



# ROADS CAPABILITY STATEMENT

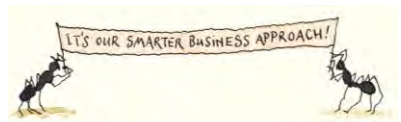


$V/V_u + T/(0.53 A_b f_u) \leq 1.0$   
 $\gamma_{xy} = (\partial v / \partial x + \partial u / \partial y)$   
 Shear = 0.80 V

$\epsilon_{xy} = (\partial v / \partial x + \partial u / \partial y) / 2 = \epsilon_{yx}$

Engineer shear strain is the **total** shear strain, i.e.,  
 $\gamma_{xy} = \partial v / \partial x + \partial u / \partial y$

Shear strain tensor is the **average** of two strains, i.e.,  
 $\epsilon_{xy} = (\partial v / \partial x + \partial u / \partial y) / 2 = \epsilon_{yx}$





**BIGEN AFRICA SERVICES (Pty) Ltd**

## ROADS CAPABILITY

### Engineering Services

The current upswing in South Africa's construction industry is largely attributed to the country's infrastructure requirements for the 2010 FIFA World Cup and the imperatives of meeting its Millennium Development Goals. The roads network, which has a 4:6 multiplier effect on the economy, is integral to the expansion of its infrastructure.

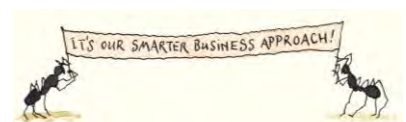
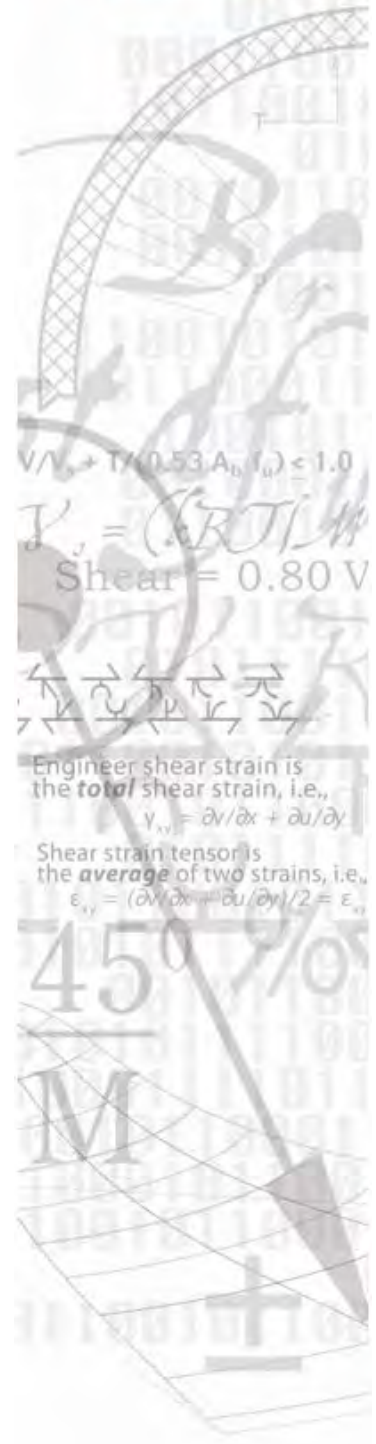
BIGEN AFRICA – a leading multi-disciplinary group that provides engineering, management consulting and project finance solutions to a wide range of public and private sector clients – has a well-established reputation in the design, development, upgrading, rehabilitation and implementation of roads engineering services.

### Our Services

We specialize in urban and rural roads, with extensive experience and sound expertise in the design, documentation, administration and commissioning of road and transportation systems.

Our consulting services include:

- Strategic and Master Planning of metropolitan, urban and rural road and storm water systems;
- Traffic and transportation studies;
- Feasibility studies;
- Technical inputs for township layout planning;
- Total cost analysis of proposals including capital cost, operation and maintenance cost and cost impact studies;
- Project financing and cost recovery;
- Policy issues and institution support; and
- Stakeholder facilitation.





