

SANRAL
SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD



Reg.No.1998/009584/30

BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL R.101-080-2019/1

**FOR THE IMPROVEMENT OF NATIONAL
ROAD R101 SECTION 8 FROM BELA BELA
(KM 0.0) TO MODIMOLLE (KM 26.8)**

PROJECT DOCUMENT

DATE: FEBRUARY 2023

TENDER DOCUMENT
VOLUME 3
BOOK 3 OF 3
PRICING DATA, SCOPE OF WORKS,
PROJECT INFORMATION, ANNEXURES

CHIEF EXECUTIVE OFFICER
SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED
48 TAMBOTIE AVENUE
VAL DE GRACE
PRETORIA, 0184

NAME OF TENDERER:

Set sequential number



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THIS DOCUMENT COMPILED UNDER THE DIRECTION OF THE REGIONAL
MANAGER
THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED
The Regional Manager (Northern Region)
The South African National Roads Agency SOC Ltd
38 Ida Street
Menlo Park
Tshwane
0081

LIST OF CONTRACT DOCUMENTS

The following documents form part of this contract:

- 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: 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.

- Volume 4: The road works drawings.
- Volume 5: The structural drawings.
- Volume 6: Materials investigation and utilisation.
- Volume 7: Environmental Management Plan report.

Notes to tenderer:

1. **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), is obtainable from CESA, P. O. Box 68482, Bryanston, 2021. Tel: (011) 463 2022 Fax: (011) 463 7383, e-mail: general@cesa.co.za.
2. **Volume 2: The COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (Draft Standard October 2020 edition)** is obtainable from SANRAL and can be downloaded free of charge from the SANRAL's website www.nra.co.za.
3. **Volume 3** is issued at tender stage in electronic format downloaded from the SANRAL's website link.

The link contains the following files:

- The full Project Document in .pdf format (excluding the standard conditions of tender)
- The returnable forms in word format
- The pricing data in Excel format

The Standard Conditions of Tender may be downloaded from the CIDB website as indicated in Book 1.

At contract stage Volume 3 will be a bound signed paper copy containing the following documents:

- Returnable schedules relevant to the project
- Agreements and Contract Data
- Pricing Data
- Scope of Work
- Project Information

4. **SUBMISSION OF TENDER** – Of the contract documents, only the following elements of Volume 3 needs to be submitted:

VOLUME 3 – ELECTRONIC SUBMISSION

The following information has to be submitted electronically on flash drive:

- (a) The 1st file in pdf format which contains;
 - Scanned copy of Form of Offer (pdf) and printed hardcopy of Form of Offer
 - Scanned copies of all returnable schedules and attachments (pdf)
 - Scanned copy and printed Summary of Pricing Schedule.
- (b) The 2nd file in Excel format which contains:
 - Completed pricing schedule

Information provided by a tenderer over and above the above elements of volume 3 shall be treated as information only and will only be bound into the document if the tenderer notes on Form A4: Schedule of Variations or deviations that the information has a bearing on the tender price.

For alternative offers the tenderer shall submit the following additional documentation, printed and bound hard copy and electronically in a separate flash drive marked:

- (a) Alternative (followed by the Tenderer name)" in a sealed envelope in the following order:
 - Form of Offer (signed and scanned as .pdf and state "Alternative Form of Offer" and printed hardcopy of Form of Offer)
 - All returnable schedules and attachments and certificates applicable to the alternative offer (signed and scanned as .pdf).
- (b) Alternative Pricing Schedule (printed Summary of Pricing Schedule and copy in Excel)
 - Other relevant information.

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PART C2: PRICING DATA

PART C2: PRICING DATA

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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.

C2.1.2 The units of measurement described in the Pricing Schedule are metric units. Abbreviations used in the Pricing Schedule are as follows:

%	=	percent
h	=	hour
ha	=	hectare
kg	=	kilogram
kl	=	kilolitre
km	=	kilometre
km-pass	=	kilometre-pass
kPa	=	kilopascal
kW	=	kilowatt
l	=	litre
m	=	metre
mm	=	millimetre
m ²	=	square metre
m ² -pass	=	square metre-pass
m ³	=	cubic metre
m ³ -km	=	cubic metre-kilometre
MN	=	meganewton
MN.m	=	meganewton-metre
MPa	=	megapascal
No.	=	number
Prov sum	=	Provisional sum
PC Sum	=	Prime Cost sum
R/only	=	Rate only
sum	=	lump sum
t	=	ton (1000kg)
W/day	=	Work day

C2.1.3 For the purpose of the Pricing Schedule, the following words shall have the meanings assigned to them:

Unit: The unit of measurement for each item of work as defined in the COTO Standard Specification for Road and Bridge Works for South African Road Authorities (Draft Standard October 2020 edition).

Quantity: The number of units of work for each item.

Rate: The payment per unit of work for which the Service Provider tenders to do the work.

Amount: The product of the quantity and the rate tendered for an item.

C2.1.4 Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.

C2.1.5 It will be assumed that prices included in the Pricing Schedule are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.sabs.co.za for information standards).

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 payitem numbers, with each rate broken down into its labour, materials, plant, fuel, overhead charges and profit components.

- C2.1.7 Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered such items.
- C2.1.8 A single lump sum will apply should a number of items be grouped together for pricing purposes.
- C2.1.9 The quantities set out in the Pricing Schedule are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in the Pricing Schedule.
- C2.1.10 Reasonable compensation will be received where no payitem appears in the Pricing Schedule in respect of work required in terms of the Contract and which is not covered in any other payitem.
- C2.1.11 The short descriptions of the items of payment given in the Pricing Schedule are only for the purposes of identifying the items. More details regarding the extent of the work entailed under each item appear in the Scope of Work.
- 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 payitem 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.

