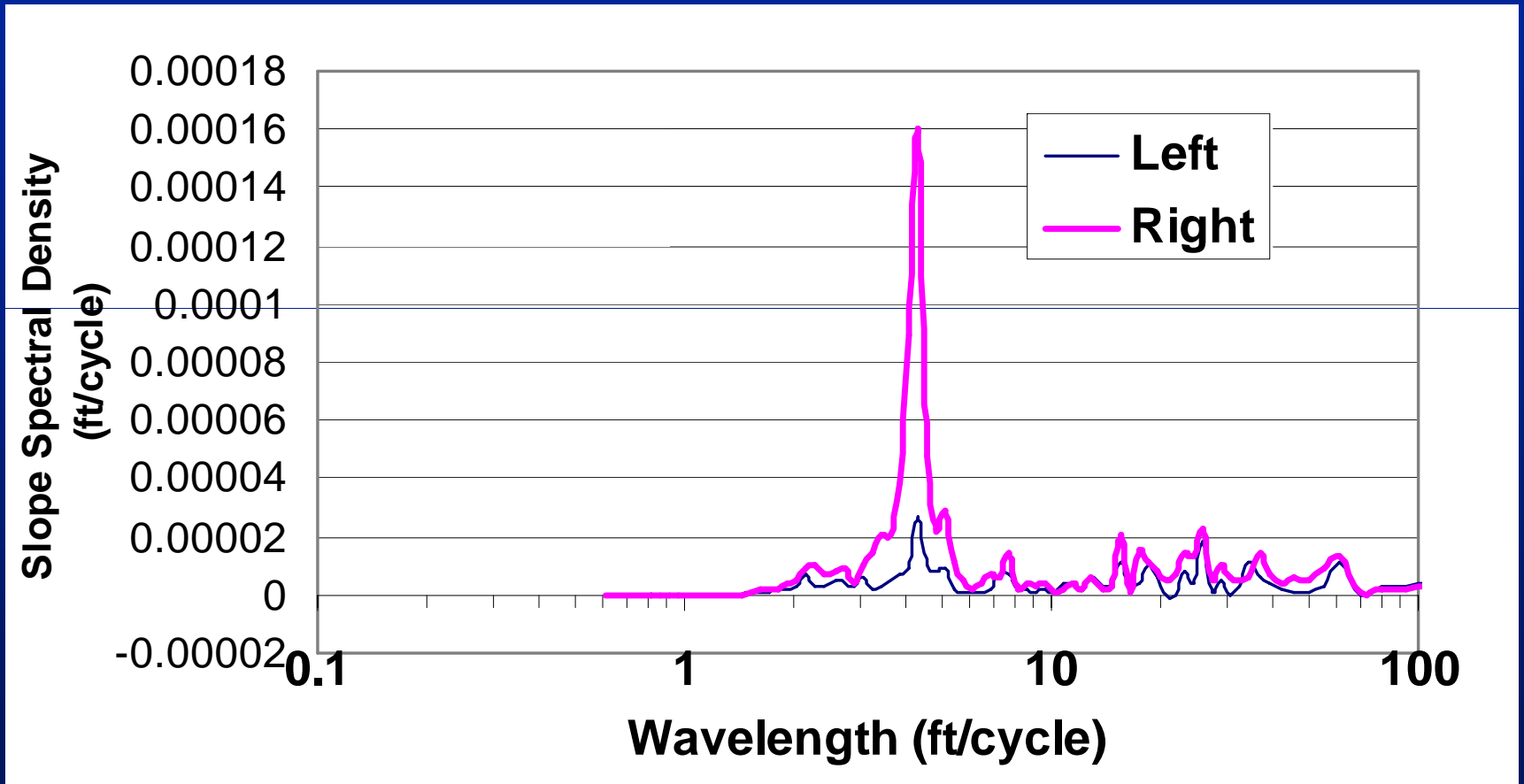
FINISHING BEHIND THE PAVER



High-Pass Filtered Profiles, Ohio Project



PSD Plot

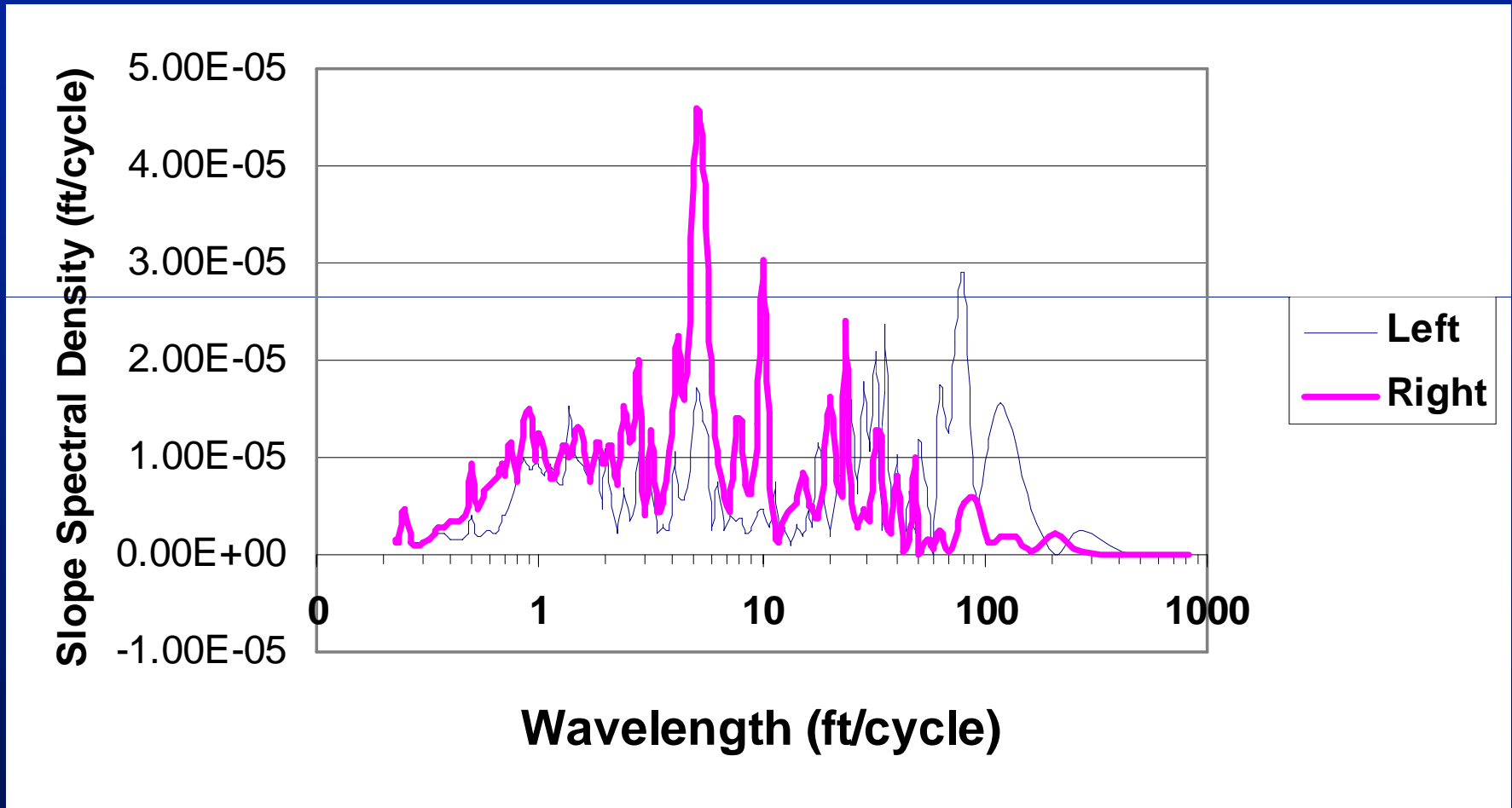


Automated Float




Float

Iowa Project, IRI-Left = 75 in/mi, IRI-Right = 105 in/mi





Automated Float

- In another project in Iowa Automated Float used successfully.
 - If an Automated Float is used, make sure it is operating properly.
- 



