

Mammoth continuous concrete pour

In November last year, Stabilid cast a 1 m thick transfer slab for a new City Lodge in Pretoria being developed by City Property. What made this pour unique is that some 1 200 m³ of concrete had to be poured in a single day.



A picture showing the start of the cement pour and one that shows the successfully completed project.

AFRISAM SUPPLIED THE concrete for this mammoth pour while the movement of readymix trucks (which hold 6 m³ of concrete) had to be carefully planned to ensure a continuous supply of concrete. The slab had to be poured in three separate layers to mitigate the effects of the heat of hydration. This made the timing for each layer particularly crucial.

Casting started at 6:00 while the concrete supply was calculated and checked every hour by Stabilid and AfriSam. The pour was completed roughly seven hours later.

Traffic controllers were placed at strategic points in the roads near the site to ensure that the concrete trucks had right of way and to assist in any traffic congestion that occurred.

A continuous supply

AfriSam supplied the concrete which was supplied from three batch plants: Ferro, Kwagga and Rosslyn. A fourth plant was

on standby for any delays in supply or breakdowns. An average of 44 m³ per hour per plant was supplied, with a total of 131 m³ per hour from all three plants.

Pumping the concrete

Once the readymix trucks entered the site, three pumps from Ferreira's Concrete Pumping were used with a fourth pump on standby. All the pumps were 36 m boom pumps. These pumps were located at strategic positions around the site. Due to the positions of the pumps, no extra pipes were needed and coverage was made by the booms only.

The slab was divided into three equal sections for each pump - 400 m³ (1 311 m² in total). With the supply of 131 m³ per hour the first layer was cast in just over an hour which made it easy for the second and third layer to be poured within the recommended two hours to prevent cold joints.



AfriSam was able to design a mix that not only achieved the required strength for the job, but ensured that the heat of hydration generated by the chemical reaction in the concrete was reduced to a minimum in order to avoid thermal cracking.

By Wilhelm du Plessis



The team – from left to right: Deon Robinson, Rudi Williams, Ben van Rooyen and Greg Francis.

Placing the concrete

The concrete was placed by Floors 4 Africa in three layers and therefore four placing teams were used. The first layer was poured to an average thickness of 350 mm and vibrated to eliminate honey combing. The second layer was poured just over an hour later (to prevent cold joints) and then vibrated so that the first and second layer were effectively knitted

together. This procedure was repeated on the third layer.

Two temperature probes were installed during the casting to monitor the temperatures in the different layers which helped to inform the contractor and structural engineers when the internal slab temperature had cooled to the recommended 20 °C threshold so that the insulating material could be removed. The probes also indicated that the temperature differentials were within tolerance.

Insulating material consisted of a layer of plastic sheeting and high density polystyrene was used in the curing process. Using the high density polystyrene ensured that work could be started on the columns as soon as the concrete had cured.

The formwork

The formwork was erected by Uni Erect according to the design from Unispan. Off-set lines from grid-lines were set out by the Stabilid's surveyor which was used by Uni Erect to set out the back propping, the design of which was done by Unispan. All props were to remain in position until a strength of 25 MPa had been reached. With the correct mix design on the concrete this was achieved in 17 days.