LEADING SAFETY PRACTICE 0057 / 10112022

SAFER CRUSHED ROCK

MAJOR TRANSPORT INFRASTRUCTURE AUTHORITY

The Western Program Alliance (WPA) introduced Safer Crushed Rock to reduce risks associated with wet and soft site conditions.

Safer Crushed Rock helps improve safety by providing greater compaction and stability under foot and plant, reducing slipperiness when wet, creating a cleaner and safer workplace.

It also, provides an engineering control (from waste) to mitigate the risk associated with plant subsidence, dust, undulating work surface, lower leg injuries, fatigue, slips, trips, and falls.

Picture of Mt Derrimut Road, Deer Park site with Safer Crushed Rock deployed.

The situation

In preparation for construction activities, it is common for sites to be cleared and back filled with virgin natural materials to provide a base for construction activities.

Virgin natural fill materials have drawbacks such as:

- Becoming soft, unstable, and slippery when wet
- Producing dust under dry conditions
- Wearing poorly under traffic and operating conditions (despite compaction)
- Producing uneven or unstable surface conditions.

As a result of these characteristics, the operating stability of plant reduces, the risk of subsidence increases, and worker stress & fatigue exacerbates due to soft or changing ground conditions.

As a result, WPA investigated a safer, more environmentally friendly, and sustainable product on their projects as a way to reduce these impacts on their workforce and the broader community.

The solution

- Safer Crushed Rock utilises a combination of recycled crushed concrete (80-90%) and recycled crushed rock sourced from waste concrete and rock removed from sites. The processing facility generates the Safer Crushed Rock which is transported back to the site as a small aggregate and dispersed as required.
- Once watered and compacted, Safer Crushed Rock produces a "concrete pad" like performance without the boxing, pouring and curing and can be used for hardstands, piling pads etc. Compared to virgin natural materials, Safer Crushed Rock material has been found to compact easily, when watered, and results in a firmer base.
- The improved compaction also makes it less slippery when wet and more stable when trafficked; in addition to providing an environmentally friendly and sustainable alternative at a lower cost.

Benefits and learnings

Mt Derrimut Road is yet to register an incident claim since implementing safer crushed rock, well below the industry average. In 2019-20, 23% of serious claims were due to falls, trips and slips of a person. With labourers (24%), technicians and trade workers (19%) and machinery operators and drivers (14%) accounting for 57% of serious claims[1]. Other benefits include:

- Increased stability and reduction of airborne dust under traffic and operating conditions.
- Engineering control to reduce risk associated with plant subsidence.
- Less surface undulation, meaning reduced lower leg injuries, fatigue, slips, trips and falls.
- Improvements in run off, drag out, erosion and dust control.
- Reduces maintenance traffic and rework.
- Recycles and reuses waste cement, which would previously end up in landfill.
- Cost is ~11% cheaper per ton than virgin fill of the same class.
- Can be acquired through existing major providers of sustainable construction materials.

[1] Statistics as per Safe Work Australia's Slips, trips and falls | Safe Work Australia and Key work health and safety statistics, Australia 2021 | Safe Work Australia report.

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