

Reconstruction of the MR172 between Helshoogte and Boschendal

OVERVIEW

This project comprised the design and rehabilitation of the MR172, which extends from Helshoogte to the R45 in the Western Cape – a scenic route meandering through the wineland towns of Johannesdal and Pniel towards Franschhoek. Valued at R50 million, construction began in January 2009. The area is both historically and environmentally sensitive, and the input of environmentalists and the Heritage Council was needed during the design and construction phases. The project included the development and upliftment of the communities by employing and training local labour and SMMEs. Main Road 172 was opened in December 2010.



RECONSTRUCTION OF THE MR172 BETWEEN HELSHOOGTE AND BOSCHENDAL

Community-based Projects category
Submitted by the SAICE Western Cape Branch

KEY PLAYERS

Client Provincial Government Western Cape

Professional Team Vela VKE Consulting Engineers

Main Contractors Vusela Construction

Major Subcontractors and Suppliers Various



SUMMARY OF TECHNICAL ASPECTS

The location and design elements of the existing road were influenced by the topography, terrain, built environment, land use and the historic significance of the neighbouring surroundings. Any future upgrades would have to include these factors in the design.

The MR172 is a very narrow section of road which carries large volumes of traffic. The layer-works had to be upgraded and the existing gravel shoulders widened to provide a facility that would cater for the ever increasing traffic volumes in the area. Furthermore, the intruding terrain and residential area did not allow for a very wide road reserve and construction had to largely occur in confined spaces. Upgrading was not limited to road works – all services, too, had to be upgraded to an acceptable standard. The existing drainage in the area was also deemed to be substandard and most of it had to be upgraded and/or extended to allow for the new design.

Since its inception, this project was an integrated one. No one part of the design could be done in isolation. Hence the technical design (cross-section, vertical and horizontal alignment, pavement construction) could not be done in isolation of the environmental aspects, the heritage impacts and the social requirements. Communication was vital to ensure that most requests and challenges were met.

A significant challenge that the team faced on site, for example, was the construction of the pavement layers through the town of Pniel by means of in-situ recycling. The road reserve was narrow and, in many instances the existing houses, many of which were old and of historic significance, were built on the reserve edge. The contractor therefore had to ensure that all the necessary precautions were in place in order to mitigate any damage to the structures as a result of the recycling.

SUMMARY OF ENVIRONMENTAL ASPECTS

- For the benefit of the local communities, sidewalks and walkways were constructed where space allowed.
- Most of the existing culverts were in a substandard condition and had to be replaced during construction. Where possible, all headwalls for pipes with 600 mm diameter and less were constructed from stone pitching instead of concrete to suit the aesthetics of the surrounding town and vineyards. Concrete would have been too intrusive in the historic town. Likewise, where possible, outlets for box culverts were constructed with gabion mattresses and not of concrete.

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- 1 Traffic calming along the MR172 – raised tables and tinted asphalt
- 2 Before – poor pedestrian environment
- 3 After – improved focal areas and refuge



- To communicate a sense of place, werf walls were constructed at the entrances to the towns of Pniel and Johannesdal, and the towns were further beautified by using Cape Dutch style low walls in appropriate locations.
- Wherever possible, trees and vegetation were left untouched. The road was realigned in the area stretching past Boschendal Wine farm to preserve the trees and vegetation in that area.
- For traffic calming purposes and aesthetic reasons, red shoulders were constructed to further enhance the design. This has resulted in cyclists using the red shoulder rather than cycling on the carriageway.

COMMUNITY-BASED ASPECTS

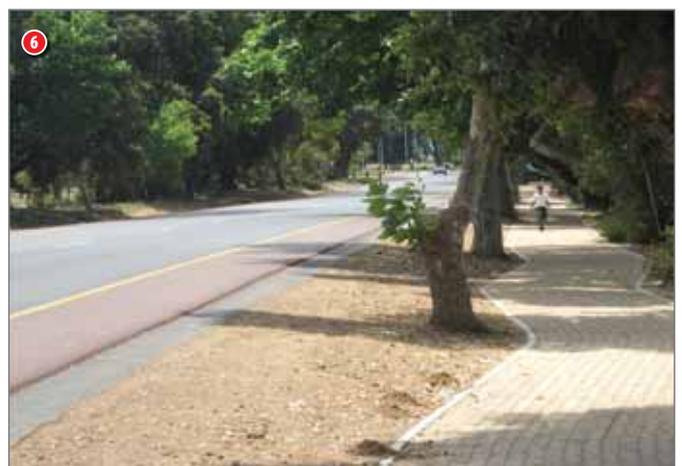
Prior to going to tender and construction, an Economic Impact Assessment was carried out to identify how the surrounding communities of Pniel and Johannesdal could benefit from the project. It was estimated that at the time 13.2% of the economically able residents were unemployed (which number increased to 37.7% if the economically inactive were taken into account). A large percentage of the work could be labour orientated instead of machine orientated, and many of the tasks could be extended to the development of SMMEs. Some of the work earmarked for community-based involvement included:

- Clearing and grubbing
- Brooming road surfaces
- Installing kerbs and channels
- Excavation for installation of guardrails
- Excavation for and installation of road signs
- Landscaping
- Construction of concrete side drains
- Construction of unlined earth drains
- Construction of stone-pitched headwalls
- Construction of walkways
- Construction of werf walls

CONCLUSION

The communities of Johannesdal and Pniel are known to be vigilant and pro-active, and hence they were key stakeholders in the design and construction process. Once the conceptual design neared completion, Vela VKE screened an innovative three-dimensional presentation to all the stakeholders before finalising the design. This enabled people to better grasp the essence of the design and to visualise the end product. This two-way communication proved invaluable to the successful completion of the project. □

4 Boschendal section before reconstruction
5 and 6 Boschendal section after reconstruction



Source:

http://www.saice.org.za/downloads/monthly_publications/2011/2011-Civil-Engineering-december/#/0