



Lessons that can be learned from hot climates

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Principal Engineer , TRL. March 2012

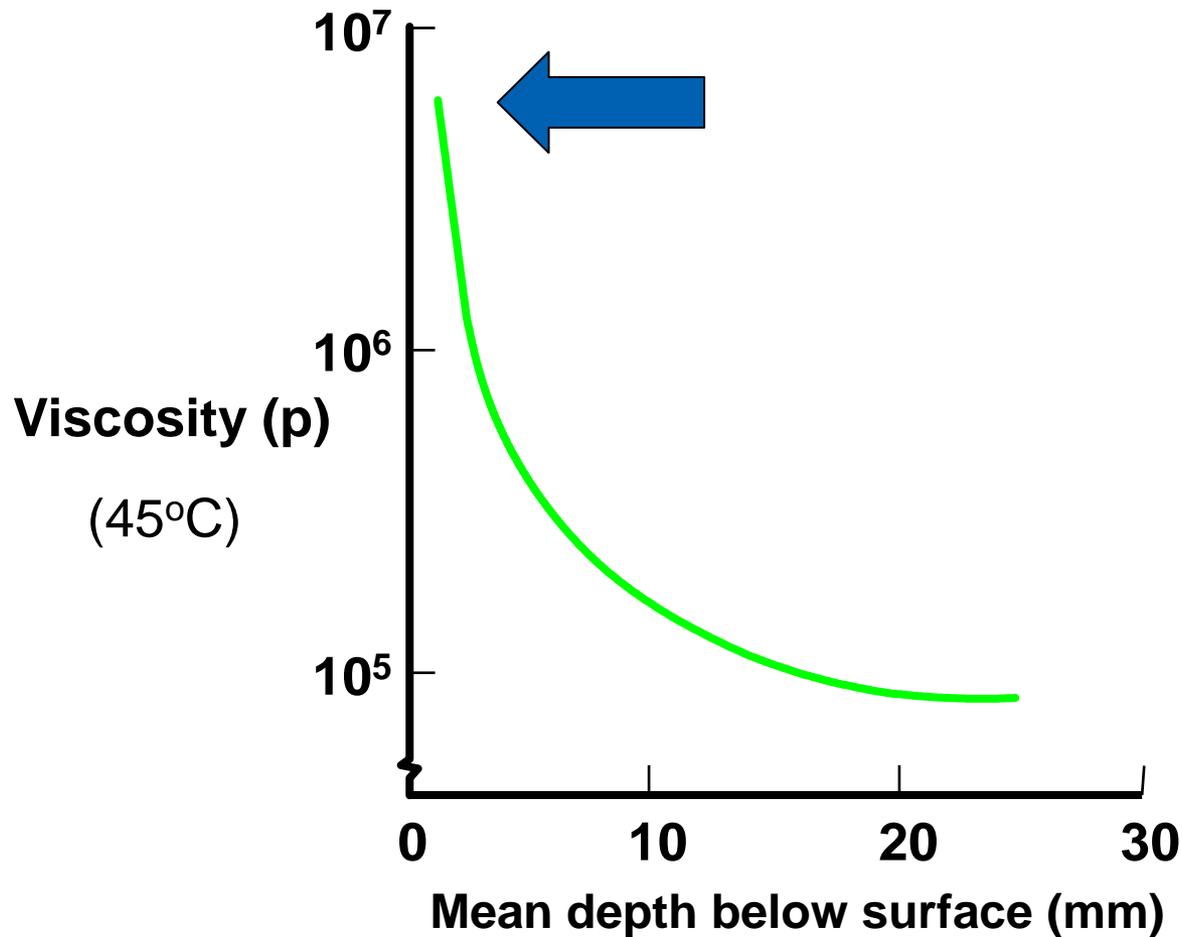


'Top-down' cracking in asphalt concrete – 1970's



- 1974
- First asphalt concrete overlay laid on the national network , Kenya
- Nairobi – Mombasa Road
- Research showed that cracking resulted from ageing of the binder at the surface

