The Long Term Durability of Load Bearing Roads, Compounds and Construction Platforms

When loads are applied to a soil sub grade, the soil will be less prone to deform or rut if the shear strength of the soil exceeds the applied loads. The strength of the soil is therefore a function of such characteristics as its angle of internal friction, its cohesion, and its degree of compaction.

Load bearing construction platforms are usually built with one or more layers of high quality fill materials placed and compacted. The function of these layers of base material is to distribute and spread the imposed loads over a large area, reducing the pressure applied to the sub grade.

The base material is able to distribute the loads because the individual aggregate particles if they are properly graded will lock together. Applied loads are transmitted through the base material both as vertical and horizontal forces. If these horizontal forces under heavy load push the base material sideways, rutting develops, resulting in early failure.

Even a really good quality graded stone base, with the proper internal strength can move laterally if the loads are frequent or heavy enough, or if rainfall washes the finer materials further down or out of the layer.

To prevent lateral movement at the bottom or even within the base layer, high modulus Geo textiles and grids have been used for several years. Because of their strength, resistance to elongation and structure, these fabrics and grids are more capable of restraining the lateral movement of the base materials with which they are combined.

Although they are a proven tool in many stabilisation applications, these fabrics and grids are only truly effective at the boundary where they contact the base soils. Prevention of lateral movement of the base materials above and even below this boundary/contact area still depends totally on the strength and quality of the soils/fill materials at this point.

The vertical and horizontal confinement of the entire depth of the base layer is only possible with a bound stabilisation of the layer and this has major implications for the bases long term performance. Cement and to a lesser degree Lime has been fulfilling the requirement of the construction industry for stabilising materials to form a bound layer, and have proven to provide long term strength and durability. Cement though is not specifically designed for the treatment of soils and can only perform to full effect with granular or cohesive soils with little organic content.

Where loadings of the construction platform are expected to be high or frequent. Lime alone is not an option, Cement in combination with Lime or on its own can be used in mix designs of up to 5% by volume. The risk of cracking will rise exponentially beyond this point. RoadCem will allow cementitious stabilisation of all types of soils and materials, with very little risk of cracking even in mixes of 10% and more needed to cope with heavy or long-term loadings.

Some of the most extreme testing of construction platform designs can be found in the construction of runways and taxiways. The most commonly used testing software FAARFIELD when used recently for comparison of conventional granular base and a RoadCem stabilised soil base, produced the following amazing results:

Long term maintenance free durability test: For the traditional granular base - 39.3 years with a CDF of 0.51
For the RoadCem stabilised soil base - 2309.6 years with a CDF of 0.01

Why take a risk with your construction working platforms, RoadCem Zeolite soil concrete produces strong predictable results with any type of soil and is perfect for long term access roads, compounds, piling mats and crane platforms. Whatever the loadings, the soil conditions, weather or construction duration.

300 tonne bridge sections on a 400 mm RoadCem base, average axle loading 40 tonnes

RoadCem manufactured in Holland by PowerCem Technologies has been available worldwide for over ten years. One of the earliest applications was at Moerdijk Harbour, close to headquarters, where a stabilised soil hard standing for containers and plant was constructed in-situ from local sandy soils and dredged harbour silt. Photo's below show the platform after eight years of continuous use.

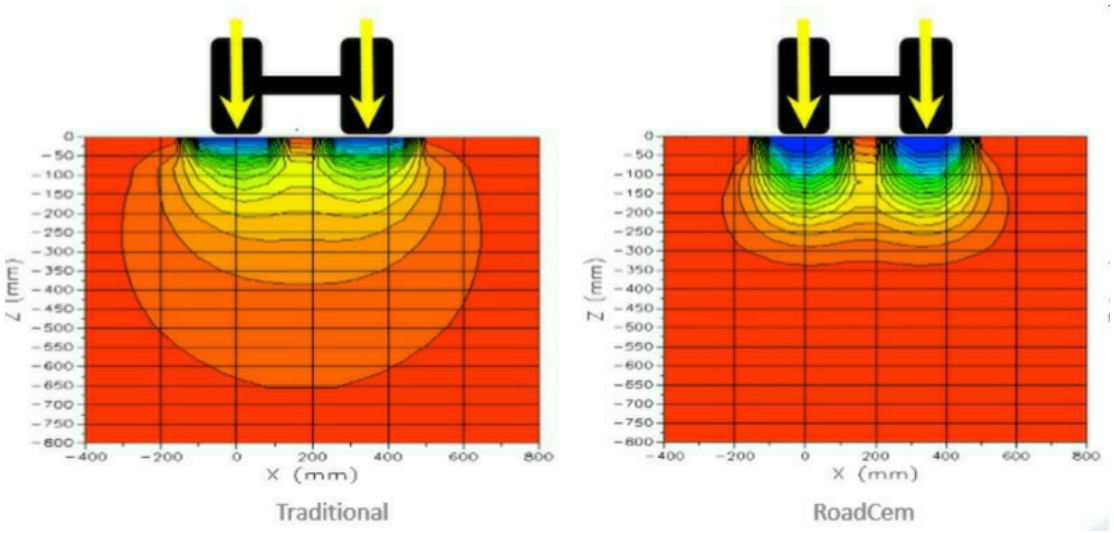
Used without protective surface since 2008 the platform has proved extremely durable and any repairs caused by accidental impact have been easy to repair.

Bound soil platforms provide a far safer operating surface for cranes, rigs and heavy plant, especially when constructed in-situ at site level. Allowing easy plant access and set up.

RoadCem is a product specifically designed to engineer superior tensile strength and impermeability in to soils, providing superior long-term durability. Allowing the platform to be used un-surfaced and virtually maintenance free for the duration of the works.

The dense surface produced with RoadCem soil concrete is perfect for the direct application of asphalt, where thin 40/50 mm of AC20 layers will bind perfectly, alternatively double bitumen & gravel surfaces have proven very effective, as has a simple 40 mm angular gravel cover for car parking areas and compounds.

The high modulus of elasticity and dynamic absorption properties created by RoadCem reduce the impact of loadings, allowing thinner stabilised layers to be used without compromise in strength or durability.



Rodgers Leask consulting engineers of Derby have partnered with PowerCem in the UK to provide stabilised soil working platform designs for both permanent and temporary construction use. Using Multi-linear strain analysis pavement design software, the Rodgers Leask engineers can prepare designs to meet almost all repetitive load requirements.

Rodgers Leask working platform designs are soil and loading specific for all locations, including when required the stabilisation of in-situ top soils and/or sites with structural problems, such as weak or very wet sub grades.

Reduce your environmental impact, lower your CO2 Emissions and be kind to neighbours by drastically cutting your truck movements to and from site. Trucks damage local infrastructure, cause traffic problems and create high levels of toxicity.

A recent NIBE Environmental study showed reductions of between 119% and 361% in Environmental Impact, CO2 Emissions and Human Toxicity levels through the use of RoadCem soil concrete technology.