



Stabilization of Military Airstrip in Afghanistan

November 2005

A military base in Central Afghanistan was experiencing problems with their landing strip which was unpaved and causing severe dust problems during landing and takeoff. The runway base consists of the local clayey soil and during the rainy season the surface ruts and also becomes very slippery. The runway is used mainly for Hercules C130 supply aircraft and these conditions make landing on the runway difficult and dangerous. Flights would have to be suspended at times, due to the poor condition of the runway.

The Military decided to try to remedy this problem by stabilizing the runway.

To achieve this, the main consideration were:

- The military base is in a remote location with hostile surroundings**
- There is no local gravel that could be used to surface the runway**
- If lime or cement stabilization of the base were to be a consideration, this material would have to be shipped in with truck convoys through Pakistan, and which would probably never reach the base's location due to hostile action along the way.**
- The time constraints to get this project completed before the rainy season set in also prevented the lime or cement option, as well as the other option of setting up a crusher and grading sieves for local gravel production.**

These factors led to the consideration of using a liquid soil stabilizer like CBR PLUS which is a highly concentrated liquid treatment medium and as result could be flown into the location on one flight together with the personnel to complete the operation.

Although the initial proposed treatment method was to scarify the surface or to haul in a suitable layer of soil and to then apply the stabilizer, it soon became apparent that these options would not be suitable, as there were numerous daily flights in and out on the runway. This method of construction of the runway was therefore not possible.

The ability to spray apply the CBR PLUS / water mixture straight onto the surface in low dosages and repeated applications proved in the end to be the best solution. This process was completed without having to delay or interrupt flights and the desired results were achieved.

Shortly after completion rains set in for three days non-stop, with the runway hardening and being solid enough for the planes to continue using the airstrip. The runway was then also compacted with a vibrating roller compactor, to leave hard dry surface.

The runway surface has stabilized now to such an extent, that the C130 planes leave rubber tire marks on the runway surface where the aircraft wheels touch down and make contact with the runway.

Dust has been reduced significantly as well.

Attached are some comments by the Ubique's project manager:

- 1. The project is now coming to completion. It was a tough go, but it is now a very fine runway. In the end Peter decided he didn't want us tearing up the runway and the flights were coming in several times a day.*

Because of this it was impractical to tear up the runway and properly treat it as you instructed. However we still did a surface application, using all of the CBR product we had. I was hoping once the rains came it would give it the moisture it needed to work, or maybe just keep the dust down. Well the rains came 2 weeks ago, it rained for three days giving it a good soak. We gave it a good steel vibratory roller compaction once it dried out enough and very good news...C-130 Hercules(those big military planes that kept landing) are now leaving burnt tire marks on the runway!!! I have asked around and nobody has ever heard of this happening on a dirt runway before. It will be very interesting to see how it continues to work over the dry season.

- 2. I am waiting for the updated photos that will show the entire runway. I will forward them to you after I get them. One is a good shot showing dozens of tire marks across the whole width. It really did turn out well, pilots say it is the best runway in Afghanistan, nice and smooth and good drainage. In fact with one night landing the pilots thought it was very muddy because it was too gentle of a landing, until they jumped out and were shocked it was hard as a rock..*

We are currently in discussions to build two more runways in this country, with a different client. It was a surprise that Peter turned around with regards to his opinion.





Hercules C130 taking off in a dust cloud



A C130 Hercules has just landed



Compacting the treated runway



Compacted runway



Tire marks on the runway where planes touch down



Close up view of tire marks.