GAUTENG FREEWAY IMPROVEMENT PROJECT

UPDATE ON PHASE I CONSTRUCTION

November 2009

HJ Kotze

THE SOUTH AFRICAN NATIONAL ROADS AGENCY LTD

Contents

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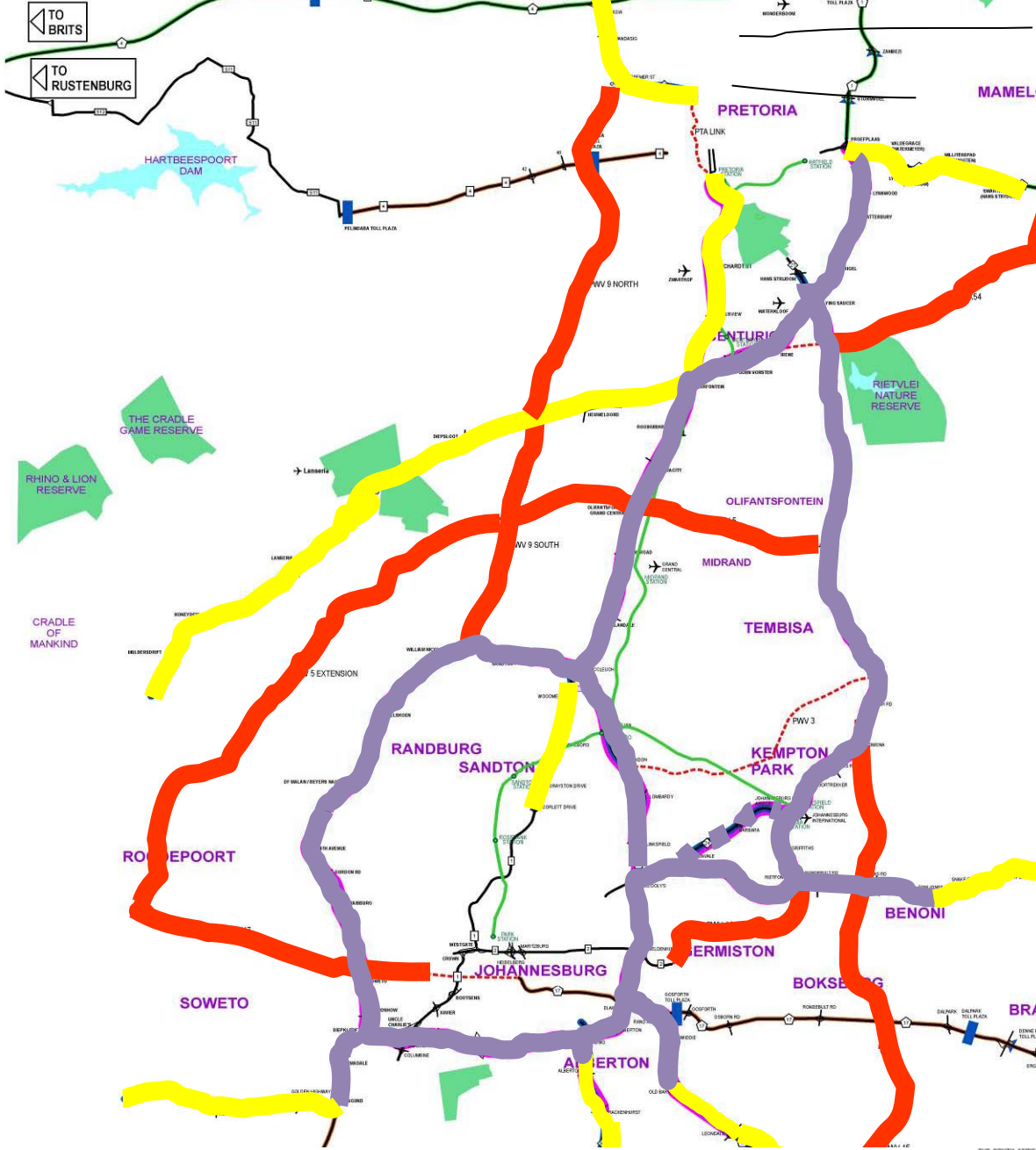
Project Extent:

PLANNED LANE ADDITIONS:
185 km (2010)

FUTURE UPGRADES:
(223 KM)

PLANNED NEW ROUTES:
158 km

FINAL SCHEME:
561 KM



Gauteng Freeway Improvement Project

Outline of Scope of works

- Upgrade 185 km of freeways
- 4 to 5 lanes per direction, certain sections up to 6 lanes
- Improve 7 system- and 21 access interchanges:
  - Auxiliary lanes at on- and off ramps
  - Additional lanes
  - Directional and switch ramps – e.g. Gillooly's and Eland's
  - Additional bridges – e.g. Olifantsfontein
  - Loop ramps – e.g. Maraisburg
  - Conversion to single point – e.g. Rigel
  - Total revamp – e.g. Allandale
  - Collector-Distributor lanes – e.g. Atterbury – Lynnwood
- Cross road improvements
- Median lighting for entire length

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Overview and Progress

Project / Action	No	Commenced	Status	Completion
Political Acceptance		Oct 2005	Complete	July 2007
Traffic Modeling		Aug 2006	Update	Dec 2009
Toll Strategy		Aug 2006	Accepted	Jan 2008
Toll Financial Feasibility		Aug 2006	Update	Dec 2009
Economic Impact		Nov 2006	Update	Dec 2009
Social Impact		Nov 2006	Complete	Feb 2007
Survey Contracts		Nov 2006	Complete	April 2007
GFIP Design	6	Nov 2006	Complete	Feb 2008
Toll Declaration Process		Oct 2007	Declared	Jan 2008
EIA	3	Feb 2007	ROD's Obtained	Feb 2008
Tenderers Pre Qual	6	Oct 2007	Awarded	Dec 2007
Contracts Procurement	6	Feb 2008	Awarded	May 2008
F-shape Barriers	2	Feb 2008	Partial Comp.	Dec 2009

Project Statistics

Work Package:	Start Date :	End Date:	Duration: (months)	Award Value (Incl. VAT):
A	4 June 2008	3 June 2010	24	1,273,487,826.11
B	26 May 2008	25 Jan. 2011	32	1,910,544,375.76
C	26 May 2008	27 Nov. 2010	30	702, 618,875.06
D1	27 May 2008	26 Oct. 2010	29	1,192,818,254.28
D2	May 2008	Oct. 2010	29	748,695,864.50
D3	July 2007	Nov. 2009	28	391,142,664.41
E1	24 July 2008	23 July 2011	36	1,383,556,423.30
E2	24 July 2008	23 July 2011	36	695,479,298.51
E3	28 April 2009	27 Oct. 2010	18	528,501,300.24
F	28 May 2008	27 Nov 2010	30	1,310,652,879.46
G	03 May 2008	02 May 2010	20	719,340,000.00
H	03 May 2008	02 May 2010	20	610,387,407.99
I	28 May 2008	27 Nov. 2010	30	1,256,603,587.29
J – Phase 1	29 June 2009	28 May 2010	11	396,722,880.39
J – Phase 2		28 Feb 2011	20	
K	15 June 2009	14 Dec. 2011	30	799,903,256.31

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Project description

Package	Route & Section	From I/C	To I/C	Consulting Engineers	Contractor
A	N1 - 20	Golden Highway	14th ave	SNA/ITS JV	Siyavaya JV
	N12 - 18	Uncle Charlies	Diepkloof		
B	N1 -20	14th ave	Buccleuch	GFC	GFI JV
C	N1 -20 & 21	Buccleuch	Brakfontein	BKS	GLMB JV
D1	N1 - 21	Brakfontein	Flying Saucer	Aurecon	BRCD JV
D3	N1 - 21	Flying Saucer	Atterbury	DCA JV	Basil Read
D2	N1 - 21	Atterbury	Scientia	DCA JV	BRCD JV
E1	N3 - 12	Heidelberg	Geldenhuys	KAS JV	Siyavaya JV
E2	N12 - 18	Reading	Elands	UWP/Nyeleti	Siyavaya JV

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Project description (cont.)

