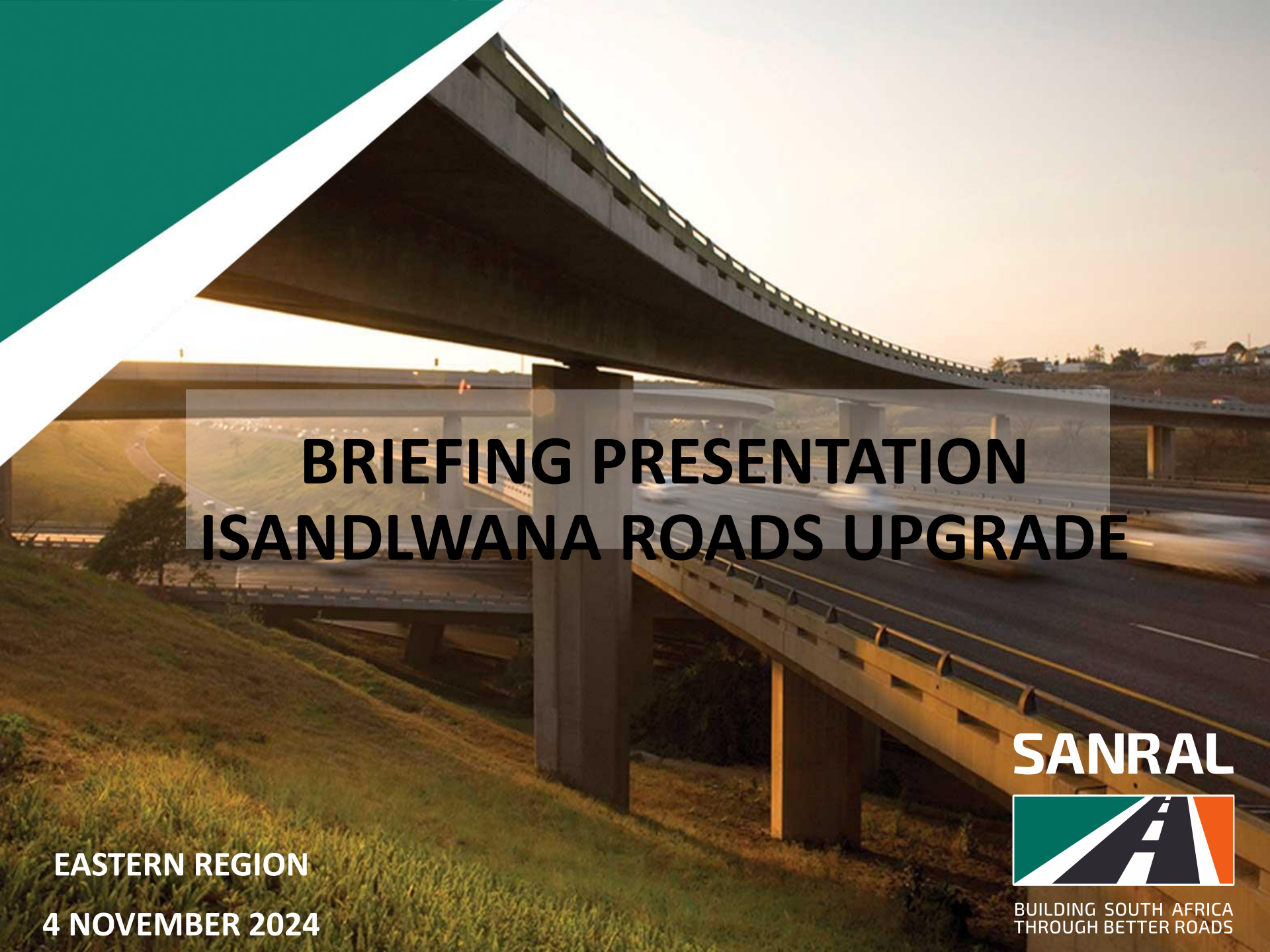




BRIEFING PRESENTATION ISANDLWANA ROADS UPGRADE

EASTERN REGION

4 NOVEMBER 2024

SANRAL



**BUILDING SOUTH AFRICA
THROUGH BETTER ROADS**

1. BACKGROUND

SANRAL



**BUILDING SOUTH AFRICA
THROUGH BETTER ROADS**

BACKGROUND



PROJECT LOCALITY

The project is located at Nquthu/Isandlwana area which is within the jurisdiction of the Nquthu Local Municipality and uMzinyathi District Municipality in the KwaZulu-Natal.

THE ROAD / ROUTE

The roads for construction in this project traverse through the Nquthu Villages and Isandlwana Battlefield Heritage Site areas. The route is Provincial Road P372 (**Package1**).

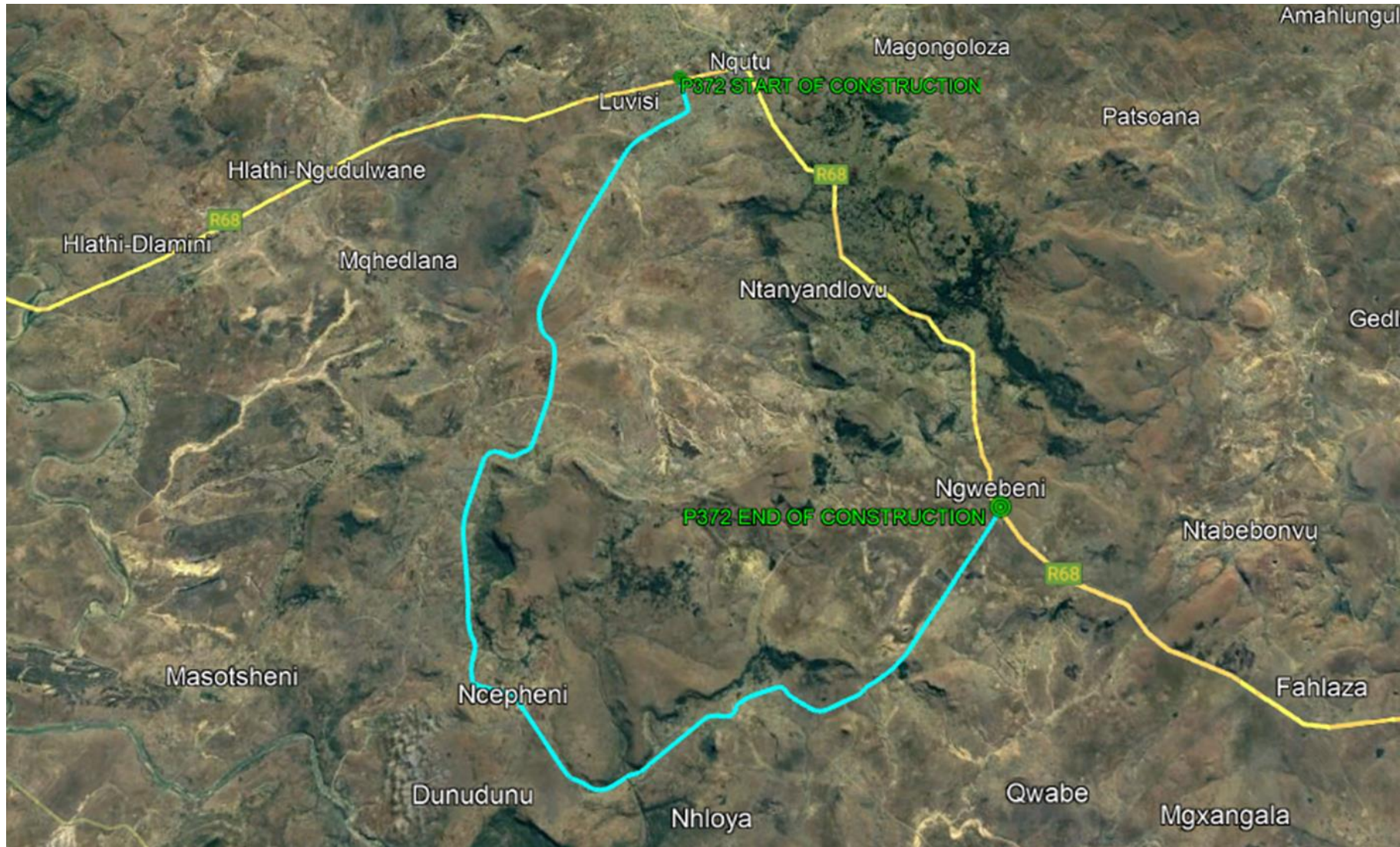
The site consists of the Isandlwana Museum, Visitors Centre, various Memorials and local communities.

PROGRAM STATUS

Road	Description	Envisaged Construction Start (After 3 Months Mobilisation)	Envisaged Construction Completion	Duration (months)	Actual Construction Start Date	Contractor	Status
P372 Package 1	Isandlwana Roads Upgrade – Phase 1 (Upgrade of Provincial Road P372)	January 2025	December 2026	24	TBD	TBA	Tender Stage

NOTE: This Brief is for Package 1

P372, FROM LUVISI VILLAGE (START KM 0.0) TO GWEBENI VILLAGE (END KM 31.0)



P372, FROM LUVISI VILLAGE (START KM 0.0) TO GWEBENI VILLAGE (END KM 31.0)

The Provincial Route (P372) is one of importance as it serves as the main access to Isandlwana Heritage Site best known for **Battle of Isandlwana**, but also for its high archaeological, historical and paleontological sensitivity.

Route P372 is a low volume road (LVR) which serves as access to fairly small remote communities, local deliveries and tourism attractions. P372 furthermore, serves as a collector road for road of lower volume roads namely: P148, D897, D30, P60, D1348, L1190, L1333 and D2286 which form part of the Isandlwana Roads Network.

The road upgrade will improve accessibility for tourist to the Isandlwana Heritage Site, including better access to amenities, such as schools and clinics.

NOTE: THERE SHALL NOT BE ANY CORRESPONDENCE BETWEEN TENDERERS AND ANY OF SANRAL OR ENGINEER DURING THE TENDER PERIOD. ALL COMMUNICATION TO BE THROUGH: procurementHO03@SANRAL.co.za

2. IMPORTANT DATES

SANRAL



**BUILDING SOUTH AFRICA
THROUGH BETTER ROADS**

IMPORTANT DATES

ISSUING DATE	25 October 2024
SUBMISSION OF QUERIES	8 working days prior to tender closing:
BRIEFING SESSION	4 November 2024
TENDER CLOSING DATE	11 November 2024

CONTRACT SANRAL SANRAL S.004-005-2020/1R

ISANDLWANA ROADS UPGRADE – PHASE 1 (UPGRADE OF PROVINCIAL ROAD P372)

Tender documents are available at no cost in electronic format downloadable from SANRAL website https://www.nra.co.za/sanral-tenders/status?region_id=national

Tenderers must have access to Microsoft Office © 2013 and Acrobat Adobe © 9.0, or similar compatible software.

3. TENDERING PROCEDURES

PART T1: CONDITIONS OF TENDER AND TENDER DATA

SANRAL



**BUILDING SOUTH AFRICA
THROUGH BETTER ROADS**

CONDITIONS OF TENDER

The Conditions of Tender are the Standard Conditions of Tender as contained in Annexure C of the CIDB STANDARD FOR UNIFORMITY IN ENGINEERING AND CONSTRUCTION WORKS CONTRACTS as per Government Notice No. 423 published in Government Gazette No. 42622 of 08 AUGUST 2019 and as amended from time to time. (see www.cidb.org.za).

The Standard Conditions of Tender may be downloaded from the CIDB website on the following link:

https://www.gov.za/sites/default/files/gcis_document/201908/42622gen423.pdf

TENDER DATA

Each item of data given is cross-referenced to the clause in the Standard and Special Conditions of Tender to which it mainly applies. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard/special conditions of tender.

CLAUSE NUMBER	TENDER DATA
C.1.1	The Employer is the South African National Road Agency SOC Limited (SANRAL). The Employer's domicilium citandi et executandi (permanent physical business address) is: 48 Tambotie Avenue VAL DE GRACE 0184
CLAUSE NUMBER	TENDER DATA
C.1.3	The Employer's Agent can be contacted as follows: procurementHO03@SANRAL.co.za

TENDER DATA

C.2.1

Eligibility

- 8CE at close of tender
- This contract is classified in terms of CIDB Regulation 25(1B), and the value of the contract may, for the purpose of CIDB Regulation 25(1), be taken at its annual value.
- **JOINT VENTURES**
Ventures are eligible to submit tenders provided that:
 - every member of the joint venture is registered with the CIDB;
 - the lead partner has a required contractor grading of 8CE or higher

CIDB Regulation 25(1B) will be applicable to this contract. Only tenderers who are registered on the National Treasury Central Supplier Database are eligible to tender”

TENDER DATA

C.2.6	Acknowledging addenda Failure to apply instructions contained in addenda may render a tenderer's offer non-responsive in terms of Condition of Tender C.3.8.
C.2.7	The arrangements for a compulsory briefing session are as stated in the Tender Notice and Invitation to Tender (T1.1). Tenderers must sign the attendance list in the name of the tendering entity. Addenda will be issued to and tenders will be received only from those tendering entities appearing on the attendance list
C.2.8	Seeking clarification Request clarifications at least 12 working days before the closing time.
C.2.9	Insurance No insurance is provided by the Employer.
C.2.10	Tenderers are required to state the rates and currencies in Rand
C.2.12	Alternative Offers Alternative tender offers will not be considered.

TENDER DATA

CLAUSE NUMBER	TENDER DATA
C.2.13.2	The tenderer is required to submit all returnable schedule as printed copy and in .pdf format (saved on a flash drive)
	Only the following needs to be submitted: Volume 3 – Printed copy and flash drive The following information has to be submitted in printed hard copy and flash drive: The 1st file in pdf format which contains: Scanned copy of Form of Offer (pdf) Scanned copies of all returnable schedules and attachments (pdf) Scanned copy of Pricing Schedule (pdf) A 2nd file in Excel format Completed pricing schedule Alternative offers will not be considered. In the event of any discrepancy between the contents of the electronically priced schedule and the electronically provided pricing schedule in pdf format, the contents of the provided pdf format shall be taken as the valid contents. For the information provided by the tenderer as part of his submission, e.g. rates, the signed print-out shall be taken as the valid submission.

TENDER DATA

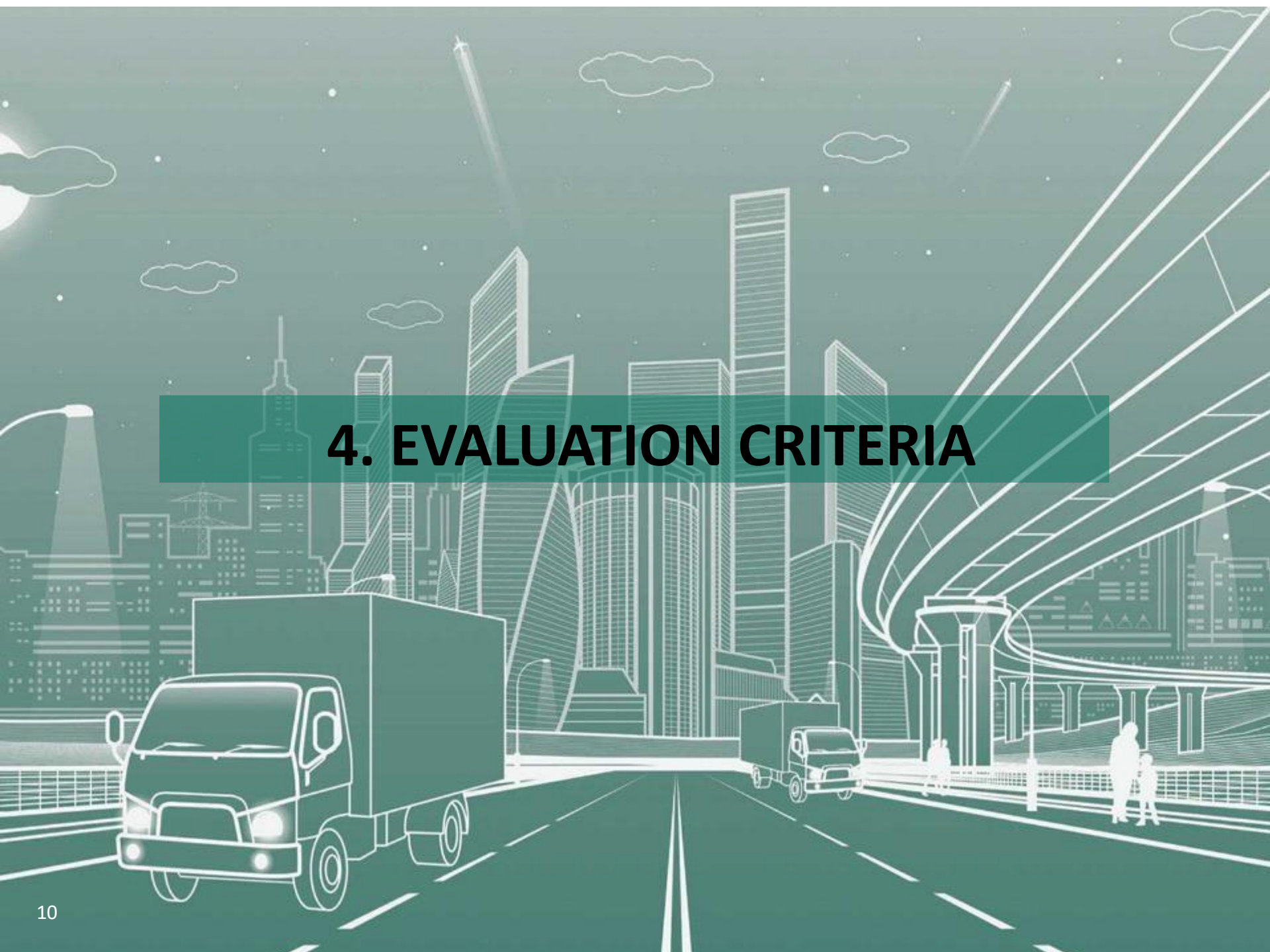
CLAUSE NUMBER	TENDER DATA
C.2.13.7	Place and seal the printed and bound hard copy and flash drive in an envelope clearly marked “TENDER” and bearing the Employer’s name, the contract number and description, the tenderer’s authorised representative’s name, the tenderer’s postal address and contact telephone numbers.
C.2.16 C.2.16.1	Clarification of tender offer after submission Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

TENDER DATA

CLAUSE NUMBER	TENDER DATA
C.3.4 C.3.4.1	Opening of tender submissions There will be public opening of tenders approximately 1 hour after tender closing, At the location of Tender box. Tender opening register will be made available to all bidders who submitted a bid.
C.3.7	Grounds for rejection and disqualification Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices. In the event of disqualification, the Employer may, at its sole discretion, claim damages from the tenderer and impose a specified period during which tender offers will not be accepted from the offending tenderer and, the Employer shall inform the National Treasury and the CIDB in writing.
C.3.8 C.3.8.2	Test for responsiveness Bidder has submitted bid on time Bidder has submitted bid with Completed in full and signed Form of offer

TENDER DATA

CLAUSE NUMBER	TENDER DATA
	Submission in tender box The Employer's address for delivery of tender offers and identification details to be shown on each tender offer package are: Location of tender box: SANRAL Eastern Region Office Physical address: 58 Van Eck Place, Mkondeni, Pietermaritzburg, 3204 Identification details: Place the tender offer and flash drive in a package marked with the tenderer's company name, the project number and description: CONTRACT: SANRAL S.004-005-2020/1R FOR: ISANDLWANA ROADS UPGRADE – PACKAGE 1 [UPGRADE OF PROVINCIAL ROAD P372] Tenders must be submitted during hours (09:00 to 16:00) Monday to Friday at the Employer's address. It is in the tenderer's interest to ensure that the delivery of the tender offer is recorded in the Employer's tenders received register and deposited in the tender box.