HEADERS



Headers

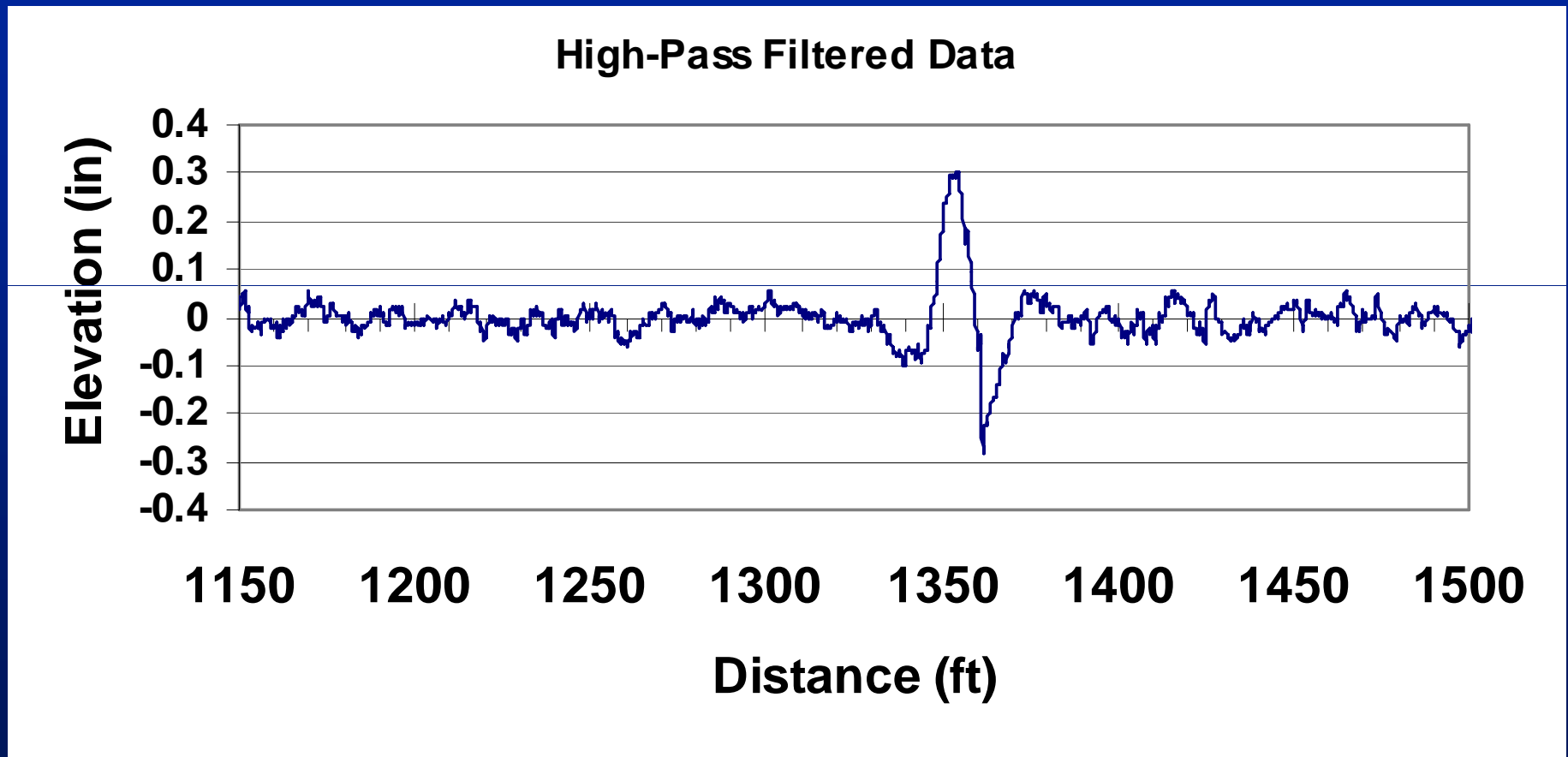


Wooden Form

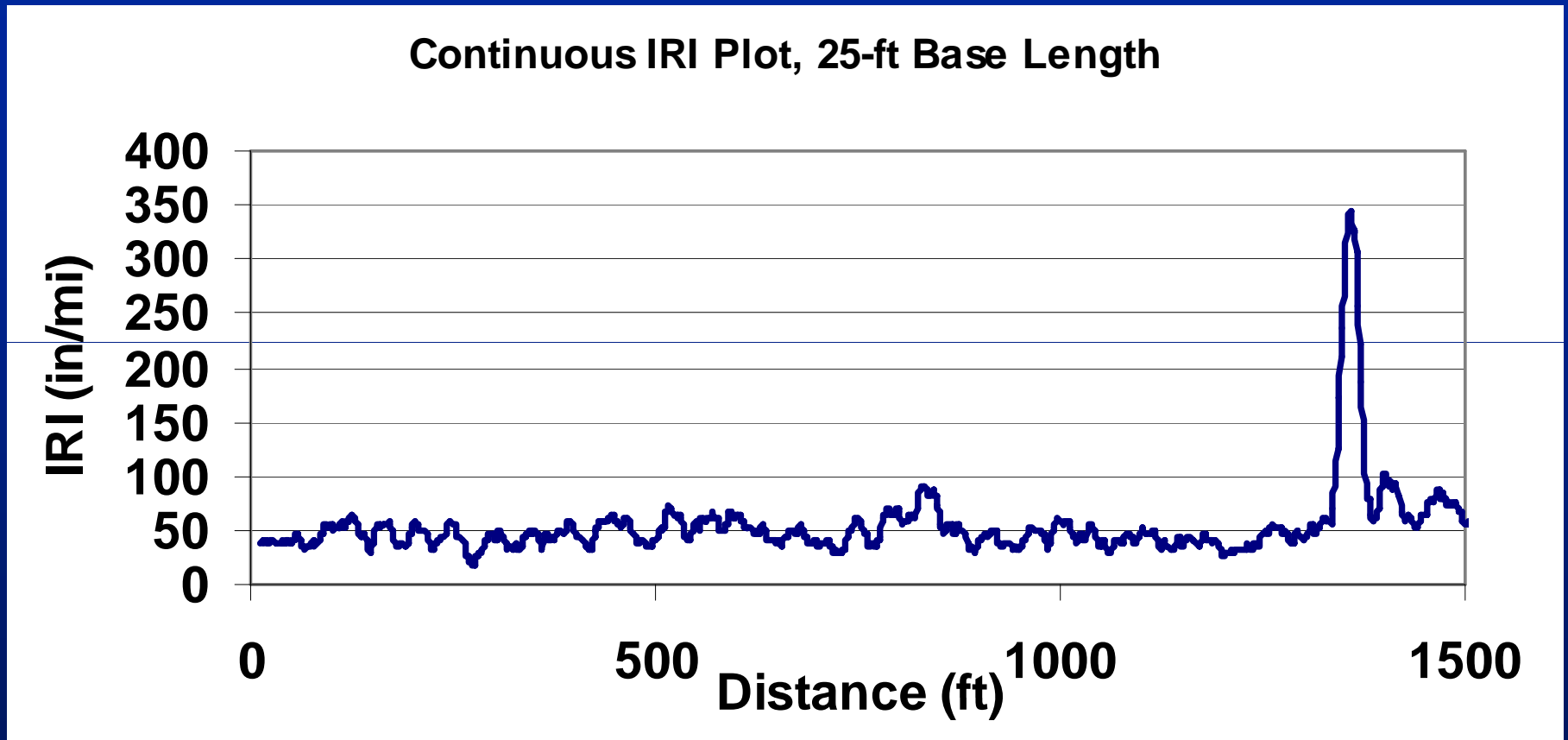


Cut-Back Method

Profile Over a Header, US-23

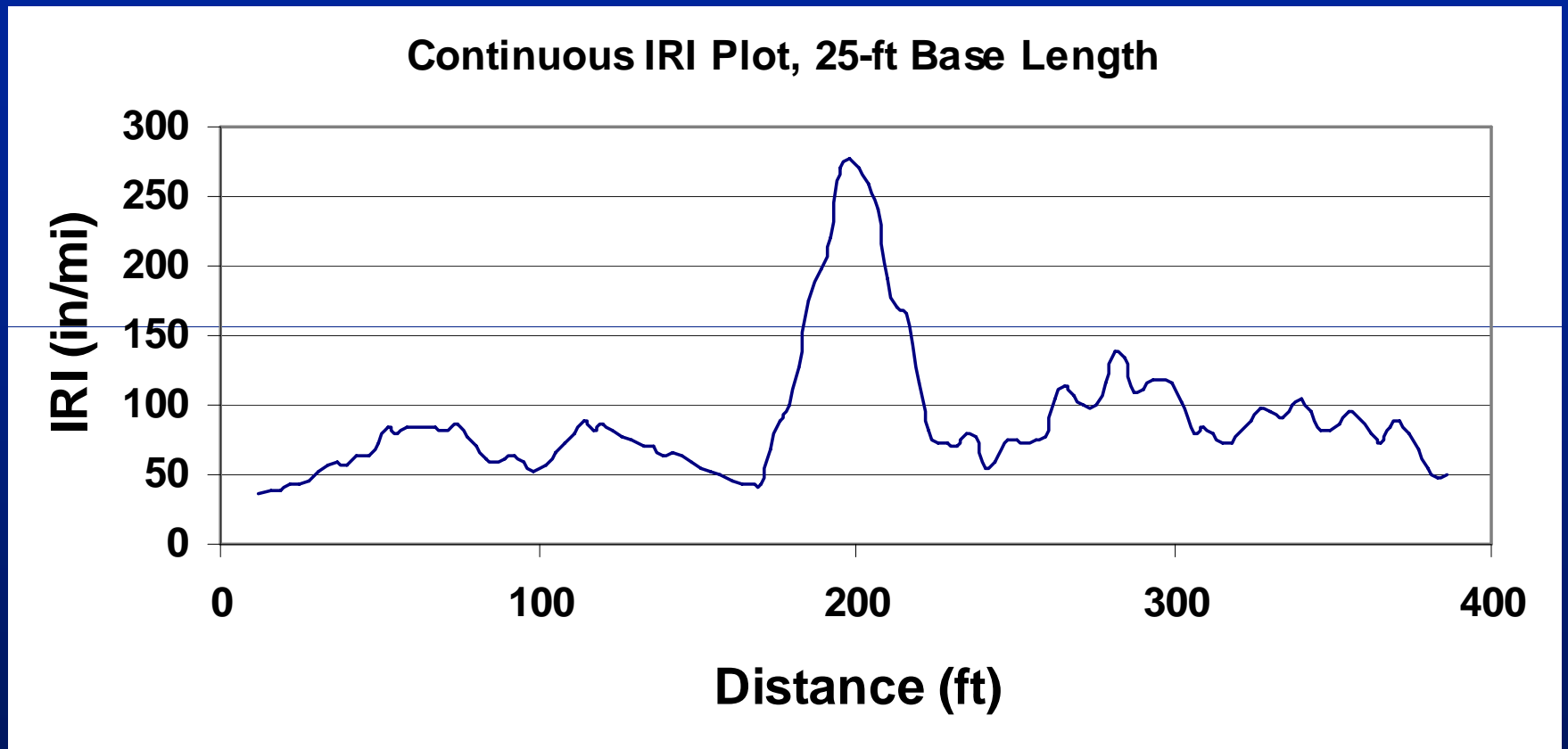


Continuous IRI Plot, US-23



ProVAL predicts peak IRI can be reduced from 340 to 180 in/mi by grinding

Continuous IRI Plot, I-69



ProVAL predicts peak IRI can be reduced from 280 in/mi to 140 in/mi by grinding

Headers

- Paving in urban areas can involve many headers. Need to provide access to businesses and residences. “Gaps or “Leaveouts”
- Creates two transverse construction joints.
- Pay close attention headers during construction.



Acknowledgements

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