Our design experience includes:

- Freeways and Interchanges;
- Urban dual carriage ways and rural single and dual carriage ways;
- Gravel roads and streets;
- Labour-intensive construction;
- Commercial parking areas;
- Landscaping and site rehabilitation; and
- Design and construction (turnkey operations)
- Roads and storm water systems in villages where heavy rainfall can result in extensive damage to infrastructure, roads and houses.

Our involvement in international, national and provincial roads projects have positioned us as one of Africa's leading Consulting Engineering companies.

## The Roads Team

The roads team has the experience, capability and expertise to provide clients with professional services in roads, transportation and all civil engineering aspects.

### Areas of expertise:

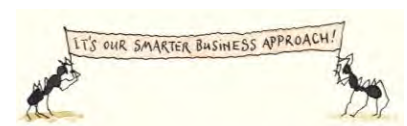
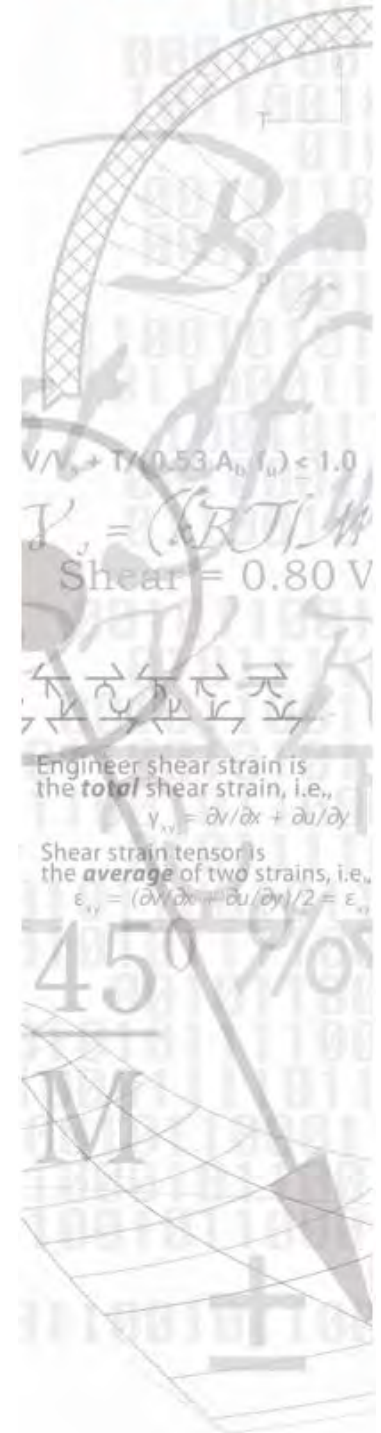
- Pavement & Materials;
- Geometric;
- Bridges;
- Geotechnical;
- Traffic & Transportation;
- Site Supervision and Project Management.

The roads team has access to a network of professionals who provide knowledge and expertise to support the execution of specialized projects.

## Key Resources

### Nico Swart

Nico has vast experience in transportation projects including traffic analyses of projects, public transport facilities, & viability studies.





His involvement includes transportation analyses of the Lindi to Dar-Es-Salaam corridor to establish freight & passenger distribution between road and sea traffic along the corridor. He has also been involved in the planning and design of highways (both major and minor), design of drainage of roads, streets, bridges, rail lines and public transport facilities. Nico Swart is an experienced Civil Engineer and is a technical director of Bigen Africa.

### Kevin Claassens

Kevin is a qualified materials technician that specialized in construction supervision. His expertise is in site supervision, laboratory management, concrete, asphalt & surfacing designs.

### Rikus Rossouw

Rikus Rossouw's field of experience is in construction management, administration and supervision. In this regard he has been involved in the construction of Civil/Mechanical Engineering Projects for the past fifteen years.

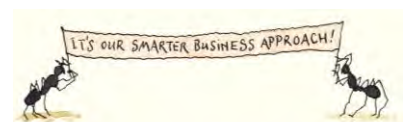
### Rudi West

Rudi has vast experience in roads and transportation systems. He is responsible for materials investigations & materials design, including centre line soil survey & borrows pit investigations; feasibility phase, preliminary & detailed design, and geometric layout of roads & intersections; hydrology and stormwater run-off calculations & sizing of stormwater drainage related structures.

