

**REAAA**<sup>®</sup>  
Driving Progress

ROAD ENGINEERING ASSOCIATION OF ASIA & AUSTRALASIA (NZ)

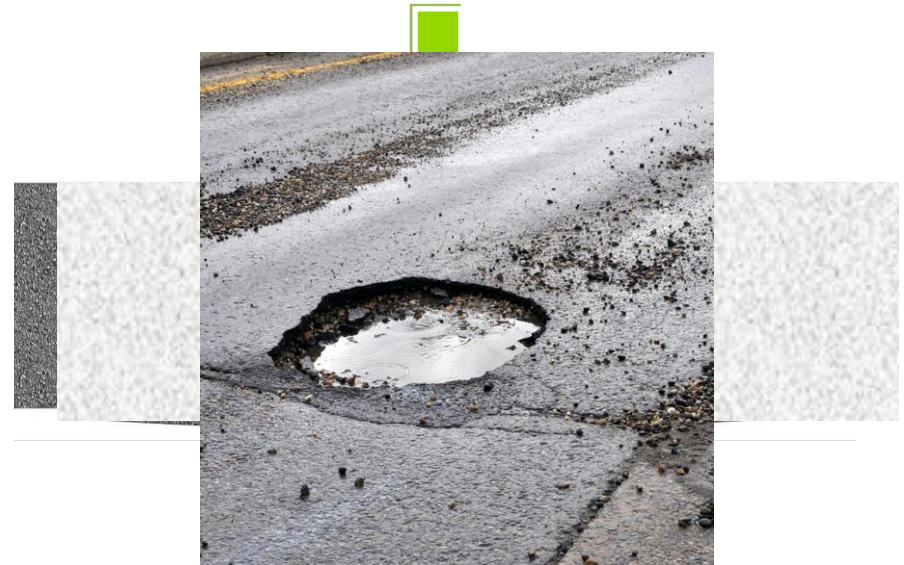
# Bitumen emulsion stabilisation

*Nik Vishwanath – Road Science*

**LOW**  
VOLUME  
**ROADS**  
WORKSHOP  
**2022**

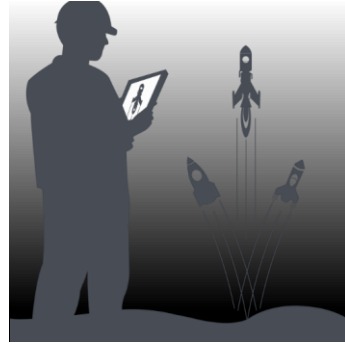
# Why?

- Unbound granular pavement
- ↓
- Cement stabilisation
- ↓
- Bitumen stabilisation
  - Foam stabilisation
  - Emulsion stabilisation