'Top-down' cracking in asphalt concrete – 1970's



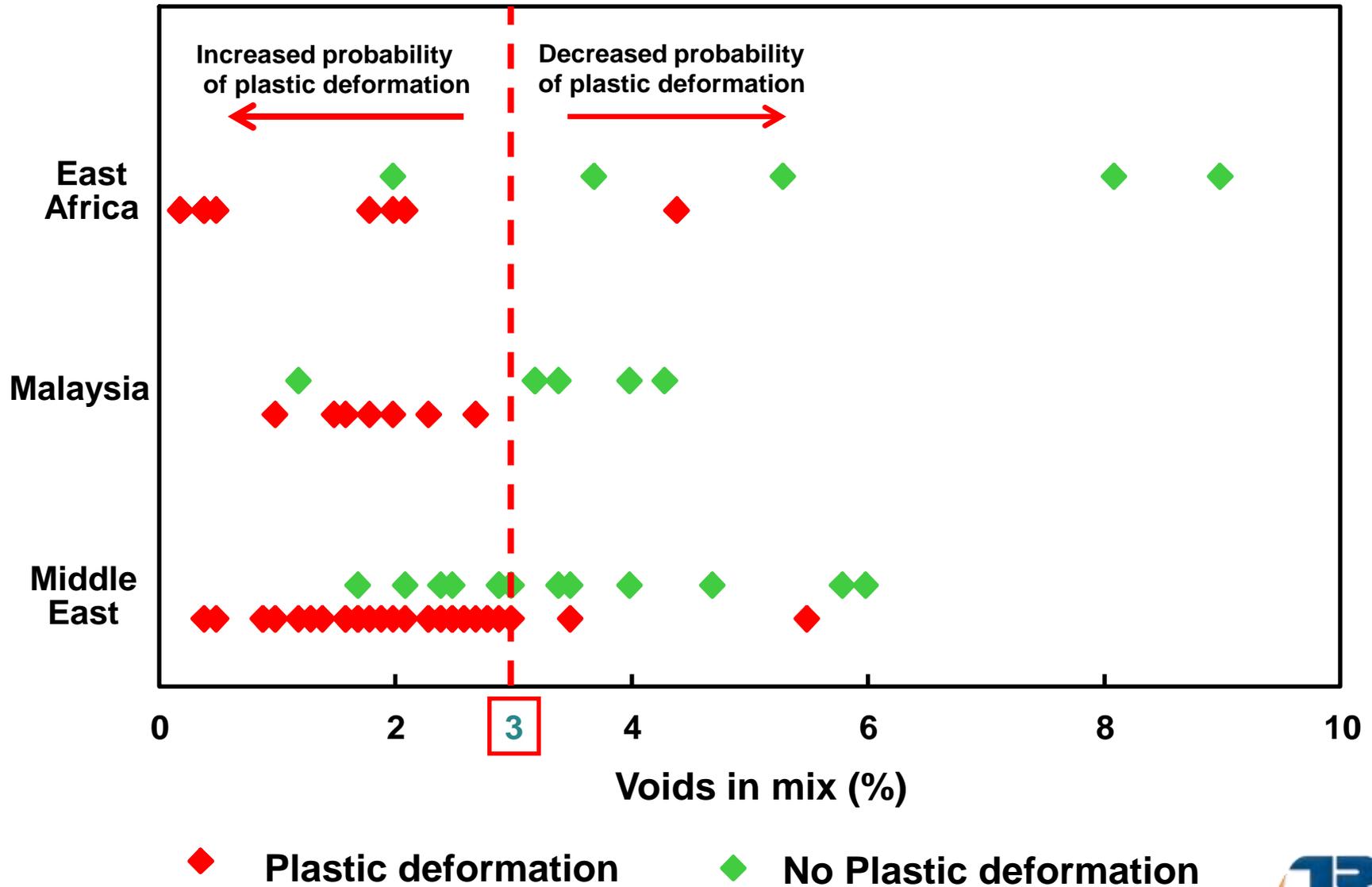
- Sliding Plate Viscometer
- Viscosity in top 3mm 2 orders of magnitude higher than lower in the core
- 'Brittle' failure at asphalt surface causes cracks to start
- Strains could result from temperature changes or traffic
- **BUT** all cracks in the asphalt overlays were found to start from the top

Deformation in asphalt concrete – 1980's



Was it due to excessive loading?

