# Wirtgen slipform paver SP 500 paves concrete in southwest Nigeria

For the construction of a concrete roadway to connect the towns of Itori und Ibese in the Nigerian state of Ogun, AG-Dangote Construction Company Limited made use of the sophisticated technology offered by Wirtgen’s SP 500 slipform paver.

For this project, the contractor, a joint venture between the Brazilian company Andrade Gutierrez Company and the Dangote Group from Nigeria, relied above all on the cost-efficiency and precision of the Wirtgen slipform paver in inset application.

**Operating principle of the inset method**

In inset application, the concrete is either deposited right in front of the slipform paver or is fed in front of the machine from the side via a belt conveyor or side feeder. In the next step, the concrete is distributed evenly across the full paving width by a spreading auger or spreading plough. Integrated electrical or hydraulic vibrators ensure homogeneous compaction of the concrete. The inset mold forms the concrete slab to the specified thickness and width while the slipform paver advances. In addition, a dowel bar inserter can be integrated which inserts the dowel bars into the concrete as specified parallel to the paver’s direction of travel. Central tie bars or side tie bars can be inserted transverse to the concrete pavement. The surface is leveled off transverse to the paver’s direction of travel by the finishing beam. The “grinding movement” produces a small concrete roll in front of the beam which enhances the high quality of the concrete surface. In the next step, a super smoother, oscillating in a combination of lateral and longitudinal movements, ensures the final surface accuracy. Wirtgen texture curing machines such as the TCM 95 or TCM 180 then create the desired surface structure, applying a dispersion to the concrete surface which prevents the surface and edges from drying too quickly.

**The longest concrete roadway in Nigeria**

Before the slipform paver, which can pave concrete pavements in widths of up to 6.0 m and thicknesses of up to 400 m as standard, was able to begin work in Itori, the substrate first had to be prepared. The construction company used compacted laterite and a 20-cm layer of crushed rock. “The SP 500 then paved the concrete quickly and cost-efficiently. At the same time, it also helps us ensure that our production quality meets the specifications for surface evenness," explains Ashif Juma, Managing Director of AG-Dangote Construction Company Limited. The SP 500 laid down the new 7.50 m-wide and 20 cm-thick roadway in two separate passes. Extending over 24 km, the new road is the longest uninterrupted stretch of concrete roadway in Nigeria.

**From raw material to building material – Wirtgen surface miners begin the process chain**

To continuously provide the concrete paver with sufficient material, a steady convoy of up to 15 concrete-mixing trucks drove to the job site, depositing their loads directly in front of the machine. However, before concrete can be paved, it must first be produced. The production chain begins with limestone mining. This mineral is one of the raw materials used in cement, which in turn forms the basis of concrete. The Dangote Group extracts limestone from its open-cast mine in Ibese, where the Dangote Cement Company operates 14 Wirtgen surface miners of the type 2500 SM. The Dangote Group not only uses road construction machinery from the Wirtgen Group's Road Technologies business sector, but also the mining technology offered by its Mineral Technologies sector. Wirtgen surface miners cut, crush and load the rock in one single operation. The rock is broken down directly during the extraction process into grain sizes that are suitable for belt conveyors, making the use of a crusher superfluous. This saves time and reduces the costs of the entire mining process. Wirtgen had already supported the Dangote Group before operations at the Ibese mine began, not only with the machinery, but also with production process planning and training for the specialists on site. This partnership has now endured for more than 15 years. It therefore stood to reason that AG-Dangote Construction Company Limited would opt to use Wirtgen technology and applications know-how for the road construction project between Itori and Ibese.

Wirtgen slipform paver delivers precision paving results

“The SP 500 not only ensured that construction project processing went off without a hitch, but also produced a paving result that impressed both us and the client. We processed more than 35,000 m³ of concrete using the Wirtgen slipform paver, and produced a very even surface,” says Juma contentedly.

Precision, flexibility and reliability are the hallmarks of the SP 500. And this also applies to the new generation of slipform payers lined up in Wirtgen's new SP 60 Series, which comprises the SP 61/SP 61i, SP 62/SP 62i and SP 64/SP 64i models. The SP 60 Series is set to replace the globally successful SP 500 model and, like its predecessor, offers a wide range of options to meet the diverse demands of inset and offset paving – including hydraulic and electrical vibrators, dowel bar inserters, finishing equipment, swivel arms, wireless 3D control, not to mention a variety of offset molds.

For example, the side tie bar inserter, which in Nigeria inserted 12 mm-diameter tie bars into the sides of the pre-compacted concrete to securely connect the two adjacent roadways, can be selected as an equipment option with the SP 64/SP 64i. The new generation of slipform pavers combines the application diversity of the SP 500 Series with the state-of-the-art technologies of the next-larger SP 90 Series.

**AG-Dangote expands its Wirtgen fleet**

Work on the 24-km concrete roadway was completed after six months of construction. After completion of the paving work, a concrete cutting machine cut slits at right-angles into the road surface at intervals of 3.65 m so that the resulting joints could be filled with expandable material. These pre-determined breaking points prevent potential tension cracks. “With professional maintenance, this will ensure that the roadway lasts for at least 40 years," says Juma, explaining the last step of the construction procedure. Thrilled with the successful outcome of the project, the Managing Director also decided to acquire additional concrete equipment from Wirtgen. AG-Dangote Construction Company Limited has expanded its fleet of road construction machines, purchasing two of the last SP 500 pavers produced, along with a TCM 95 texture curing machine.

Photos:

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|  | SP500\_01040 The Wirtgen SP 500 slipformed the concrete slab in a width of 7.50 m and a thickness of 20 cm in two passes. The result is the longest uninterrupted concrete roadway in Nigeria. |
|  | SP500\_01043 Material supply: The truck deposits the concrete directly in front of the machine, the spreading plough of the Wirtgen slipform paver subsequently distributes the concrete across the entire paving width between the crawler tracks. |
|  | SP500\_01044 The finishing beam and super smoother of the Wirtgen SP 500 add the finishing touches to the concrete slab, ensuring an even surface. |
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|  | Wirtgen 2500SM\_00383 With its engine power of 1.065 HP, the Wirtgen surface miner 2500 SM at the Ibese mine loads the mined material directly onto the truck via its discharge conveyor, even in the most adverse conditions. The truck immediately takes it away for further processing. |

*Note: These photographs are only intended as a preview. For printing in publications, please use the photographs in 300 dpi resolution that are available for download from the Wirtgen GmbH / Wirtgen Group websites.*

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