C2.2 PRICING SCHEDULE (INCORPORATING SBD3)

SCHEDULE A

ROADWORKS

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C1.2	GENERAL REQUIREMENTS AND PROVISIONS					
C1.2.1	Environmental Management:					
C1.2.1.1	Monitoring of compliance with and reporting on the EMP	month	27	20,000.00	540,000	00
C1.2.1.2	Dedicated environmental officer	month	27	30,000.00	810,000	00
C1.2.2	Programming and Reporting:					
C1.2.2.4	Submission of a Scheme 2 Full Programme	Lump sum	1	150,000.00	150,000	00
C1.2.2.5	Reviewing and updating a Scheme 2 programme every month	month	27	25,000.00	675,000	00
C1.2.2.6	Preparation and submission of all information and reports specified in the Contract Documentation	month	30	10,000.00	300,000	00
C1.2.3	Routine road maintenance of existing public roads within the Site of the Works or other public roads outside the Site of the Works which are used as detours:					
C1.2.3.2	Drain cleaning	km	6	20,000.00	120,000	00
C1.2.3.3	Cleaning out culverts	m ³	60	100.00	6,000	00
C1.2.3.5	Base patching using crushed stone material stabilised with bitumen emulsion and cement	m ³	400	850.00	340,000	00
C1.2.3.6	Base and / or surface patching using cold premixed asphalt	kg	5,000	20.00	100,000	00
C1.2.3.7	Base and / or surface patching using hot plant mixed asphalt	t	50	1,800.00	90,000	00
C1.2.3.8	Replacement of damaged guardrails including posts	m	100	1,000.00	100,000	00
C1.2.3.10	Watering of temporary gravel deviations and existing roads used as detours	kℓ	50	20.00	1,000	00
C1.2.3.11	Other road maintenance work ordered by the Engineer	Prov sum	1	250,000.00	250,000	00
C1.2.3.12	Handling cost, profit and all other charges in respect of item C1.2.3.11	%	250,000.00	5.00	12,500	00
C1.2.3.13	Liaison with the routine road maintenance contractor	month	27	5,000.00	135,000	00
C1.2.4	Stakeholder liaison	month	30	10,000.00	300,000	00
C1.2.5	Safety:					
C1.2.5.1	Health and safety plan	Lump sum	1	30,000.00	30,000	00
C1.2.5.2	Implementation of health and safety plan	month	30	80,000.00	2,400,000	00
Total Carried Forward					6,359,500	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					6,359,500	00
C1.2.6	Work adjacent to properties:					
C1.2.6.1	Survey of adjacent properties	No	15	6,000.00	90,000	00
C1.2.6.2	Preventive and / or mitigation measures	Prov sum	1	150,000.00	150,000	00
C1.2.6.3	Handling cost, profit and all other charges in respect of item C1.2.6.2	%	150,000.00	5.00	7,500	00
C1.2.7	Road safety audits:					
C1.2.7.1	Stage 4 work zone traffic management audit	Prov sum	1	150,000.00	150,000	00
PC1.2.7.2	Handling cost, profit and all other charges in respect of item C1.2.7.1	%	150,000.00	5.00	7,500	00
C1.2.7.3	Stage 5 pre-opening stage traffic safety audit	Prov sum	1	150,000.00	150,000	00
PC1.2.7.4	Handling cost, profit and all other charges in respect of item C1.2.7.3	%	150,000.00	5.00	7,500	00
C1.2.8	Dayworks:					
C1.2.8.1	Personnel:					
	(a) Unskilled labourer	h	140	75.00	10,500	00
	(b) Semi-skilled labourer	h	140	85.00	11,900	00
	(c) Skilled labourer	h	140	100.00	14,000	00
	(d) Gang leader	h	140	105.00	14,700	00
	(e) Foreman	h	140	300.00	42,000	00
	(f) Skilled Artisan	h	140	350.00	49,000	00
C1.2.8.2	Construction equipment:					
	(a) Motor grader (140 S)	h	40	950.00	38,000	00
	(b) Vibratory roller (minimum 17 ton)	h	40	450.00	18,000	00
	(c) Pneumatic roller (27 ton)	h	40	320.00	12,800	00
	(d) Front end loader (minimum 82 kw)	h	40	475.00	19,000	00
	(e) Tractor loader backhoe (minimum 52 kw)	h	40	450.00	18,000	00
	(f) Excavator (crawler, minimum 92 kw)	h	40	500.00	20,000	00
	(g) Compressor (portable diesel with 3 jackhammers and 90 m house)	h	40	250.00	10,000	00
C1.2.8.3	Vehicles:					
	(a) Light delivery vehicle (7 ton with hydraulic crane)	km	2,000	6.50	13,000	00
	(b) Flatbed truck (10 m³)	km	500	15.00	7,500	00
Total Carried Forward					7,220,400	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					7,220,400	00
C1.2.8.4	(c) Dump truck	km	500	10.00	5,000	00
	Materials:					
	(a) Procurement of materials	Prov sum	1	150,000.00	150,000	00
	(b) Contractor's handling costs, profit and all other charges in respect of item C1.2.8.4(a)	%	150,000.00	10.00	15,000	00
PC1.2.10	Dispute Adjudication Board (DAB):					
PC1.2.10.1	Employer's contribution to DAB (50%)	PC sum	1	1,000,000.00	1,000,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C1.3	CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS					
C1.3.1	The Contractor's general obligations:					
C1.3.1.1	Fixed obligations	Lump sum	1	2,000,000.00	2,000,000	00
C1.3.1.2	Value-related obligations	Lump sum	1	2,000,000.00	2,000,000	00
PC1.3.1.3	Time-related obligations:					
	(a) Mobilization period	month	3	1,500,000.00	4,500,000	00
	(b) Execution of the works	month	27	2,800,000.00	75,600,000	00
PC1.3.1.4	Suspension Cost:					
	(a) De-establishment	No	1	2,500,000.00	2,500,000	00
	(b) Re-establishment	No	1	2,500,000.00	2,500,000	00
	(c) Suspension period	month	2	800,000.00	1,600,000	00
	(d) Engineer's cost	PC sum	1	2,000,000.00	2,000,000	00
C1.3.2	Contract sign boards	m²	20	2,000.00	40,000	00
PC1.3.3	Contractors additional obligations:					
PC1.3.3.1	Photos and video footage using a drone	No	27	20,000.00	540,000	00
	<i>Note to Tenderer:</i>					
	<i>Should the combined, extended total tendered for Item C1.3.1 The contractor's general obligations:</i>					
	<i>C1.3.1.1 Fixed obligations</i>					
	<i>C1.3.1.2 Value-related obligations</i>					
	<i>PC1.3.1.3 Time-related obligations</i>					
	<i>exceed a maximum of 20% of the tender sum, the tenderer shall clearly set out his reasons for tendering in this manner in a letter attached to Form B1.</i>					
Total Carried Forward To Summary					93,280,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C1.4	FACILITIES FOR THE ENGINEER					
C1.4.1	Site accommodation:					
C1.4.1.1	Offices and conference room	m ²	150	1,500.00	225,000	00
C1.4.1.2	Laboratories	m ²	200	1,500.00	300,000	00
C1.4.1.3	Open concrete working floors and verandas	m ²	100	300.00	30,000	00
C1.4.1.4	Roofs over open concrete working floors and verandas	m ²	100	300.00	30,000	00
C1.4.1.5	Store rooms inside the laboratory	m ²	40	500.00	20,000	00
C1.4.1.6	Car ports	No	8	5,500.00	44,000	00
C1.4.1.7	Ablution unit (equipped as specified)	No	2	10,000.00	20,000	00
C1.4.1.9	Kitchen unit (equipped as specified)	No	2	10,000.00	20,000	00
C1.4.2	Items measured by area:					
C1.4.2.1	Shelving as specified, complete with brackets	m ²	20	450.00	9,000	00
C1.4.2.2	Work benches with a concrete slab top	m ²	20	650.00	13,000	00
C1.4.2.3	Work-benches with a wooden top	m ²	20	750.00	15,000	00
C1.4.2.4	Constant-temperature baths of concrete and / or plastered brick	m ²	10	1,000.00	10,000	00
C1.4.2.5	Concrete footings and pedestals for laboratory equipment	m ²	5	1,000.00	5,000	00
C1.4.2.6	Roller blinds, opaque type	m ²	20	750.00	15,000	00
C1.4.2.7	Venetian blinds	m ²	20	750.00	15,000	00
C1.4.2.8	Notice boards	m ²	6	950.00	5,700	00
C1.4.2.9	White boards	m ²	6	950.00	5,700	00
C1.4.2.10	Galvanised wire mesh fencing for store rooms	m ²	30	500.00	15,000	00
C1.4.2.11	Galvanised wire mesh store room gate with a padlock	m ²	2	500.00	1,000	00
C1.4.3	Items measured by number:					
C1.4.3.1	Office swivel chair	No	8	1,500.00	12,000	00
C1.4.3.2	Office chair	No	20	400.00	8,000	00
C1.4.3.3	Draughtsman's stool	No	6	530.00	3,180	00
C1.4.3.4	Laboratory high chair	No	6	400.00	2,400	00
C1.4.3.5	Office desk with 3 drawers (at least one lockable drawer)	No	6	2,000.00	12,000	00
C1.4.3.6	Typist desk (L-shaped)	No	4	2,000.00	8,000	00
Total Carried Forward					843,980	00