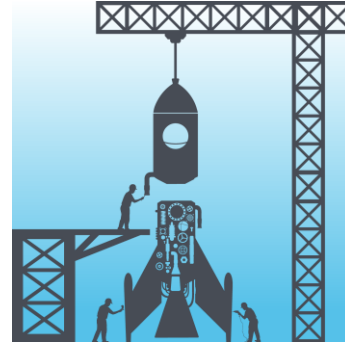




Problem



Solution



Scale



Launch

# Enviro Base

# Enviro Base



# Performance – Water pressure test

Unbound



Stabilised



## Performance – Water pressure test

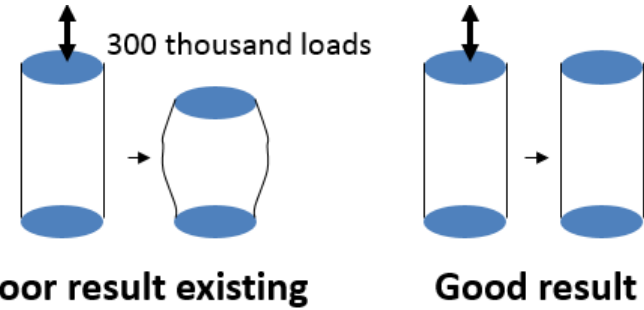
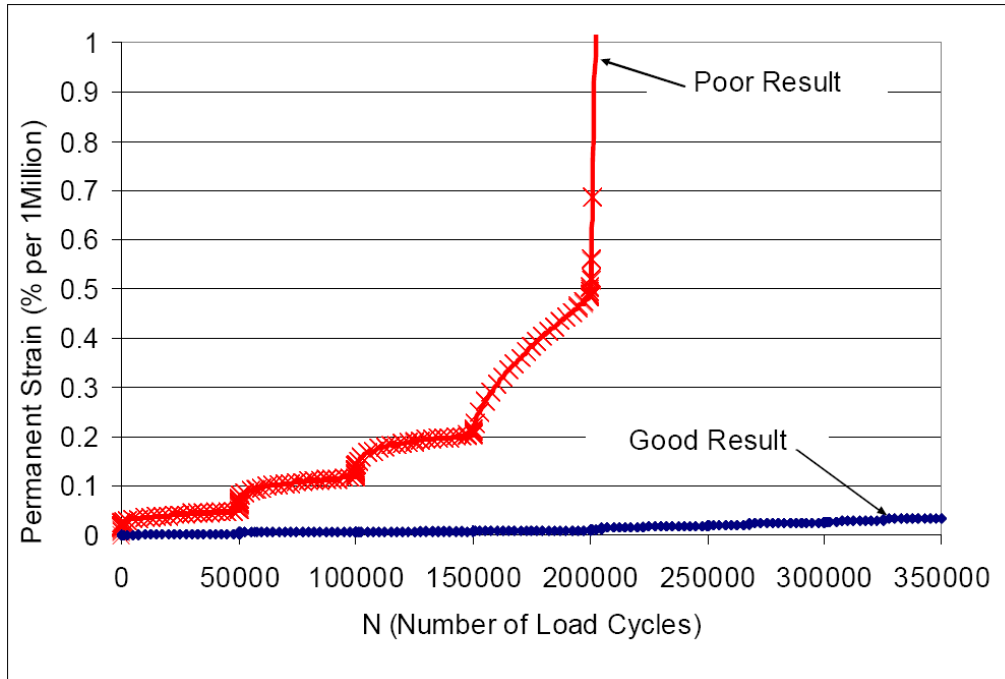


- Unbound base course
- Water-blasted
- Fines washed away
- Material blew out



- Emulsion stabilised base course
- Water-blasted
- Fines remained intact
- Material performed well