Package	Route & Section	From I/C	To I/C	Consulting Engineers	Contractor
E3	N12 - 18	Uncle Charlies	Reading	UWP/ Nyeleti JV	Rumdel
F	N3 - 12	Geldenhuys	Bucclecuh	GFC	GLMB
J	R21 - 1	Rietfontein	Pomona	Vela VKE	Patula
H	R21 - 1	Benoni	Olifantsfontein	Vela VKE	Power
G	R21 - 2	Olifantsfontein	Hans Strydom	Vela VKE	Raubex
I	N12 - 19	Gillooly's	Rietfontein	Gillooly's JV	CMC/G4 JV
	N3 - 12	Gillooly's	Modderfontein		
K	N12 - 19	Rietfontein	Tom Jones	Aurecon/ASCH/ Vela VKE JV	Basil Read

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Challenges

- Low temperatures affecting SAMI, asphalt paving and structural concrete placing
- Impact of asphalt supply
- Impact of bitumen supply on SAMI and various asphalt mixes
- Median barrier construction time and effort
- Timeous relocation of services
- Working under traffic
- Working on the same site with other contractors, e.g. Gautrain
- Working at night
- Security

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Material quantities

- BTB – 300 000t
- SAMI – 3 300 000m2
- BRASO – 650 000t
- Other asphalt – 530 000t
- UTFC – 3 200 000m2
- JCP – 32 000m2
- CRCP – 470 000m2
- UTCRCP – 120 000m2

Project Status

Work Package:	Scheduled progress: %	Current progress: %	Scheduled expenditure: %	Current expenditure: %
A	67	68	57	52
B	50	58	51	64
C	53	47	54	49
D1	55	45	54	41
D2	55	64	53	49
D3	99	97	92	94
E1	42	36	40	39
E2	52	38	45	34
E3	39	21	24	22
F	53	50	60	44
G	70	60	70	42
H	65	61	57	56
I	56	33	56	32
J	20	4	18	13
K	12	8	12	5

Package A

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N1: Maraisburg Interchange

Package B

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Milestones

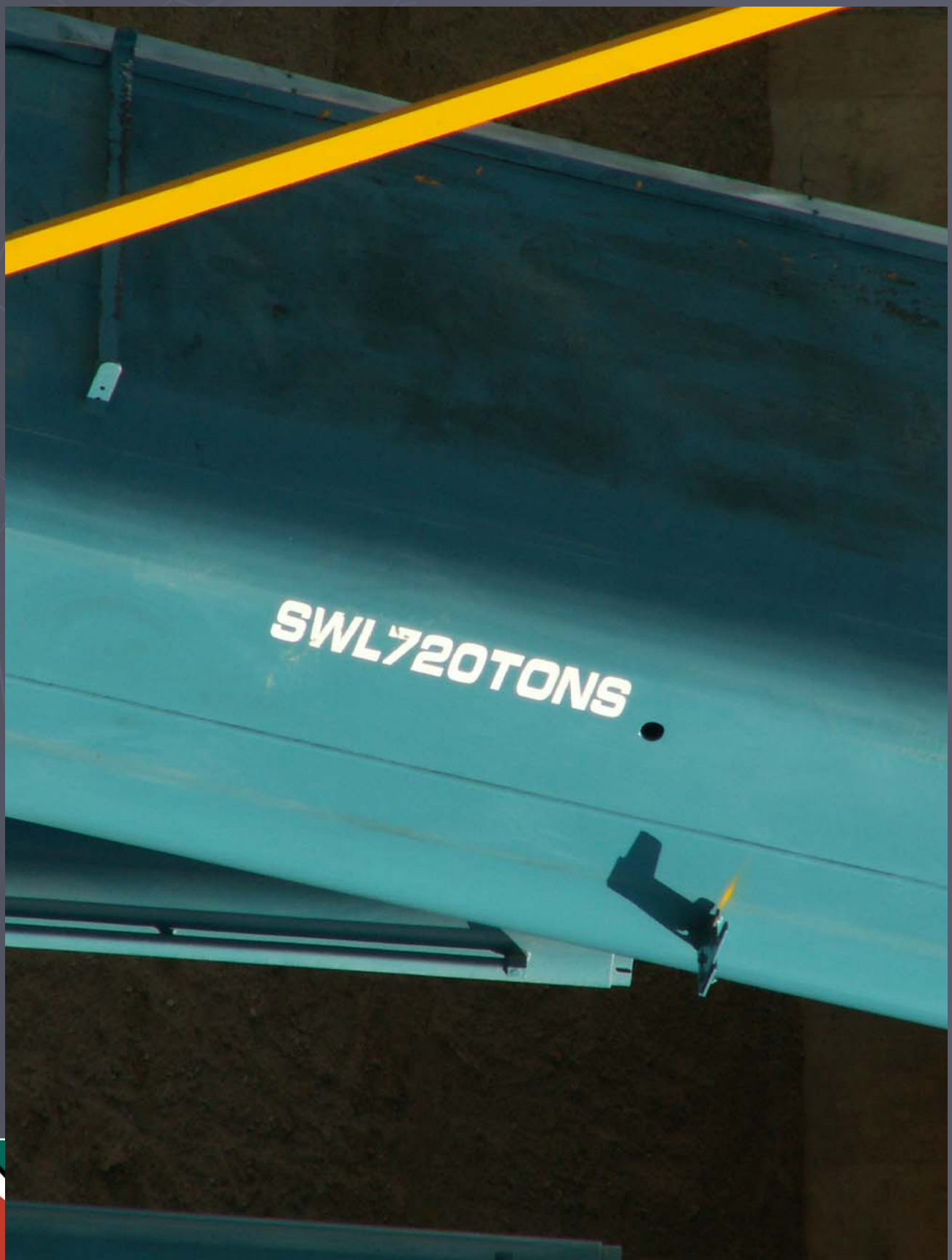
William Nicol bridge – deck placement (north)

- Convert interchange to single point
- 4 pre-cast decks sections
- 2 on northern side placed in position
- 720 t crane – 110 t lift

Milestones

William Nicol bridge – deck placement (north)


sarens
AC 650
sarens
www.sarenssa.com


SWL720TONS

Milestones

William Nicol bridge – deck placement (north)

Milestones

William Nicol bridge – deck placement (north)

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GFI CONTRACTORS JV
WBHO
sarens
sarens
sarenssa


WBHO
Atlanta
GR CONTRACTORS JV
www.sarenssa.co.za
JOHNSON ACCESS

Milestones

William Nicol bridge – deck placement (north)


GROVE
SWL 45T
WBHO
B076
600E

Challenges overcome

- Stabilised layers mixed with pug mill
- Transported to median with conveyor
- Into trucks to destination
- Save 15 to 20 000 entries and exits