BILL OF QUANTITIES
SCHEDULE A: ROADWORKS
SECTION C1.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					843,980	00
C1.4.3.7	Drawing table	No	4	2,000.00	8,000	00
C1.4.3.8	Conference table	No	4	6,000.00	24,000	00
C1.4.3.9	Bookcase	No	4	1,500.00	6,000	00
C1.4.3.10	Filing cabinet	No	4	2,500.00	10,000	00
C1.4.3.11	General purpose steel cabinet with shelves	No	6	2,200.00	13,200	00
C1.4.3.12	Wall mounted pivot plan filing system	No	1	500.00	500	00
C1.4.3.13	220 / 250 volt power outlet plug point	No	25	600.00	15,000	00
C1.4.3.14	400 / 231 volt 3-phase power outlet plug point	No	4	3,000.00	12,000	00
C1.4.3.15	Single 1 500 mm, 58 watt fluorescent tube ceiling light	No	8	650.00	5,200	00
C1.4.3.16	Single 1 500 mm, 22 watt LED tube ceiling light	No	12	600.00	7,200	00
C1.4.3.17	11 watt compact fluorescent bulb ceiling light	No	10	350.00	3,500	00
C1.4.3.18	7 watt LED bulb ceiling light	No	5	200.00	1,000	00
C1.4.3.19	Wash-hand basin	No	5	1,200.00	6,000	00
C1.4.3.20	Laboratory basin	No	3	2,000.00	6,000	00
C1.4.3.21	Extractor fan	No	2	3,000.00	6,000	00
C1.4.3.22	Fume cupboard	No	1	4,000.00	4,000	00
C1.4.3.23	Fire extinguisher 9,0 kg, dry powder type	No	12	1,000.00	12,000	00
C1.4.3.24	Air-conditioning unit	No	6	6,500.00	39,000	00
C1.4.3.26	Concrete specimen curing bath	No	1	6,500.00	6,500	00
C1.4.3.27	Waste paper basket	No	6	600.00	3,600	00
C1.4.3.28	UPS / Voltage stabiliser	No	1	6,500.00	6,500	00
C1.4.3.29	A3 / A4 colour printer, copier, scanner	No	1	15,000.00	15,000	00
C1.4.3.34	Mobile outdoor weather station	No	2	20,000.00	40,000	00
C1.4.3.35	3,0 m aluminium straight edge complete with two measuring wedges	No	4	800.00	3,200	00
C1.4.3.36	Measuring wheel	No	4	4,000.00	16,000	00
C1.4.3.37	First aid kit	No	4	400.00	1,600	00
C1.4.3.38	Standpipe complete with 30 m of 19 mm dia. heavy duty hose pipe	No	1	2,000.00	2,000	00
Total Carried Forward					1,116,980	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					1,116,980	00
C1.4.4	Prime cost items:					
C1.4.4.3	The provision of a direct independent telephone line for the Engineer, including the monthly rental charges and the cost of business calls	PC sum	1	50,000.00	50,000	00
C1.4.4.4	Handling costs and profit in respect of item C1.4.4.3	%	50,000.00	5.00	2,500	00
C1.4.4.5	The provision of internet connectivity and WiFi data for Engineer's site staff	PC sum	1	30,000.00	30,000	00
C1.4.4.6	Handling costs and profit in respect of item C1.4.4.5	%	30,000.00	10.00	3,000	00
C1.4.4.7	The provision of paper and ink for a combination colour printer / copier / scanner	PC sum	1	20,000.00	20,000	00
C1.4.4.8	Handling costs and profit in respect of item C1.4.4.7	%	20,000.00	10.00	2,000	00
C1.4.4.11	The provision of a complete 440 / 231 volt three phase electrical power installation, including all poles, insulators, wiring, switchboards, mains connections, meters, etc.	PC sum	1	35,000.00	35,000	00
C1.4.4.12	Handling costs and profit in respect of item C1.4.4.11	%	35,000.00	10.00	3,500	00
C1.4.4.13	Provision of a 440 / 231 volt three phase electricity generator if electricity from a power supply authority is not available on site	PC sum	1	50,000.00	50,000	00
C1.4.4.14	Handling costs and profit in respect of item C1.4.4.13	%	50,000.00	10.00	5,000	00
C1.4.4.15	The provision of all gas installations required at the site offices, laboratories and at the Engineer's staff accommodation (if required), including gas storage cylinders, tubing, regulators, gas burners and shut-off cocks	PC sum	1	35,000.00	35,000	00
C1.4.4.16	Handling costs and profit in respect of item C1.4.4.15	%	35,000.00	10.00	3,500	00
C1.4.5	Services at site offices, laboratories and site accommodation:					
C1.4.5.1	Fixed costs	Lump sum	1	50,000.00	50,000	00
C1.4.5.2	Running costs	month	27	40,000.00	1,080,000	00
C1.4.7	Site inspection transport:					
C1.4.7.1	Provision of a bus, mini-bus or combi van for site inspection purposes (16 seater)	per day	54	500.00	27,000	00
C1.4.7.2	Travel on site	km	2,600	4.00	10,400	00
C1.4.8	Site security measures for the Engineer's facilities:					
C1.4.8.1	Supply and installation of all required security measures at the Engineer's site offices and laboratories	Lump sum	1	60,000.00	60,000	00
Total Carried Forward					2,583,880	00