## Our Value-Add Proposition

Our integrity, commitment, desire to serve, passion for excellence, empowerment, innovative and creative working environment provides our specialist, multi-disciplinary teams with a solid foundation to implement successful projects for our clients.

The extensive range of our roads services include the planning, design, construction supervision and project management of large-scale township and spatial development projects. These projects are being successfully implemented throughout Africa, where the labour-intensive nature of many of these projects provides employment for local people.





## Completed Projects

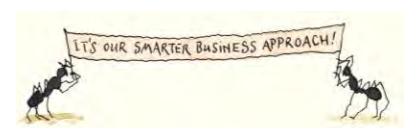
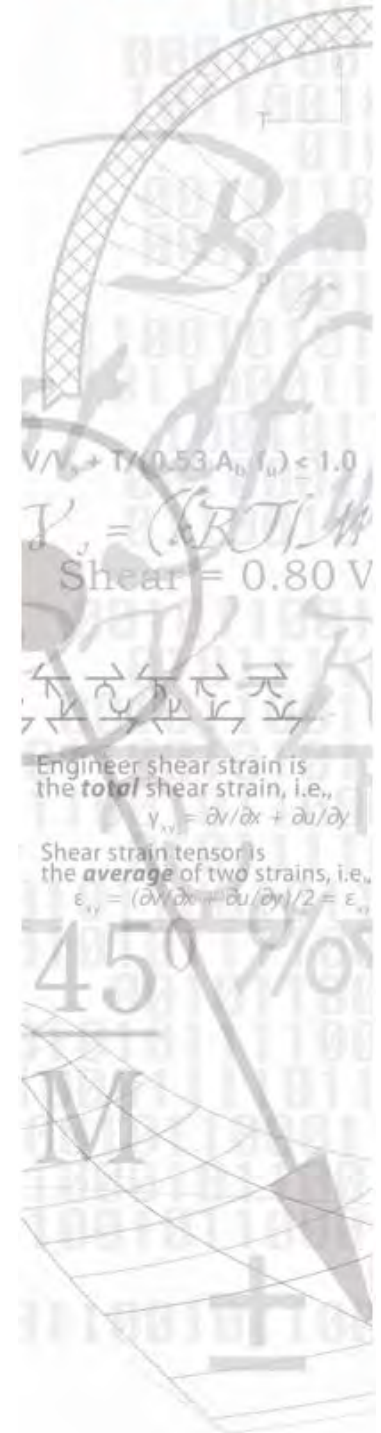
The following projects highlight our competencies:

Roads design		
<b>National and Provincial roads</b>	Primary road P28-4, Mafikeng to Ramatlabama	R96 million
	Provincial road P25-1, Manthestad to P34-5, Bophirima	R41 million
	Mingoyo-Lindi Road, Tanzania	US\$54 million
	Kalamare access road, Botswana	R52,6 million
	National road Route N2-07, Groot Brak to Kraaybosch	R46 million
	National road Route N2-16, Komga to Blue Water	R196 million
	Construction supervision of N3-11, Heidelberg to Lagerspoort)	R11,0 million
	National road Route 1, Barrage to Grasmere	R46,0 million
<b>Urban roads</b>	Stormvoël Road, Pretoria (arterial)	R13,0 million
	Duncan Street, Pretoria (arterial)	R11,0 million
	Dorp Street , Pietersburg (arterial)	R 3,0 million
	Streets in Volksrust	R 1,3 million
	Freeway N3 ramp and interchange, Germiston (arterial)	R56,3 million
Roads rehabilitation		
<b>Rural roads</b>	Road P20-1, North West Province	R13,0 million
	Road P17-1 (7km), Limpopo Province	R11,0 million
	Road 978 (10km), Limpopo Province	R 6,0 million
	Road P43-3 (27km), Limpopo Province	R 9,0 million
	Road P23-1, North West Province	R 6,0 million
	Road P34-4, North West Province	R 3,0 million
	Mingoyo-Lindi Road, Tanzania	US\$54 million
	Kalamare access road, Botswana	R52,6 million

### Turnkey Design and Construction

In 2002 BIGEN AFRICA refined a turnkey design and construct methodology which forms the basis of our design and construction supervision services. We provide these services directly to clients or with joint venture partners. The methodology includes a legal framework and contractual basis for contracts, as well as reporting structures and standardized documentation and procedures.