Challenges overcome – Pug Mill

Retaining walls

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Package C

Allandale interchange

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Bridge deck pours

B0027 - Allandale

Nellmapius

Jukskei River Bridge

Support Work

Allandale Interchange

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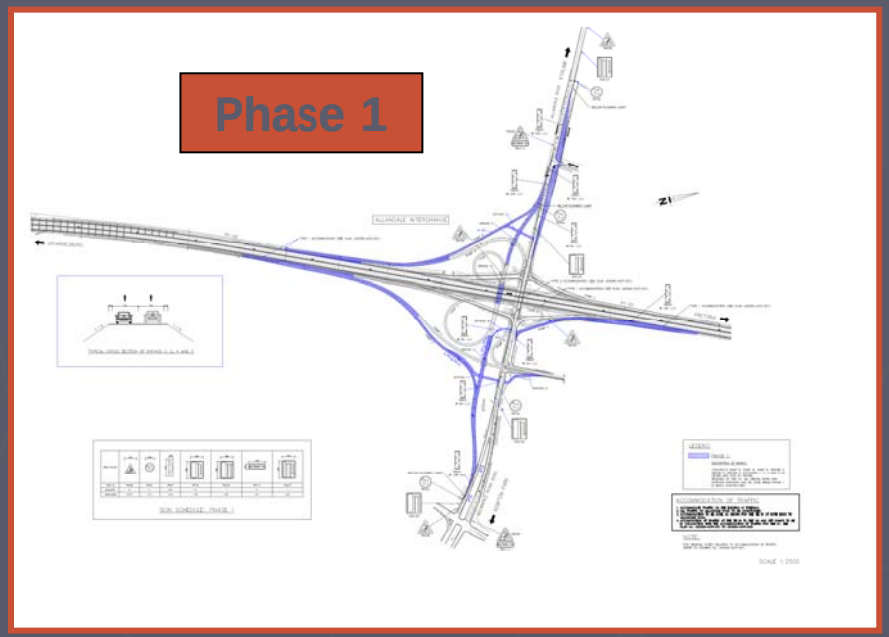
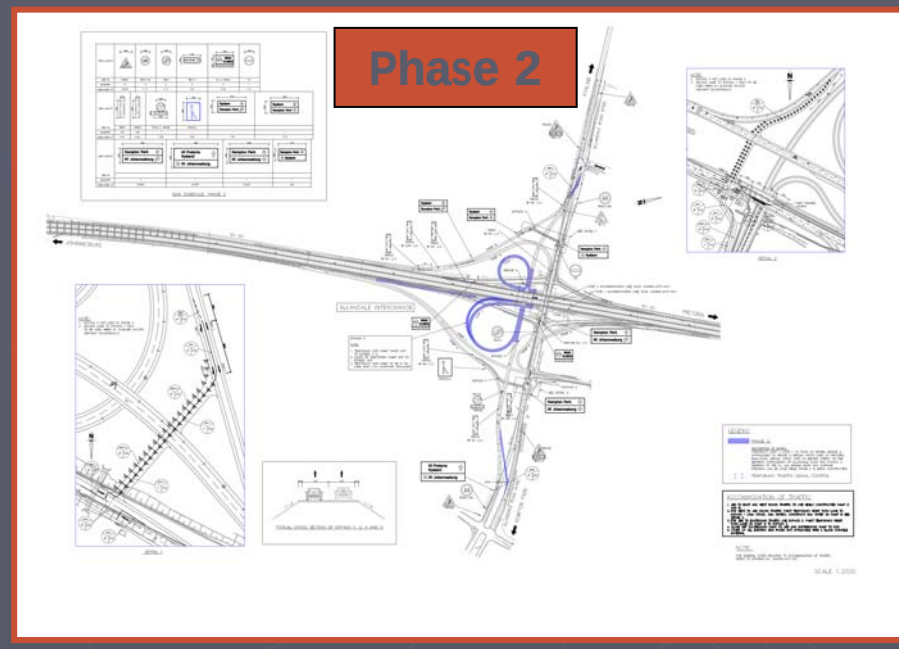
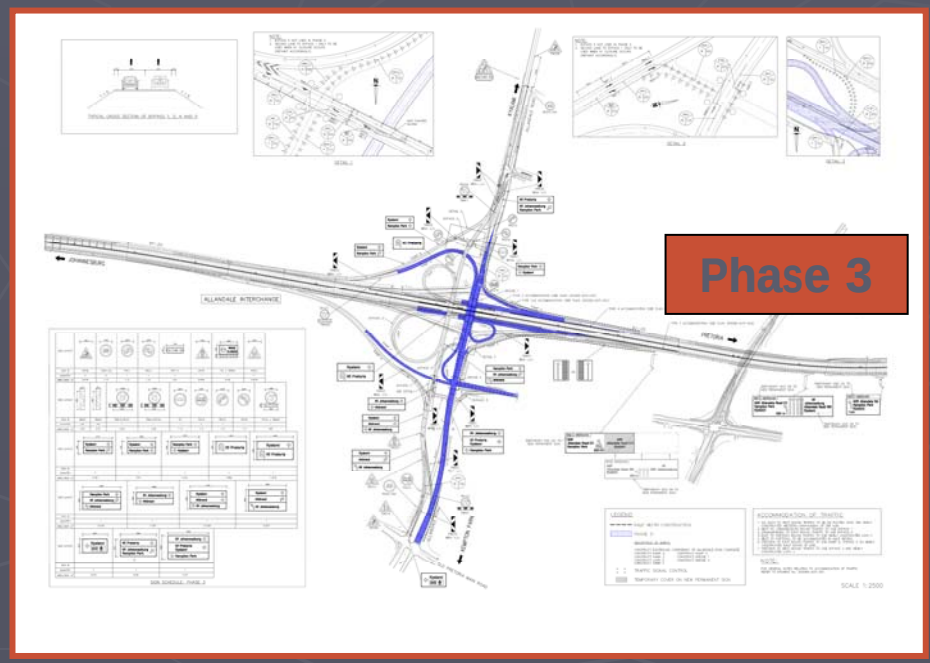




Allandale -

Accommodation of Traffic –

3 Phases of Construction



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Allandale Interchange – N1

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Allandale bridge demolition

Package D1

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Challenges and Milestones

- Large grouting volumes for structures foundations in dolomite areas – 100% increase in scheduled quantities
- In excess of 6000 m3 at 5 structures
- Incremental launch bridge – launch complete

Challenges
Reinforced slab over dolomite area

Structures
Incremental launch bridge

Package D3

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Milestones

- Contract 97% complete
- Garstfontein Interchange complete and opened to traffic
- Most freeway lanes open to traffic

Challenges

- Fitting the road widening into the available road reserve
- Dealing with accidents on the steep down-hill at Rigel Avenue
- Dealing with broken down trucks on the up-hill at Rigel Avenue
- Accommodation of high volumes of traffic

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N1 at Rigel Ave

- Down-hill
  - accidents

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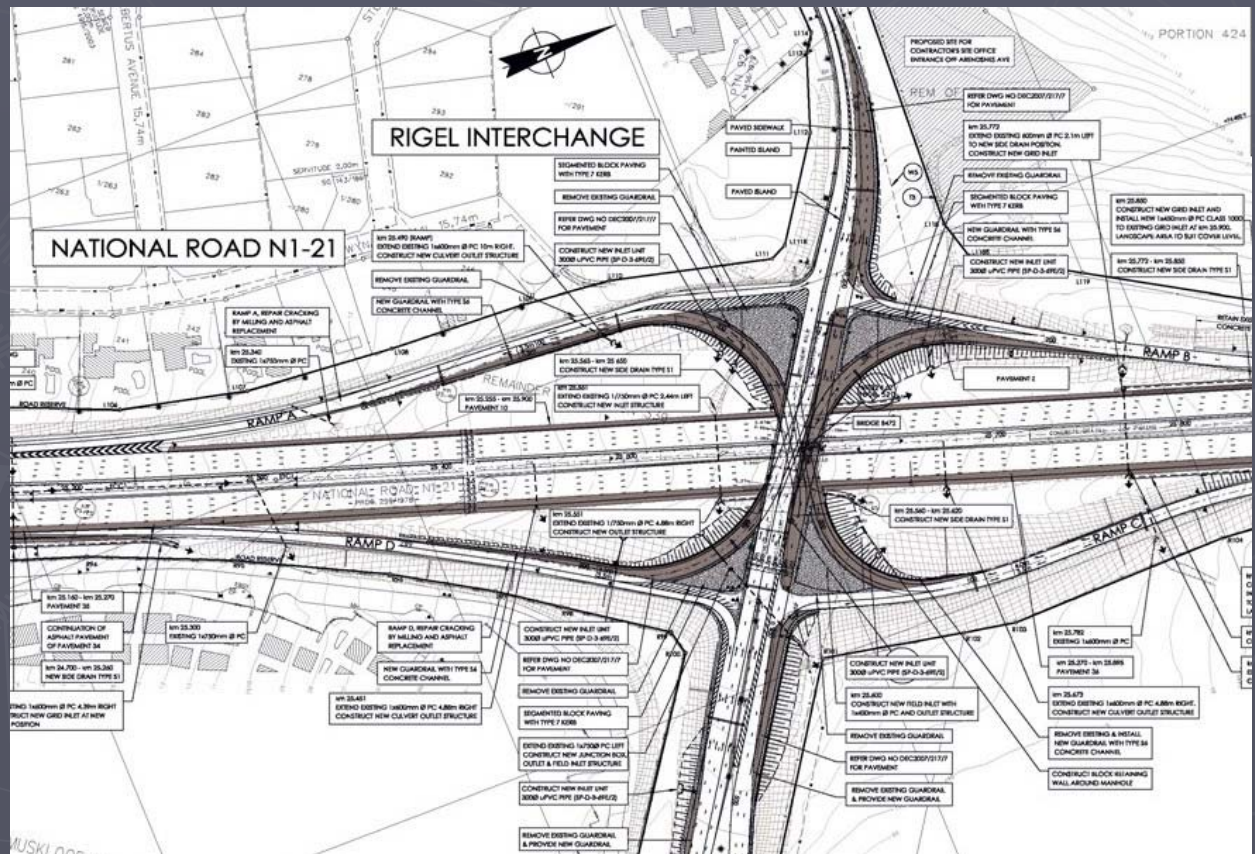
Rigel Avenue Interchange

