# C177 Mobe

by Bigboy Sibindi

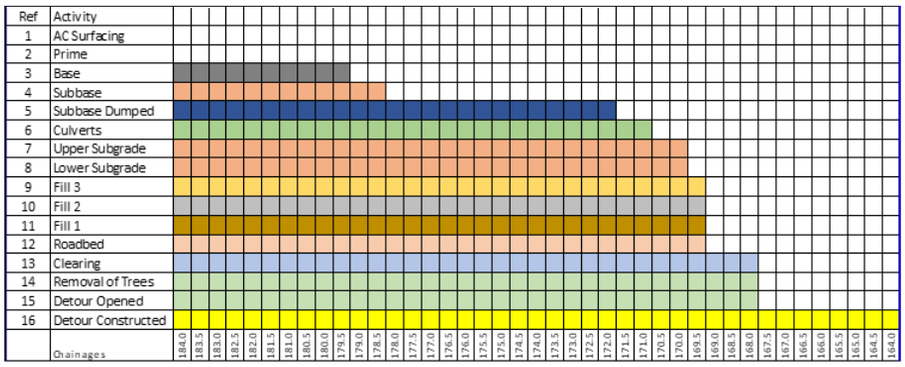
*The month of June had its ups and downs at the MOBE site. The continued non-payment by the Client gave rise to a week-long work stoppage from 24 May to 31 May. On the upside, the site has recorded phenomenal progress to date and continues to make good progress despite the lack of adequate funding. The current weighted average progress for Phase 3 is 42%. The pictorial progress chart below depicts the current progress at MOBE. At the current pace of construction, MOBE Phase 3A should be fully opened to traffic by 31 October 2021.*

*Left: Part of the section of detour after opening to traffic for about 6 hours. Immediate results show a strengthening of the layer and no dusting, no rutting and no raveling.*

*The product is supplied by Rubicon a distributor under license from Cypher Environmental of Canada.*

## Detour

Detour construction is complete throughout the 20km project, of which 12km is opened to traffic. Major works are still on going at the Mwenezi river crossing. We had the opportunity to carry out trials on the use of Earthzyme on a portion of the detour.




Earthzyme is a soil stabilizer specifically suited to soils with a high clay content that would generally be considered unsuitable for use in the road structure and cut to spoil. Laboratory tests and other field trials have shown that it has the following potential benefits:

- Increases bearing strength – (normally measured by the CBR and UCS tests)
- Reduces dust
- Reduces environmental footprint
- Applicable for use in lower quality materials
- Lower life cycle costs on earth and gravel roads


## Subbase

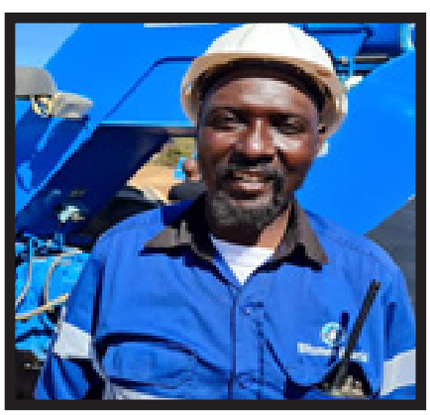
Subbase has been dumped from Ch 184 to 168, a total distance of 16km. Subbase stabilization is currently in progress and set to reach 10km complete by 2 July 2021.

Since Phase 1 subbase construction has been premised on using 120 tonnes of cement per day. The tradition has been maintained in Phase 3 and work on the subbase is progressing at approximately 600 metres per day for the 2.5% cement content by mass of gravel to yield a C3 quality base. Achieving this is not always easy as the logistics involve over 400km to be