'Secondary compaction' in asphalt concrete



Revision of AI asphalt concrete design standards

MS-2
Voids >3%
after trafficking?



SUPERPAVE
Gyratory compaction
for different levels of traffic

Asphalt concrete in desert regions



Asphalt concrete in desert regions



HA Renewal Works (2011 and 2012)

Budget constraints have resulted in an additional maintenance option



Do Something

- The maintenance option that will address a combination of defects such as the serviceability, structural integrity and safety of the proposed scheme.



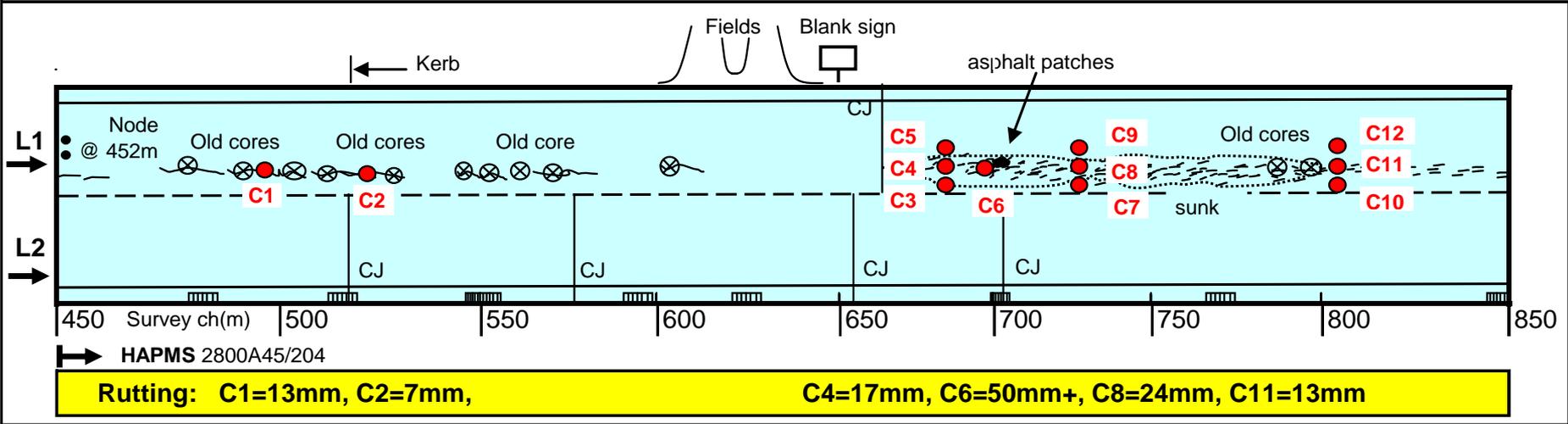
Do Something – Holding Works

- The maintenance option that addresses essential work to those defects which cannot be postponed beyond the forward programme period to restore its serviceability. **The treatments proposed must also rectify any major/structural defects present.** The treatments must be targeted and based on sound objective evidence of the asset condition