- Converting an existing Diamond Interchange to a Single-point Interchange



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Rigel Avenue Interchange

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Rigel Avenue Interchange

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Rigel Avenue Interchange

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Walls

Garstfontein interchange

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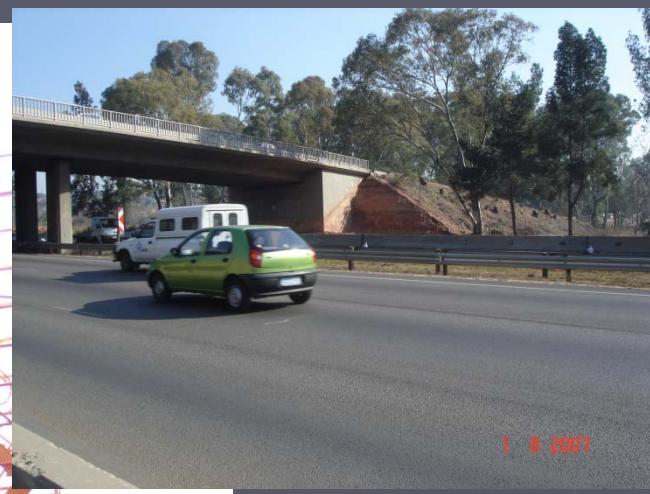
Garstfontein interchange



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Package D2

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Milestones

- Lynnwood Ridge pedestrian bridge demolished
- Pedestrian bridge (CSIR) demolished
- Atterbury In-fill bridge complete, existing northern bridge demolished
- New northern bridge almost complete

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Challenges

- Atterbury Road Bridge construction under normal traffic conditions
- Lynnwood Glen Pipe Bridge under construction while existing bulk water supply remains in working condition
- Noise attenuation walls – Alternatives
- Geometric design of Lynnwood Road Interchange incorporating Meiring Naude Road into the design and the phased construction thereof

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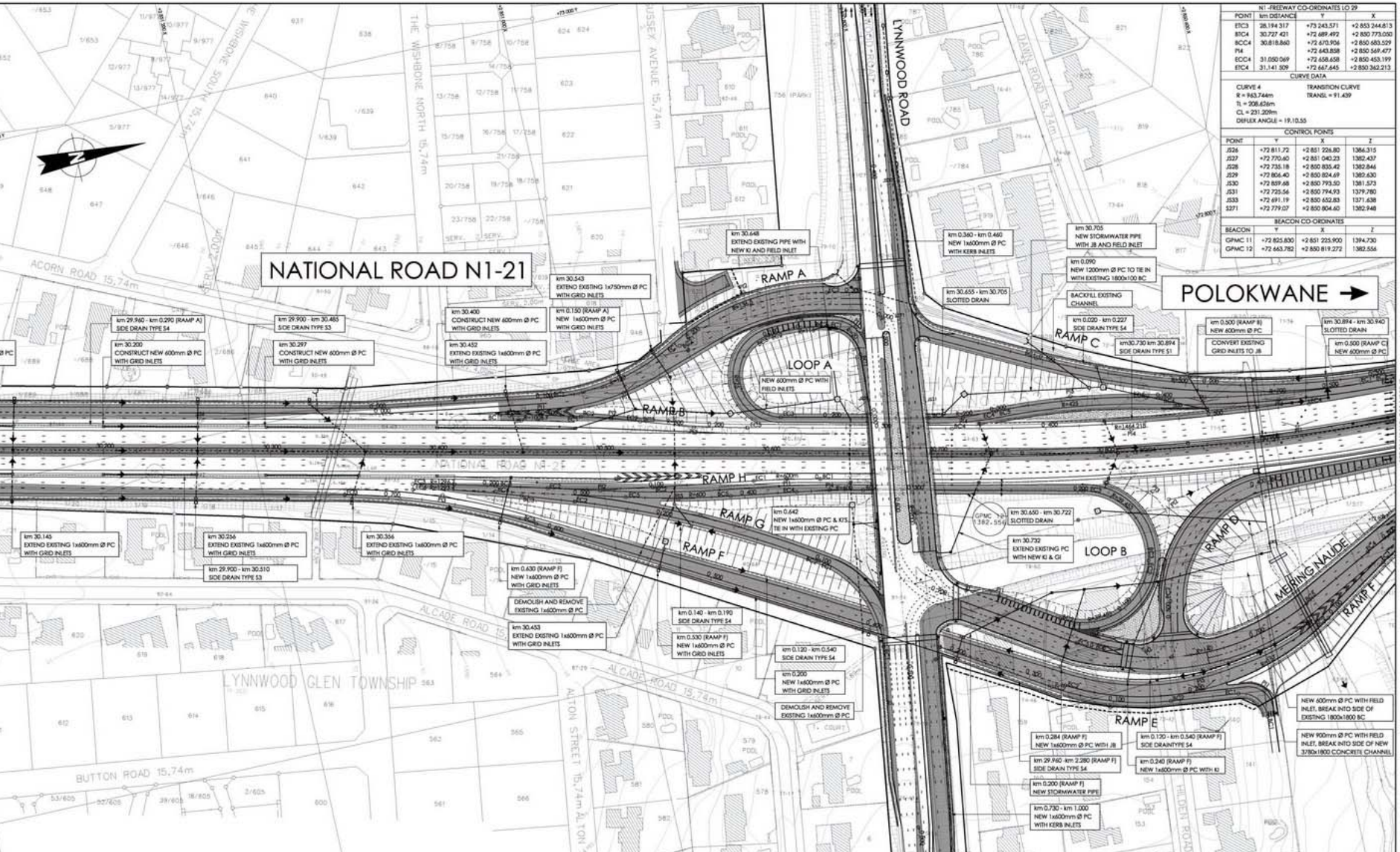
Lynnwood Road Interchange



Placing precast beam at Atterbury Road

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Placing precast beam at Atterbury Road

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Placing precast beam at Atterbury Road

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Demolish Atterbury Road Northern Bridge

- 14-16 Aug 09 - Before

Demolish Atterbury Road Northern Bridge

- 14-16 Aug 09 - Before

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Demolish Atterbury Road Northern Bridge – Package D2

- 14-16 Aug 09 - Before

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Demolish Atterbury Road Northern Bridge

- 14-16 Aug 09

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Demolish Atterbury Road Northern Bridge