We have also refined the turnkey contract structure to suit the standardized documentation, invoicing, quality and safety management, reporting procedures of local government structures and different types of work.





To date, turnkey design and construct projects have included:

Johannesburg Roads Agency		
Upgrade of gravel roads to surfaced roads	2002/03	R 70 million
	2003/04	R285 million
	2004/05	R130 million
	2005/06	R 35 million
	2006/07	R 20 million
Ekurhuleni Metropolitan Municipality		
Design and construction of gravel roads upgrade	2004/05	R108 million
	2005/06	R144 million
	2008/09	R 55 million

### Bridges

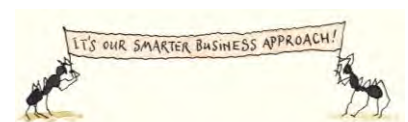
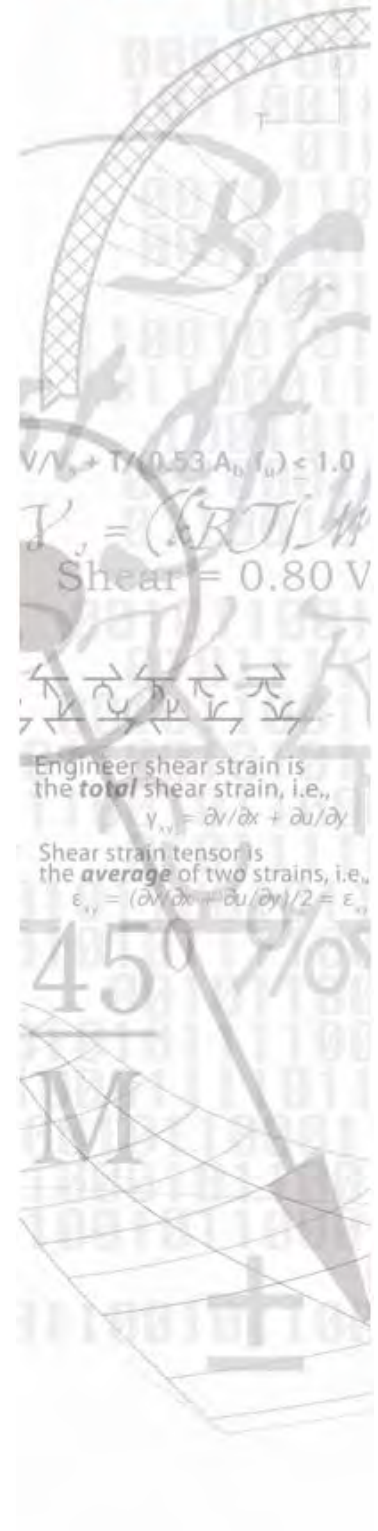
BIGEN AFRICA's bridge design and construction experience over the past 20 years has been substantial and underscores our expertise and ability to provide practical and cost-effective solutions to all bridge challenges.

Areas of expertise include:

- Site selection and site optimization
- Economic optimization of structural designs
- Concrete designs
- Determination of flood run-offs
- Determination of flood lines
- Environmental friendly structures
- Bridge aesthetics
- Planning, design, documentation and construction supervision
- Project Management

Bridge projects completed:

Power Street, Germiston	R 1,2 million
Beitbridge West Nicholson Running Rail line, Zimbabwe	R18,0 million
Stormvoël Road, Pretoria (Road over River)	R 1,6 million
Duncan Street, Pretoria (Road over Rail)	R 1,3 million
OR Tambo International Airport (Sky bridges)	R30,0 million





## Job Creation and Social Upliftment

BIGEN AFRICA'S wealth of experience in roads design, construction and rehabilitation enables it to assist clients with community upliftment.

Our support includes assisting local authorities with development programmes to drive job creation, poverty relief and community upliftment initiatives.

Our assistance to clients has resulted in the development and implementation of highly acclaimed job creation and social upliftment programmes, many of which have received national and international awards.

## Contact Details

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