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Getzner RAILWAY Solutions

Asia Pacific Railway Innovation Forum ADB, Manila 21st 24th May 2019

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Why Elasticity?



Why elasticity? \rightarrow To reduce dynamic forces and therefore prevent damages



High requirements for designed elastic elements \rightarrow

→ Railpads, Baseplate Pads, Under Sleeper Pads, Sub Ballast Mats ...

Transition Areas

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Degradation of Sleepers

engineering a quiet fu

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Degradation of Rail Pads



Degradation of Ballast



Overview Elasticity Management in Railways





Mass Spring System (MSS)

Elasticity Management in Ballasted Tracks





Under Ballast Mat

Under Sleeper Pads Material: Wood

For >150 Years: Wooden Sleepers
good contact area
'built-in elasticity'
scarce material

80% of sleepers worldwide

durability & weight \rightarrow lower than concrete

COLUMN ADDRESS OF TAXABLE PARTY.

Under Sleeper Pads Material: Concrete

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Since the 1950s: Concrete Sleepers

- bad contact area
- no elasticity

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- abundant material
- high durability & weight

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Increase of Contact Area





Padded sleeper from DB track after 190 Mio. load tons (type plastic/elastic) No perforations or any other signs of deterioration

Distribution of Axle Loads to more Sleepers





Sleeper w/o sleeper pad and low rail deflection

Sleeper with sleeper pad and designed rail deflection



Increase of Contact Area

ballast contact pressure



Ballast Protection





Radius R = 280m, loading 100 million tons

without USP

Radius R = 280m, loading 100 million tons

with USP

Effects in Track using USP



- Increase of contact area between concrete sleeper and ballast
- Distribution of axle load to more sleeper
- Less maintenance requirements
- Better track quality, hence increased stability
- Longer lifetime of track

Increased availability and reduced life cycle costs



Frankenmarkt, 4014 Track 1, Austria Test track, constructed September 2001





Infrastruktur Bau

Frankenmarkt, 4014 Track 1 Test track, Constructed September 2001



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Change of tamping intervals by using USP



An evaluation of more than **1500 cross sections** of Getzner Under Sleeper Pads installed in Austria on mainline track with **more than 20 MGT** was carried out by TU Graz. The result showed a **tamping interval increase factor of 2.75** (e.g. Frankenmarkt went from approx. 3 years to 9 years).



Alignment in VALE USP test section