BILL OF QUANTITIES**SCHEDULE A: ROADWORKS****SECTION C1.4**

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					2,583,880	00
C1.4.8.2	Provision of security guards / watchmen and an armed response service at the Engineer's site offices and laboratories	month	54	50,000.00	2,700,000	00
Total Carried Forward To Summary					5,283,880	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C1.5	ACCOMMODATION OF TRAFFIC					
C1.5.1	Accommodation of pedestrian and non-motorised traffic:					
C.1.5.1.1	Accommodation of pedestrian and non-motorised traffic	month	15	10,000.00	150,000	00
C1.5.2	Accommodation of vehicular traffic	month	27	55,000.00	1,485,000	00
C1.5.3	Liaison with traffic authorities	month	27	1,000.00	27,000	00
C1.5.4	Construction of temporary deviations					
C1.5.4/ 1.6.1	Clearing:					
C1.5.4/ 1.6.1.1	Clearing with machines and some hand labour where necessary	ha	17.5	35,000.00	612,500	00
C1.5.4/ 1.6.2	Grubbing:					
C1.5.4/ 1.6.2.1	Grubbing with machines and some hand labour where necessary	ha	6	20,000.00	120,000	00
C1.5.4/ 1.6.3	Removal and grubbing of large trees and tree stumps:					
C1.5.4/ 1.6.3.1	Girth equal to or exceeding 1,0 m up to and including 2,0 m	No	180	500.00	90,000	00
C1.5.4/ 1.6.3.2	Girth exceeding 2,0 m up to and including 3,0 m	No	20	1,500.00	30,000	00
C1.5.4/ 1.6.3.3	Girth exceeding 3,0 m	No	5	6,000.00	30,000	00
C1.5.4/ 1.6.3.4	Removal of trees in forests and plantations	ha	9.5	60,000.00	570,000	00
C1.5.4/ 1.6.9	Conservation of topsoil:					
C1.5.4/ 1.6.9.1	Stockpiling topsoil	m³	9,600	35.00	336,000	00
C1.5.4/ 1.6.9.2	Windrowing topsoil	m³	5,300	15.00	79,500	00
C1.5.4/ PC1.6.9.3	Excavate topsoil material to spoil in sites designated by the Contractor.	m³	37,200	20.00	744,000	00
C1.5.4/ 1.7.1	Loading:					
C1.5.4/ 1.7.1.1	Loading from stockpile using machines and some hand labour where necessary	m³	70,500	15.00	1,057,500	00
C1.5.4/ 1.7.1.2	Loading from heaps or windrows using machines and some hand labour where necessary	m³	23,500	18.00	423,000	00
Total Carried Forward					5,754,500	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					5,754,500	00
C1.5.4/ 1.7.2	Hauling:					
C1.5.4/ 1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:					
	(a) Soil, gravel, crushed stone and pavement layer material	m³-km	508,000	6.00	3,048,000	00
	(b) Boulders and hard material	m³-km	26,500	6.00	159,000	00
C1.5.4/ 1.7.2.2	Hauling material to spoil and off-loading it at a designated spoil area:					
	(a) Cleared and grubbed material (organic matter and all other unsuitable or waste material)	m³-km	34,500	5.00	172,500	00
C1.5.4/ PC3.2.29	Provision of drainage structure for the temporary deviation for the construction of:					
C1.5.4/ PC3.2.29.1	Bridge B447	Lump sum	1	500,000.00	500,000	00
C1.5.4/ PC3.2.30	Provision of design and drawings of temporary drainage structures as described in item PC3.2.29 by an ECSA registered Professional Engineer or Technologist for the construction of:					
C1.5.4/ PC3.2.30.1	Bridge B447	Lump sum	1	50,000.00	50,000	00
C1.5.4/ 4.1.7	Producing the material by:					
C1.5.4/ 4.1.7.3	Multiple-stage crushing including screening					
	(a) G5A 37.5 mm maximum aggregate size	m³	41,200	200.00	8,240,000	00
C1.5.4/ 4.1.9	Breaking down oversize material	m³	2,700	95.00	256,500	00
C1.5.4/ 4.2.1	Compiling and implementing M&U plans for the cuttings:					
C1.5.4/ 4.2.1.1	Cuttings exceeding 5 000 m³ up to 10 000 m³	No	1	10,000.00	10,000	00
C1.5.4/ 4.2.3	Excavating of materials in cuttings, material obtained from:					
C1.5.4/ 4.2.3.1	Soft excavation	m³	660	45.00	29,700	00
C1.5.4/ 4.2.3.2	Boulder excavation class A	m³	360	45.00	16,200	00
C1.5.4/ 4.2.3.3	Boulder excavation class B	m³	360	60.00	21,600	00
Total Carried Forward					18,258,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					18,258,000	00
C1.5.4/ 4.2.3.4	Hard excavation (other than by blasting)	m³	4,700	65.00	305,500	00
C1.5.4/ 4.2.3.5	Hard excavation (by blasting)	m³	670	45.00	30,150	00
C1.5.4/ 4.2.4	Excavating of materials in box cuts, material obtained from:					
C1.5.4/ 4.2.4.1	Soft excavation	m³	5,700	45.00	256,500	00
C1.5.4/ 4.2.4.2	Boulder excavation class A	m³	4,700	45.00	211,500	00
C1.5.4/ 4.2.4.3	Boulder excavation class B	m³	4,700	60.00	282,000	00
C1.5.4/ 4.2.4.4	Hard excavation (other than by blasting)	m³	10,000	65.00	650,000	00
C1.5.4/ 4.2.4.5	Hard excavation (by blasting)	m³	14,500	45.00	652,500	00
C1.5.4/ 4.2.7	Removal of unsuitable stable cut material to spoil:					
C1.5.4/ 4.2.7.1	In layer thicknesses of 200 mm and less	m³	500	50.00	25,000	00
C1.5.4/ 4.2.9	Excavate material to spoil in sites designated by the Contractor, material obtained from:					
C1.5.4/ 4.2.9.1	Soft excavation, overburden and unsuitable material	m³	3,750	115.00	431,250	00
C1.5.4/ 4.2.9.2	Boulder excavation class A	m³	480	180.00	86,400	00
C1.5.4/ 4.2.9.3	Boulder excavation class B	m³	480	200.00	96,000	00
C4.2.11	Breaking down oversize material	m³	200	120.00	24,000	00
