

# The Importance of Best Practice Training for Contractors Involved with the Maintenance & Construction of LVR

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# Introduction

- The maintenance & construction of LVR presents many challenges to the contractor
- LVR provide a completely different environment than major routes
- Low traffic counts but with some intense periodic HV events



# Introduction...con't



- This presentation will look at the development of crews around NZ over the last 3 – 4 years
- Development was achieved through the implementation of a regular training program which included short courses and site work



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# Training modes

- Initially through a series of short courses ran at the branch with practical sessions in the yard
- Initially the level of understanding of basic best practice principles were limited
- This was highlighted due to the high amount of remedial work in certain areas
- Site follow-ups were then conducted over the next few years and involved a day or two with each crew observing and providing feedback and instruction directly to field staff. The progress was very encouraging



# LVR – a unique environment



- LVR present many challenges to the authorities responsible for their upkeep
- Often, the environment provides very little room to work, is remote from services and the traffic is variable
- However, it can be done!



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# How to build and maintain LVR

- In short it requires access to good materials (e.g. well graded 'GAP' style aggregates), water, and compaction equipment
- Compaction equipment should not be limited to the conventional items
- Some of the best compactors are the least obvious!



# Best Practice Principles

- To build or maintain LVR we need to follow some Best Practice Principles:
- How to **recognise good material** by way of observation
- How to **recognise OWC** in the field
- How to determine **correct layer thickness**
- How to **compact properly and efficiently** and know when enough is enough
- How to apply **cement** and **lime** for stabilised areas
- How to **achieve a surface that can be sealed** (or unsealed as the case may be)



# Materials

- Not enough can be said about the importance of good materials
- Material needs to be well graded, and have enough non-plastic fines to be workable
- Material should be close to OWC, especially if large distances are involved for transport to site



# OWC in the field – critical!



- Obtain palm size sample of material
- Remove all large stones
- Squeeze as tight as you can
- Observe the material
- Water can act as glue or lubricant

# Layer thickness

- Some of the biggest causes of failure on LVR is incorrect layer thickness
- Layer thickness (and OWC) are the two most important criteria for efficient compaction
- 2.5 max stone rule....as a guide



# Compaction

- Falls in to two categories, Primary and Secondary
- Primary is achieved with vibration and **CAN BE OVERDONE!**
- Secondary is achieved by weight and kneading
- If done in this order (and properly!) then compaction can be achieved quickly



# Compaction – con't

- Don't just use rollers, plates etc
- For the best surface finish and reduced material breakdown, as much as possible should be done with rubber tyres
- Where do we get the rubber tyres from?



# Rubber Tyres



- Most compaction gear used on LVR is lightweight
- However the aggregate truck, water cart, and even the crew truck are outstanding compactors and will yield a decent surface



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# Stabilising

- One of the best ways to increase in-situ strength and reduce the need for imported aggregate
- Commonly done with up to 3 or 4% cement or lime (typically around 2%)
- Time is of the essence here and access to the right gear and water



# Stabilising con't



- Use water injection on hoes if fitted
- Apply some thought to dose rates
- Remove large clumps of seal after hoe has passed
- Water + primary is the 1<sup>st</sup> thing



# Stabilising – con't

- Then add shape through clipping with underbelly grader (or the real thing if you can)
- Apply secondary through rollers with **NO VIBE** and rubber tyres
- Water cart to be kept active during this phase



# Drag-brooming for surface prep



- A bit of a lost art these days!
- Drag-brooming (which can be done by hand on small patches) is the process of dragging the fines across the surface to fill in voids
- If allowed to dry a mosaic surface can be achieved



# Surface prep – con't

- Be careful not to over water if the patch is to be sealed the same day
- If the patch is to be left open, keep an eye open for cracks, and water if necessary
- Apply a running course or membrane to protect basecourse



Thank you for your time.  
Do you have any questions?



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