4. EVALUATION CRITERIA

CONDITIONS OF TENDER

The Evaluation Process for this tender will be as follows:

Step 1: Responsiveness

Step 2: Mandatory responsiveness

Step 3: Functional evaluation criteria

Step 4: Price and Specific goals

Note: Price and Specific Goal in the RFP refers to Step 5. Note this is step 4, no material impact thus no addendum required.

CONDITIONS OF TENDER

The Evaluation Process for this tender will be as follows:

Step 1 – Responsiveness

Tenderer must pass all criteria for the tender to be eligible for further evaluation :

- ✓ Bidder has submitted bid on time
- ✓ Bidder has submitted bid with Completed in full and signed Form of offer

NB: Tenderer shall also mean Bidder:

CONDITIONS OF TENDER

The Evaluation Process for this tender will be as follows: Tenderer will be eliminated for not meeting the above stated requirements

Step 2 – Mandatory

Tenderer must pass all criteria for the tender to be eligible for further evaluation :

- ✓ Bidder is registered with Central Supplier Database (CSD)
- ✓ Bidder has Valid Letter of Good Standing issued in accordance with the Compensation for Occupational Injuries and Diseases Act (COIDA).
- ✓ Bidder has attendant the compulsory briefing session.
- ✓ Lead Bidder is CIDB contractor grading of 8CE or higher (Emerging Contractors will not be acceptable)
- ✓ **X1Contract Director** has an active professional registration with Engineering Council of South Africa as Professional Engineer or Professional Technologist/ SACPCMP as Construction Manager/ Construction Project Manager & Minimum 15-year experience
- ✓ **X 1Contract Manager** has an active professional registration with Engineering Council of South Africa as Professional Engineer or Professional Technologist/ SACPCMP as Construction Manager/ Construction Project Manager & Minimum 10-year experience
- ✓ **1 X Construction Manager** has an active professional registration with Engineering Council of South Africa as Professional Engineer or Professional Technologist SACPCMP as Construction Manager/ Construction Project Manager and Minimum 10-year experience
- ✓ **1X Construction Health and Safety Officer (CHSO)** has an active registered as CHSO with SACPCMP Minimum 5-year experience

CONDITIONS OF TENDER

Step 3 – Functional evaluation criteria

Functionality is the terminology used to define the technical ability of the Tenderer, based on experience to deliver the required product in accordance with the specialized quality, reliability, and functionality. The functionality evaluation will be conducted by the Evaluation Committee which comprises of various skilled and experienced members from diverse professional disciplines.

The evaluation process will be based on functionality criteria. The criteria will be as follows: Points allocated for Functionality shall be evaluated in accordance with the criteria as listed below. Total Quality points allocated shall be 100. **Tenderer must score minimum score per each sub-criterion and an overall minimum threshold of 75 points out of 100 is required to be achieved for the tender to be eligible for further evaluation.**

REFER TO PAGE 13 OF THE RFP

CONDITIONS OF TENDER

Step 4 – Price and Specific goals

This is the final stage of the evaluation process and will be based on the PPPFA preference point system. Bidders will be ranked by applying the preferential point scoring 90/10 for bids with the rand value above R50 million. A maximum of 90 points is allocated for price based on the following formulae:

$$PS = 90 (1 - \frac{Pt - Pmin}{Pmax - Pmin})$$

Where:

Ps = Score for the Bid under consideration

Pt = Price of Bid under consideration

Pmin = Price of lowest acceptable Bid

SANRAL will score specific goals out of 10. If a bidder fails to meet the Specific goals as outlined on the table below and to submit proof, the bidder will score zero (0) out of 10. Sanral will not disqualify the bidder. In terms of this bid/tender, Preference points will be awarded in terms of the table below:

CONDITIONS OF TENDER

Step 4 – Price and Specific goals

Specific goals	Criteria	10 points		20 points	
		Point allocation	Maximum points	Point allocation	Maximum points
B-BBEE Level	Level 1	10.00	10.00	20.00	20.00
	Level 2	9.00		18.00	
	Level 3	6.00		14.00	
	Level 4	5.00		12.00	
	Level 5	4.00		8.00	
	Level 6	3.00		6.00	
	Level 7	2.00		4.00	
	Level 8	1.00		2.00	
	Non-compliant contributor	0.00		0.00	

5. TENDERING PROCEDURES

: RETURNABLE SCHEDULES

SANRAL



BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

RETURNABLES ANNEXURES

The bidder must complete and submit the following returnable documents:

FORM 1A	SBD 1 FORM
FORM A2:	CERTIFICATE OF AUTHORITY FOR SIGNATORY
FORM A3:	CERTIFICATE OF AUTHORITY FOR JOINT VENTURES (WHERE APPLICABLE)
FORM A4:	DECLARATION OF TENDERER'S CURRENT STATUS OF ANY DEBT OUTSTANDING TO SANRAL
FORM A5:	DECLARATION FORM - MANAGEMENT OF DOMESTIC PROMINENT INFLUENTIAL PERSONS, FOREIGN PROMINENT PUBLIC OFFICIALS AND FOREIGN INFLUENTIAL NATIONALS
FORM A6	CERTIFICATE OF FRONTING PRACTICES
FORM A7	REGISTRATION ON NATIONAL TREASURY CENTRAL SUPPLIER DATABASE
FORM A8:	DECLARATION OF TENDERER'S LITIGATION HISTORY
FORM A9:	CERTIFICATE OF TAX COMPLIANCE STATUS

RETURNABLES ANNEXURES

The bidder must complete and submit the following returnable documents:

FORM A10:	SCHEDULE OF DEVIATIONS OR QUALIFICATIONS BY TENDERER
FORM A11 (SBD4):	BIDDER'S DISCLOSURE
FORM A12 (SBD6.1):	PREFERENCING SCHEDULE - TENDERER'S B-BBEE VERIFICATION
FORM A13:	POPIA
FORM A14:	CERTIFICATE OF PERMISSION TO CONDUCT DUE DILIGENCE INVESTIGATION
FORM A15:	DECLARATION OF TENDERER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES
FORM A16:	SCHEDULE OF ADDENDA TO TENDER DOCUMENTS
FORM A17:	CERTIFICATE OF INSURANCE COVER

RETURNABLES ANNEXURES

The bidder must complete and submit the following returnable documents:

FORM A18:	TENDERER'S REGISTERED FINANCIAL SERVICE PROVIDER LETTER AND BANK DETAILS
FORM A19:	SCHEDULE OF CURRENT COMMITMENTS
FORM A20:	CERTIFICATE OF COMPLIANCE WITH COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT,1993
FORM A21	REGISTRATION WITH CIDB
FORM A22:	DECLARATION OF TENDERER'S FINANCIAL SUBMISSION
FORM A23:	COMPLIANCE WITH LABOUR LEGISLATION DECLARATION