C1.5.4/ 4.3.3	Removal of bituminous seal surfacing (thickness not exceeding 30 mm)	m²	9,200	10.00	92,000	00
C1.5.4/ 4.3.4	Saw-cutting existing materials within the following average depth ranges:					
C1.5.4/ 4.3.4.1	Asphalt material:					
	(a) Up to 50 mm	m	18,350	10.00	183,500	00
Total Carried Forward					21,584,300	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					21,584,300	00
C1.5.4/ 4.4.2	Commercial materials identified by the Contractor from commercial, private or other non-commercial suppliers:					
C1.5.4/ 4.4.2.1	Pavement layer material:					
	(c) G7 material for upper selected layer	m³	9,200	280.00	2,576,000	00
C1.5.4/ 4.4.2.5	Fill material in the earthworks:					
	(a) Normal or coarse fill	m³	7,500	200.00	1,500,000	00
C1.5.4/ 4.4.4	Cementitious stabilising agents:					
C1.5.4/ 4.4.4.1	Cement (CEM II 32.5N)	t	1,850	1,700.00	3,145,000	00
C1.5.4/ 4.4.4.2	Road lime	t	200	1,750.00	350,000	00
C1.5.4/ 5.1.1	Roadbed construction and compaction:					
C1.5.4/ 5.1.1.2	Compaction of in-situ material to 93% of MDD	m³	21,000	31.00	651,000	00
C1.5.4/ 5.1.4	Removal of unsuitable material to spoil:					
C1.5.4/ 5.1.4.1	In layer thicknesses of 200 mm and less:					
	(a) Stable material	m³	300	35.00	10,500	00
C1.5.4/ 5.1.5	In-situ treatment of roadbed in hard material:					
C1.5.4/ 5.1.5.1	In-situ treatment by ripping	m³	1,200	55.00	66,000	00
C1.5.4/ 5.1.5.2	In-situ treatment by drilling and blasting	m³	4,800	58.00	278,400	00
C1.5.4/ 5.1.6	Roller-pass compaction:					
C1.5.4/ 5.1.6.1	Grid rollers	m²	35,800	0.21	7,518	00
C1.5.4/ 5.1.6.2	Pad foot vibratory rollers	m²	35,800	0.21	7,518	00
C1.5.4/ 5.1.6.3	Smooth drum vibratory rollers	m²	23,800	0.21	4,998	00
Total Carried Forward					30,181,234	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					30,181,234	00
C1.5.4/ 5.1.7	Construction of a roadbed trial section:					
C1.5.4/ 5.1.7.4	Inactive and normal clay:					
	(b) By lime modification	m³	68	50.00	3,400	00
C1.5.4/ 5.1.9	Construction of roadbed comprising normal and inactive clay:					
C1.5.4/ 5.1.9.2	By lime modification	m³	3,550	41.00	145,550	00
C1.5.4/ 5.2.2	Fill construction:					
C1.5.4/ 5.2.2.1	Normal fill material in compacted layer thicknesses of 200 mm and less:					
	(b) Compacted to 93% of MDD	m³	56,200	30.00	1,686,000	00
	(c) Roller-pass compaction	m²	4,750	0.30	1,425	00
C1.5.4/ 5.2.2.2	Coarse fill material in compacted layer thicknesses exceeding 200 mm but less than 500 mm:					
	(b) Compacted to 93% of MDD	m³	2,000	30.00	60,000	00
C1.5.4/ 5.2.2.4	Rock fill material all as per Clause A5.2.7.6	m³	1,000	35.00	35,000	00
C1.5.4/ 5.2.2.7	Drainage blanket layer	m³	900	35.00	31,500	00
C5.2.3	Side-cut to fill compacted to 93% of MDD in compacted layer thicknesses of 200 mm and less	m³	15,500	25.00	387,500	00
C1.5.4/ 5.2.9	Removal of oversize material	m³	1,400	32.00	44,800	00
C1.5.4/ 5.3.2	Construction of pavement layers:					
C1.5.4/ PC5.3.2.1	Construction of layers using conventional construction methods:					
	(c) Upper selected subgrade layer (G7 200 mm thick) compacted to 95% of MDD	m³	9,200	30.00	276,000	00
	(j) Lower subbase gravel layer (chemically stabilised) (150 mm thick) compacted to 95% of MDD	m³	25,400	50.00	1,270,000	00
	(r) G5A crushed rock / boulder base layer (150 mm thick) compacted to 100% of MDD	m³	25,000	50.00	1,250,000	00
Total Carried Forward					35,372,409	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					35,372,409	00
C1.5.4/ 5.3.9	Construction of a trial section:					
C1.5.4/ 5.3.9.1	Construction of a trial section using conventional methods of construction:					
	(b) Crushed stone subbase layer (150 mm thick) trial section	m³	70	300.00	21,000	00
	(c) Crushed stone base layer (150 mm thick) trial section	m³	70	350.00	24,500	00
C1.5.4/ 5.4.2	Chemical stabilisation:					
C1.5.4/ 5.4.2.1	Chemical stabilisation (150 mm thick) of pavement layers (lower subbase)	m³	25,400	30.00	762,000	00
C1.5.4/ 5.4.5	Cementitious stabilisation agents for pavement layers:					
C1.5.4/ 5.4.5.2	Addition of cementitious stabilisation agents (CEM II 32.5N) for pavement layers and spreading the agent using bags and labour enhancement methods:					
	(a) Cement (Subbase)	t	1,850	30.00	55,500	00
C1.5.4/ 5.5.9	Temporarily blading layer material to windrow	m³	10,400	20.00	208,000	00
C1.5.4/ 8.1.1	Prime coat:					
C1.5.4/ 8.1.1.2	MC -30 cut-back bitumen	ℓ	58,000	10.00	580,000	00
C1.5.4/ 8.1.1.3	Inverted bitumen emulsion	ℓ	87,500	12.00	1,050,000	00
C1.5.4/ 10.1.9	Bituminous binder variations:					
C1.5.4/ 10.1.9.2	60% Stable-grade emulsion	ℓ	5,100	10.00	51,000	00
C1.5.4/ 10.1.9.5	Homogeneous modified binder (SC-E1;70-73(t)) cold applied	ℓ	5,250	15.00	78,750	00
C1.5.4/ 10.1.9.12	Anionic spray grade emulsion	ℓ	3,250	15.00	48,750	00
C1.5.4/ 10.1.10	Aggregate variation (Grade A):					
C1.5.4/ 10.1.10.3	10 mm aggregate	m³	110	350.00	38,500	00
Total Carried Forward					38,290,409	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					38,290,409	00
C1.5.4/ 10.1.22	Bituminous single seal and slurry, including a cover spray if specified:					
