Swampy Marshall

Unsealed Road Improvement Projects
Operator Perspective
Abstract

• Clay and lime wearing course construction
• Machine Applications
• Proof Stories from Ashburton District Council Network
Background

- Ashburton District Network 1159km Unsealed (56% of the total network)
- Land use changes driven by Dairy boom
- Poor aggregate sources from Council Pits
- Challenge to do more for less with reducing budgets
- Improve wearing courses
The problem
Poor Drainage
Increased loadings
Increased loading frequency
Poor Aggregate
Lime and clay stabilised aggregate

- Mixed on site
- Mixed through portable crusher
Comparison of lime/clay stabilised AP20 vs additional AP20 Topcourse from Council

Advantages:
- Hard wearing
- Less maintenance
- Corrugation prevention
- Dust reduction

Advantages:
- Extra cartage from clay/lime source
The stabilised vs clay stabilised wearing course

**Mogram**
- Easy to spread
- Crushed to size
- Better at dust suppression than clay

**Clay**
- Cheaper to extract
- Difficult to blend on road or through a crusher

**Lime and clay**
- Susceptible to moisture
- Additional cartage
- Frost Heave
Methodology

1. Drainage: Remove high shoulders, construct swales, disk/mulching and direct drilling
Bovine Applications
Methodology

In-situ Evaluation: Shape, loose aggregate utilisation

Decide on application type: Mixed on site vs mixed at pit

Dust (20-25%) and lime (45-50%) to stabilise aggregate
Methodology

Blended on road

• Cones set up to control spread lengths
• AP20 spread first
• Clay (difficult to spread) clods need to be broken up
• Lime easier to blend already crushed to desired size
• Blend in windrow: consistency; moisture content
• Laying out: over-construct crown, additional compaction, 4-6% crossfall
Methodology

Machine Application

Rated Edges,
mm gap,
justing blade angle reduces gap setting.
Pitch blade forward to achieve a good rolling action for uniform mixing.
Limit material bypassing end of blade.
Methodology

Machine Application
Articulation, aids blade angle, minimises blade side thrust, keeps rear drive axle on firm surface.
Methodology

Machine Application

Trailer mounted roller.

Roller based on oscillating pneumatic tyre roller.

Good for tightening up finish surface with optimum moisture content

Reduces labour and plant requirement
Methodology

Machine Application

Traditional rollers.

Dry surface allows for lumps of clay to break down, and less sticking to roller drum.
Methodology

Blended at quarry

- Less time spent with disruption to traffic
- More consistent product
- Custom mix design
- Smart stockpiling
Case Study 1 – Dip Road Fishtail

No maintenance for 2 years
Minor potholing after 2 years
No corrugations
Proof Story 2 – Simpsons Rd (clay vs lime)

COMPARISON OF LIME VS CLAY WEARING COURSE
2.5KM OF EACH, ADJACENT SECTIONS
LIME CRUSHED TO 20MM DOWN, EASY TO BLEND
CLAY TAKES LONGER TO BLEND IN WINDROW
Clay vs Lime

Clay.

Lime.
Utilised excess loose aggregate on site

Heavily trafficked road

Clay blended on road
Generating Connections

Story 3 – Winslow Westerfield Rd
ture Maintenance
Sandviks
Rear-mounted roller
Stockpiles for potholing
Stabilise council aggregate source
Create a low maintenance and hard wearing surface
Greater initial investment with less maintenance required
Long term
Correct machine application
any questions?