7. PROJECT DETAILS

C4 - DESCRIPTION OF WORKS

SANRAL



BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

LOCALITY



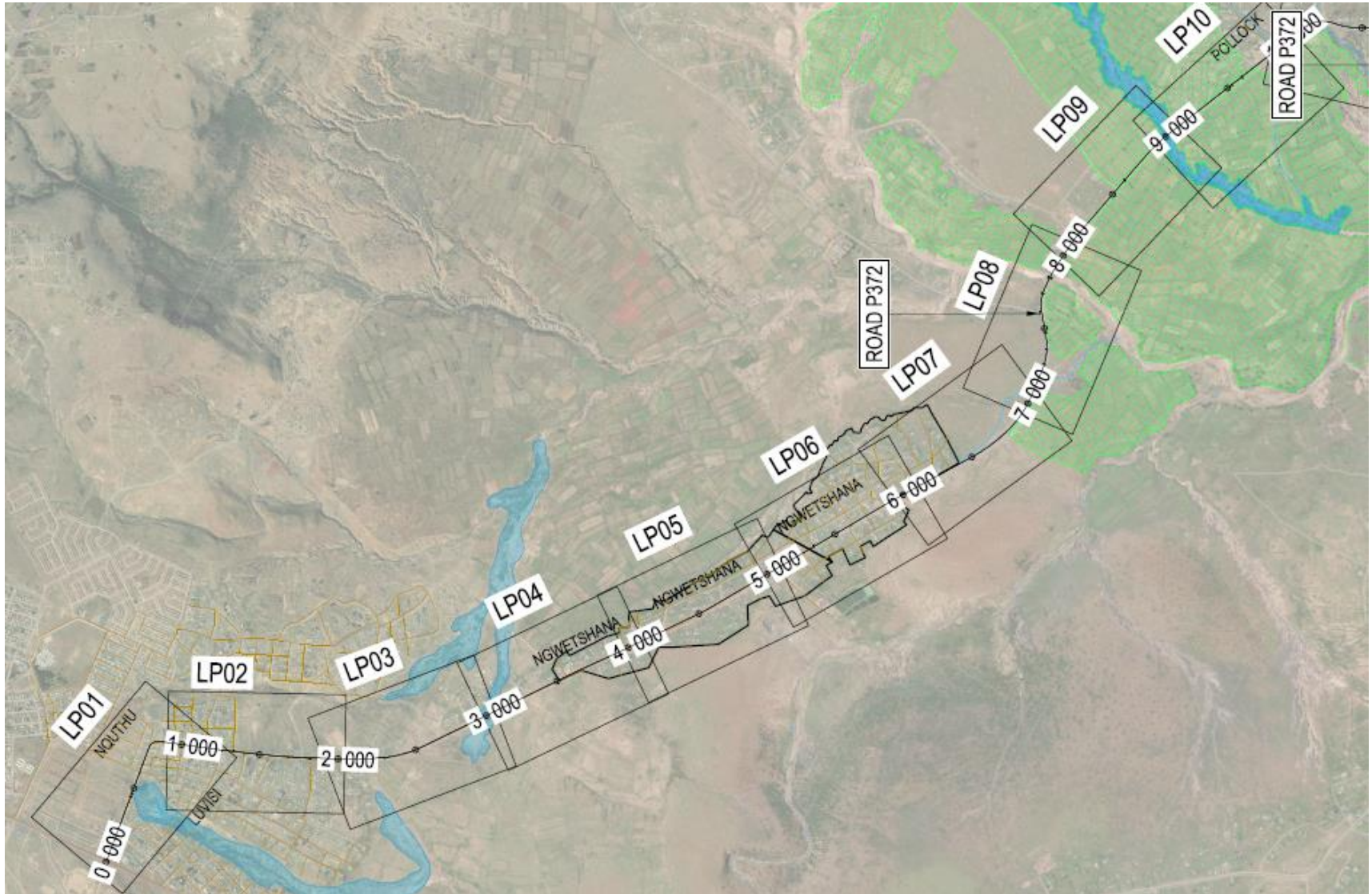
LAYOUT



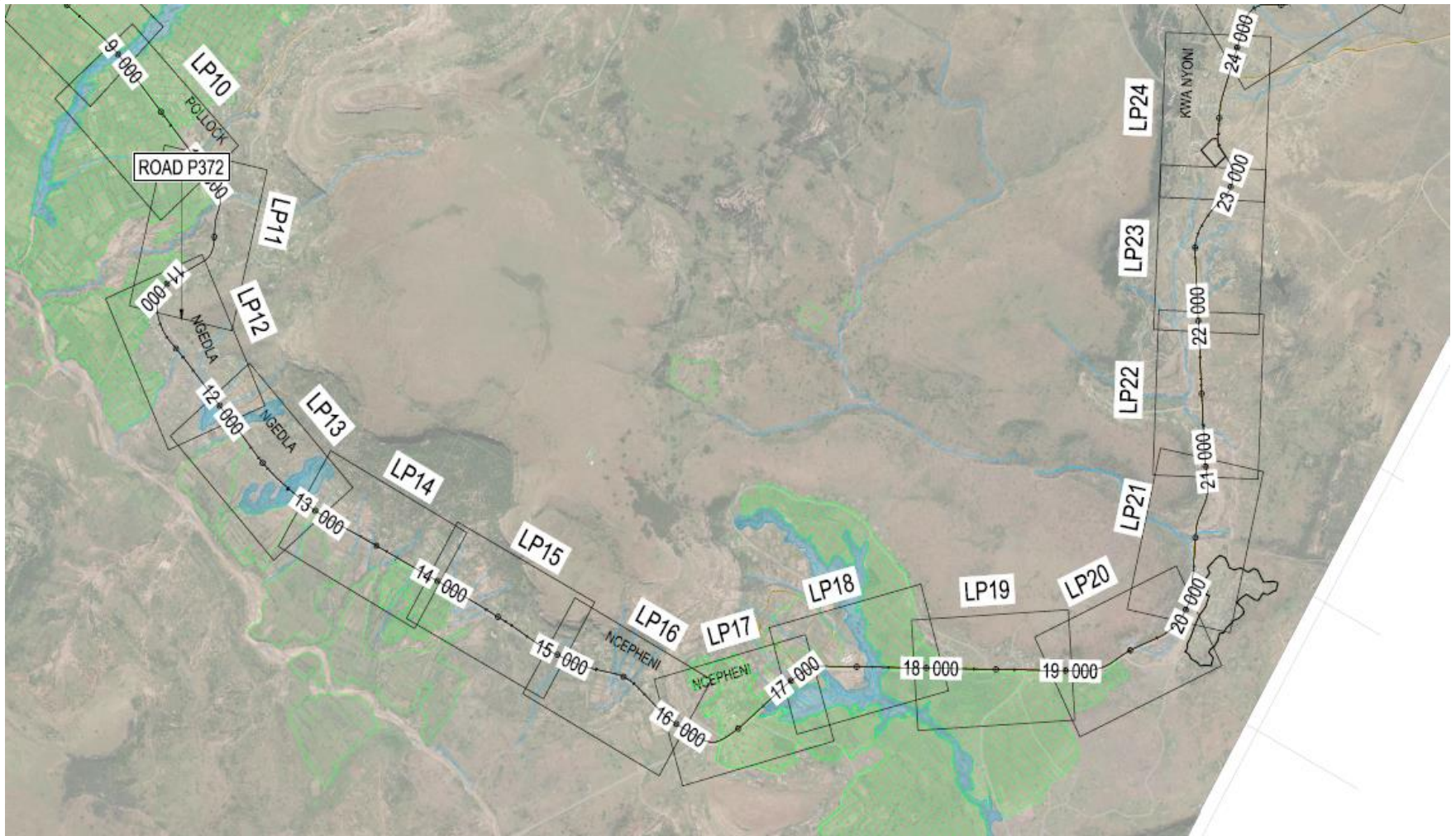
LAYOUT EXTENT



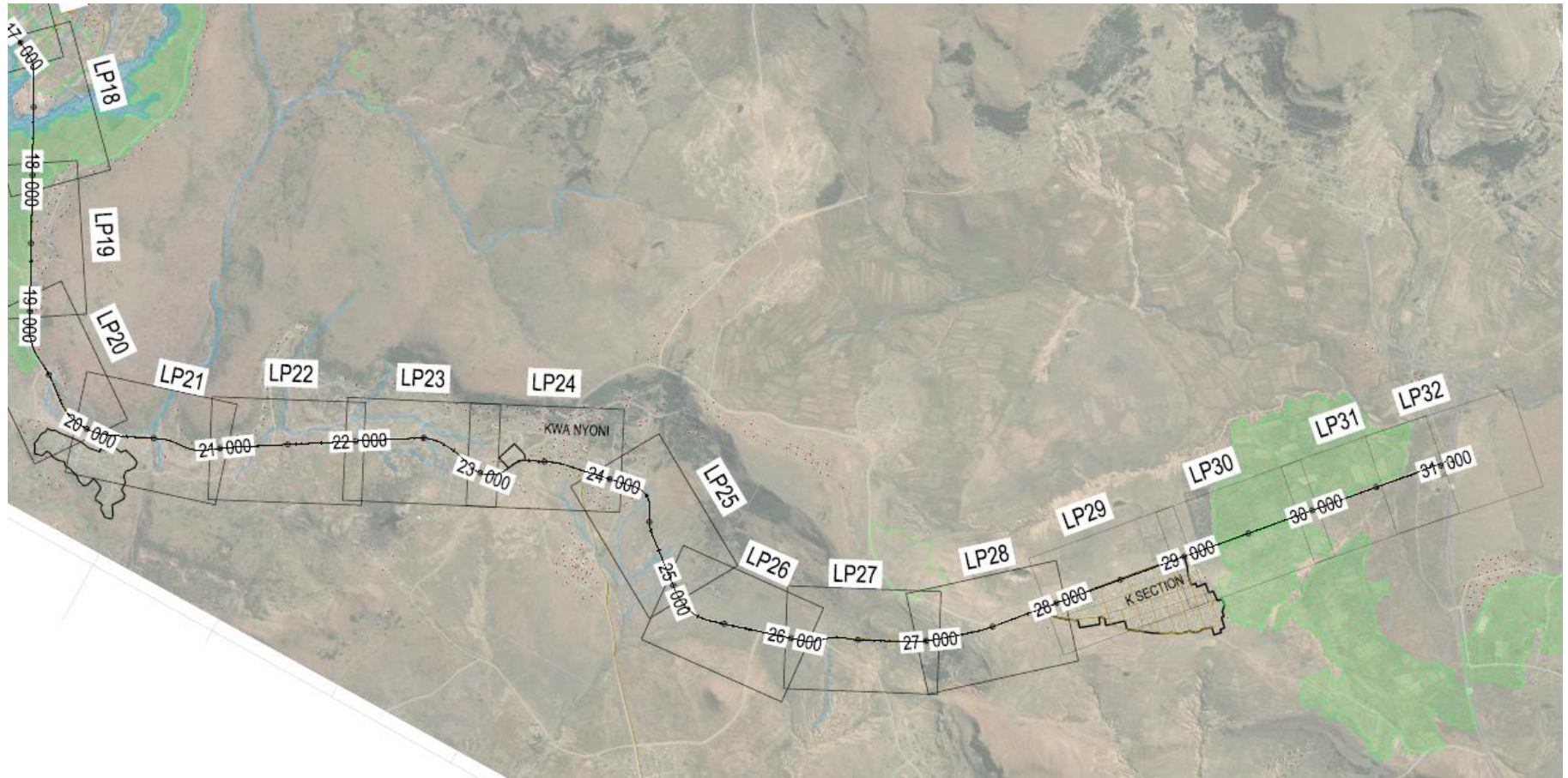
LAYOUT



LAYOUT



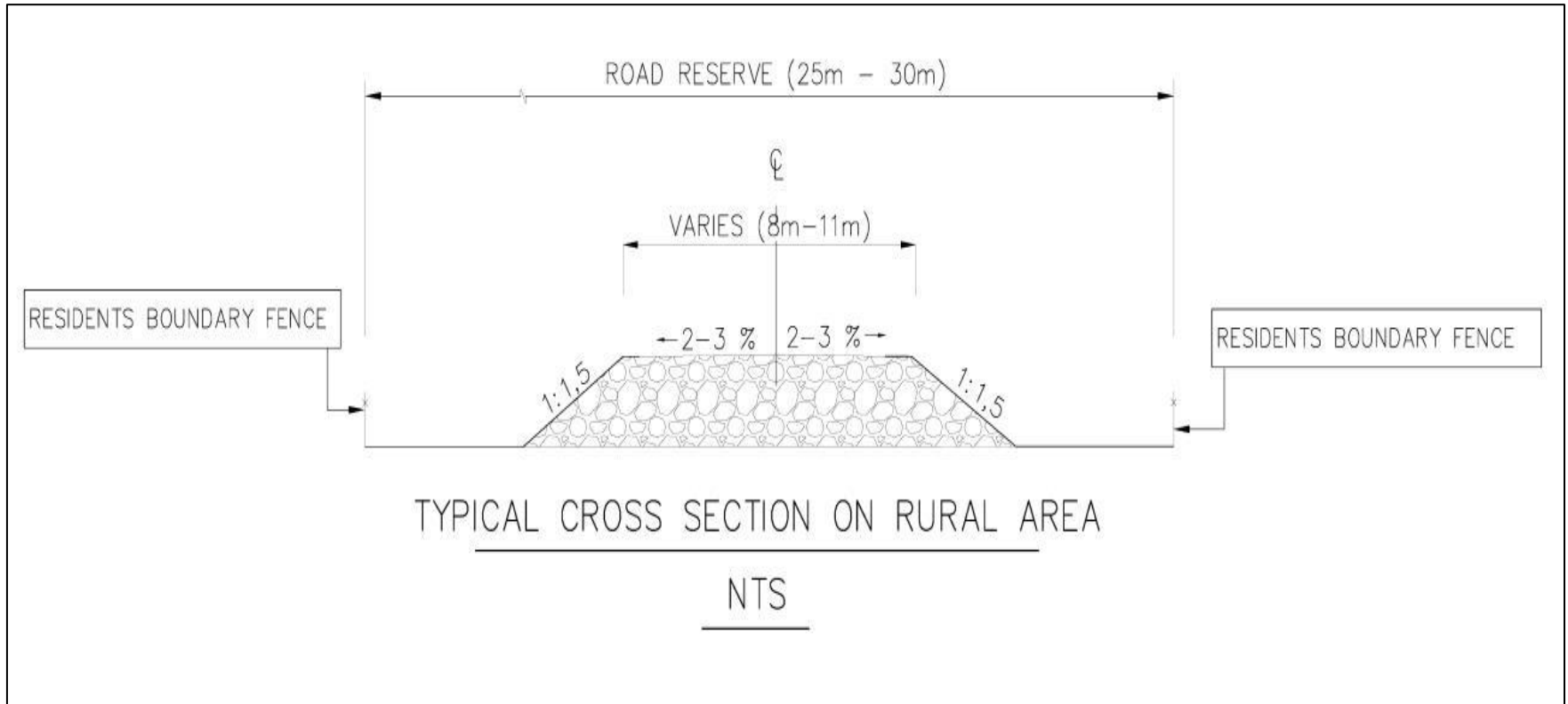
LAYOUT





EXISTING ROAD

PART C4: SITE INFORMATION – EXISTING ROAD



TYPICAL ROAD CROSS SECTION

P372

(Urban Rural / Area)

PART C4: SITE INFORMATION – EXISTING ROAD



START OF PROJECT
R68 & P372 Intersection (Luvisi Village)
(Looking South)

PART C4: SITE INFORMATION – EXISTING ROAD



GENERAL ROAD
Cross Sectional Profile
G8/G9 Wearing Course

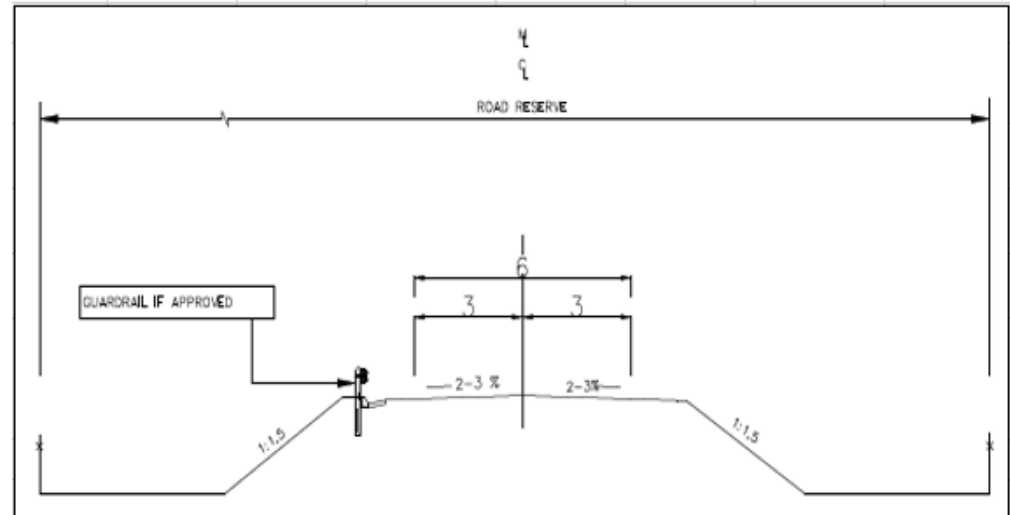
PART C4: SITE INFORMATION – EXISTING ROAD



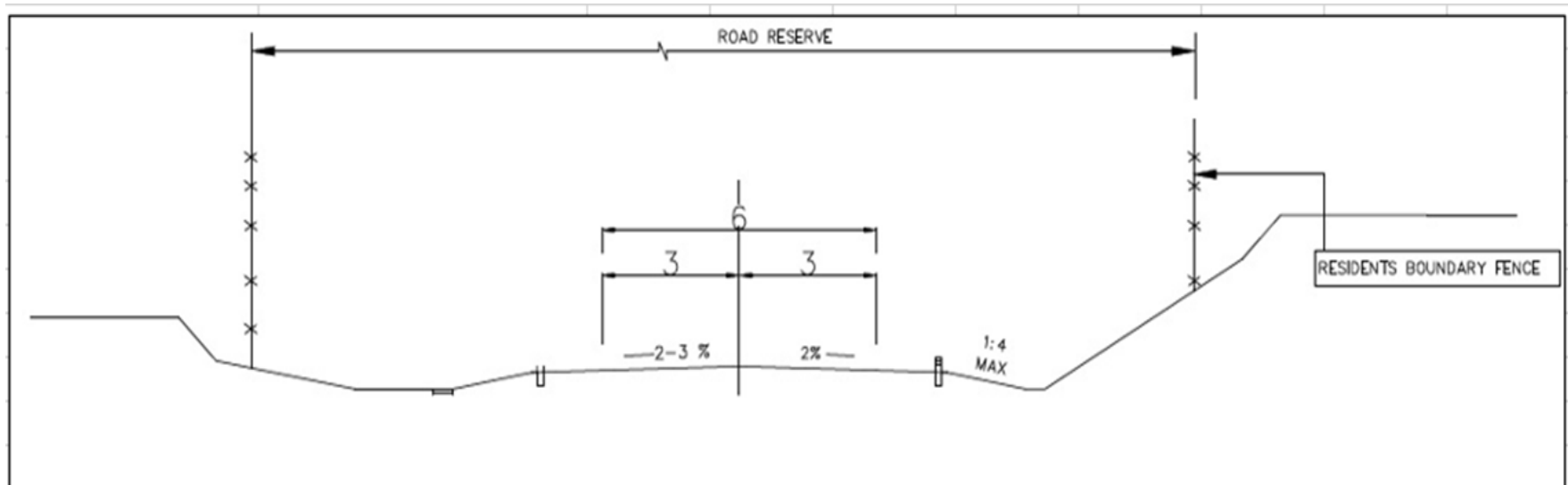
END OF PROJECT
R68 & P372 Intersection (Ngwebeni Village)
(Looking South West)

PART C4: SITE INFORMATION – EXISTING ROAD OVERVIEW

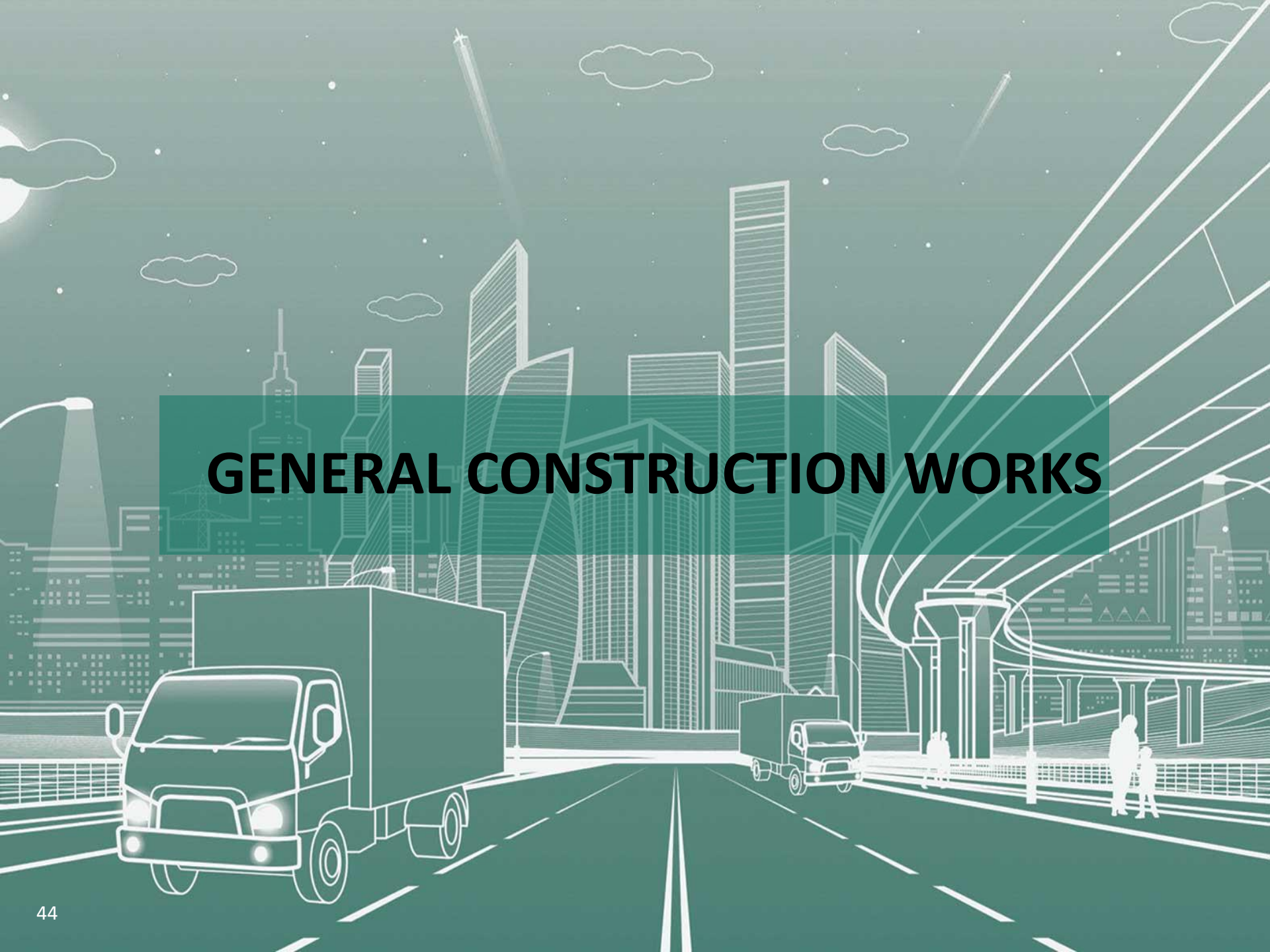
Description	Current
Project Limits	R68 Km 0 from Luvisi Village to R68 Km 32
TRH4 Road Category	2 Lane Single Carriageway
Design Speed	60km/h to 80km/h
Level of Service	D
Cross Section	Main Carriageway $\pm 12\text{m}$ - Shoulder: 1m to 2m - Lanes: 2 x 3.5m



Cross Section: Rural Area



Cross Section: Urban Area



GENERAL CONSTRUCTION WORKS

GENERAL CONSTRUCTION WORKS

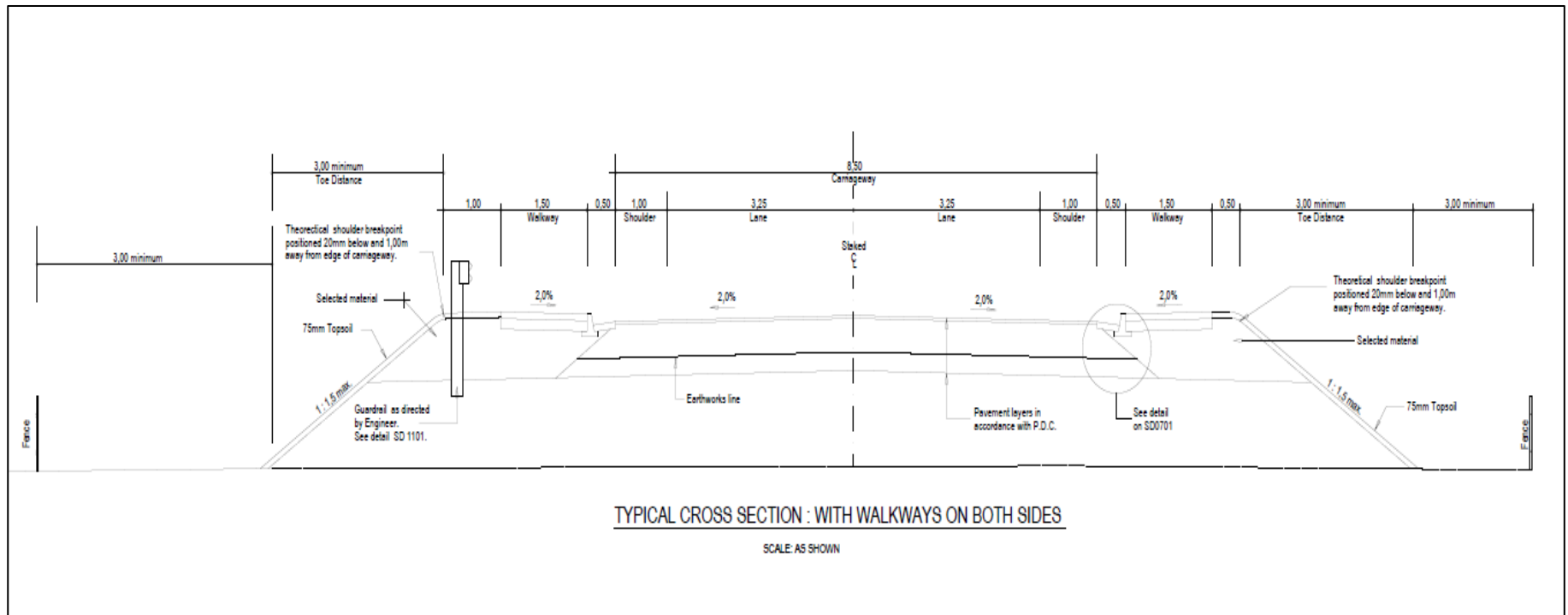
General Construction Works are as follows:

Works includes the listed below, but may not be limited to this list:

- Traffic accommodation
- Mass Earthworks (Cut and Fill)
- Earthworks (Pavement Strengthening and Upgrading)
- Prime coat & surfacing
- Installation of road signs
- Drains, Culverts and wingwalls
- Kerbs, channel and concrete lined drains, Stone pitching and erosion protection
- Non-Structural Gabions
- Road Marking and road studs
- Guide blocks and Kilometre markers
- Road Restraint Systems
- Landscaping and planting of plants
- Finishing the road and road reserve and treating old roads
- Construction of pedestrian walkways and bus bays