C1.5.4/ 10.1.22.3	Bituminous single seal with 10 mm aggregate and slurry ((SC-E1; 70-73 (t)) tack coat, 60% Anionic diluted spray grade emulsion as cover spray, grade A seal stone and fine slurry, medium grade)	m²	162,000	50.00	8,100,000	00
C1.5.4/ 10.1.24	Variation in the rate of application of the fine slurry:					
C1.5.4/ 10.1.24.2	Medium grade	m³	90	300.00	27,000	00
C1.5.4/ 11.4.2	Performance based vehicle restraint systems:					
C1.5.4/ 11.4.2.1	Complete longitudinal barrier system to EN 1317 or AASHTO MASH or NCHRP350 as alternative where no MASH product is available:					
	(c) Concrete barrier system (H4b-W6)	m	300	3,000.00	900,000	00
C1.5.4/ 11.4.2.2	Terminal sections for the following to EN 1317 or AASHTO MASH or NCHRP350 as alternative where no MASH product is available:					
	(a) End treatments (H4b-W6)	No	15	5,000.00	75,000	00
C1.5.4/ 11.4.2.3	Relocation of temporary systems (type, EN or MASH, or NCHRP350 as alternative where no MASH product is available, containment level and working width indicated)	m	300	500.00	150,000	00
C1.5.4/ 11.6.1	Road signboards with painted or coloured semi-matt background. Symbols, lettering and borders in semi- matt black or in Class I retro-reflective material, where the sign board is constructed from:					
C1.5.4/ 11.6.1.7	Regulatory signs, permanent:					
	(c) 1 200 mm diameter (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III)	No	28	900.00	25,200	00
C1.5.4/ PC11.6.1.8	Regulatory signs, temporary:					
	(c) 1 200 mm diameter (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III)	No	60	900.00	54,000	00
	(d) 1 200 mm x 2 800 mm size (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III)	No	8	1,200.00	9,600	00
Total Carried Forward					47,631,209	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					47,631,209	00
C1.5.4/ PC11.6.1.10	Warning signs, temporary: (d) 1 500 mm size (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III) (e) 1 200 mm x 1 600 mm size (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III) (f) 1 200 mm x 2 800 mm size (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III) (g) 2 400 mm x 400 mm size (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III)	No	14	900.00	12,600	00
		No	34	1,200.00	40,800	00
		No	32	1,200.00	38,400	00
		No	4	200.00	800	00
C1.5.4/ 11.6.1.12	Supplementary plates to temporary regulatory or warning signs (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III)	m²	60	200.00	12,000	00
C1.5/ PC11.6.1.13	Moveable barricade/road sign combination (1,4 mm thick prepainted galvanised steel, background Class I and symbol retro-reflective Class)	No	8	1,500.00	12,000	00
C1.5.4/ 11.6.2	Extra over on item C11.6.1 for using:					
C1.5.4/ 11.6.2.1	Background of retro-reflective material: (a) Class III	m²	440	10.00	4,400	00
C1.5.4/ 11.6.3	Road sign supports (overhead road sign structures excluded):					
C1.5.4/ 11.6.3.2	Timber: (a) 125 mm dia. (b) 150 mm dia.	m m	80 120	175.00 200.00	14,000 24,000	00 00
C1.5.4/ PC11.6.12	Mounted on stands:					
C1.5.4/ PC11.6.12.1	Road signs, R- and TR-series	m²	150	100.00	15,000	00
C1.5.4/ PC11.6.12.2	Road signs, TW-series	m²	120	100.00	12,000	00
C1.5.4/ PC11.6.12.3	Road signs, TGS- and TG-series	m²	40	100.00	4,000	00
Total Carried Forward					47,821,209	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					47,821,209	00
C1.5.4/ 11.7.2	Retro-reflective road marking:					
C1.5.4/ 11.7.2.2	Yellow lines broken or unbroken (water borne, 100 mm wide)	km	3	5,000.00	15,000	00
C1.5.4/ 11.7.2.14	Hand operated pressure applied machine white lines broken or unbroken (water borne, 100 mm)	km	15.5	3,200.00	49,600	00
C1.5.4/ 11.7.2.17	Hand operated pressure applied machine white lettering and symbols (water borne)	m²	150	3,200.00	480,000	00
C1.5.4/ 11.7.2.19	Hand operated pressure applied machine transverse lines, painted island and arrestor bed markings (any colour) (water borne)	m²	100	3,200.00	320,000	00
C1.5.4/ 11.7.5	Variations in rate of application:					
C1.5.4/ 11.7.5.1	White paint	ℓ	50	45.00	2,250	00
C1.5.4/ 11.7.5.4	Retro-reflective beads	kg	10	20.00	200	00
C1.5.4/ 11.7.7	Road studs:					
C1.5.4/ 11.7.7.3	Temporary road studs compliant to SANS 1442 or 1463					
	(a) RSA-T					
	(i) Red/ white	No	500	95.00	47,500	00
	(ii) Red/ red	No	500	95.00	47,500	00
	(iii) Yellow/ red	No	500	95.00	47,500	00
C1.5.4/ 11.7.8	Setting out and premarking the lines (excluding traffic island markings, lettering and symbols)	km	27	950.00	25,650	00
C1.5.4/ 11.7.10	Removal of existing, temporary or final road markings by:					
C1.5.4/ 11.7.10.1	Sandblasting	m²	200	110.00	22,000	00
C1.5.4/ 11.7.10.2	Water-jetting	m²	1,500	180.00	270,000	00
C1.5.4/ 11.7.10.3	Overpainting as temporary measure	m²	500	60.00	30,000	00
C1.5.4/ 11.7.11	Removal of existing road studs	No	500	15.00	7,500	00
C1.5.4/ 12.10.1	Excavation in hard rock using controlled blasting techniques	m³	15,170	50.00	758,500	00
Total Carried Forward					49,944,409	00

