surfaced with 30mm asphalt. This pavement design is suitable for at least 1 million equivalent standard axle loads.

The Ecobond BituForce approach was to only stabilize the top 100mm of sandy material using 0.75% (by compacted aggregate mass) Ecobond and 1.25% gross bitumen emulsion, saving the effort of discarding 150mm of material. This material and binder content in the laboratory mix design process resulted in a BSM 2 (bitumen stabilized material) which is suitable for base courses in road pavement designs carrying less than 6 million equivalent standard axle loads in its life span. This is then to be surfaced with 30mm hot mix asphalt.

The consulting engineer and client calculated that using the Ecobond BituForce design was between **30% and 50% cheaper** than the previously used method when all costs are included. This can potentially allow the client to construct significantly more roads using the same budget while making optimal use of their non-renewable resources.

Once the road reaches the end of its design life it can also be recycled using the same BituForce procedure and not requiring any additional crushed stone or gravel for the structural layers.

Ecobond BituForce BSM1 Base Course – In-situ Rehabilitation William Nicol Drive – Sandton Johannesburg – Johannesburg Roads Agency

A 6 lane major urban road linking the N1 national highway with Sandton, Bryanston and Fourways. This road carries >60,000 vehicles per day to arguably Africa's most productive financial area.

An existing road pavement structure following the standard South African inverted pavement design (Asphalt surface 30mm, Crushed stone base – 150mm, Cemented sub base – 250mm) was suffering from deformation and rutting and required structural maintenance to correct. The conventional approach would be to mill off the old asphalt, remove the crushed stone base, stabilize the sub base 300mm, bring in new crushed stone base and then prime and asphalt. Due to the high traffic volumes the conventional approach would shut down the road for several weeks and cause significant traffic delays, hurting productivity of the road users in one of Africa's busiest areas.