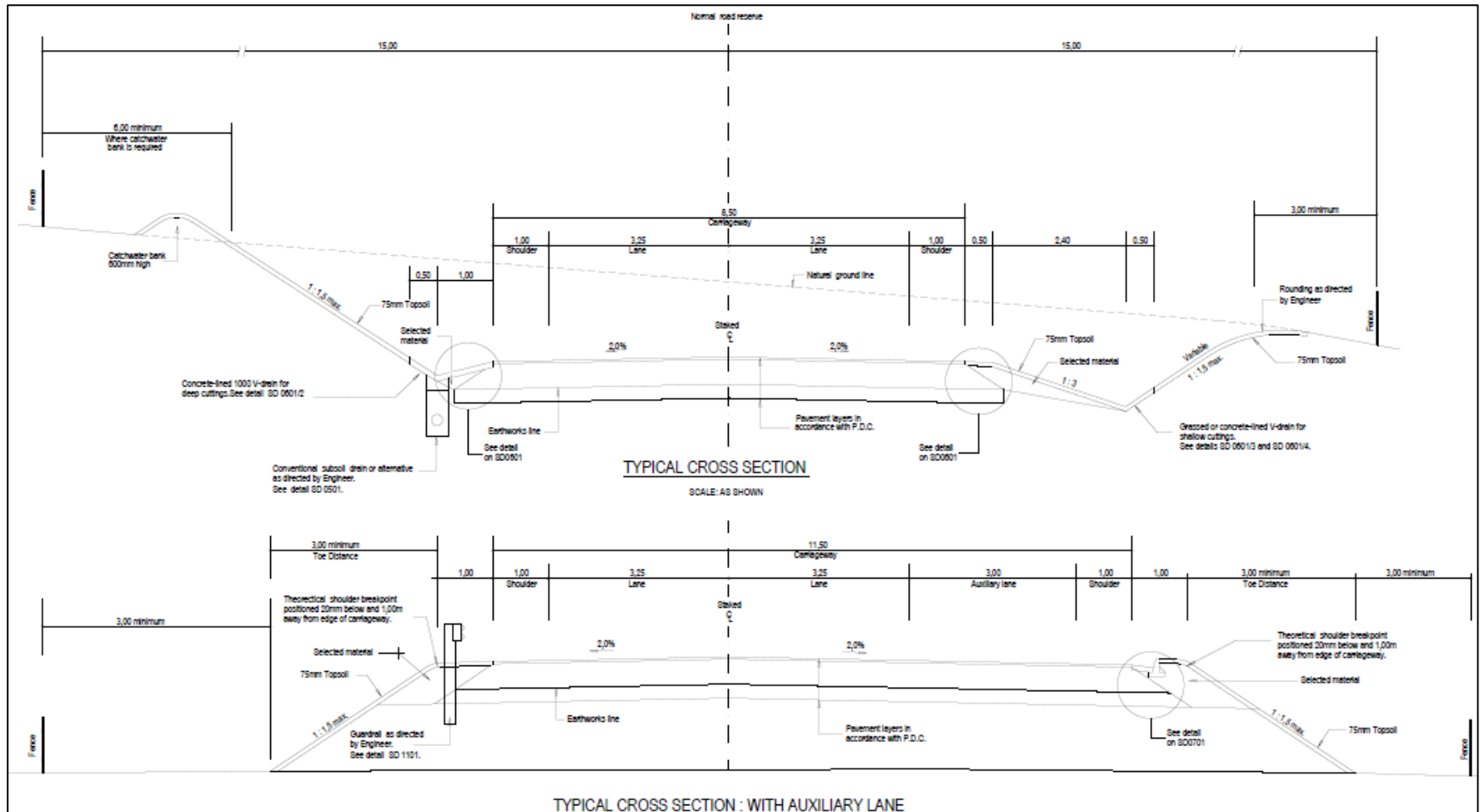
GENERAL CONSTRUCTION WORKS

Typical Cross Section – Urban Section of Road



GENERAL CONSTRUCTION WORKS

Typical Cross Section – Rural Sections of Road





PAVEMENT DESIGN

EXISTING PAVEMENT, PAVEMENT HISTORY & PAVEMENT MAINTENANCE

EXISTING PAVEMENT STRUCTURE

Wearing Course	150mm Thick, Silty Sandy G8 Material
Upper Layer	250mm of silty clayey Sand Material (G9)
Lower Layer	600mm of Slight Moist, Medium Dense, Silty Clay. Residual Material

PAVEMENT HISTORY

Not Available. Not Applicable

PAVEMENT MAINTENANCE

Re-gravelling, Patch Gravelling, Grading on an As and When Required

PAVEMENT DESIGNS - APPROACH

The new proposed approach allows for providing a road category E with a design structural capacity of ES1. The structural design period is 15 years.

The design approach included:

- South African Mechanistic-empirical Design Method (SAMDM)

The design parameters (TRH 24) used in the pavement design are as follows:

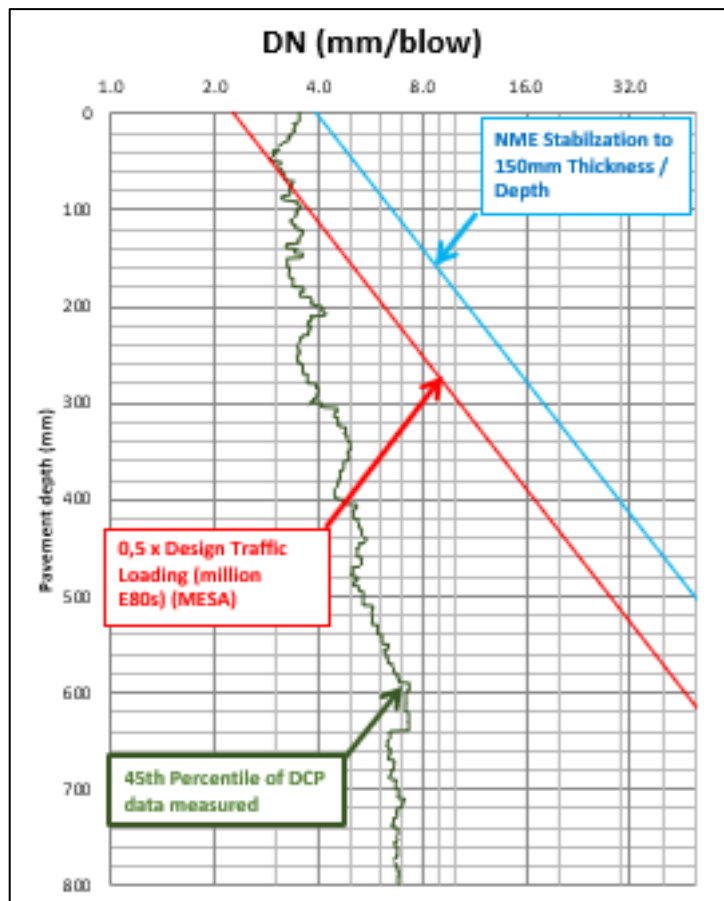
- Road Category: Category E
- Structural design life: 15 years
- Design traffic loading: 0,5 MESA
- Climatic region: Wet

PAVEMENT DESIGNS REFERENCE – TRH24

Design traffic Loading	Typical road Category	Recommended Pavement structure (Material classification - draft TRH14 (1987) - Layer thicknesses in mm)				Alternative NME design Pavement structure with naturally available (in-situ or close borrow-pits) materials stabilised with a material compatible New (3rd Millinium) Modified Emulsion (NME) meeting the mininum specifications for the stabilised material class			
		(draft TRH4)* Granular Base (Dry)	(draft TRH4)* Granular Base (Wet)	(draft TRH4)* Hot-Mix Asphalt Base layer (BC)	(draft TRH4)* Cemented Base				
ES30 (NOT APPLICABLE TO Upgrading of unpaved roads)	A*	40 A*	50 A*	25 A*		20 mm Cape Seal (CS*)/ Double seal / 30 mm Aspahalt*			
		150 G1*	150 G1*	120 BC		150 NME1*	150 NME1*	150 NME1*	
		125 C3*	200 C3*	200 C3*		100 NME3*	150 NME3*	150 NME3*	
		125 C3*	200 C3*	200C3*		150 G6*	150 G7*	200 G7*	
		G7*	G7*	G7*		G9/G8*	G9/G8*	G10*	
ES10 NOT APPLICABLE TO LVRs	A/B*	40 A*	40 A*	40 A*		20 mm Cape Seal (CS*)/ Double seal / 25 mm Aspahalt*			
		150 G2*	150 G1*	90 BC		100 NME2*	100 NME2*	150 NME2*	
		125 C3*	150 C3*	150 C3*		100 NME4*	150 NME4*	150 NME4*	
		125 C3*	150 C3*	150 C3*		150 G6*	150 G7*	G10*	
		G7*	G7*	G7*		G9/G8*	G9/G8*		
ES3.0	B/C*	CS* / 30 A*	CS* / 30 A*	30 A*	CS* / 40 A*	Cape Seal (10/14/20 CS*)/ Double seal / 25 mm Aspahalt*			
		150 G3*	150 G1*	80 BC	125 C3*	100 NME4*	150 NME4*	200 NME4*	
		150 C4*	150 C3*	200 C4*	200 C4*	150 G6*	150 G7*	G10*	
		G7*	G7*	G7*	G7*	G9/G8*	G9/G8*		
<ES1.0	C* D / E	CS* / 40 A*	CS* / 40 A*		CS* / 40 A*	Cape Seal (10/14/20 CS*)/Double seal / Slurry seal			
		125 G4*	125 G2*		125 C3*	100 NME4*	100 NME4*	150 NME4*	
		125 C4*	150 C4*		125 C4*	100 G6*	150 G7*		
		G7*	G7*		G7*	G9/G8*	G9/G8*	G10*	

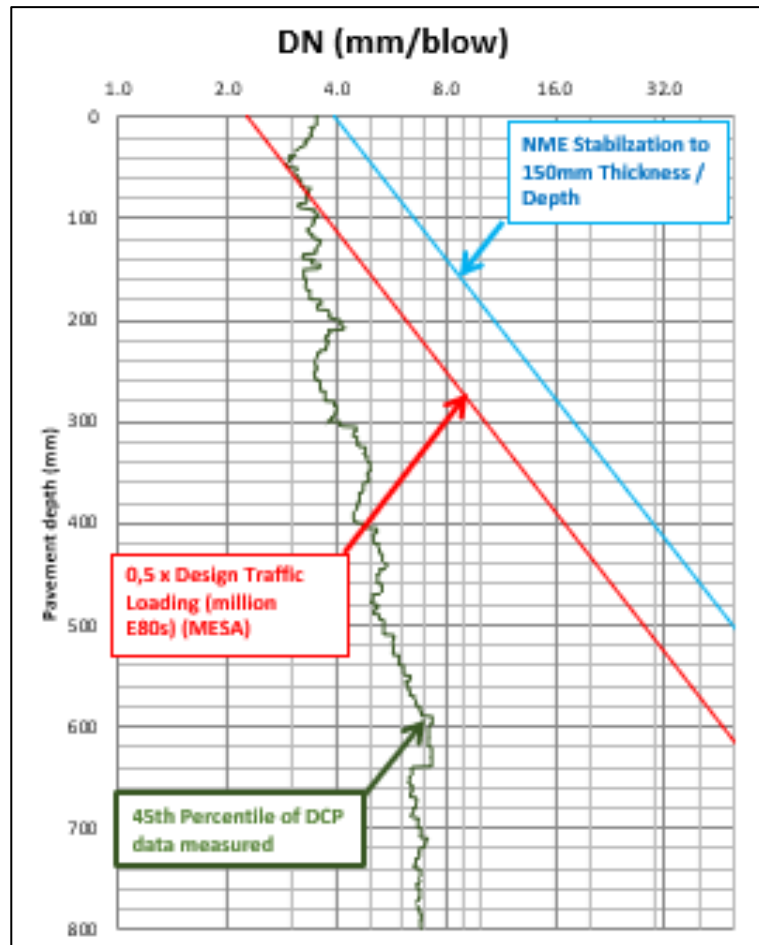
PAVEMENT DESIGNS FOR ALL PARTS OF THE WORKS

Strengthening of Section 1: Km 0+000 – Km10+450:



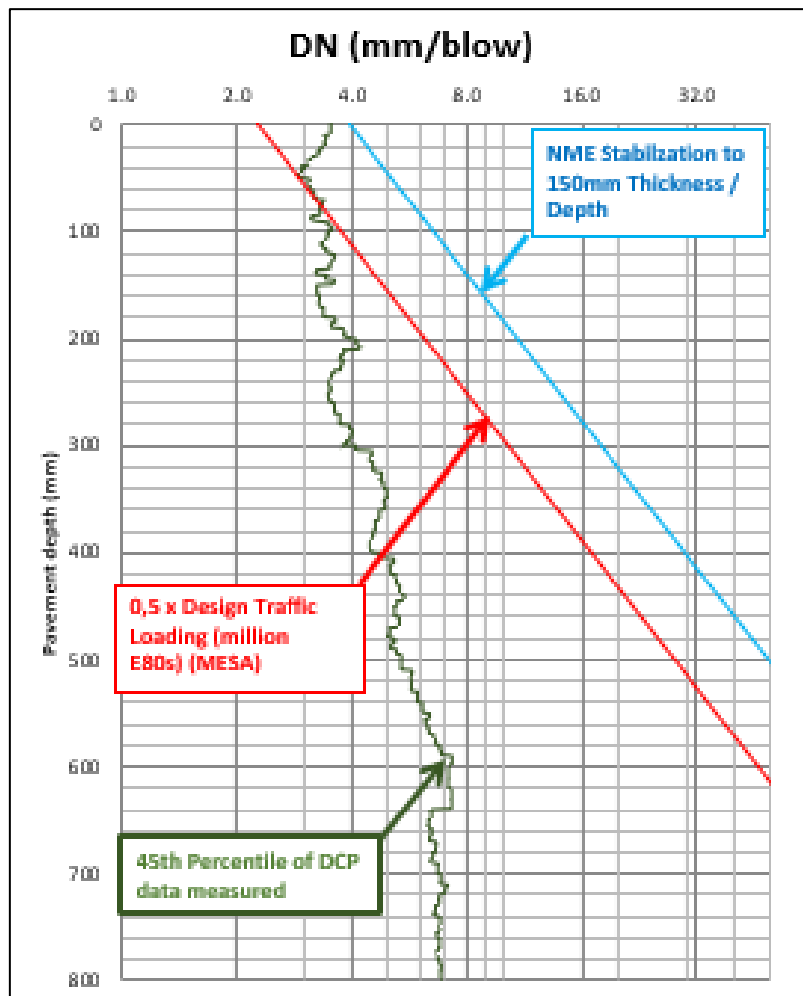
PAVEMENT DESIGNS FOR ALL PARTS OF THE WORKS

Strengthening of Section 2: Km10+450 – Km15+900 :



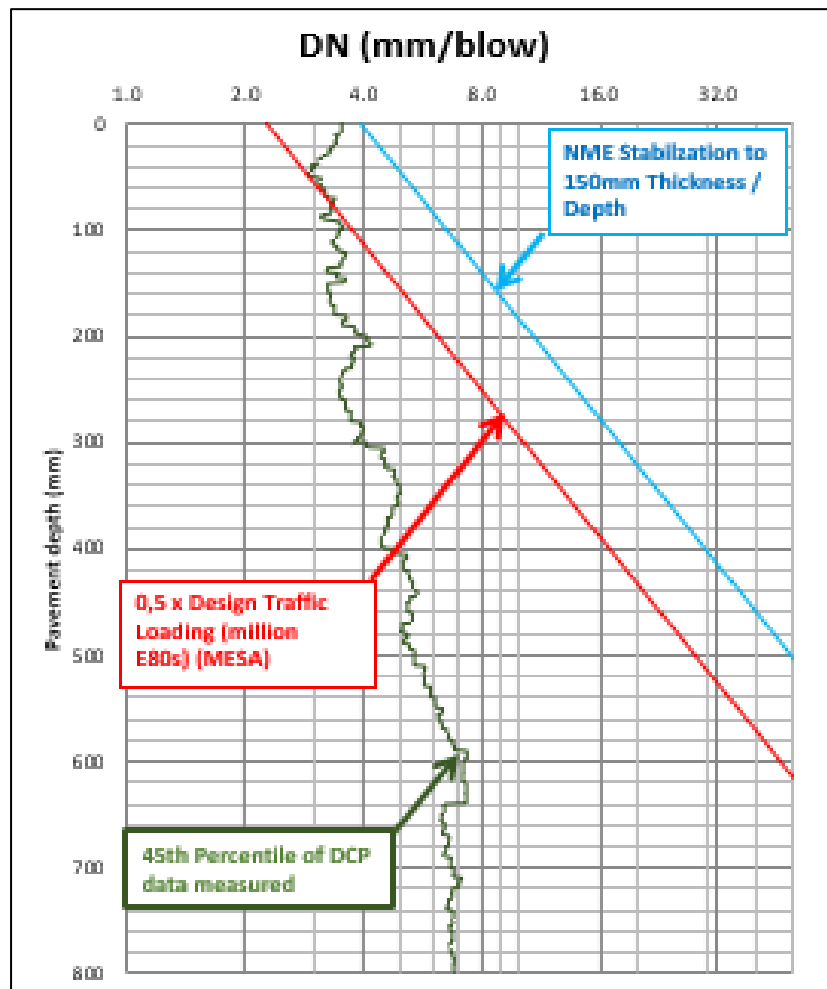
PAVEMENT DESIGNS FOR ALL PARTS OF THE WORKS

Strengthening of Section 3: 15+900 – Km22+400:



PAVEMENT DESIGNS FOR ALL PARTS OF THE WORKS

Strengthening of Section 4: Km 22+400 – km31+400:

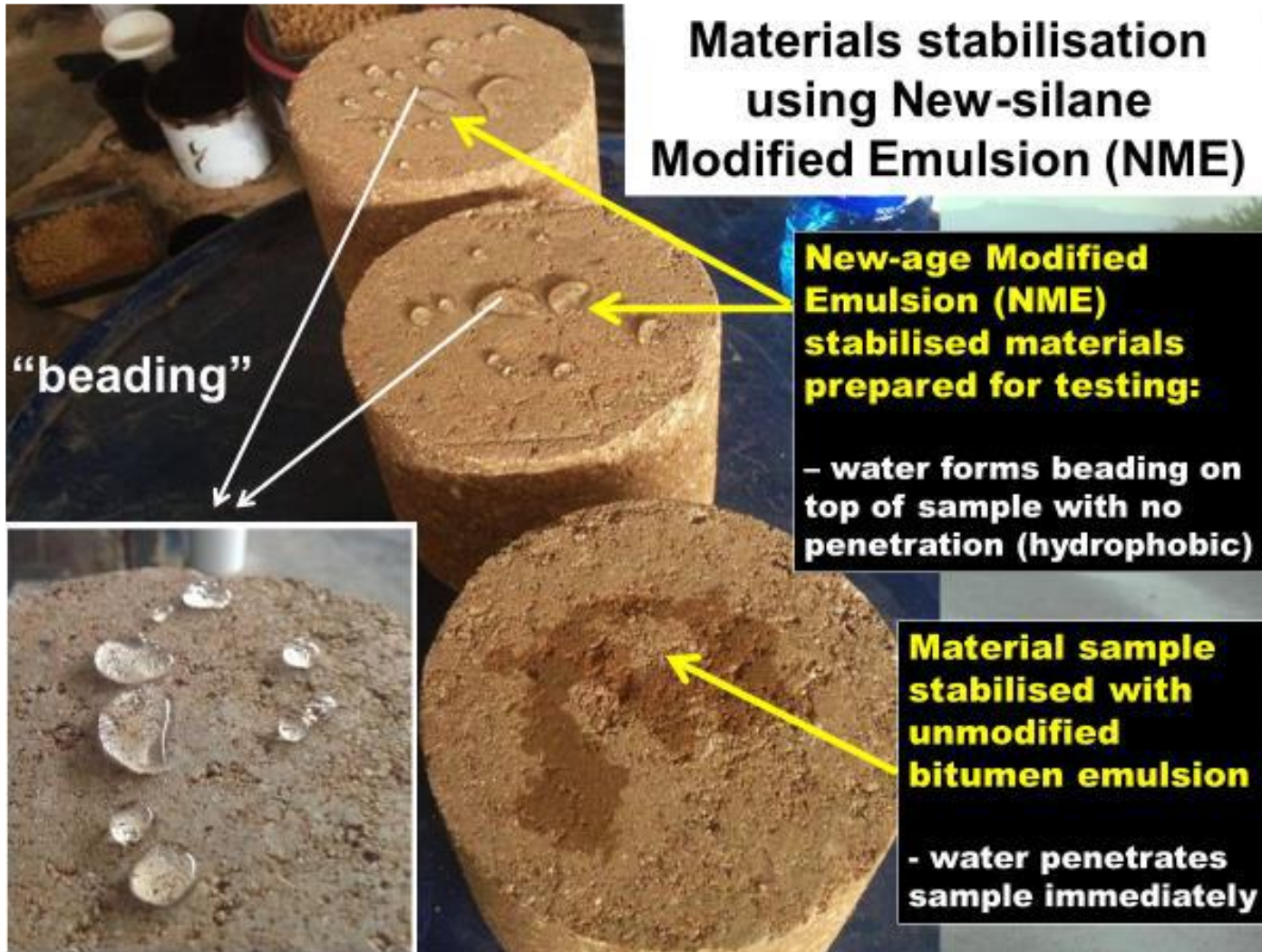


GENERAL PAVEMENT UPGRADE ALL PARTS OF THE WORKS

Pavement Upgrading strategy for P372:

Existing Pavement			New Proposed Pavement Upgrade		
Existing Layers / Pavement	Wearing Course	150mm G8	Pavement Upgrade	Surface	14mm Cape Seal
	Upper Layer	250mm G9		Base	150mm NME Stabilized to 97% MDD (Imported G5A)
	Lower Layer	Insitu-Subgrade (Clayey - Residual Material)		Sub-base	200mm Rip and Re-compact Insitu to 95% MDD
			200mm Depth		

GENERAL PAVEMENT UPGRADE – NME STABILIZED





ROAD DRAINAGE

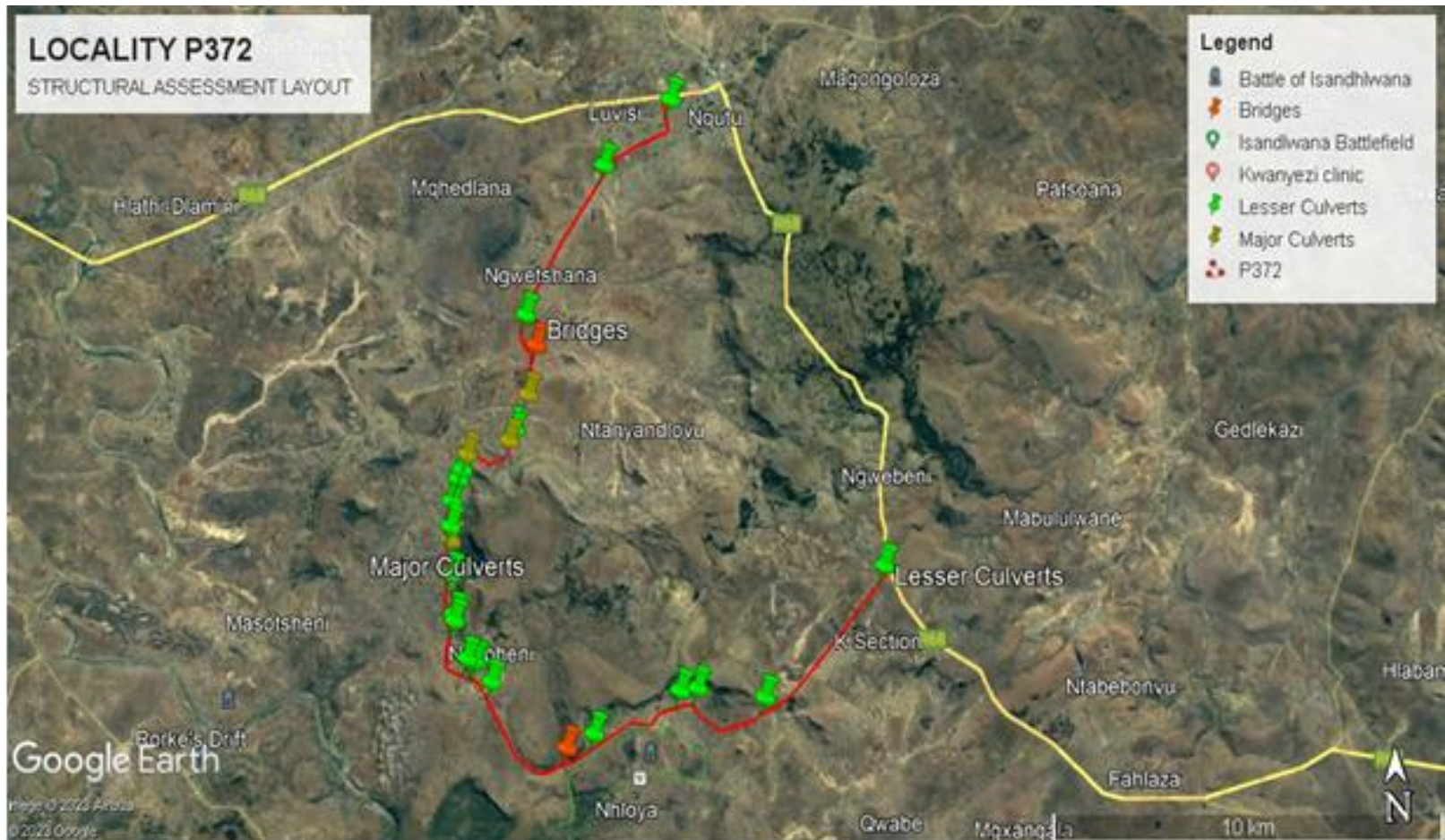
STORMWATER: CROSS DRAINAGE STRUCTURES

Existing Cross Drainage Structure



STORMWATER: CROSS DRAINAGE STRUCTURES

Existing Cross Drainage Structure



STORMWATER: CROSS DRAINAGE STRUCTURES

Existing Cross Drainage Structure (Cont...)

Catchment No.	Existing Drainage Structures	Km	Required Capacity Analysis / Upgrade	New Design BMS Classification
1	Low level River Crossing	30.81	2 x 1.5 m dia. PC	Lesser Culvert
2	None	26.310	2 x 1.2 m dia. PC	Lesser Culvert
3	None	24.308	2 x 1.2 m dia. CP	Lesser Culvert
4	None	23.845	2 x 1.2 m dia. CP	Lesser Culvert
5	0.22 m dia. Armco pipe	21.295	2 x 1.8 m dia. CP	Lesser Culvert
6	Bridge	20.500	-	-
7	None	17.610	2 x 1.5 m dia. CP	Lesser Culvert
8	None	17.085	1 x 1.2 m dia. CP	Lesser Culvert
9	None	16.995	1 x 0.6 m dia. CP	Lesser Culvert
10	None	16.880	2 x 1.2 m dia. CP	Lesser Culvert
11	1 x 1.7 m dia. Armco Pipes	15.590	1 x 1.5 m dia. PC	Lesser Culvert
12	1 x 2.3 m dia. Armco Pipes	15.435	1 x 1.5 m dia. PC	Lesser Culvert
12.1	2 x 1.2 m dia. Armco Pipes	14.245	2 x 1.5 m dia. PC	Lesser Culvert
13	1 x 2.5 m dia. Armco Pipe	13.657	1 x 3m dia. PC	Major Culvert

STORMWATER: CROSS DRAINAGE STRUCTURES

Existing Cross Drainage Structure (Cont...)

Catchment No.	Existing Drainage Structures	Km	Required Capacity Analysis / Upgrade	New Design BMS Classification
14	1 x 0.6 m dia. Pipe Culvert	13.657	2 x 0.6 m dia. CP	Lesser Culvert
15	2 x 1,15 m dia. Pipe Culvert	12.755	2 x 1.2 m dia. CP	Lesser Culvert
16	2 x 0.85 m dia. Pipe Culvert	12.207	2 x 1.5 m dia. CP	Lesser Culvert
17	2 x 0.85 m dia. Pipe Culvert	12.072	2 x 1.2m dia. CP	Lesser Culvert
18	1 x 0.85 m dia. Pipe Culvert	11.953	2 x 1.05 m dia. CP	Lesser Culvert
19	2 x 1.2 m dia. Armco Pipes	11.580	1 x 2.4 m dia. PC	Major Culvert
20	1 x 2.3 m dia. Armco Pipes	10.224	1 x 2.4 m dia. PC	Major Culvert
21	1 x 1.1 m dia. Concrete Pipe	9.850	2 x 1.5 m dia. PC	Lesser Culvert
22	1 x 2.2 m dia. Armco Pipe	9.020	2 x 2.4 m dia. PC	Major Culvert
23	2 x 5.75 m dia. Armco Pipe	7.838	5 x (4 x 3) m dia. PC	Bridge
24	1 x 0.85 m dia. Pipe Culvert	7.075	2 x 1.5 m dia. CP	Lesser Culvert
25	1 x 1.2 m dia. Pipe Culvert	2.950	2 x 1.2 m dia. CP	Lesser Culvert
26	3 x 0.6 m dia. Pipe Culvert	0.462	2 x 1.5 m dia. PC	Lesser Culvert

STORMWATER: ROAD SIDEDRAINS

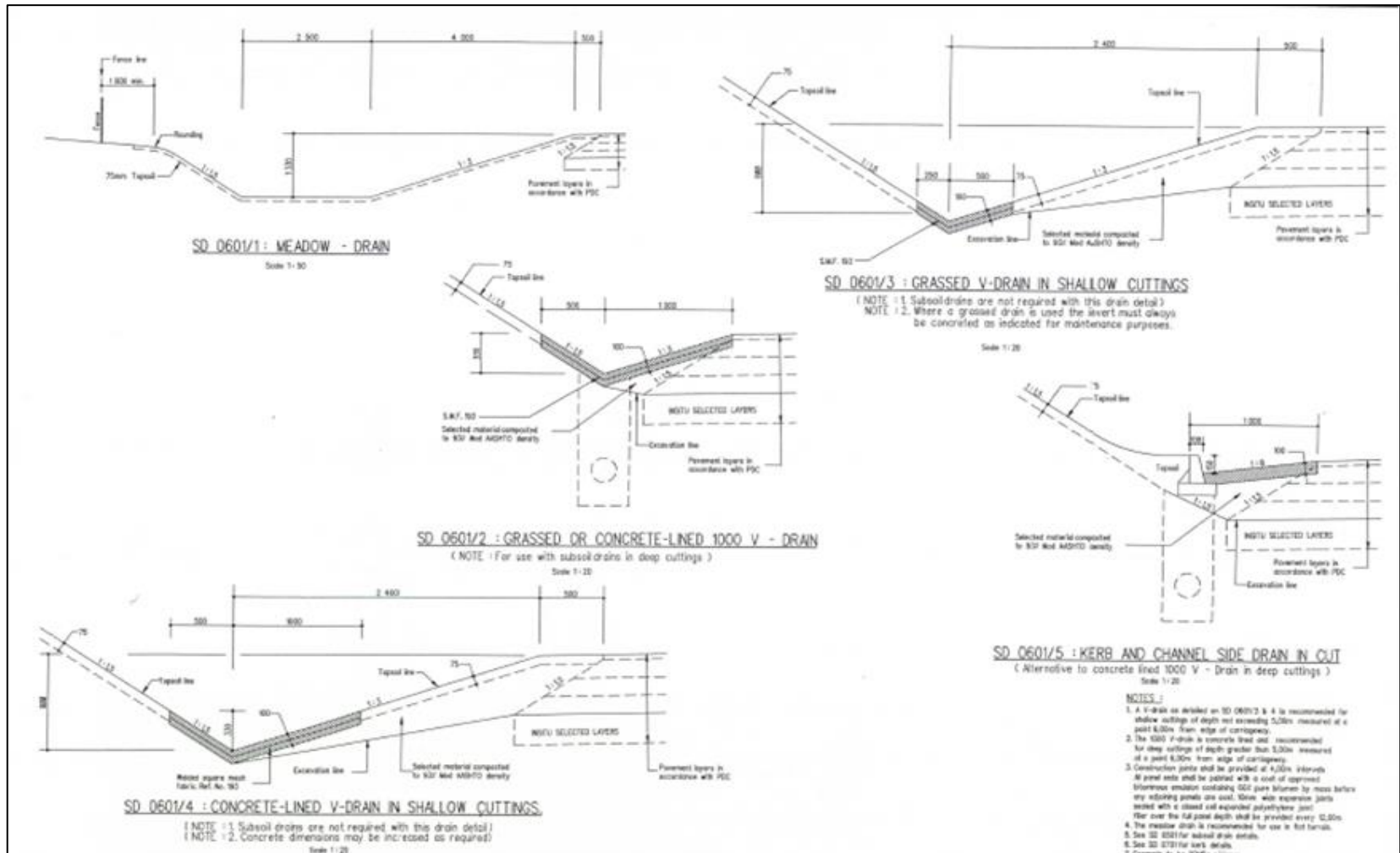
Road side drainage infrastructure to be implemented along P372:

The drainage infrastructure to be implemented along P372 are as shown in the layout plans and will comprise of the following drainage elements:

- Kerb and channel as per the DOT Standard Detail SD 0601/5 will be constructed along the fill sections from chainage 0 – 1815 m. Kerb inlets to be installed in areas of high surface run off flow depths and on low points.
- The spacing for the between outlets should not exceed:
 - ✓ 200 m for side channels and
 - ✓ 300 m for channels above cutting.
- Concrete lined drains as per the DOT Standard Detail SD0601/2 and SD0601/4. The concrete lined drains as per SD0601/2 will be utilized along the deep cuts See BELOW Figure - SD0601 Extract
- The concrete lined drain as per SD0601/4 will be utilized along the shallow cuts.
- Slope tie ins to the edge of the drains will be 1:15 along the embankment edge and 1:3 along the road edge.
- Concrete lined drains will tie into pipe culverts by either shaping the drain into the culvert inlet or to a grid inlet tying into the crossing pipe and drained towards the low point.
- All outlet structures will have sufficient erosion protection control in the form of reno-mattresses and dissipaters.