BILL OF QUANTITIES
SCHEDULE A: ROADWORKS
SECTION C1.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					49,944,409	00
C1.5.5	Maintenance of temporary deviations:					
C1.5.5.1	Grass cutting	ha	2	10,000.00	20,000	00
C1 5.5.2	Drain cleaning	km	0.5	5,000.00	2,500	00
C1.5.5.3	Cleaning out culverts	m³	3	2,500.00	7,500	00
C1.5.5.4	Collection of rubbish / litter	km	26	1,500.00	39,000	00
C1.5.5.6	Base patching using crushed stone material stabilised with bitumen emulsion and cement	m³	250	200.00	50,000	00
C1.5.5.7	Base and / or surface patching using hot plant mixed asphalt	t	100	2,200.00	220,000	00
C1.5.5.8	Replacement of damaged guardrails	m	100	200.00	20,000	00
C1.5.5.9	Grading of temporary deviations and existing roads used as detours	km	2	15,000.00	30,000	00
C1.5.5.11	Other road maintenance work ordered by the Engineer	Prov sum	1	250,000.00	250,000	00
C1.5.5.12	Handling cost, profit and all other charges in respect of item C1.5.5.11	%	250,000.00	5.00	12,500	00
C1.5.6	Removal of temporary deviations	km	2	100,000.00	200,000	00
C1.5.7	Temporary traffic control facilities:					
PC1.5.7.1	Reboundable delineators including mounting bases and ballast:					
	(a) Single sided, reversible left or right (heavy duty, 200 x 800 mm, TW401 and TW402, 20 kg base)	No	300	250.00	75,000	00
	(b) Double sided, reversible left or right (heavy duty, 200 x 800 mm, 20 kg base)	No	800	250.00	200,000	00
C1.5.7.2	Traffic cones, minimum height 750 mm	No	20	100.00	2,000	00
C1.5.7.3	Flagmen	man-shift	35,000	225.00	7,875,000	00
C1.5.7.4	Traffic controllers	man-shift	10,500	350.00	3,675,000	00
PC1.5.7.5	Provision of illuminated traffic signs:					
	(a) Sign mounted flashing amber lights (2 lights with the specified power supply) mounted on a backing board which is:					
	(ii) 1 200 mm wide x 200 mm high	No	44	800.00	35,200	00
	(b) Flashing LED illuminated arrow board	No	24	500.00	12,000	00
	(f) Mobile variable message sign with a speed measuring and display capability	No	4	10,000.00	40,000	00
Total Carried Forward					62,710,109	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					62,710,109	00
C1.5.7.6	Maintenance of illuminated traffic signs:					
	(a) Sign mounted flashing amber lights (a pair of two lights mounted on a separate backing board)	month	27	1,100.00	29,700	00
	(b) Flashing LED illuminated arrow board	month	27	1,150.00	31,050	00
	(f) Mobile variable message sign with a speed measuring and display capability	month	27	10,000.00	270,000	00
C1.5.7.7	Traffic calming devices:					
	(a) 25 mm high x 100 mm wide asphalt rumble strips	m	100	350.00	35,000	00
C1.5.7.8	Traffic control stations	month	27	5,000.00	135,000	00
C1.5.8	Traffic safety officer	man-month	27	50,000.00	1,350,000	00
C1.5.9	Traffic safety vehicle	month	27	60,000.00	1,620,000	00
C1.5.11	Provision of safety equipment for visitors:					
C1.5.11.1	Provision of reflective safety vests for visitors	No	8	300.00	2,400	00
C1.5.11.2	Provision of hard hats for visitors	No	6	450.00	2,700	00
C1.5.12	Additional traffic accommodation facilities ordered by the Engineer:					
C1.5.12.1	Provision of additional traffic accommodation facilities	Prov sum	1	100,000.00	100,000	00
C1.5.12.2	Handling cost, profit and all other charges in respect of item C1.5.12.1	%	100,000.00	10.00	10,000	00
Total Carried Forward To Summary					66,295,959	00

