



*The Nancefield Bridge Project in progress.*

## New-generation plasticiser used on Musina bridge project

An advanced new-generation water reducing plasticiser – CHRYSO® Plast Omega 174 – has notched up another successful application. The product has been used in the concrete mixes for the new Nancefield bridge, which forms part of SANRAL's Musina Ring Road Project in Limpopo Province. The R640 million project, which allows the N1 to bypass Musina, is due for completion in Q2 2022.



*The prominent pair of 13 metre high hands was designed to give visitors a welcoming experience.*

The N1 will pass under the 77 metre long bridge. SANRAL wanted visitors from Zimbabwe and South Africa travelling on the N1 to experience a feeling of being welcomed and the bridge therefore features a prominent pair of 13 metre high 'hands' – which are essentially extensions of the centre piers – which express this message. The deck is supported by the columns of the hands and the bridge is aesthetically held on the palms of the hands.

One of the main reasons CHRYSO Plast Omega 174 plasticiser was selected for the project was that it countered the problem of slump loss. Due to the available aggregate, ambient temperature and distance from site, CHRYSO Plast Omega 174 was tested and found to be the most suitable admixture. Mix designs were conducted by Matthew Barker, general manager at CHRYSO for technical, mining and export at CHRYSO's centre of excellence.

Another challenge was presented by the hot temperatures – up to 45°C – typical of Musina in summer. The concrete temperature needed to be kept under 30°C to prevent thermal cracking. This was achieved by a combination of measures, which included keeping the concrete under shade and cooling it with sprayers, which involved installing a cooling tower to keep the water cool. CHRYSO Plast Omega 174 allowed the mix designs to be optimised, giving more open time on the fresh mix concrete.

CHRYSO Plast Omega 174 was the primary product supplied for the Nancefield bridge and was used for the bridge decks, balustrades and the bridge piers with hands.

Just over 3 000 m<sup>3</sup> was required for the concrete of the bridge. The use of CHRYSO admixtures for the mix design was implemented by Jacques Marais, senior plant foreman for the production of concrete



*The deck is supported by the columns of the hands.*

at OMV, part of the Raubex Group. The consulting engineers for the project were KBK Engineers.

CHRYSO Southern Africa's personalised technical service offering and logistics were the deciding factor in OMV using CHRYSO as the main admixture supplier for the project.

According to Ben Myburg, technical consultant at CHRYSO Southern Africa, "CHRYSO Plast Omega 174 is a multi-dose admixture, which allows concrete to exhibit extended workability characteristics. It improves the cohesion and lowers the viscosity of a concrete mix, which results in an improved homogeneity and compaction, allowing for superior off-shutter finishes thereby eliminating the risk of repairs. By

reducing the need for extra water, it increases the durability of concrete by reducing permeability."

CHRYSO Plast Omega 174 is part of the wider CHRYSO Plast Omega range. Products in the range are ideal for applications such as underwater concrete, pumped concrete, large pours and flowing concrete. **CB**

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*The specially designed balustrades follow the angle of the fingers.*