STORMWATER: ROAD SIDEDRAINS

Road side drainage infrastructure Standard Extracts:



Road side drainage infrastructure Standard Extracts (Cont....):



STORMWATER: GENERAL EXISTING ROAD DRAINAGE PHOTOS



GEOLOGY, TOPOGRAPHY & CLIMATE

SANRAL

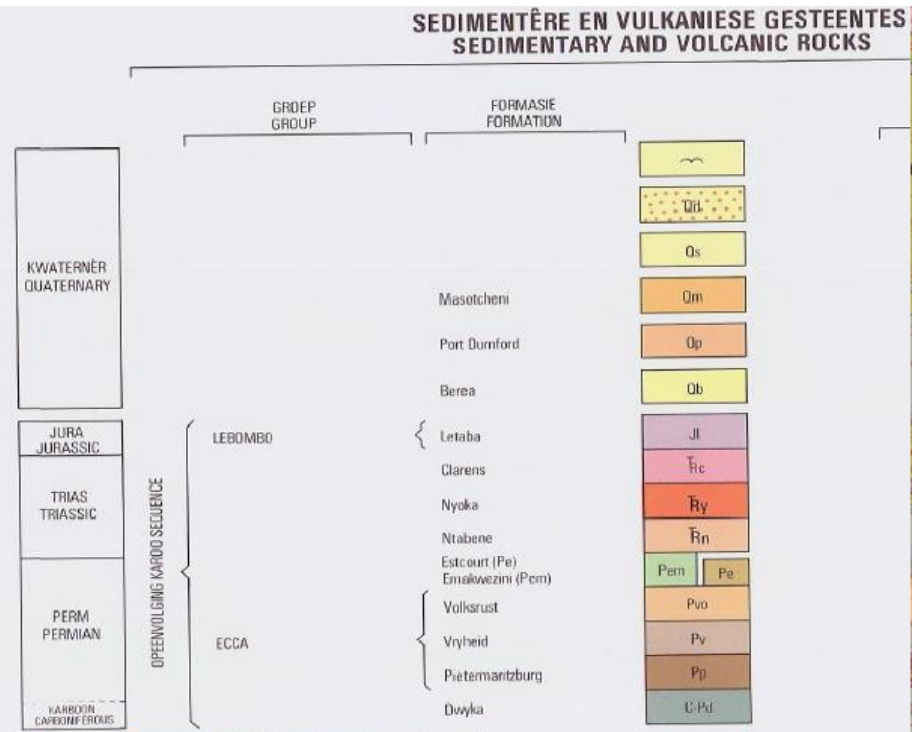
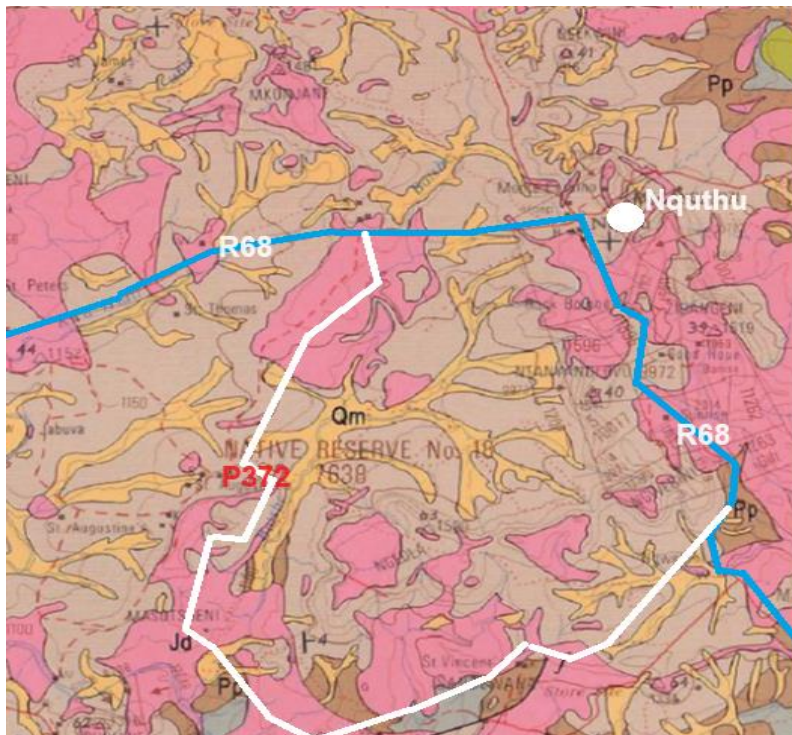


BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

GEOLOGY

According to the 1:250 000 Geological Series as published by the Department of Mineral and Water Affairs, and more specifically the 2830 DUNDEE Map, the length of the P372 under consideration is underlain by the following geological formations.

- Pp Dark grey shale, of the Pietermaritzburg Formation, ECCA Group,
- Pv Medium to coarse grained sandstone, grey micaceous shale and coal of the Vryheid Formation
- Jd Dolerite intrusions of the Jurassic Period
- Qm Boulder beds and yellow brown sandy clay of the Masotcheni Formation, Quaternary Period





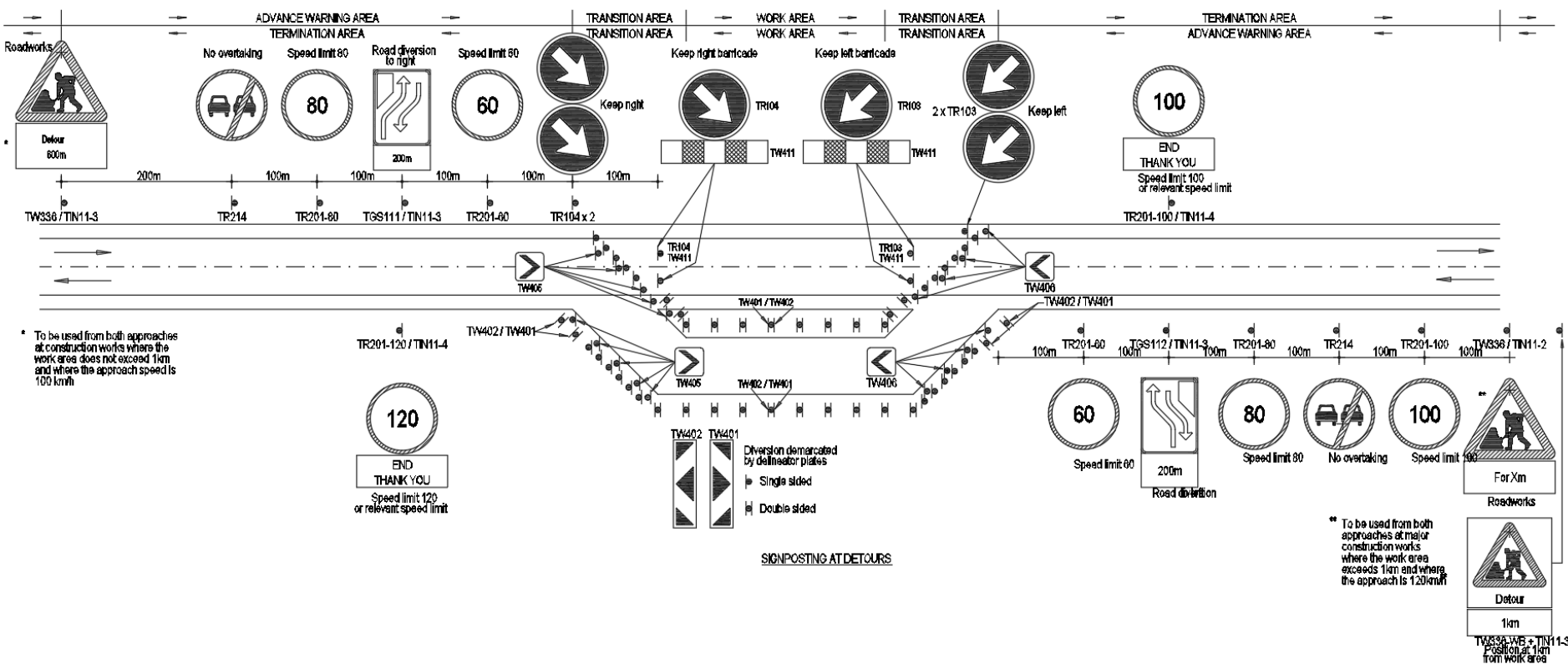
TRAFFIC ACCOMMODATION

Traffic Accommodation: Method of Construction

The method of construction to be adopted for this project will be construction in half or partial widths and temporary deviations will be adopted as listed below, with the use of STOP/GO systems manned by an adequate number of traffic controllers, flagmen and all appropriate signage as per the South African Roads Traffic Signs Manual (SARTSM) standards:

- Motorized traffic between CH0+000 up to CH23+000 will be accommodated by adopting half width or partial width construction.
- Motorized traffic between CH23+000 up to CH 25+750 will be temporarily deviated through roads D2286, P148 and L1333.
- Motorized traffic between CH25+750 up to CH 27+000 will be temporarily deviated through roads D2286 and L1190.
- Motorized traffic between CH27+000 up to CH31+000 will be accommodated by adopting half width or partial width construction.

Traffic Accommodation: Typical Detail for Halfwidth Construction



Traffic Accommodation: Detours

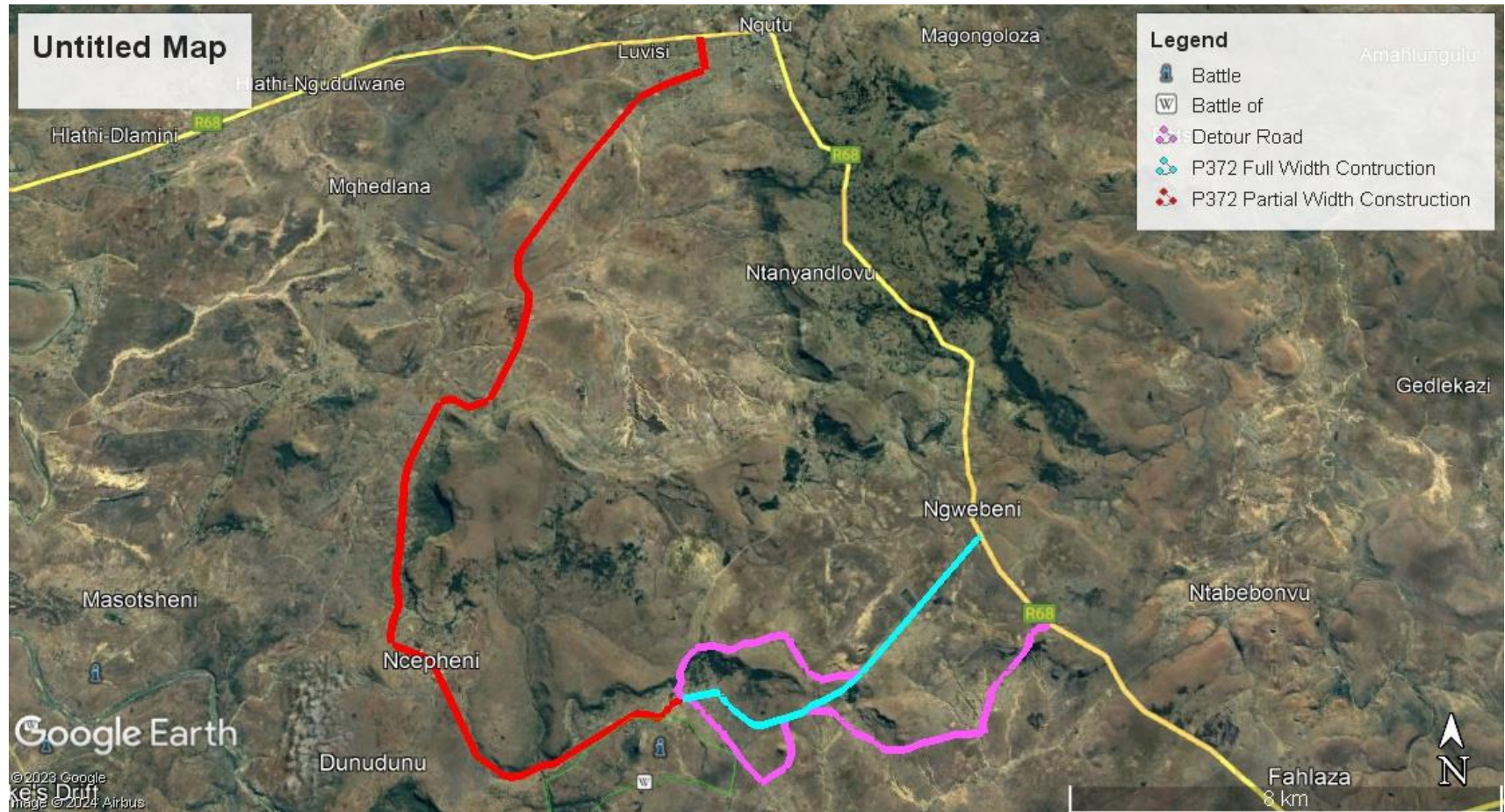
The D2286 detour will give access to the residents of Magaga village and the following Facilities: Isandlwana Battlefield Heritage Site, Isandlwana Visitors Centre and Museum, Isandlwana Lodge, Isandlwana Primary School, Siyanda Secondary School.

P148-L1333 detour provides access to Kwa-Nyoni, Nhloya, Mathutshana village and the following Facilities: Isandlwana Clinic, Nhloya Primary School, Mathutshana Primary School. Temporary access will be provided strictly for Buhlebamangwe Primary school staff, students and the residents surrounding the school. L1190 provides access to Kwa-Nkoko and K-Section village.

It is to be noted that the **final traffic accommodation plan is the responsibility of the Contractor**, and all traffic accommodation is to adhere to specifications as stipulated within the Contract Document and **as per Chapter 1.5 of the COTO specifications**. Failure to adhere to these specifications will result in penalties being implemented on the Contractor.

TRAFFIC ACCOMMODATION – TRAFFIC ACCOMMODATION SEQUENCE

Traffic Accommodation: Detours Details





ROAD SIGNAGE, ROAD MARKINGS, FENCING & GUARDRAILS

ROAD SIGNAGE AND ROAD MARKINGS

Road Signage

1. Signboards to be chromadek type material and comply with SANS1519 standards.
2. Signage backgrounds to be Class 1 retro-reflective material to colours specified.
3. All borders, symbols and text to be Class 3 retro-reflective material to colours specified.

Road Markings

1. Road marking to be applied with a Rural Module of 12m. All arrows and other relevant markings to be placed in accordance with this module dimension.
2. Lane Dividing Lines and Painted Island Markings to be constructed by applying:
 - Solvent Base Acrylic White road marking paint with drop-on type retro-reflective glass beads.
3. Edge Markings lines to be constructed by applying:
 - Solvent Base Acrylic Yellow road markings with drop-on type retro-reflective glass beads; and
4. Arrows to be constructed by applying:
 - Solvent Base Acrylic paint reflectorized by mixing in glass beads.

FENCING AND GUARDRAILS

Road Studs

1. Road studs to be applied at the same 12m module as road markings. Permanent road studs compliant to SANS 1442 (RSA 2, Bi-directional Galvanized Steel, Anchored road stud, White, Red & Yellow)

Guardrails

1. The condition of existing guardrails within the road reserve are in a poor condition with no reflectors.
2. Geometrically the road is being improved with cut and fills, thus new guardrails will need to be constructed in line with the new road geometry.

Fencing

1. Geometrically the road is being improved with cut and fills, thus new guardrails will need to be constructed in line with the new road geometry.
2. No new fencing will be installed in this contract



EXISTING SERVICES

LIST OF UTILITY SERVICE PROVIDERS

No.	Service Provider	Contact Person	Telephone	Email	Services Affected (Yes/No)	Comment
1	Dark Fibre Africa	Ockert Smit	082 828 1396	ockert.smit@dfafrica.co.za	No	services are not affected.
2	Liquid Telecom	Nicholas Leslie	084 777 1031	nicholas.Leslie@liquidtelecom.co.za	No	services are not affected.
3	Eskom: Transmission	Swazi Simelani	076 349 4349	simelan@eskom.co.za	No	services are not affected.
4	Eskom: Distribution	Khanyisa Sihlobo	083 535 9952	sihlobkp@eskom.co.za	No	services are not affected.
5	FMS	Seekander Mahomed	084 208 2473	smahomed@benjimark.co.za	No	services are not affected.
6	Telkom SA	Rishi Rampershad	031 459 1768	rishir@openserve.co.za	No	services are not affected.
7	Transnet Pipelines	Muzi Zulu	031 361 4549	thami.hadebe@transnet.net	No	services are not affected.
8	MTN	Sifiso Sithole	083 200 2322	sifiso.sithole@mtn.com	No	services are not affected.
9	Link Africa	Shivane Munsamy	072 330 5883	wayleaves@linkafrica.co.za	No	services are not affected.
10	Ceenex Engineering	Lionel Sibala	079 084 3628	lionel@ceenex.com	No	services are not affected.

EXISTING SERVICE

General

Existing services along the route require to be temporarily protected by Utility Service Providers prior to works commencing in certain areas – refer to Tender Drawings for details.

Contractor to liaise and co-ordinate works with all affected Utility Service Providers.

GEOTECH, MATERIALS & TESTS

Geotechnical Investigations
Factual Information
(logs, laboratory, and other
test results)

SANRAL



BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

GEOTECHNICAL INVESTIGATIONS

SANS 3001 Soil Classifications/Testing for Convention Design

A conventional geotechnical investigation, with tests based on SANS 3001 testing methods, the existing pavement is found to be of poor quality (G9 or poorer) for road construction, with shale material in all layers of all 5 test pits that were subjected to material classifications. Due to the shale and high PI content, it would have been recommended that the use of the in-situ material in the pavement layers and fill be avoided as far as possible.

Test Pit	Chainage	TRH 14 CLASSIFICATION					
		Layer 1		Layer 2		Layer 3	
		Type	Thickness (mm)	Type	Thickness (mm)	Type	Thickness (mm)
1	0 + 130 (RHS)	<G10	400	<G10	600	N/A	N/A
2	6 + 790 (LHS)	G9	500	N/A	N/A	N/A	N/A
3	8 + 910 (RHS)	G9	1000	N/A	N/A	N/A	N/A
4	14 + 250 (LHS)	G10	150	G9	250	<G10	600
5	27 + 200 (RHS)	G9	1000	N/A	N/A	N/A	N/A

PAVEMENT TEST PITS EXCAVATED TP1 @0.13km & TP2 @6.790

Client	Madan Singh & Associates
Project	P372 Islandlwana Road Upgrade
Job Card No.	228881
Date of Test	2021-05-31
Field Technician	S.M.
Position	RHS
Test Pit Number	TP 1
Chainage	CH 0+130
Co - Ordinates	S 28°19'00.41"
	E 30°43'02.61"



FIELD SOIL SURVEY TEST REPORT

Water Table	Soil Legend	Depth (mm)	DESCRIPTION
			Moisture ; Colour ; Consistency ; Structure ; Soil Type ; Origin; Sampling ; Laboratory Testing : - (I = Indicator ; M = MOD AASHTO ; C = CBR)
		400	Slightly moist, dark greyish brown, dense, uniform, silty CLAY and ferricrete pebbles.
		1000	Moist, dark reddish brown, medium dense, intact, silty CLAY and ferricrete pebbles, residual.