Holding Do Something investigation - 1



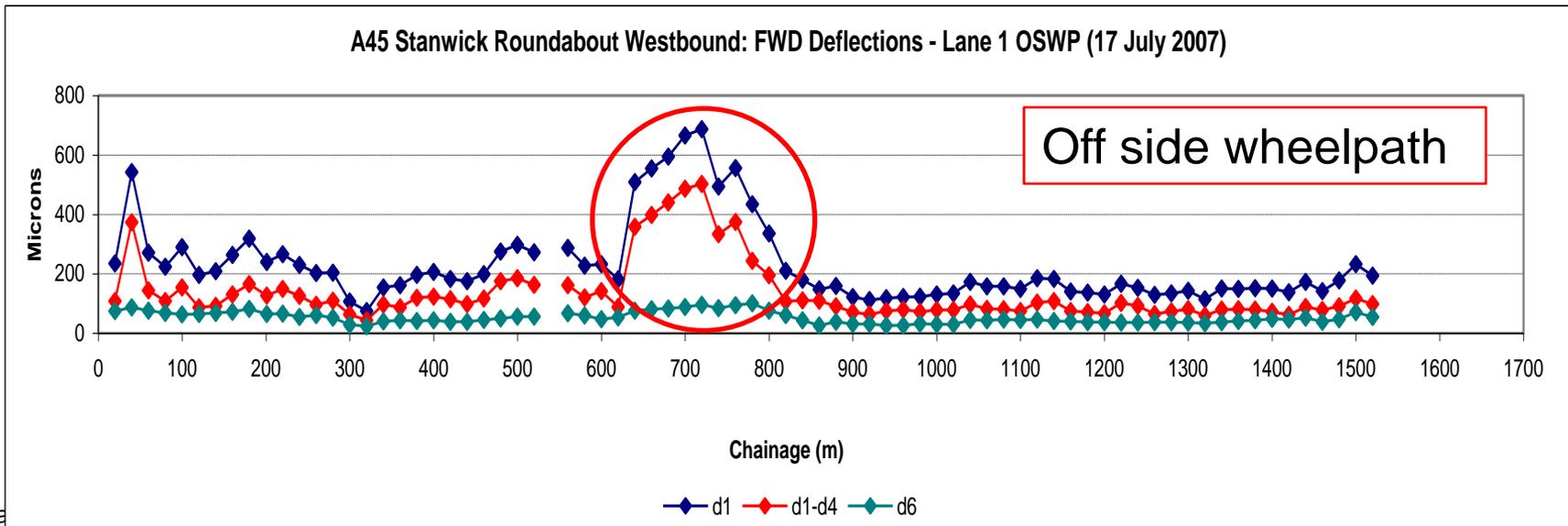
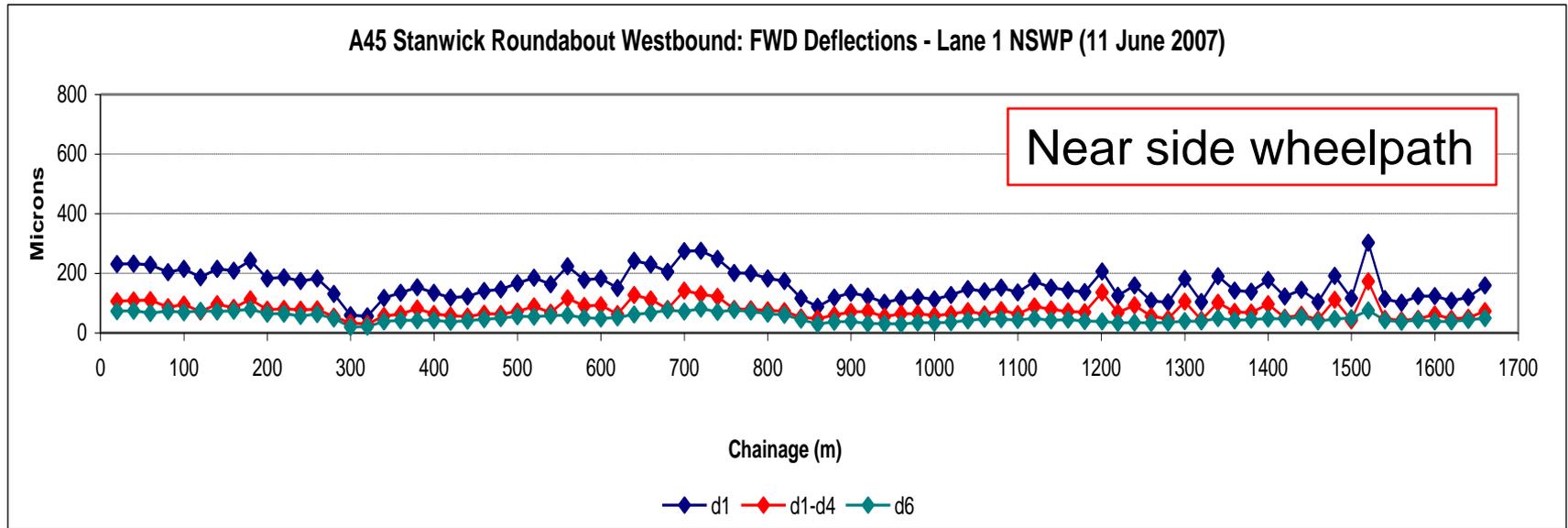
Holding Do Something investigation - 1