- 14-16 Aug 09

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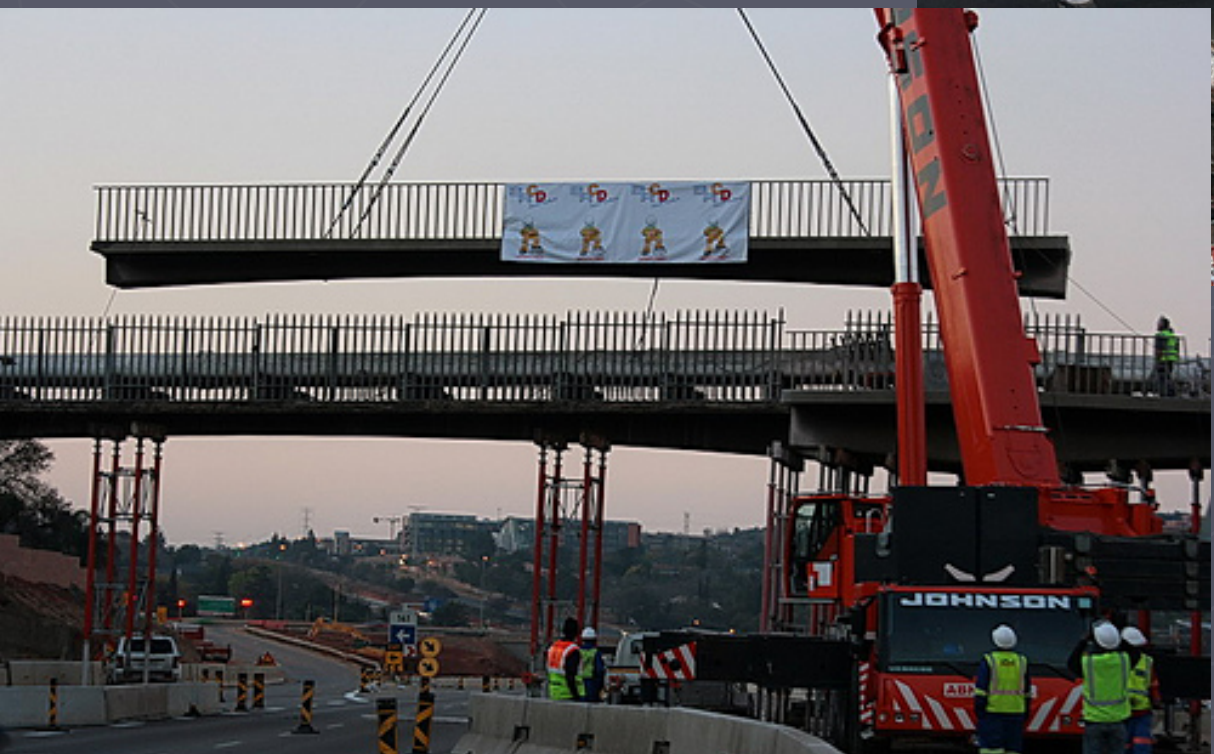
Demolish Atterbury Road Northern Bridge

- 14-16 Aug 09 - After

Demolish Pedestrian Bridge – Lynnwood Glen



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Shotcrete walls complete