Client	Madan Singh & Associates
Project	P372 Islandlwana Road Upgrade
Job Card No.	228881
Date of Test	2021-05-31
Field Technician	S.M.
Position	LHS
Test Pit Number	TP 2
Chainage	CH 6+790
Co - Ordinates	S 28°20'43.27"
	E 30°40'03.03"



FIELD SOIL SURVEY TEST REPORT

Water Table	Soil Legend	Depth (mm)	DESCRIPTION
			Moisture ; Colour ; Consistency ; Structure ; Soil Type ; Origin; Sampling ; Laboratory Testing : - (I = Indicator ; M = MOD AASHTO ; C = CBR)
		500	Slightly moist, dark brown + dark grey, dense, uniform, crushed rock SHALE.

PAVEMENT TEST PITS EXCAVATED TP3 @8.91km & TP4 @14.250

Client	Madan Singh & Associates
Project	P372 Islandlwana Road Upgrade
Job Card No.	228881
Date of Test	2021-05-31
Field Technician	S.M.
Position	RHS
Test Pit Number	TP 3
Chainage	CH 8+910
Co - Ordinates	S 28°20'53.59"
	E 30°38'57.38"



FIELD SOIL SURVEY TEST REPORT

Water Table	Soil Legend	Depth (mm)	DESCRIPTION
			Moisture ; Colour ; Consistency ; Structure ; Soil Type ; Origin ; Sampling ; Laboratory Testing : - (I = Indicator ; M = MOD AASHTO ; C = CBR)
			Slightly moist, dark yellowish orange brown, dense , uniform, clayey weathered SANDSTONE + weathered TILLITE, residual.
		1000	10xLarge

Client	Madan Singh & Associates
Project	P372 Islandlwana Road Upgrade
Job Card No.	228881
Date of Test	2021-05-31
Field Technician	S.M.
Position	LHS
Test Pit Number	TP 4
Chainage	CH 14+250
Co - Ordinates	S 28°20'19.47"
	E 30°36'41.21"



FIELD SOIL SURVEY TEST REPORT

Water Table	Soil Legend	Depth (mm)	DESCRIPTION
			Moisture ; Colour ; Consistency ; Structure ; Soil Type ; Origin ; Sampling ; Laboratory Testing : - (I = Indicator ; M = MOD AASHTO ; C = CBR)
		150	Slightly moist, light yellowish brown, dense, uniform, silty SAND with shale. 7xLarge
		400	Slightly moist, light yellowish brown, dense, uniform, slightly clayey, silty SAND. 2xLarge
		1000	Slightly moist, dark brown, medium dense, intact, silty CLAY, residual. 2xLarge

Client	Madan Singh & Associates	
Project	P372 Islandlwana Road Upgrade	
Job Card No.	228881	
Date of Test	2021-05-31	
Field Technician	S.M.	
Position	RHS	
Test Pit Number	TP 5	
Chainage	CH 27+200	
Co - Ordinates	S	28°14'43.45"
	E	30°38'02.92"

The photograph shows a vertical cross-section of a test pit. The soil is a reddish-brown color and appears to be relatively uniform in texture. A vertical crack or crevice is visible on the right side of the pit. A white measuring tape is placed vertically against the right wall of the pit, providing a scale for the height. The tape shows markings in centimeters and millimeters. The top of the pit is at the top of the frame, and the bottom is at the bottom of the frame.

[illegible]

PAVEMENT MATERIAL TEST RESULTS

MATERIALS TEST REPORT

Laboratory Number	1777	1778	1779	1780
Field Number	TP1	TP1	TP2	TP3
Position in field	CH 0 + 130 RHS	CH 0 + 130 RHS	CH 6 + 790 LHS	CH 8 + 910 RHS
Depth (mm)	0 - 400	400 - 1000	0 - 500	0 - 1000
Sample Description	Dk.Gr.Br.Silty Clay + Ferricrete Pebbles	Dk.R.Br.Silty Clay + Ferricrete Pebbles	Dk.Br.Dk.Gr.Shale, C/Rock	Dk.Y.O.Br.Clayey Wth Sandstone + With Tillite
Stabilising Agent	Natural	Natural	Natural	Natural

Sieve Analysis (Wet Preparation) SANS 3001 - GR 1

100.0 mm	Percentage Passing				
75.0 mm					
63.0 mm					
50.0 mm					
37.5 mm					
28.0 mm				100	
20.0 mm				95	100
14.0 mm		100	100	78	88
5.0 mm		91	86	51	62
2.0 mm		62	64	33	41
0.425 mm		37	50	18	26
0.075 mm		25	38	11	15
Grading Modulus	SANS 3001 - PR 5	1.76	1.49	2.38	2.19

Mechanical Analysis - SANS 3001 - GR 1

Coarse Sand (%)	40	22	45	37
Coarse - Fine Sand (%)	4	4	8	6
Medium - Fine Sand (%)	6	5	8	9
Fine - Fine Sand (%)	9	9	8	12
Silt and Clay (%)	41	59	32	36

Atterberg Limits - SANS 3001 - GR 10 - GR 12

Liquid Limit (%)	27	30	25	24
Plasticity Index (%)	13	13	11	12
Linear Shrinkage (%)	6.3	6.5	5.6	5.5
Classification Group Index	A-2-6(0)	A-6(1)	A-2-6(0)	A-2-6(0)
COLTO Classification #	Less than G9	Less than G9	G9	G9
TRH 14 Classification (1985) #	Less than G10	Less than G10	G9	G9

Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30

Optimum Moisture Content (%)	13.1	14.0	9.9	10.3
Maximum Dry Density (kg/m ³)	1964	1913	2071	1980

California Bearing Ratio - SANS 3001 - GR 40

CBR @ 100 % Compaction	17	27	8	9
CBR @ 98 % Compaction	8	16	8	9
CBR @ 95 % Compaction	3	7	7	9
CBR @ 93 % Compaction	2	4	7	9
CBR @ 90 % Compaction	1	2	6	9
Swell @ 100 % Compaction	0.09	0.12	0.19	0.19

MATERIALS TEST REPORT

Laboratory Number	1781	1782	1783	1784
Field Number	TP4	TP4	TP4	TP5
Position in field	CH 14 + 250 LHS	CH 14 + 250 LHS	CH 14 + 250 LHS	CH 27 + 200 RHS
Depth (mm)	0 - 150	150 - 400	400 - 1000	0 - 1000
Sample Description	LL.Y.Br.Silty Sand With Shale	LL.Y.Br.Slightly Clayey Silty Sand	Dk.Br.Silty Clay	Dk.R.Berea Red Sand
Stabilising Agent	Natural	Natural	Natural	Natural

Sieve Analysis (Wet Preparation) SANS 3001 - GR 1

100.0 mm	Percentage Passing				
75.0 mm					
63.0 mm					
50.0 mm					
37.5 mm					
28.0 mm					
20.0 mm		100	100		
14.0 mm		86	88	100	100
5.0 mm		65	69	99	80
2.0 mm		46	41	82	68
0.425 mm		23	25	34	56
0.075 mm		9	12	17	38
Grading Modulus	SANS 3001 - PR 5	2.22	2.22	1.67	1.37

Mechanical Analysis - SANS 3001 - GR 1

Coarse Sand (%)	49	38	59	17
Coarse - Fine Sand (%)	10	9	6	9
Medium - Fine Sand (%)	12	12	6	9
Fine - Fine Sand (%)	11	12	8	9
Silt and Clay (%)	19	29	21	56

Atterberg Limits - SANS 3001 - GR 10 - GR 12

Liquid Limit (%)	CBD	19	23	32
Plasticity Index (%)	NP	4	11	14
Linear Shrinkage (%)	0.0	2.5	5.1	6.7
Classification Group Index	A-1-a(0)	A-1-9(0)	A-2-6(0)	A-6(1)
COLTO Classification #	Less than G9	G9	Less than G9	G9
TRH 14 Classification (1985) #	G10	G9	Less than G10	G9

Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30

Optimum Moisture Content (%)	6.0	9.6	9.6	17.9
Maximum Dry Density (kg/m ³)	2035	2062	1896	1743

California Bearing Ratio - SANS 3001 - GR 40

CRR @ 100 % Compaction	28	16	6	22
CBR @ 98 % Compaction	17	13	5	17
CBR @ 95 % Compaction	9	10	4	11
CBR @ 93 % Compaction	5	9	3	8
CBR @ 90 % Compaction	3	7	2	5
Swell @ 100 % Compaction	0.09	0.13	0.63	0.08

NANO PAVEMENT MATERIAL SAMPLES XRD SCANS

Specialized Material Testing for NME

Following the TRH24 design methods, material samples were sampled and analyzed using XRD scans as per recommended protocol (Jordaan and Steyn, 2019a; Jordaan and Steyn 2019b).

The XRD scans indicated the basic mineralogy of the materials required to prevent failures and enable the Engineers make informed decisions on the suitability of materials for use, together with various available modifiers, in combination with a specific stabilizing agent.

NANO PAVEMENT MATERIAL SAMPLES XRD SCANS

G5 Quarry

MDD : 2474 kg/m³

OMC : 6.50%

Hygroscopic : -

N.B: Mixed specimens at 7.0%.

UCS				ITS			
FORMULA	1% GE-NME-(BE + 1,5NS)		1.2% Ge-NME (BE+ 1,5NS)	FORMULA	1% Ge-NME (BE+ 1,5NS)		1.2% Ge-NME (BE+ 1,5NS)
Percentage NME	1.00%		1.20%		1.00%		1.20%
Sample Reference:	G5 Quarry		G5 Quarry	Sample Reference:	G5 Quarry		G5 Quarry
DRY WEIGHT (Kg)	5.483		5.361	DRY WEIGHT (Kg)	5.337		5.225
WET WEIGHT (Kg)	5.615		5.450	WET WEIGHT (Kg)	5.462		5.306
GAIN (Kg)	0.132		0.089	GAIN (Kg)	0.125		0.081
% GAIN	2.41%		1.66%	% GAIN	2.34%		1.55%
Dry Density of Specimen(kg/m ³)	2376		2323		2312		2264
UCSd (MPa)	2.7		3.0	ITSd (kPa)	140.1		189.1
UCSw (MPa)	1.8		2.1	ITSw (kPa)	115.1		135.2
RCS - UCSw/UCSd (%)	68%		70%	RTS - ITSw/ITSd (%)	82%		71%
RCS (effective) (NME1)	50%		59%	RTS (effective) (NME1)	39%		40%
RCS (effective) (NME2)	61%		84%	RTS (effective) (NME2)	47%		48%
RCS (effective) (NME3)	112%		178%	RTS (effective) (NME3)	59%		60%
RCS (effective) (NME4)	274%		502%	RTS (effective) (NME4)	79%		81%
PENETRATION (mm)	> 20mm		≥ 15mm	ITS/UCS DRY (%)	5.2%		6.3%
UCSd (kN)	48.97		55.14	ITSd (kN)	4.26		5.75
UCSw (kN)	33.44		38.64	ITSw (kN)	3.50		4.11
UCS Factor	0.01824		0.01824	ITS Factor	32.89		32.89
NME classification	< NME 4		NME 4	ITSd (kN)	**< NME 4		NME 4
Class Per	New Age 2020		New Age 2020	ITSw (kN)	New Age 2020		New Age 2020
Max.Dry Density	2474						
Mould volume	0.002308						
Specifications			N.B:**Does not meet minimum ITS requirements.				
NME 1 (wet)	2.5 MPa				240 kPa		
NME 2 (wet)	1.5 MPa				200 kPa		
NME 3 (wet)	1 MPa				160 kPa		
NME 4 (wet)	0.75 MPa				120 kPa		

NANO PAVEMENT MATERIAL

Standard specifications for New (3rd-millennium) Modified Emulsion (NME) stabilised materials

Test or Indicator	Material ¹	Material classification			
		NME1	NME2	NME3	NME4
Minimum material requirements before stabilisation and/or treatment (Natural materials)					
Material spec. (minimum) Unstabilised material: Soaked CBR ² (%) (Mod AASHTO)	NG /(CS)	> 45 ² (95%)	> 25 ² (95%)	> 10 ² (93%)	> 7 ² (93%)
		ACV < 30%			
Grading Modulus (GM)	NG	> 1.5	> 1.0	-	-
	GS	NA	> 1.0	-	-
Sieve analysis: % < 0.075 mm (P _{0.075})	ALL	< 25 %	<25 %	< 35 %	< 50 %
XRD scans: - Total sample - 0.075 mm fraction (P _{0.075})	ALL	√	√	√	√
	ALL	√	√	√	√
% Material passing 2 µm (P _{0.002}) (e.g. Clay & Mica & Talc) as a % of Material (with Talc <10%) (XRD-scans of the material passing the 0.075 mm sieve are used to determine the % clay, mica and talc in the material – In this case P _{0.002} = P _{0.075} X (P _{clay} , etc. in P _{0.075})	NME stabilisation with micro-meter (µm) emulsion particle sizes				
	ALL	< 15 %	< 15 %	< 15 %	< 15 %
	NME stabilisation with emulsion containing micro-scale as well as nano-scale particles (adjusted according to material grading)				
	ALL	NA	< 35 %	< 35 %	< 35 %
	NME stabilisation with emulsion containing nano-scale and pico-scale particles (grading adjustments) together with technologies addressing workability of materials on site				
	ALL	NA	NA	> 35 %	> 35%

NME STANDARD SPECIFICATION

Standard specifications for New (3rd-millennium) Modified Emulsion (NME)
stabilised materials

Material specifications after stabilisation and/or treatment					
In-situ density to be required after stabilisation and compaction (mod AASHTO) (%) (minimum)	Base	> 100 %	> 100 %	> 98 %	> 97 %
	Sub-base	NA	> 98 %	> 97 %	> 95 %
DCP(DN mm/blow)(Quality control) (stabilised and compacted)		NA	NA	< 2.6	< 3.5
Mod AASHTO density (%) (for laboratory testing)		> 100 %	> 100 %	> 100 %	> 100 %
*UCS _{wet} (kPa) (150 mm Φ Sample)	Design³	> 2 500	> 1 500	> 1 000	> 750
	Construction⁴	> 2 200	> 1 200⁵	> 700⁵	> 450⁵
Retained Compressive Strength (RCS): (UCS _{wet} /UCS _{dry}) (%)		> 85	> 75	> 70	> 65
RCS in relation to minimum UCS _{wet(criteria)} = RCS _{effective} = (RCS x (UCS _{wet} /UCS _{wet(criteria)})) (%)		>100	> 90	>85	> 80
*ITS _{wet} (kPa) (150 mm Φ Sample)	Design³	> 240	> 200	> 160	> 120
	Construction⁴	> 220	> 180⁵	> 140⁵	> 100⁵
Retained Tensile strength (RTS): ITS _{wet} /ITS _{dry} (%)		> 85	> 75	> 70	> 65
RTS in relation to minimum ITS _{wet(criteria)} = RTS _{effective} = ((RTS x (ITS _{wet} /ITS _{wet(criteria)})) (%)		>100	> 90	> 85	> 80

MATERIALS UTILISATION

Borrow Materials

- There are no borrow pits identified by the Employer for the works.

Cut Materials

- Several cuttings and excavations along the route may produce suitable material for **general fill**.
- Several cuttings along the route may produce usable quantities of suitable materials **for the selected layers**. The quantity is expected to be **limited**.

Spoil Material

- The Contractor must identify and obtain approval for spoil sites.
- **Surplus** excavated material from the road prism must be disposed of in **spoil sites identified by the Contractor**.

MATERIALS UTILISATION

Materials Stockpiling and Processing Sites

- The Contractor must identify and obtain all approvals for stockpile and materials processing sites

Commercial Sourcing

Materials that will be sourced commercially are:

- Concrete - for drainage furniture elements and side walks
- Aggregates - for seal surfacing and concrete
- Bitumen – for priming and seal binder

Known Source

The closest commercial quarry to P372 is Afrimat Dundee Quarry.

- **The quarry supplies G2, G5 and G7 gravel material, 10 mm and 20 mm road stone, concrete stone, hand stone and crusher sand.**

CONDITIONS OF CONTRACT (C1)

SANRAL



BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

LIST OF CONTRACT DOCUMENTS

Volume 1: The Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer (1999), published by the Federation Internationale des Ingenieurs-Conseils (FIDIC) which the tenderer shall purchase himself. (See note 1 below).

Volume 2: The COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (Draft Standard October 2020 edition), issued by the Committee of Transport Officials which the tenderer shall obtain himself. (See Note 2 below).

Volume 3 (Books 1, 2 and 3): The Project Document, containing the tender notice, Conditions of Tender, Tender Data, Returnable Schedules, general and particular conditions of contract, project specifications, Pricing Schedule, Form of offer and Project Information is issued by the Employer (see note 3 below). The Employer's Form of Acceptance and any correspondence from the selected tenderer, performance security-demand guarantee, and all addenda issued during the period of tender will also form part of this volume once a successful tenderer has been appointed.

The conditions of tender are the standard conditions of tender as indicated in Book 1.

LIST OF CONTRACT DOCUMENTS

Volume 4:	The road works drawings.
Volume 5:	Materials investigation and utilisation.
Volume 6:	Environmental Management Plan report.