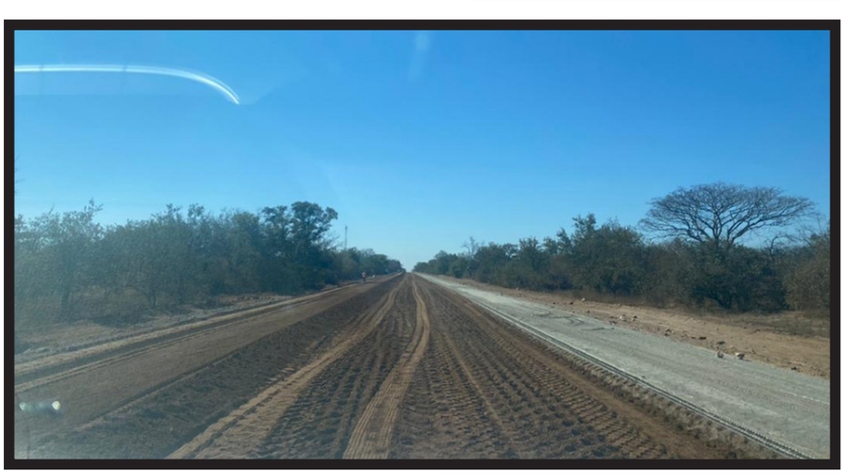
travelled by the 4 bulk spreaders spanning two companies, PPC and Colbro. Breakdowns and delayed arrivals have sometimes impacted negatively to the subbase program. The man behind it all is July Mudagandi. July has earned himself a reputation for his toughness and uncompromising insistence on quality. His understanding of road geometry, road materials and productivity is an inspiration for all. Recently individuals serving last warnings were transferred to his gang for rehabilitation. To date he has overseen subbase construction on the entire Bitumen World section of the Masvingo to Beitbridge Project, currently 48km total and counting.

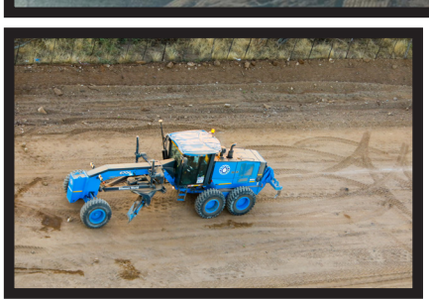
The 250mm thick subbase layer is the main load carrying and distribution layer. It is stabilized with cement and constructed monolithically to reach a compressive strength of a minimum of 1.5 Mega Pascals and a maximum of 3.0 Mega Pascals (classified as C3 quality gravel in terms of SATTC Specifications). A rigorous materials selection and testing process is employed to ensure the specified parameters are met prior to the material being brought to the road. The material must be at least a G5 quality natural gravel, with a plasticity index not exceeding 6%. The stabilization process is carefully controlled during spreading of the cement, as well as recycling and compaction of the stabilised layer.

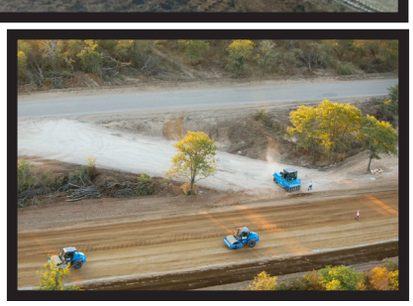
Testing continues post construction by conducting UCS and ITS tests on samples extracted during the recycling process.



July Mudagandi







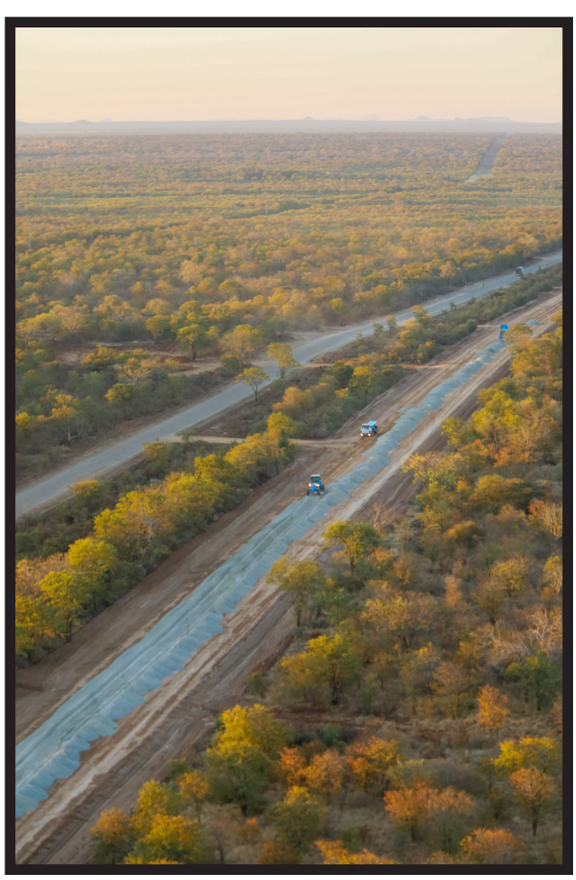
**Testing continues post construction by conducting UCS and ITS tests on samples extracted during the recycling process.**