# RLT Testing



## Repeated Load Triaxial Testing

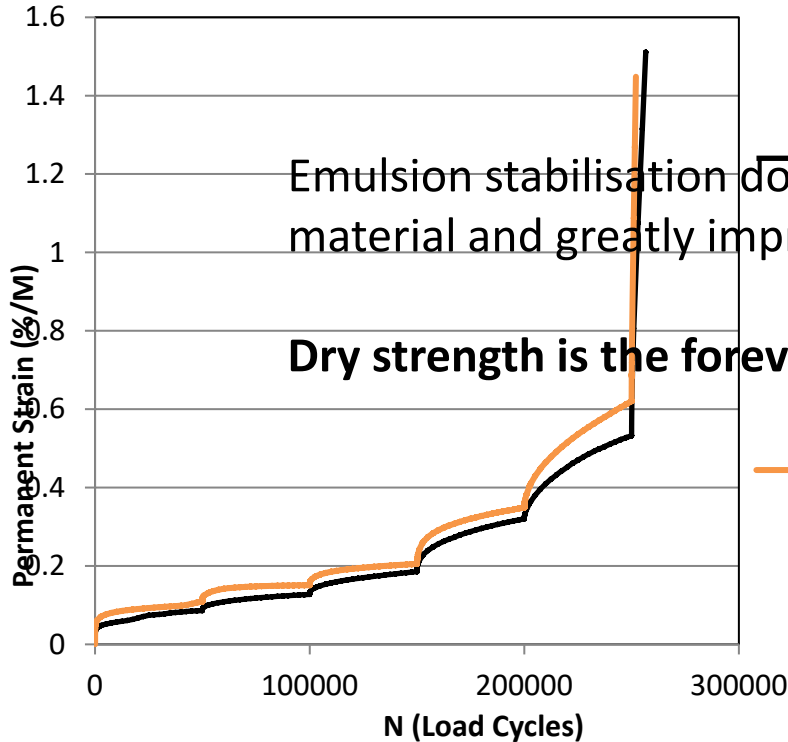


**Soaking sample  
For saturated test**



# RLT Performance

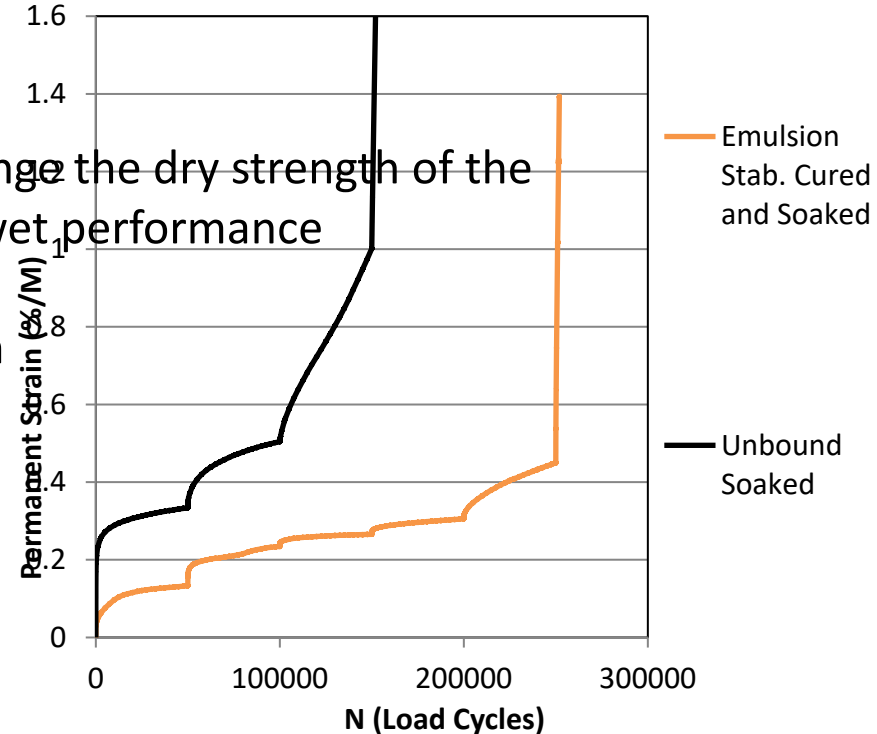
## Dry Testing



Emulsion stabilisation does not change the dry strength of the material and greatly improves the wet performance

**Dry strength is the forever strength**

## Wet Testing





# LVR Field Trial – Waikato District Alliance Nov 2020





## Advantages Observed by WDA

- No dust containing cement leaving site
- No cement splashes on vehicles
- Compaction was fast and surface locked up quickly
- Trafficable quicker than cement stab surface
- Reduced construction time
- All QA testing was excellent.

**Feb 2022**

## **Enviro Base**



## **Cement Stab**





# Patching/Pre-seal repairs field trial



# Patch Performance

Jan 2014

Significant deformation  
and shoving

Cement stabilisation  
completed Feb 2014



# Patch Performance

July 2016

Significant cracking and  
pumping of fines

2.5 years life max



# Patch Performance

July 2018

Emulsion stabilised





Day 0







Day 21





9 months



# Patch Performance

Jan 2020 & 2021

Deformed and levelled  
with cold mix in 2019

4 years on, performing  
the same, if not better  
than previous treatment



# Fit for purpose plant





## Conclusions so far for emulsion stabilisation

- Great tool for waterproofing granular material
- Comparable to foam
- Operational advantages
  - Safety, quality, efficiency, flexibility of application

Questions?

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