

Massive road project uses **Bell brawn**

A Bell B25D Articulated Dump Truck (ADT) hauling a load of fill from a borrow pit on Section 7A of the Bakwena Platinum Highway. The truck is one of four identical units working on this project.



Work is well underway and on schedule on the largest road construction project to be undertaken in southern Africa, the R1,7-billion Bakwena Platinum Highway project.

The highway forms part of a chain which will, in the first instance, link the Indian Ocean port of Maputo in Mozambique with Lobatse in Botswana and ultimately, like its now operational counterpart, the Maputo Corridor, link Maputo with the Atlantic Ocean port of Walvis Bay on the west coast.

The concession contract was awarded on 4 October 2000, to the Bakwena Platinum Corridor Concessionaire (BPCC) by the South African National Roads Agency (SANRA). Work on the four year project started towards the end of August last year when the Platinum Joint Venture (JV) company, formed by Concor Holdings, Murray & Roberts, Wilson Bayly Holmes & Ovcon (WBHO), and the Spanish-based Dragados Obras y Proyectos SA, moved onto site.



Bell B25D Articulated Dump Trucks are loaded with fill while working on Section 7A of the Bakwena Platinum Highway Project.

Mike Gair, Commercial Manager of the JV company, says the concession contract - which will employ an estimated 2 900 people at peak - calls for the BPCC to be responsible for the design, construction, finance-operation and maintenance of sections of National Routes 1 and 4 as a toll highway, including associated facilities and developments.

"The scope of the contract awarded to the Platinum JV includes the construction of associated facilities such as toll plazas and service and access roads. The JV company will also be responsible for any defects during the defect liability period, but will not be responsible for the operation and maintenance of the facilities," he explains.

The local JV partners, Gair adds, have (together with the indigenous Royal Bafokeng Nation) contributed 14% of the overall equity

funding, with 50% having been contributed by Dragados Obras y Proyectos SA and Cofides (the Spanish shareholders), and 25% by the South African Infrastructure Fund (SAIF). The balance of the funding was raised locally.

"The concessionaire will manage this contract on a build, operate and transfer basis for a 30-year period, whereafter the road will be handed back to the State in a prescribed condition," he explains.

The Bakwena Platinum Highway will have a total length of 380km, of which 90km comprises new road (the largest section of which is a 50km stretch between Brits and Kameeldrift) and 290km consists of existing highway which will be widened, rehabilitated and upgraded.

The starting point of the highway is the Proefplaas Interchange at the intersection of the N4 and N1 freeways some 13km north of Pretoria, and the highway has north/south and east/west sectors.



A Bell B25 Articulated Dump Truck tips a load of fill onto a section of the Bakwena Platinum Highway.

“...acquired in the **mid-80s** when Bell launched its first Dump Truck,... **All the Bell ADTs** are still **actively operating** and providing reliable service - which speaks volumes ...”

It extends north on the N1 National Highway to Zimbabwe for a distance of 94km, where it ends this section at the Warmbaths Interchange, and extends west from the Pumulani Mainline Plaza (located 13,3km north of Proefplaas) where it bypasses Rustenburg and continues for a distance of 290km until it reaches its end point at the Skilpadhek border post at Lobatse on the South African-Botswana border.

Gair says the project contains several key challenges. "Our main objective is to target Small, Medium and Micro Enterprises (SMMEs) from the local communities located along the routes. A structured Community Participation and Liaison Programme has been implemented, with its objective being the creation of employment opportunities for SMMEs.


"The contract stipulates that SMMEs must be given inclusion in the managerial, supervisory and labour roles in the design, initial construction phase and expansion period, and operating and maintenance (O&M). Training will be provided to locally recruited labour, and we aim to recruit in the region of 20 managerial and 200 supervisory personnel, and 1 000 labourers in the initial construction phase. Construction work to the value of around R70-million will be awarded to SMMEs during the course of this year, as will design work valued at about R12-million.