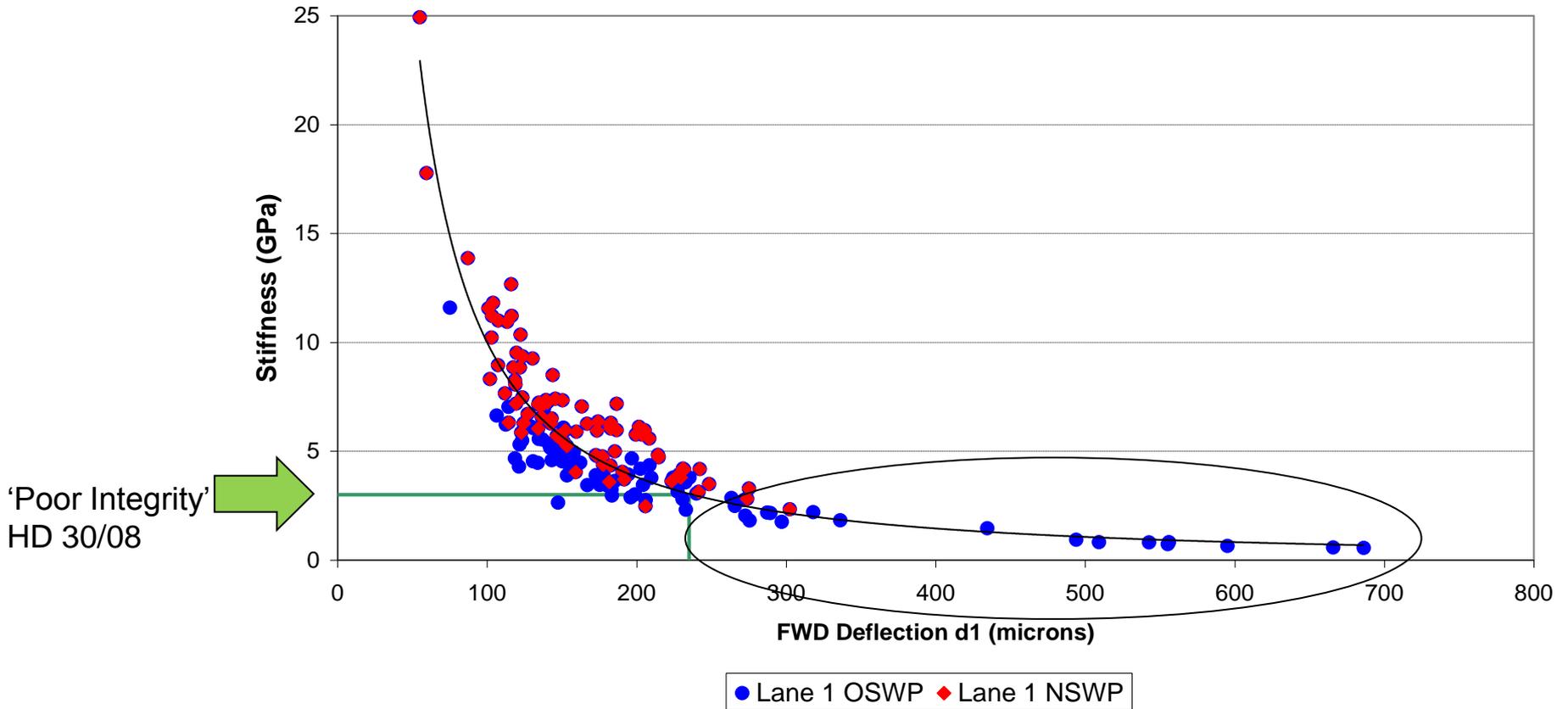
Holding Do Something investigation - 1



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Holding Do Something investigation - 1