(between Atterbury & Lynnwood)

Package E1

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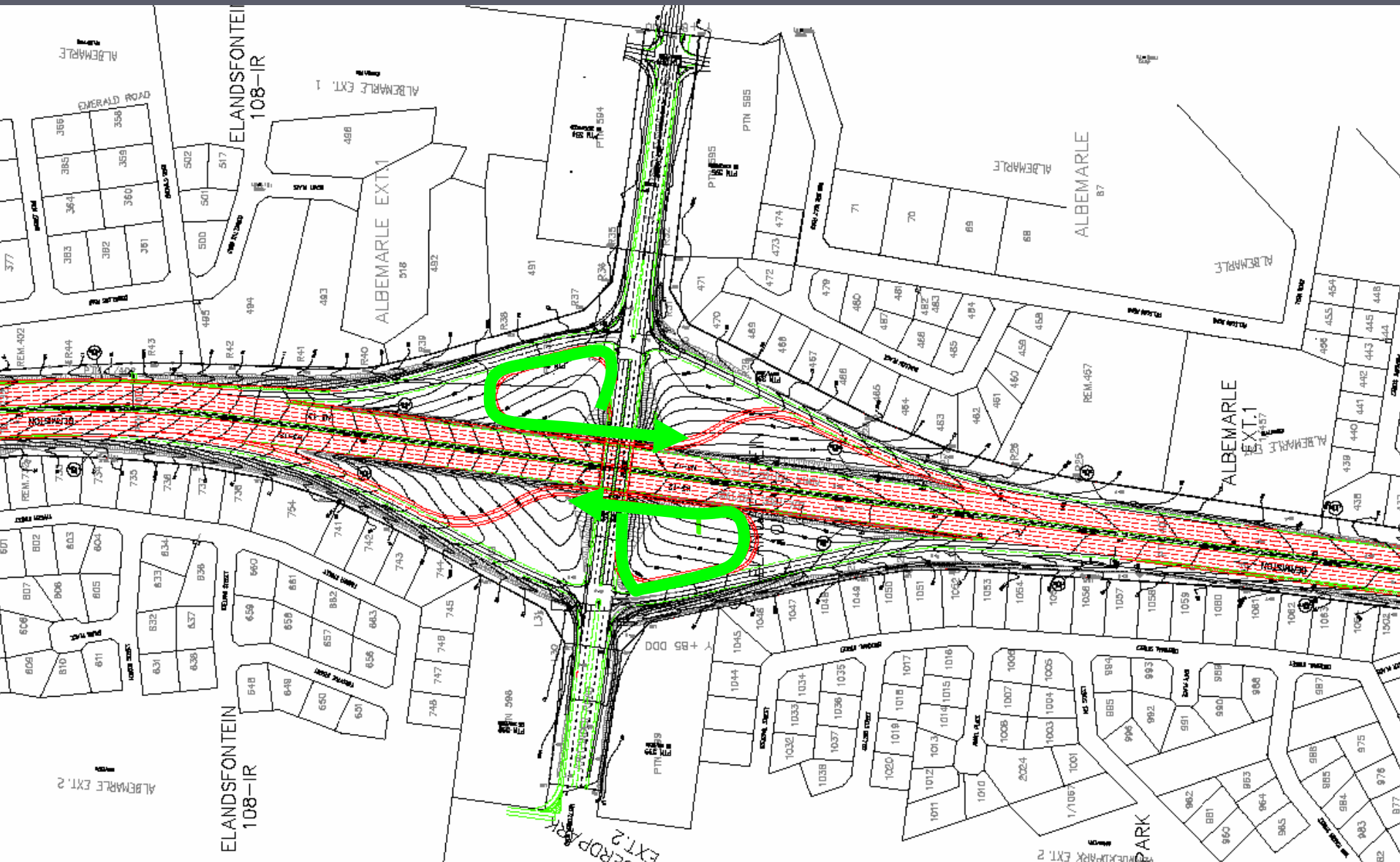
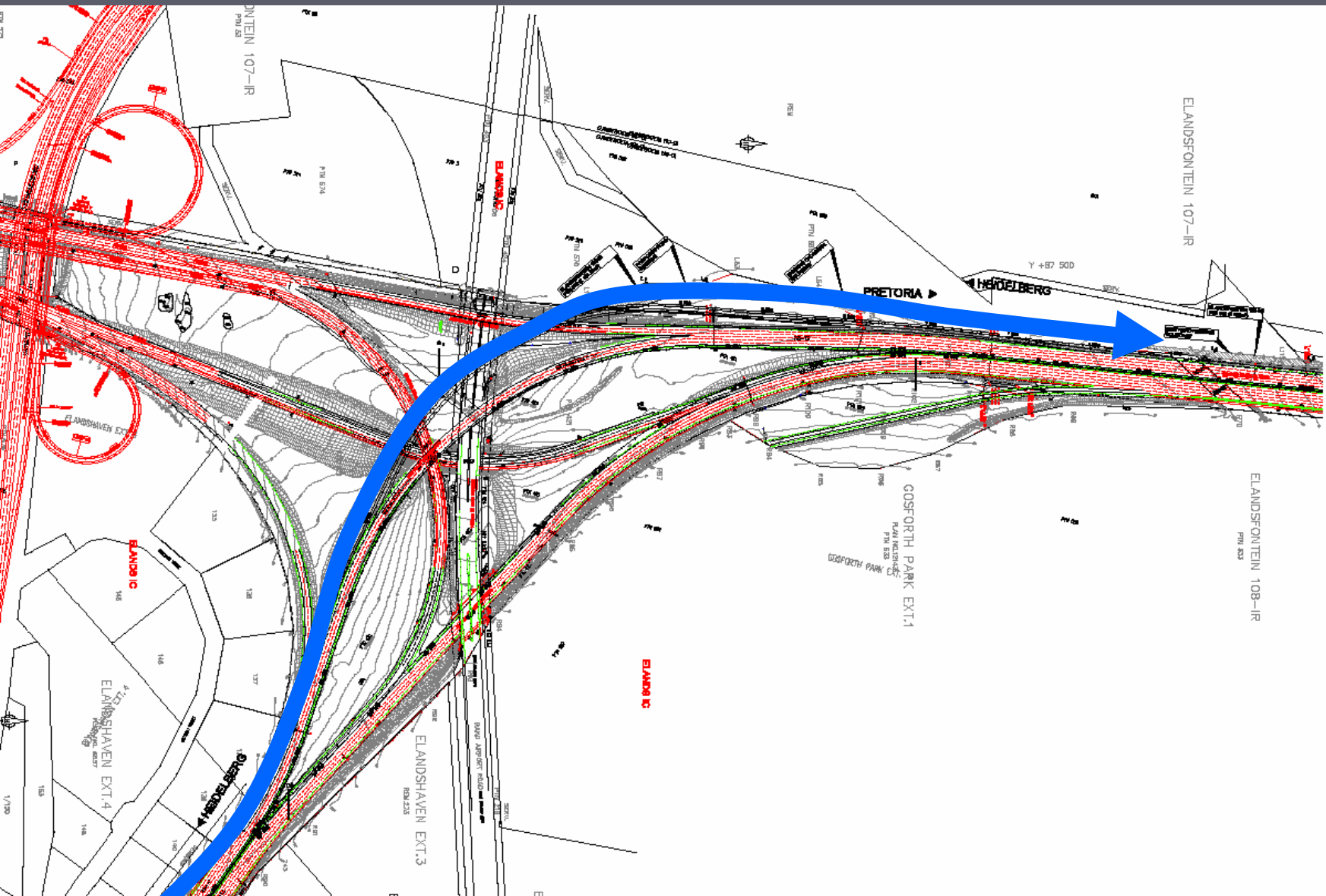
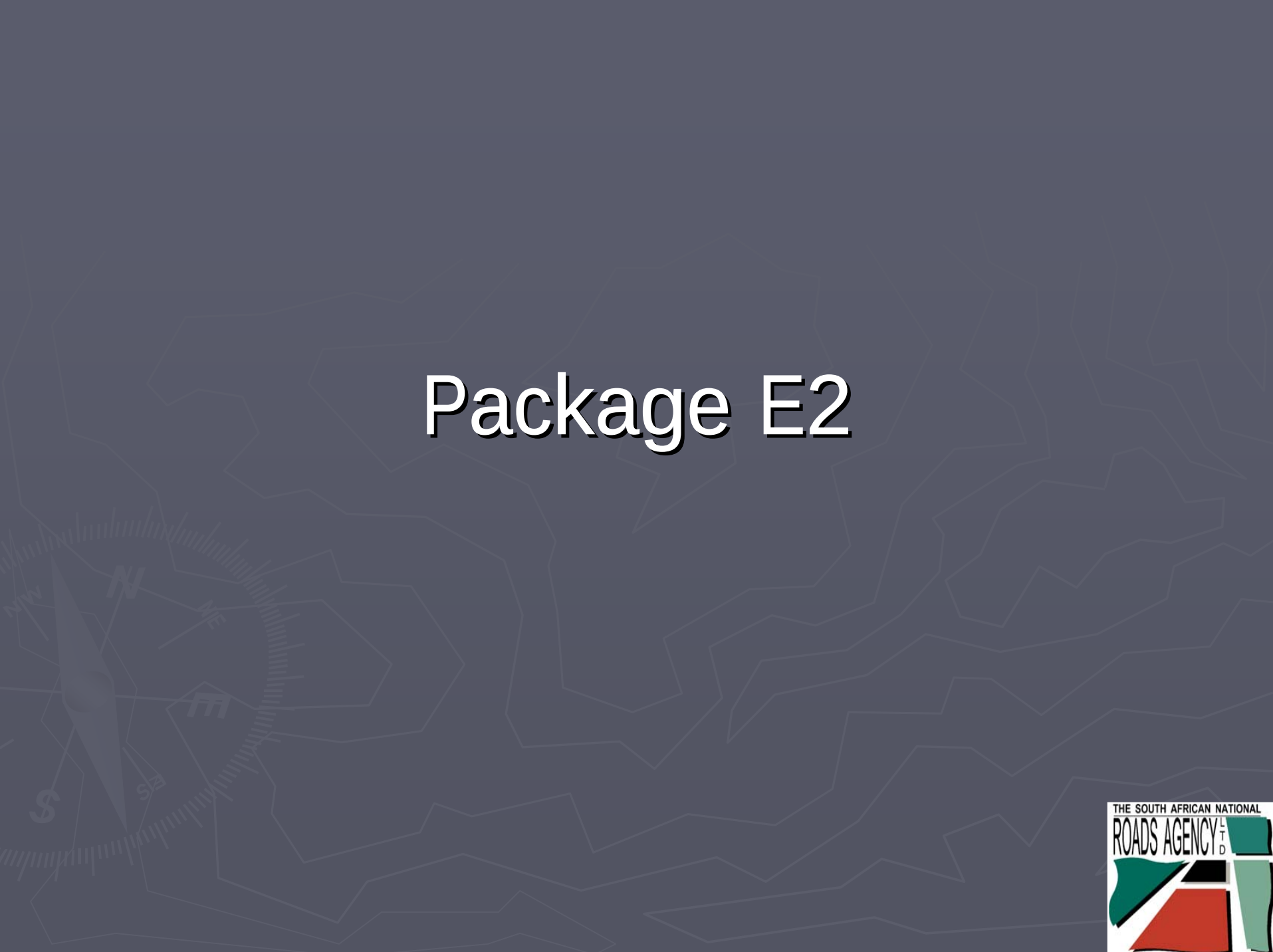
N3: Grey Ave. Interchange