"The JV company has undertaken to assist the SMMEs by providing pre-and post-tendering training and mentoring, technical advice, market support, cash flow management, procurement of financial support (which will include access to a development fund) and programming.

"The project, parts of which are subject to very tight time schedules, contains a significantly large environmental annexure, and a full-time environmentalist is employed. Bohlweki Environmental was appointed to conduct in-depth impact studies, the extent of which delayed the commencement of the contract," he explains.

Main line toll plazas, of which there are six, are to be established at Kameeldrift at both the N1 and N4 junctions, at Hammanskraal, Swarttruggens, Marikana and Brits. Ramp plazas will be erected at Stormvoël, Zambezi, Wallmansthal, Murrayhill, Hammanskraal, Maubane, Kroondal, Buffelspoort and the K99 Eastern Bypass-off/Western Bypass-on ramps.

Commenting on major structures to be built, Gair says four major road-over-road bridges will be constructed at Kameeldrift where the N4 highway intersects with the N1, and a 75m long bridge will be constructed to cross the Apies River. A further two road-over-road bridges will be constructed at a point where the N4 crosses the Mabopane freeway.



A section of the Bakwena Platinum Highway under construction. The R1,7 billion project is the largest road construction project to be undertaken in southern Africa.

This project has provided an ideal testing ground for Bell Equipment Company's recently launched D-series range of Articulated Dump Trucks (ADTs). According to Conradt Meyer, a JV Site Agent looking after a 37km section - referred to as Section 7A - which extends from the Mabopane Freeway to a point 10km west of Brits, a total plant fleet of some 61 units has been deployed.

"A labour force of around 150 people - which includes 13 sub-contractors (among which there are five SMMEs) is employed on this section of the highway. Earthworks amount to the removal of some 1,66-million cubic metres of unstable clay, and 2,3-million cubic metres of cut-and-borrow-to-fill. The unstable clay spoil is being stockpiled next to the road and will eventually be flattened, thus making the footprint of the road wider," Meyer explains.

Commenting on the logistical challenges encountered on this section, Meyer says the high water table and poor drainage in this area will necessitate the installation of some 14km of drainage pipes.

"We have also had to contend with the existing services such as electrical installations, power lines, sewer and water lines and Eskom pylons which are directly in the route path of the new road."

There are, Meyer says, seven major cuttings on this section, and material extracted from the cuttings will be used as fill. Two borrow pits on this section will supply the balance of the required fill.

This section of highway will include an 8km stretch of four-lane dual carriageway which extends from Mabopane to the Hornsnek Road (K67). Thereafter it becomes a four-lane undivided carriageway with the two lanes in each direction having a total width of around 14m.

The Bell D-series ADTs working on this section consist of four B25D units which belong to ALS Plant Hire, a Potchefstroom-based company which is one of the sub-contractors employed on this section.

According to Johan Janse van Rensburg, a Director of ALS Plant Hire, the trucks work a 12-hour day for five days a week and an eight-hour shift on the Saturday. Haulage distances vary from under 1km to up to 6km, and the Bell B25D units are employed on cut-to-fill and borrow-to-fill haulage applications.

"Average haul distances are in the region of 2km, and the Bell ADTs are completing around 40 haul cycles in each 12-hour shift. The new Bell B25D units, acquired in the latter part of last year, have proved ideal haulage vehicles for this demanding off-road application, and the machines have provided excellent mechanical availability and an economic fuel consumption," van Rensburg points out.

ALS Plant Hire is, van Rensburg attests, one of the very few operations of its kind in the country which actively runs Bell ADTs from each of its four generations.

"The company's ADT haulage fleet has three Bell A-series B25 units which were acquired in the mid-80s when Bell launched its first Dump Truck, six B20B units, 18 B25B trucks, four B20C and 12 B25C units, and the recently purchased B25D trucks we have working on this contract. All the Bell ADTs are still actively operating and providing reliable service - which speaks volumes for the longevity and durability of Bell Equipment's Dump Trucks," he concludes.

Design Engineers for the project are Stewart Scott and Keeve Steyn.