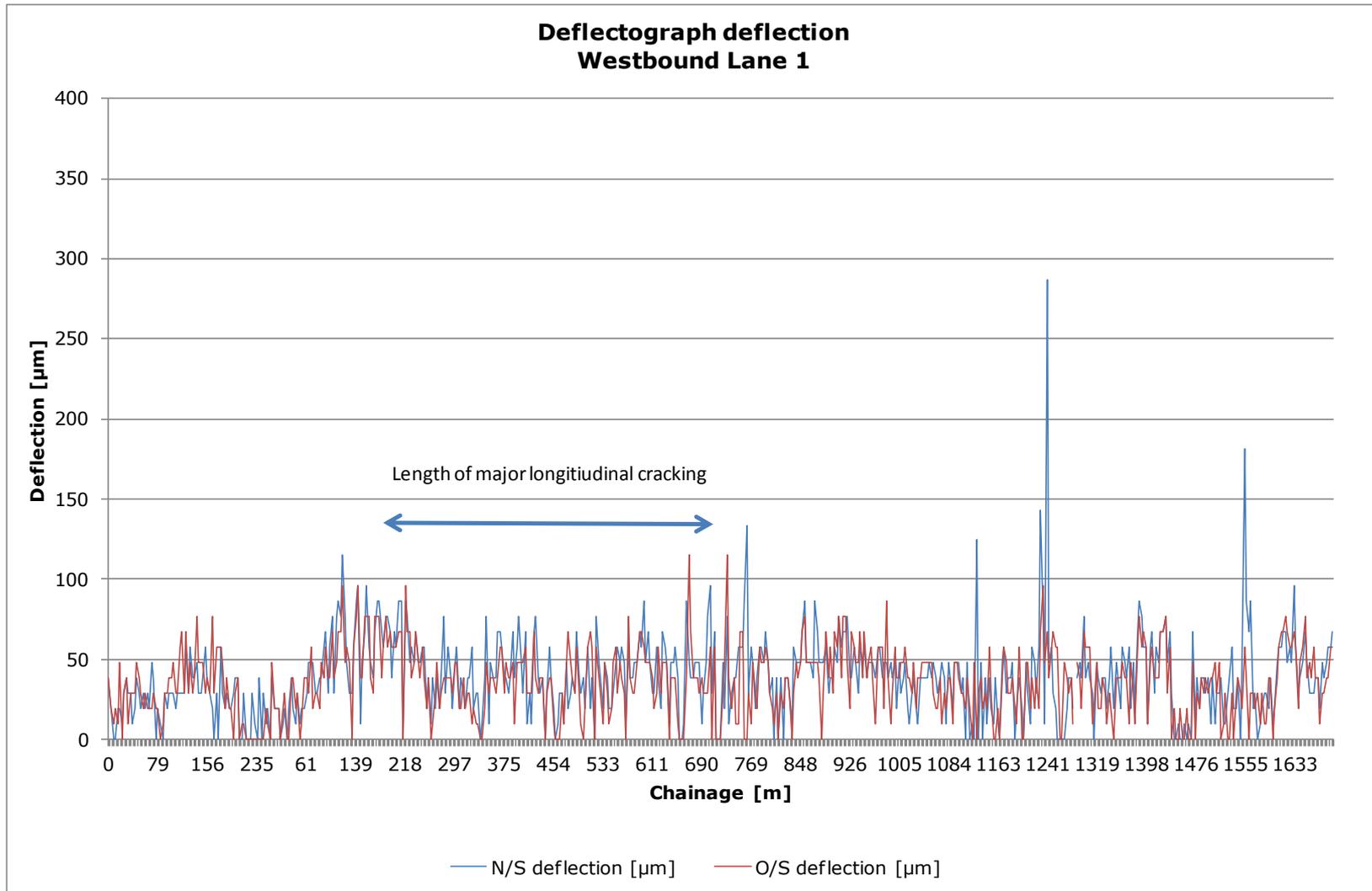
Holding Works



Holding Do Something investigation - 2



Holding Do Something investigation - 2



Holding Do Something investigation - 2



Holding Do Something investigation - 2



Holding Do Something investigation - 2



TOP SURFACE



BOTTOM SURFACE

Holding Do Something investigation - 2



Illustration of Holding Do Something approach - 2



Holding Works