N3: Elands Interchange



Package E2



N12/N17 Interchange

Package F

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New Technology used

- Triple beam roller screed – for texturing on CRCP

- High durability concrete – 24 hrs strength (20MPa) & flexural strength (2MPa)

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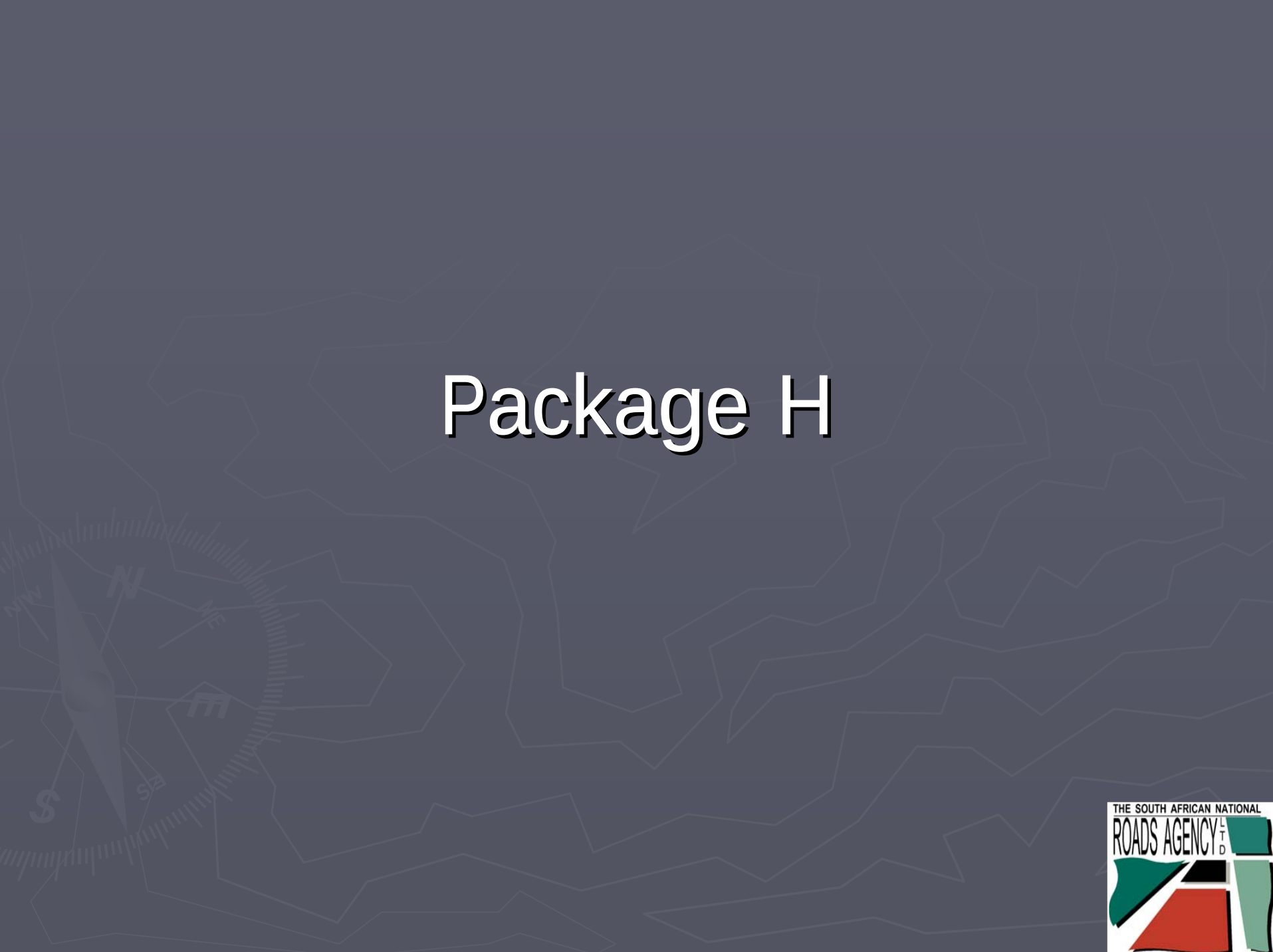
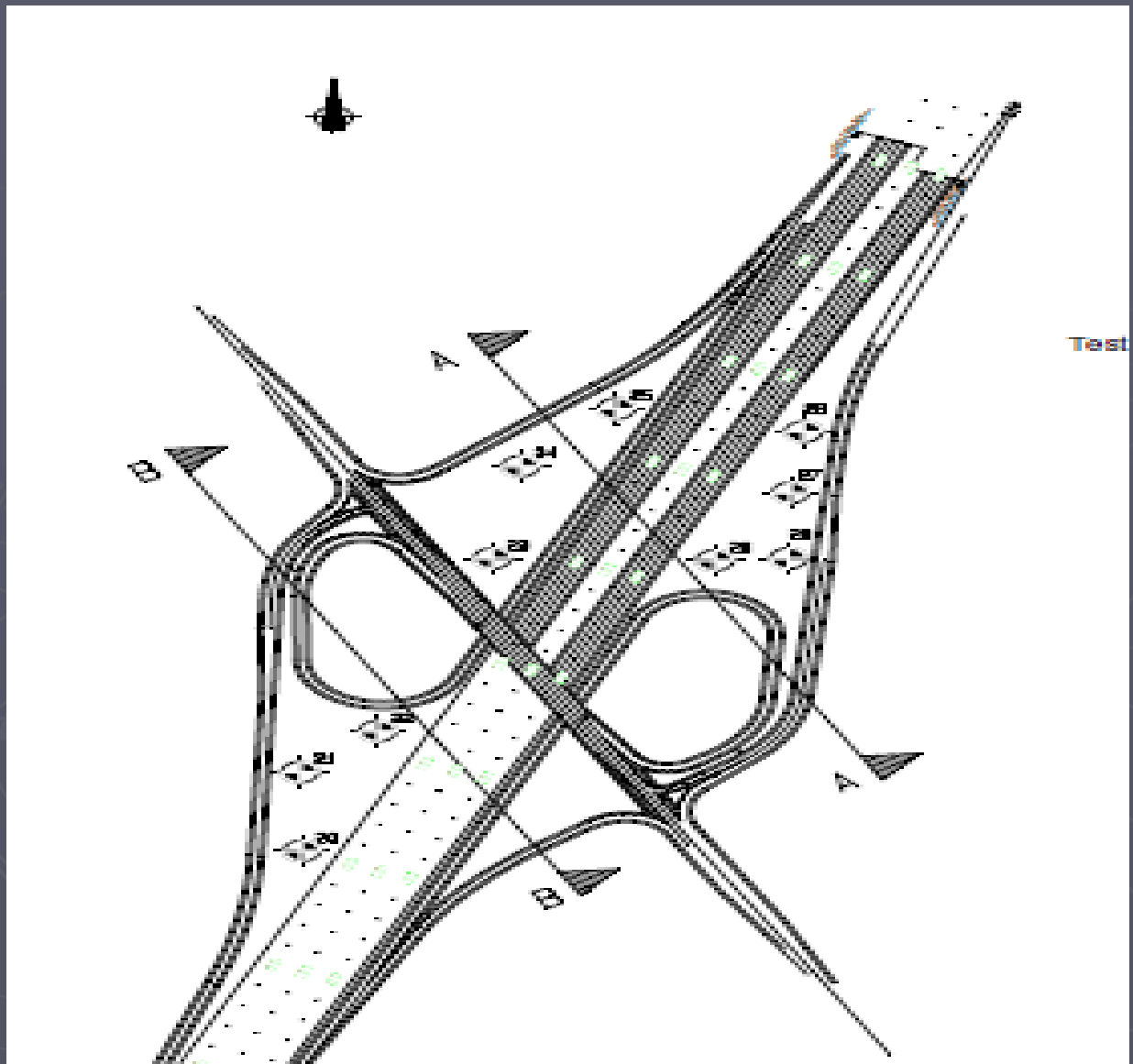
Package H



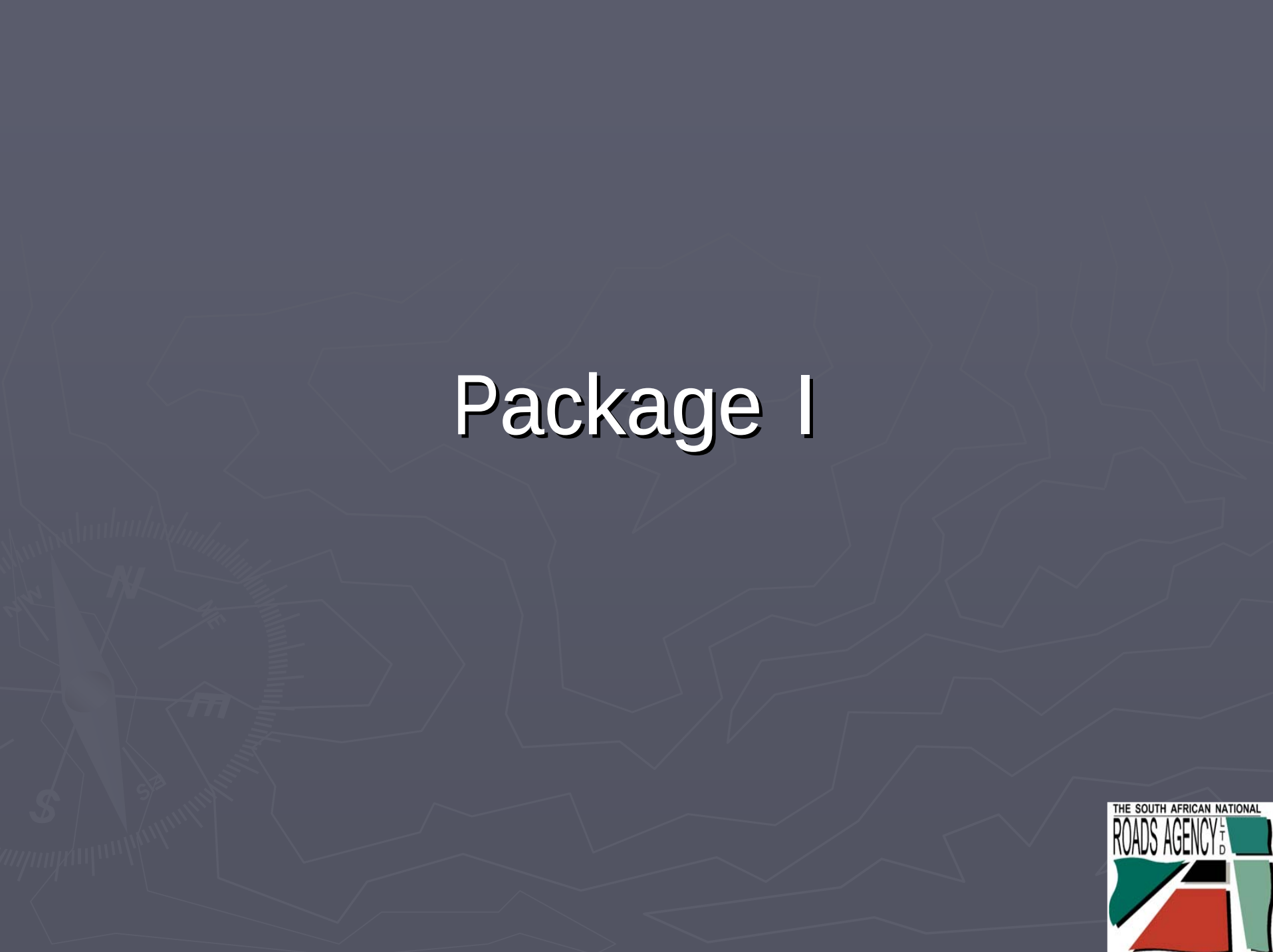
Benoni I/C – Package H



Progress Photos – Package H
December 2008

Progress Photos – Package H
June 2009

Package I



Challenges

Placing the barriers closing lanes, 9:00 – 12:00pm

Remove steel cover plate at day joint 11:00pm

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Milling with two milling machines

