

# Ivory Park

Polymer Stabilized Road



## Ivory Park, Johannesburg Road Stabilization

During the month of August 2011, the Johannesburg Road Agency authorized the stabilization of a gravel road in Ivory Park, using SoilTech polymer from Polymer Pavements.

PMPZ Construction, was appointed to build the road. A polymer engineer was seconded from Polymer Pavements, to assist in the supervision of the application of SoilTech polymers.

Material was taken from the gravel road, to the company's laboratory for grading analysis, plasticity index and performance testing with SoilTech polymers.

A series of Dynamic Cone Penetrometer (DCP) tests were completed on the road prior to stabilization and again 28 days after stabilization.

	<b>Before</b>	<b>After 28 days</b>
• <b>CBR</b>	- 56	<b>115</b>
• <b>UCS</b>	- 220kPa	<b>978kPa</b>
• <b>E modulus</b>	- 212 MPa	<b>386MPa</b>

The road was ripped and stabilized to a depth of 150mm. SoilTech polymer was applied at 0.5% per MOD of the material, which equates to approximately 1.5 litres per m<sup>2</sup>.

After stabilization, a diluted mix of polymer was sprayed over the stabilized road, forming a clear seal and making the surface even more water resistant.

Two days after completing the construction of the road, an unseasonable cloud burst occurred, followed by a fine downpour of icy hail. The road was unaffected.



## Average DCP Reading Prior to Stabilisation

### DCP Report - Average analysis

Region: Ivory park Tembin Road number: 001  
 Project date: 15 August, 2011 Print date: 31 August, 2011

#### Measurements included in analysis

Measurement Names	Measurement Date	Position	Distance (km)	Condition	Rutting	Pumping	Long Crack	Circ. Crack	Deform	Other
SV 20	15 August 2011	5 - MID	20	Sound	No	No	No	No	No	No
SV60	15 August 2011	5 - MID	20	Sound	No	No	No	No	No	No
SV100	15 August 2011	5 - MID	20	Sound	No	No	No	No	No	No
SV140	15 August 2011	5 - MID	20	Sound	No	No	No	No	No	No
SV180	15 August 2011	5 - MID	20	Sound	No	No	No	No	No	No
SV220	15 August 2011	5 - MID	20	Sound	No	No	No	No	No	No
SV260	15 August 2011	5 - MID	20	Sound	No	No	No	No	No	No
SV300	15 August 2011	5 - MID	20	Sound	No	No	No	No	No	No
MR1 SV 80	15 August 2011	5 - MID	20	Sound	No	No	No	No	No	No
MR2 SV190	15 August 2011	5 - MID	20	Sound	No	No	No	No	No	No

Ave. Design Structure Number in blows (DSN<sub>1000</sub>): 112 Selected DCP Design Curve: Light traffic  
 Rut Limit: 20mm Road category: C  
 Structural capacity (MISA): 0.4 Base type: Granular  
 (MISA = Million Standard Axles, 80 kN) Moisture condition of base: Optimum

#### Average equivalent strength (Existing Pavement Structure)

Depth (mm)	W. Ave. Pen. * (mm / blow)	Blows	SD (mm / blow)	90P (mm / blow)	CBR ** (%)	UCS *** (kPa)	Ave. E-Moduli (MPa)	E-Moduli Range 20P - 80P (MPa)
0 - 150	4.78	40	0.5	5.2	56	520	312	194 - 2412
161 - 320	7.24	25	1.3	8.3	33	327	136	117 - 834
321 - 480	12.44	15	1.3	13.6	17	179	77	70 - 812
481 - 640	15.62	16	0.8	16.3	12	138	60	58 - 1417
641 - 800	18.06	15	1.8	19.6	10	118	52	47 - 603

## Average DCP Reading 28 days After Stabilisation

### DCP Report - Average analysis

Region: Ivory Park Tembin Road number: 01  
 Project date: 02 September, 2011 Print date: 02 September, 2011

#### Measurements included in analysis

Measurement Names	Measurement Date	Position	Distance (km)	Condition	Rutting	Pumping	Long Crack	Circ. Crack	Deform	Other
Stabilized SV 500 @ 28 Days	02 September 2011	5 - MID	0.5	Sound	No	No	No	No	No	No
Stabilized SV 100 @ 28 days	02 September 2011	5 - MID	0.1	Sound	No	No	No	No	No	No
Stabilized SV 400 @ 28 days	02 September 2011	5 - MID	0.4	Sound	No	No	No	No	No	No
Stabilized SV 600 @ 28 days	02 September 2011	5 - MID	0.6	Sound	No	No	No	No	No	No
Stabilized M1 road SV 20 @ 28 days	02 September 2011	5 - MID	0.02	Sound	No	No	No	No	No	No
Stabilized SV 40 @ 28 days	02 September 2011	5 - MID	0.04	Sound	No	No	No	No	No	No

Ave. Design Structure Number in blows (DSN<sub>1000</sub>): 181 Selected DCP Design Curve: Light traffic  
 Rut Limit: 20mm Road category: C  
 Structural capacity (MISA): 5.1 Base type: Granular  
 (MISA = Million Standard Axles, 80 kN) Moisture condition of base: Dry

#### Average equivalent strength (Existing Pavement Structure)

Depth (mm)	W. Ave. Pen. * (mm / blow)	Blows	SD (mm / blow)	90P (mm / blow)	CBR ** (%)	UCS *** (kPa)	Ave. E-Moduli (MPa)	E-Moduli Range 20P - 80P (MPa)
0 - 150	3.72	94	1.2	3.7	115	978	386	277 - 927
161 - 320	6.12	33	0.4	6.5	41	394	163	153 - 2740
321 - 480	8.76	24	0.9	9.5	26	264	111	102 - 1258
481 - 640	11.87	15	1.1	12.8	18	188	81	75 - 1016
641 - 800	14.69	14	1.0	15.6	14	148	64	61 - 1067