*Left: Site Technician Brian Mbewe seen here with Specialist Gravel Sniffer Madziwana. The new spacious Lab at MOBE Phase 3 receives all samples and carries out all control and acceptance testing.*

While not visible on the road work site itself, the Laboratory team is an integral part of the whole value chain of the subbase construction. They are responsible for sampling prior, during and after the actual construction of the subbase layer. The subbase has the most intense test regime compared to the other pavement layers. The MOBE Site Laboratory is indeed well equipped to carry out these tests with the precision and accuracy stated under the TMH1 Standard.

**Base**

Dumping and processing of G1 gravel is in progress immediately behind the subbase. To date 5 km has been completed and awaits drying to enable it to receive MC30 prime coat. While it is often considered that the crushed stone base is easy to construct, in reality it is a very tough undertaking in terms of the specified requirements with regard to particle size distribution, minimum compacted density, finished surface levels and tight surface matrix achieved by "slushing".



*A GPS-fitted grader is pre-shaping the G1 material prior to conditioning with a reclaimer and compacting with appropriate rollers. G1 gravel, being a commercial sourced material and not a naturally occurring gravel, is tightly controlled to minimize wastage. The man behind this intricate and precise process is Richard Chirau. Richard cut his teeth in mid-2020 when he was tutored by Roger Tshuma. To date he can boast to having successfully supervised the processing of 45 km of G1 Base on the Bitumen World portion of the Masvingo to Beitbridge Highway.*

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**Cut to spoil at Sosonye –** A section of potentially expansive clay was encountered south of the Sosonye Bridge at chainage 169+700 to 169+000. The Engineer instructed that it be cut to waste to a depth of 1,500 mm below natural ground level. The process of cutting to waste this unsuitable material was recently completed and backfilling is now in progress.

Bulk excavation to correct vertical alignment – The Engineer's design to flatten the sharp crest curve at the Mkwasine junction, between the Sosonye and Mwenezi rivers, was provided by PCE recently as Revision 3 of the alignment design. The work entails excavating the original road down to a depth of as much as 2 metres to reach the new roadbed level.

*Right: The motivation behind this mega cut is to improve the sight distances to meet requirements for 120km/hr design speed. At the Mkwasine turn off additional geometric design features have been added. These include a slip lane from the Mkwasine side and a turning lane for south bound turning traffic.*

*This work will result in a much wider pavement, and given that the cut is extending down to 2 metres below existing surface, it means this section will cost more both in cash and time. The MOBE team is excited to meet such a challenge and the section has been resourced sufficiently to meet the challenge.*

*Adjacent to the deep cut going north towards the Mwenezi River, the geometric design calls for fills up to 1.5 metres above the existing road surface. This picture shows the level to which the new finished road level will be. Given the wider road structure to accommodate slip lanes and passing lanes, a significant quantity of fill will go into this section.*


*Putting icing on the cake – Installation of L-channels and Tshongololo channels, or flumes, at selected sections on Phase 1. Our Chief Builder, Clement Mlala, takes great pride in his work and the finished product is a marvel to behold.*

## Top Performers Corner

From this month onwards the MOBE contribution will feature some of the site heroes, those employees who have shown great commitment to their work and are exemplary in production, ISO systems and social interaction.

***Markren Gukwa*** *is an Excavator Operator, having joined Bitumen World in 2016. A highly religious man, Gukwa is a hard worker par excellence. His knowledge of the job, his motivation and his demeanor are top-notch. He scarcely needs supervision and when deployed with tippers he immediately assumes the roll of supervisor. Gukwa is an excellent worker and a blessing among any supervisor or manager's team. Tinotenda Siyabonga Gukwa is applauded for his contribution to productivity, ISO systems and care of his machine. Keep up the good work!!*