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Steel fixing

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Concrete paving operation

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UTCRCP Concrete paving operation

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Open Road Tolling

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Project / Action	No	Commenced	Status	Completion
Toll System DBO Design	1	Jan 2008	Completed	Apr 2009
Toll Infrastructure Des.	1	June 2008	Completed	Aug 2009
Above Platform Works	4	Aug 2009	Awarded	Aug 2010
E&M Subcontract	1	Aug 2009	Awarded	Aug 2010
Structural Steel Sub	1	Aug 2009	Awarded	Aug 2010
Toll System Pre Qual	5	Sept 2008	Awarded	Nov 2008
Toll System (DBO)	1	Oct 2009	Adjudication	Mar 2011
Satellite Centres	3	Sept 2009	Tender	June 2010
COC platform & Services	1	Sept 2009	Adjudication	Feb 2010
COC Building	1	Oct 2009	Tender	Aug 2010
Dalpark Refurbishment	1	Sept 2009	Adjudication	Feb 2010
ORT Toll Signage	1	Aug 2009	Design	Oct 2009
Marketing Plan	1	Jan 2008	Ongoing	Dec 2011
ITS DBO	1	Jan 2010	Design	Mar 2011
Communications DBO	1	Jan 2010	Design	Oct 2010
TDM and HOV Int.	1	Aug 2009	Adjudication	Feb 2010
Toll Operations (DBO)	1	March 2011	Adjudication	Mar 2019

PROJECT FINANCING & IMPLEMENTATION

- User pay principle will be used to finance project
- Provides a mechanism for accelerated financing of infrastructure
- Implemented by means of Open Road Tolling (ORT)

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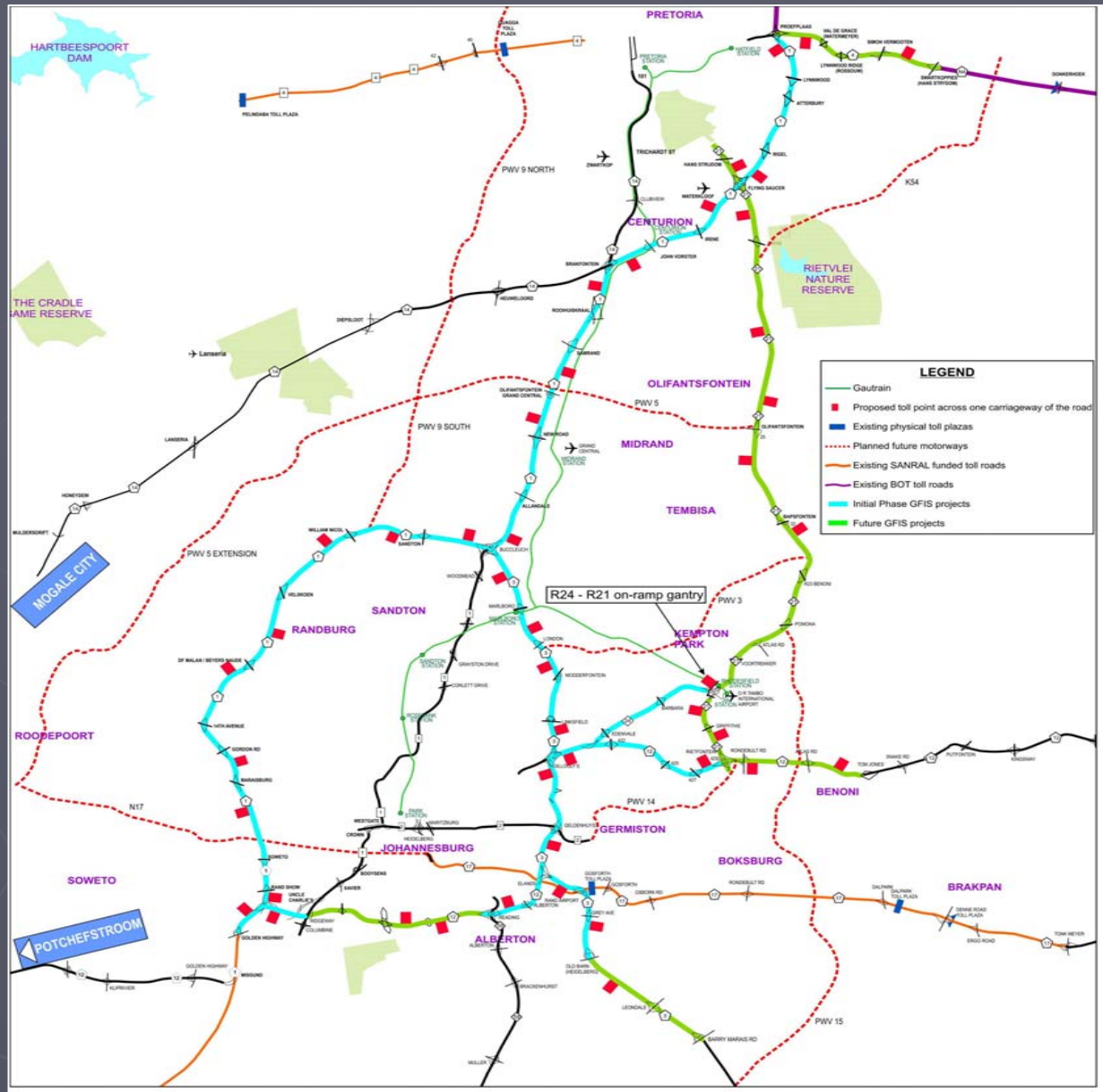
Position of Toll Points



INITIAL (2010) AND FUTURE PHASES OF THE PROPOSED GAUTENG TOLL NETWORK

PROJECT FINANCING & IMPLEMENTATION

- Gantries spaced at approximately 10km
- As part of project – distribute on board unit (OBU) – e-tag
- One tag standard, one account, central clearing – means full interoperability between all toll roads in South Africa
- Challenge to effectively distribute tags – user friendly
- Effective revenue collection and violation processing essential
- 2 400 000 electronic transactions per day

Open Road Tolling ORT

- All the toll transactions will take place electronically
- No physical toll plazas

Tag

Also known as: Transponder or On Board Unit (OBU)

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ORT Building Blocks

- Consist of following:
  - Kiosks/Mobile Kiosks
  - Satelite Centres
  - Technical Shelters and Gantries (Toll Point)
  - Communications Backbone
  - Central Operations Centre (ORT Back Office, TCH, VPC, ITS
  - Disaster Recovery Centre

Project Description

Construction of open road tolling facilities:

- Above platform works (APW)
- Satellite Centres (SC)
- Central Operations Centre (COC)

- Consultants: Tollplan and TIS
- Contractor:
  - APW – Trencon/Present Perfect JV
  - SC – to be awarded
  - COC – Mass earthworks and services –Protech Khutele Lidonga JV
    - Building – to be awarded

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Technical Shelters & Gantries

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Technical Shelters & Gantries

- 42 toll gantries with technical shelters
  - Technical shelter with direct access from freeway
  - Technical shelter with access from municipal street
  - Standard enforcement facilities
  - Minimum enforcement facilities

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Customer Service Centres

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Customer Service Centres

- 11 centres to be constructed

Central Operations Centre

- ORT Back Office
- Transaction Clearing House (TCH)
- Violations Processing Centre (VPC)
- New ITS ops centre

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Acknowledgements

- Alex van Niekerk
- SANRAL GFIP project managers
- Various photographers
- Consultants and Contractors

Thank You

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