

Greenfield challenges



BUILDING A STATE-OF-THE-ART particle board plant as part of a greenfield development in the remote rural town of Ugie with little by way of supporting infrastructure or services presented PG Bison's project engineers and contractors with unique opportunities and challenges.

Managing the logistics of keeping the works supplied with materials and tools is in itself a challenge, as there are no local suppliers and much of the plant and requirements are carted in from Durban, East London and Johannesburg. For example, to date, for the civil engineering requirements alone, over 4 600 truckloads of supplies, ranging from cement and aggregate to reinforcing steel, have been brought to site. Except for the aggregate, which was quarried locally, all other supplies travel long distances – in some cases 900 km or more.

Grinaker-LTA was responsible for the earthworks which involved some 350 000 m³ of earth being moved in cutting and filling to establish the platform. The process was hampered by flooding and snow in July last year.

The civil engineering contract was awarded to a joint venture between Grinaker-LTA, Concor and Trencon. Footings and foundations required 43 000 m³ of excavations, with substantial blasting needed. Seven hundred tonnes of reinforcing is being used.

Two batch plants are being used to

mix the 35 000 m³ of concrete, with 3 650 loads of aggregate quarried locally while 8 720 t of bulk cement was brought in, on 290 loads. The bulk cement was supplemented by 11 520 pockets used for building works, which, to date has consumed over 800 000 bricks.

The plant covers some 71 000 m² of covered hardtop and 85 000 m² of cladding is being used. The widest roof spans are 50 m, and have had to be engineered to cope with snow coverage load of up to 200 kg/m². Some 3 600 t of galvanised steelwork is being used.

The joint venture partners, have, to date, committed in excess of one million man hours in the civil engineering aspect of the project.

Says project manager Gerhard Victor: 'It was a significant psychological milestone for the team to get the first sheeting onto the structures prior to the builders' holidays in December last year. The sometimes severe weather conditions during the earthworks phase of the project put us back at times, but once the structures were covered, we were less exposed to the elements and we are on track to complete the project on time.'

Weather conditions are not only influencing the construction of the cluster – its impact on operations has had to be considered as well. During the production of particle board, the heat and humidity levels in the buildings are very high,

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which can lead to condensation forming on the underside of the roof which can damage the particle board. To overcome this problem, 71 000 m² of 75 mm thick insulating sheeting had to be especially imported from Germany in 179 containers. Tolerances on the steel structures have been particularly tight to ensure that the pre-fabricated sheeting fits exactly to avoid on-site installation problems. Local construction crews were advised by the manufacturer's specialists.

Although some 78% of the total project costs is being spent locally, the project is dependent on several key components being manufactured abroad. The first and largest single component that was brought in is the particle dryer, manufactured by Recalor from Spain. The dryer was shipped in parts, with the largest weighing 30 t measuring 6,4 m in diameter. Vanguard assembled and lifted the 172 t dryer measuring 24 m in length and 6,4 m in diameter.

Vuncke Belgium manufactured the step-grate energy plant which will burn forest waste and bark as fuel, generating the equivalent of 45 MW to heat the 72 kl of thermal oil which will be used to heat the particle board press. The flue gas from the energy plant will be used to evaporate

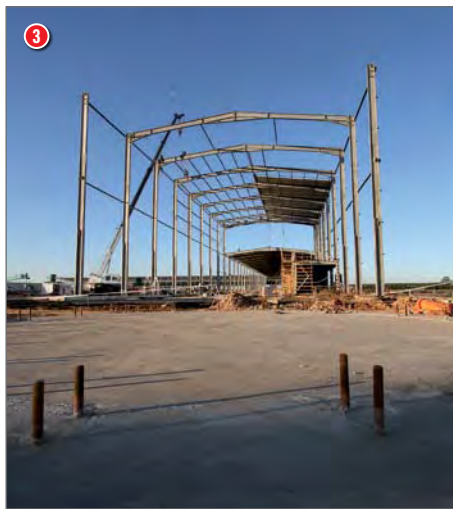
moisture from the timber particles (prior to being pressed into boards) at a rate of 45 tph.

According to Francois Pienaar, PG Bison's mechanical engineer overseeing construction of the energy plant, managing the interface between locally manufactured components and imported plant proved to be as much a challenge as transporting the bulky components and reassembling these on site. Although the construction of the energy plant is exposed to the elements, Pienaar believes that the calibre of his boilermakers and their assistants has made all of the difference in sometimes difficult conditions to keep the energy plant construction on schedule. 'They're the best in the world. We can be proud of our South African skills which match the specialists brought in from abroad,' he said.

At the heart of the particle board plant is a state-of-the-art Conti Roll press, supplied by Siempelkamp, the leading German-based manufacturer of wood beneficiation equipment, at €24 million. With an average output of 1 000 m³ per day, the press will feature the latest technology and be the largest of its kind in Africa. The plant will produce for both the local and the export markets. Specialists and artisans from Europe are supporting local crews in assembling the press.

The installation of a 132 kVA electricity supply line from Qumbu to Ugie has been completed ahead of schedule. The new supply line is expected to significantly improve the quality of supply to the Ugie/Maclear region. The costs of the improved electricity supply to the region are being shared by PG Bison and Eskom on the basis of required capacity. The particle board plant will have 16 MW installed power.

The electrical installations are being carried out by Cato Ridge Electrical and SGS Austria under the watchful eye of Gert Bezuidenhout, PG Bison's electrical engineer. He is confident that the on-site electrical work will be completed to standard and in time for testing by the Siempelkamp engineers in October. ■



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- 3 and 4 Seven hundred tonnes of reinforcing and 3 600 t of galvanised steel is being used
- 5 Vanguard assembled and lifted the 172 t dryer measuring 24 m in length and 6,4 m in diameter
- 6 At the heart of the particle board plant is a state-of-the-art Conti Roll press, supplied by Siempelkamp. With an average output of 1 000 m³ per day, the press will feature the latest technology and be the largest of its kind in Africa
- 7 Vuncke Belgium manufactured the step-grate energy plant which will burn forest residue and bark as fuel. The bulk of the mechanical engineering at the energy plant and the wood chip dryer has been completed on schedule



Source:

http://www.saice.org.za/downloads/monthly_publications/2007/CivilOct2007/#/0