C1.1.1/C1.1.2 FORMS OF OFFER AND ACCEPTANCE

C1.1.3 APPENDIX TO FORM OF ACCEPTANCE - DEVIATIONS

C1.1.4 OTHER STANDARD FORMS

1. OHS AGREEMENT
2. PERFORMANCE SECURITY - DEMAND GUARANTEE
3. FORM OF APPLICATION FOR A PERMIT TO DEPARTMENT OF LABOUR
4. FORM OF RETENTION MONEY GUARANTEE
5. FORM OF BANKING DETAILS
6. TAX COMPLIANCE PERMISSION DECLARATION
7. APPOINTMENT IN TERMS OF SECTION 4 OF THE MINE HEALTH AND SAFETY ACT
8. EXAMPLE: APPOINTMENT AS MINE OPERATION MANAGER
9. APPOINTMENT OF PRINCIPAL CONTRACTOR: OHS

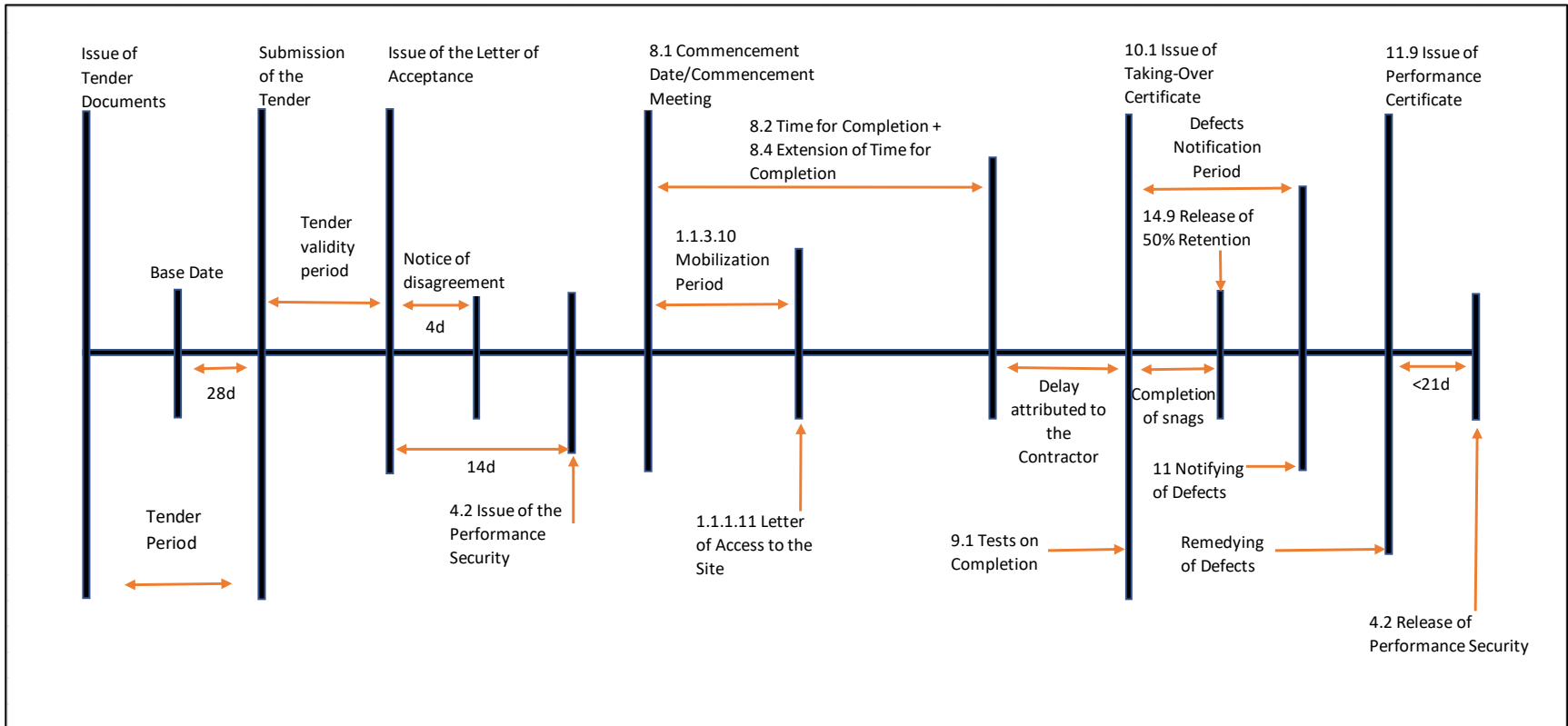
C1.2.1 CONDITION OF CONTRACT

The Conditions of Contract for Construction (1999 edition) published by the Federation Internationale des Ingenieurs-Conseils (FIDIC), as amended, shall apply to this contract.

The amendments are those published by FIDIC and reproduced hereafter, together with additional amendments (particular conditions of contract) as prescribed by the South African National Roads Agency SOC Limited

C1.2.1 CONDITION OF CONTRACT

PART A:	GENERAL CONDITIONS - FIDIC AMENDMENTS
	Errata – 30 June 2021
PART B:	PARTICULAR CONDITIONS OF CONTRACT – SANRAL AMENDMENTS



C1.2.1 CONDITION OF CONTRACT
PART B - PARTICULAR CONDITIONS OF CONTRACT – SANRAL AMENDMENTS

1.1.3.10	“Mobilisation Period” means the period between: • the Commencement Date and • the date of Access to Site (as defined in Clause D1002.01(I) in the Scope of Works (Part C3): Section D1000). The requirements of the Mobilisation Period is specified in the Scope of Works (Part C3): Section D1000: Stakeholder and Community Liaison, and Targeted Labour and Targeted Enterprises Utilisation and Development”..
8.3	Programme The Contractor shall submit an initial programme for the execution of the Works to the Engineer within 28 days after the Commencement Date. This programme shall be prepared using programming software stated in the Specification (if not stated, the programming software acceptable to the Engineer). The Contractor shall also submit a revised programme which accurately reflects the actual progress of the Works, every month.

C1.2.1 CONDITION OF CONTRACT
PART B - PARTICULAR CONDITIONS OF CONTRACT – SANRAL AMENDMENTS

14.1(e)

The Contract Price

The Contractor shall submit to the Engineer within 28 days after the Commencement Date **a full breakdown of all rates.**

The Engineer may take account of the breakdown when **evaluating claims** and making Determinations.”

C1.2.2 APPENDIX TO TENDER: CONTRACT DATA - INFORMATION PROVIDED BY THE EMPLOYER

1.1.2.2	Employer South African National Roads Agency SOC Limited The Employer's address is: The South African National Roads Agency SOC Limited 48 Tambotie Avenue Val De Grace Pretoria, 0184
1.1.2.4	To be announced (TBA)
1.1.3.3	Time for Completion 24 months maximum (including the contractor's holidays in December and January), of which 3 months maximum will be the Mobilisation Period
1.1.3.7	Defects for notification period 12 calendar months
A1.1.3.10	Mobilisation Period 3 months maximum commencing on the Commencement Date.

C1.2.2 APPENDIX TO TENDER: CONTRACT DATA - INFORMATION PROVIDED BY THE EMPLOYER

A4.2	Performance Security One Performance Security totaling 10% of the Accepted Contract Amount (excluding VAT) is required.		
4.3	Contractor’s Representative The Construction Manager shall be; employed full time on the Works , the single point accountability and responsible for the management of the construction works and shall be registered with SACPCMP as PrCM or ECSA as PrEng or PrTechEng with minimum experience of 10 years . Where the Contracts Manager will not be employed on the Works full time, his powers will be delegated to the approved construction manager in accordance with Clause 4.3 of the Conditions of Contract. with Clause 4.3 of the Conditions of Contract.		
A4.4	Subcontractors and suppliers The % of the contract value that may be sublet is dependent on the minimum Targeted Enterprise subletting targets and shall not exceed the maximum subcontracting allowed % as per the following table:	Minimum Targeted Enterprise (TE) subletting (%)	Maximum Subcontracting allowed (%)
≤30		50	
>30 to ≤40		60	
>40 to <45		65	
≥45 to <50		70	
≥50		80	

C1.2.2 APPENDIX TO TENDER: CONTRACT DATA - INFORMATION PROVIDED BY THE EMPLOYER

A6.2	Rates of Wages and Conditions of Labour The Contractor and his Subcontractors shall be registered with the Bargaining Council for the Civil Engineering Industry (Government Notice R.490 – Part III contained in Government Gazette No. 37750) and rates for wages and conditions of labour agreed by the Bargaining Council for the Civil Engineering Industry shall apply to the Contractor and all his Subcontractors except where a specific industry publishes its own wage rates and conditions of labour
A6.5	Special non-working hours/days a) All designated public holidays (including all foreseeable statutory declared election days) b) The annual shut-down period between December and January c) Day of State school term closure and day prior to State school term start d) Day before Easter Weekend e) Sundays f) Between sunset and sunrise g) Weekend of the commemoration of Battle of Isandlwana and weekend of the Battle of Ncome

C1.2.2 APPENDIX TO TENDER: CONTRACT DATA - INFORMATION PROVIDED BY THE EMPLOYER

A6.9	Contractor's Personnel The Contractor shall provide the key personnel (as indicated in form C1.2.3 - Appendix to Tender: Contract Data – Information Provided by the Tenderer). Where the key personnel are no longer available to undertake the necessary work after the award of the contract, the Contractor shall within a period of 14 working days replace the key personnel stated in the Appendix to Tender with personnel with equivalent competencies and subject to approval by the Employer. Such approval shall not be unreasonably withheld.
A8.1	Commencement Date As stated in the Form of Acceptance
A8.1	Period in which Works must commence Not prior to the date of Access to Site and not later than 1 Month after the end of Mobilisation Period

C1.2.2 APPENDIX TO TENDER: CONTRACT DATA - INFORMATION PROVIDED BY THE EMPLOYER

A8.3(b)	Date of access As per clause 2.1 Access to site
A8.3(h)	Special non-working days As per A6.5 - Special non-working hours/days
A8.3(l)	Embargo hours and days Embargo period for seal work as defined in Part C3: Scope of Works, clause A10.1.3.2

C1.2.2 APPENDIX TO TENDER: CONTRACT DATA - INFORMATION PROVIDED BY THE EMPLOYER

A8.3(m)	Restricted working conditions i. During the contractor's annual shutdown period between December and January, the contractor shall maintain two-way traffic within the contract limits ii. For the shutdown period, service provider to ensure there is no longitudinal construction joint in place
A8.4	Extension of time for completion An exceptional adverse climatic condition shall be considered where the return period of the climatic condition exceed a return period of 1:10.

C1.2.2 APPENDIX TO TENDER: CONTRACT DATA - INFORMATION PROVIDED BY THE EMPLOYER

A8.7(a)	Delay damages Delay Damages – R 30 000. /day
A8.7(b)	Other Non-compliance charges: i. Non-compliance to requirements of clause A8.3(m) for Accommodation of traffic restrictions during the contractor's annual shutdown period between December and January – R50,000-00 /day ii. Accommodation of traffic non-compliance as specified in Part C3 clause A1.5.3.7. - Fixed penalty – R20 000.00/occurrence - Time related penalty – R2000.00/hour iii. Overloading – 2 x Unit Rate of material hauled x overload factor x distance hauled as specified in Part C3 clause A1.7.7. The overload factor is the difference between the Actual loaded vehicle mass and the Gross vehicle mass iv. Contract Participation Targets – Calculated as per D1003.05

A8.7(b)	Other Non-compliance charges: (Continued) v. Contract Skills Development Goal – Calculated as per D1010.05 vi. Subcontracting without disclosure or non-compliance to Subcontract agreement requirements – up to 10% of the Contract Price vii. (i) Layer Irregularities Asphalt – quantity/100m x unit rate x payment adjustment factor
---------	---

A12.3	Evaluation The term “fixed rate item” shall apply to all items of work listed in the Pricing Schedule (Including agreed items of work listed in Works Authorisations)
-------	---

C1.2.2 APPENDIX TO TENDER: CONTRACT DATA - INFORMATION PROVIDED BY THE EMPLOYER

A13.5	Provisional Sums 5%
13.6	Daywork allowances Not required (Dayworks provided for in the pricing schedule)
A13.8	Special materials Bitumen binder extracted from petroleum-based products and used on site, including that used in asphalt, irrespective of whether it is produced and/or placed by the contractor or an approved sub-contractor. Only net bitumen content excluding emulsifiers, diluents or modifiers. A supplier of bitumen shall be any company that supplies to a Contractor binder with bitumen as the sole or blended ingredient in the binder.
A13.8	Adjustments for Changes in Cost $X = 0.15$ Roadworks $a = 0.20$ $b = 0.40$ $c = 0.25$ $d = 0.15$

C1.2.2 APPENDIX TO TENDER: CONTRACT DATA - INFORMATION PROVIDED BY THE EMPLOYER

A14.3(c)	Retention money: Percentage 10% of value of completed work Limit 5% of the Accepted Contract Amount (Including VAT) Guarantee This will be considered provided that the tenderer submits his proposal as an alternative tender and provided that a discount equal to or more than R 14 000 000-00 is offered. The discount shall be effected through two equal deductions from IPC 1 and 2
A14.6	Minimum amount of interim payment certificate R 3 500 000.00 excluding payments during the Mobilisation Period
18.1	Time period for submission of evidence of insurance and copies of insurance As stated in the Form of Acceptance
18.3	Minimum Insurance cover for Injury to persons and Damage to Property R20 000 000.00

C1.2.2 APPENDIX TO TENDER: CONTRACT DATA - INFORMATION PROVIDED BY THE EMPLOYER

A20.1	Payment items for calculation of Cost for Extension of Time Cost for delays as a result of Suspension of Work instructed under Sub-Clause 8.8 [Suspension of Work] shall be based only on the Suspension cost calculated in pay item C1.3.1.4, as appropriate having regard to any other compensation which may already have been granted in respect of the circumstances concerned. Cost for delays as a result of approved extensions of time granted in terms of the Conditions of Contract for delays during the Mobilisation Period shall be based only on the Mobilisation Period cost calculated in pay item C1.3.1.3(a), as appropriate having regard to any other compensation which may already have been granted in respect of the circumstances concerned. Cost for delays as a result of approved extensions of time for inclement weather granted in terms of amended Sub-Clause 8.4(f) of the Conditions of Contract shall be based only on the applicable payment items for which the unit of measurement is “month” for the period of the delay (excluding payment items with negative rates and non-applicable payment items).
-------	--

C1.2.2 APPENDIX TO TENDER: CONTRACT DATA - INFORMATION PROVIDED BY THE EMPLOYER

A20.1	Payment items for calculation of Cost for Extension of Time Cost for approved extensions of time granted in terms of the Conditions of Contract (other than for delays as a result of Suspension of Work, or delays during the Mobilisation Period, or delays as a result of inclement weather), shall be based on the applicable payment items for which the unit of measurement is “month” for the period of the delay (excluding payment items with negative rates and non-applicable payment items), except in specific circumstances where progress on all activities on the accepted Works programme is prevented and audited statements for proven cost is provided and it is proven that the payment items for which the unit of measurement is “month” does not include for any of the proven costs.
A20.3	Appointment (if not agreed) to be made by The President of SAICE or a person appointed by the SAICE President

C1.2.3 APPENDIX TO TENDER: CONTRACT DATA – INFORMATION PROVIDED BY THE TENDERER

PRICING DATA & PROJECT SPECIFICATIONS

SANRAL



BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

PART C2: PRICING DATA

C2.1	PRICING INSTRUCTIONS
C2.1.1	Measurement and payment shall be in accordance with the relevant provisions of Chapter 1, Section C1.1 of the COTO Standard Specification for Road and Bridge Works for South African Road Authorities (Draft Standard October 2020 edition) or as amended in the Scope of Works
C2.1.6	The prices and rates in the Pricing Schedule are fully inclusive prices for the work described under the items. Such prices and rates cover all costs and expenses that may be required in and for the execution of the work described in accordance with the provisions of the Scope of Work, and shall cover the cost of all general risks, liabilities and obligations set forth or implied in the Contract Data, as well as overhead charges and profit. These prices will be used as a basis for assessment of payment for additional work that may have to be carried out. The Contractor shall submit to the Engineer within 28 days after the Commencement Date a full breakdown of all rates. The rates are to be clearly referenced to the relevant pay item numbers, with each rate broken down into its labour, materials, plant, fuel, overhead charges and profit components.

PART C2: PRICING DATA

C2.1	PRICING INSTRUCTIONS
C2.1.12	The item numbers appearing in the Pricing Schedule refer to the corresponding item numbers in the COTO Standard Specification for Road and Bridge Works for South African Road Authorities (Draft Standard October 2020 edition). Where a standard COTO payitem is amended or a new pay item added, the item number is preceded by the letter “P” in the Pricing Schedule.
C2.1.13	The pricing schedules are provided electronically. A printout of the entire completed pricing schedule must be signed and scanned and saved in .pdf format, and an electronic copy of the priced pricing schedule must be saved in Excel format and the printed copy bound. In the event of any discrepancy between the signed .pdf copy, and the electronically submitted copy in Excel format and the printed hard copy, the tender rates in the printed hard copy will govern. The item numbers and description of the printed hard copy document will govern. For all addenda issued relating to the pricing schedule, the item numbers, description and quantities of the issued document will govern.

PART C2: PRICING DATA

11	SCHEDULE D: TRAINING, COACHING, GUIDANCE, MENTORING AND ASSISTANCE Major amendment on Community Development project
----	---

PART C3: SCOPE OF WORK

SECTION A1	STANDARD AMENDMENTS ISSUED BY COTO
	The Standard Specifications for Road and Bridge Works for South African Road Authorities (Draft Standard October 2020 edition) prepared by the Committee of Transport Officials, (COTO), as amended, shall apply to this contract. The amendments are those issued by COTO and reproduced in Section A1, together with additional amendments as set out in Section A2 and Project specific Specification Data as set out in Section B
	As at October 2022 no amendments have been issued.by COTO.

PART C3: SCOPE OF WORK

SECTION A2	PROJECT SPECIFICATION AMENDMENTS TO THE COTO STANDARD SPECIFICATIONS
	This Section A2 contains amendments to the Standard Specification, including additional clauses, amendment to clauses or deletion of clauses and specifications, required for this particular contract. Where the Standard Specifications allow a choice to be specified in the Contract Documentation or Project Specifications, between alternative materials or methods of construction, and for additional requirements to be specified to suit a particular contract, these selections are not made in this Section A2. Details of such alternatives or additional requirements applicable to this contract are contained in Section B: Specification Data. Section B also contains project specific sections for Sections C, D and E
	The number of each clause and each payment item in this part of the project specifications follows the numbering format of the standard specifications

PART C3: SCOPE OF WORK

	SANRAL STANDARD SPECIFICATION SECTIONS
SECTION C	ENVIRONMENTAL MANAGEMENT PLAN (EMP)
SECTION D	STAKEHOLDER AND COMMUNITY LIAISON AND TARGETED LABOUR AND TARGETED ENTERPRISES UTILISATION AND DEVELOPMENT
SECTION E	REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS
SECTION F	HERITAGE SITE REFURBISHMENT

8. SITE VISIT

SANRAL



BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

9. QUESTIONS

SANRAL



**BUILDING SOUTH AFRICA
THROUGH BETTER ROADS**

9. CLOSURE

SANRAL



BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

THANK YOU

SANRAL



BUILDING SOUTH AFRICA
THROUGH BETTER ROADS