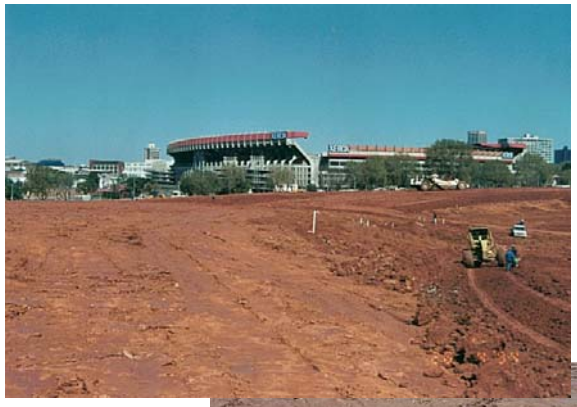
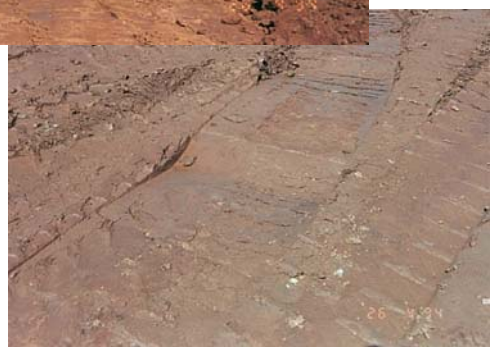
Stabilisation of a ramp at Johannesburg athletics stadium

The clayey soil at the site of the new Johannesburg Athletics Stadium, which was recently built close to Ellis Park Rugby Stadium in Johannesburg, was so water-logged that earthworks contractor, Stocks Roads faced a difficult situation. With a soil moisture content of 29%, it was virtually impossible to employ scrapers on the 1:6 ramp to remove the final 86 000 cubic meters of cut-to-fill. Stocks Roads' site agent Allan Rutherford, who had previously successfully utilized CON-AID to stabilize heavy trafficked roads at the Koornfontein mine in the Witbank area and at Duhva Power Station, immediately suggested using CON-AID.





Time was of the essence. With elections looming, CON-AID's engineer advised that the chemical be applied to the ramp immediately, so that stabilization could take place while the site was closed for the election holidays.

Low Rate:

Because so much water was trapped in the soil, the CON-AID chemical was applied at the low rate of 1:10. Although the usual minimum application rate is 1:200, CON-AID's engineers believed that the application of the chemical would release the trapped absorbed water from the clay. This released absorbed water would thus assist with the diffusion of the CON-AID within the material and achieve a virtual “chain reaction”. The CON-AID was applied by hand using watering cans, after which a grader was used to blade-mix the material. The ramp was then left undisturbed for the next five days.

Upon resumption of work after the election holidays, the layer was re-mixed by the grader blade and compacted using a tamping roller. As this layer was not thick enough to support the heavy loads transported by the scrapers, it was decided to introduce a further 150 mm layer of the same material for treatment with CON-AID. As this material had much lower moisture content, the entire operation of mixing and compacting could be completed in a day.

Full Production:

One week after the first application of CON-AID, the ramp was operational; on the first day 508 loads of 60 tonne loaded scrapers were running over the

ramp. During the following three days the slight heaving settled down, enabling the scrapers to achieve full production. Four weeks later 7 166 loads totalling 86,000 cubic meters had traversed the CON-AID treated ramp, which showed no sign of deformation whatsoever.

As there was no water cart on site, it was not possible to water the very fine material (90% passing a 2 mm sieve) on the ramp. This resulted in the formation of a fine layer of dust, which would not have been the case if the ramp could have been watered regularly.

It is noteworthy that the CBR of the material prior to the treatment was 2, whereas four weeks after treatment the DCP-CBR measured 62.

Time and cost saving:

Stocks Roads is very pleased with the result. "If we had not used CON-AID to stabilize the soil, we might have had to discontinue using scrapers and employ loaders and trucks instead - which would have taken much longer and would have pushed up our costs considerably," said Rutherford. "This is the fourth time I have used CON-AID to stabilize difficult roads and the projects have always been successful. It will probably not be the last time."

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