BILL OF QUANTITIES
SCHEDULE A: ROADWORKS
SECTION C1.6

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C1.6	CLEARING AND GRUBBING					
C1.6.1	Clearing:					
C1.6.1.1	Clearing with machines and some hand labour where necessary	ha	33	35,000.00	1,155,000	00
C1.6.1.2	Clearing with hand labour only when labour enhanced work is specified	ha	1	40,000.00	40,000	00
C1.6.1.3	Clearing for new fence lines (over a width of 2,0 m)	km	59	5,000.00	295,000	00
C1.6.2	Grubbing:					
C1.6.2.1	Grubbing with machines and some hand labour where necessary	ha	22	20,000.00	440,000	00
C1.6.2.2	Grubbing with hand labour when labour enhancement work is specified or it is not practical to use a machine	ha	1	40,000.00	40,000	00
C1.6.2.3	Grubbing by hand for new fence lines (over a width of 2,0 m)	km	38	20,000.00	760,000	00
C1.6.2.4	Grubbing by hand for service trenches (over the agreed width required)	m ²	1,500	5.00	7,500	00
C1.6.3	Removal and grubbing of large trees and tree stumps:					
C1.6.3.1	Girth equal to or exceeding 1,0 m up to and including 2,0 m	No	180	500.00	90,000	00
C1.6.3.2	Girth exceeding 2,0 m up to and including 3,0 m	No	20	1,500.00	30,000	00
C1.6.3.3	Girth exceeding 3,0 m	No	5	6,000.00	30,000	00
C1.6.3.4	Removal of trees in forests and plantations	ha	9.5	40,000.00	380,000	00
PC1.6.4	Removal of buildings and structures:					
PC1.6.4.1	Radiant brick and pave at PTN 43 of Farm 464	Prov sum	1	20,000.00	20,000	00
PC1.6.4.2	Light structure at PTN 34 of Farm 708	Prov sum	1	20,000.00	20,000	00
C1.6.8	Conservation of vegetation:					
C1.6.8.1	Establishment of a temporary nursery	No	1	100,000.00	100,000	00
C1.6.8.3	Removal, storage and maintenance of trees, girth up to and including 1,0 m	No	80	1,000.00	80,000	00
C1.6.8.4	Removal, storage and maintenance of trees, girth exceeding 1,0 m up to and including 2,0 m	No	10	2,000.00	20,000	00
C1.6.9	Conservation of topsoil:					
C1.6.9.1	Stockpiling topsoil	m ³	7,500	25.00	187,500	00
C1.6.9.2	Windrowing topsoil	m ³	7,600	15.00	114,000	00
Total Carried Forward					3,809,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C1.6

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					3,809,000	00
PC1.6.9.3	Spoil topsoil at contractor designated sites	m³	54,000	28.00	1,512,000	00
C1.6.10	Disposal of hazardous waste material:					
C1.6.10.1	Disposal of hazardous waste material at an approved hazardous waste material facility	Prov sum	1	50,000.00	50,000	00
C1.6.10.2	Handling cost, profit and all other charges in respect of item C1.6.10.1	%	50,000.00	10.00	5,000	00
C1.6/ 1.7.1	Loading:					
C1.6/ 1.7.1.1	Loading from stockpile using machines and some hand labour where necessary	m³	7,500	15.00	112,500	00
C1.6/ 1.7.1.2	Loading from heaps or windrows using machines and some hand labour where necessary	m³	7,600	18.00	136,800	00
C1.6/ 1.7.2	Hauling:					
C1.6/ 1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:					
	(a) Soil, gravel, crushed stone and pavement layer material	m³-km	45,100	5.00	225,500	00
C1.6/ 1.7.2.2	Hauling material to spoil and off-loading it at a designated spoil area:					
	(a) Cleared and grubbed material (organic matter and all other unsuitable or waste material)	m³-km	54,000	5.00	270,000	00
Total Carried Forward To Summary					6,120,800	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C2.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C2.1	GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES					
C2.1.1	Location, identification, protection and relocation of existing services:					
C2.1.1.1	Contractor's obligations	Lump sum	1	15,000.00	15,000	00
C2.1.1.2	Permanent services relocation or protection work by others	PC sum	1	250,000.00	250,000	00
C2.1.1.3	Handling costs and profit in respect of item C2.1.1.2 above	%	250,000.00	10.00	25,000	00
C2.1.1.4	Permanent services relocation or protection work by the Contractor	Prov sum	1	250,000.00	250,000	00
C2.1.2	Existing services location, detection and verification:					
C2.1.2.1	Using specialist detection services (ground penetrating radar, radio detection, etc.)	PC sum	1	30,000.00	30,000	00
C2.1.2.2	Handling costs and profit in respect of item C2.1.2.1 above	%	30,000.00	10.00	3,000	00
C2.1.2.3	Survey to verify existing service positions	PC sum	1	20,000.00	20,000	00
C2.1.2.4	Handling costs and profit in respect of item C2.1.2.3 above	%	20,000.00	10.00	2,000	00
C2.1.2.5	Using hand excavation to locate, expose and verify services	m ³	750	200.00	150,000	00
C2.1.3	Obtaining construction or work permits	Lump sum	1	10,000.00	10,000	00
C2.1.4	Provision of guarantees or deposits for services:					
C2.1.4.1	Providing guarantees and deposits	PC sum	1	300,000.00	300,000	00
C2.1.4.2	Handling costs and profit in respect of item C2.1.4.1 above	%	300,000.00	5.00	15,000	00
C2.1.5	Provision of record drawings and applicable data	Lump sum	1	20,000.00	20,000	00
C2.1.6	Trench excavation (in soft material):					
C2.1.6.1	Trenches up to 1,0 m wide:					
	(a) Up to 1,0 m deep	m ³	100	100.00	10,000	00
	(b) Over 1,0 m and up to 2,0 m deep	m ³	1,125	100.00	112,500	00
C2.1.7	Extra over items C2.1.6, C2.1.8 and C2.1.16 for excavating in:					
C2.1.7.1	Hard material irrespective of depth	m ³	60	200.00	12,000	00
C2.1.7.2	Stabilised material irrespective of depth	m ³	60	200.00	12,000	00
Total Carried Forward					1,236,500	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C2.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					1,236,500	00
C2.1.11	Backfilling of trenches:					
C2.1.11.1	Backfill compacted to 93 % (100 % for sand) of MDD (areas subject to traffic loads) using material:					
	(a) From the excavated trench material	m³	350	100.00	35,000	00
	(e) From commercial sources (state material type)	m³	820	350.00	287,000	00
C2.1.17	Removal and disposal of spoil material from trench excavations:					
C2.1.17.2	To spoil sites or dumping areas provided by the Contractor	m³	860	150.00	129,000	00
C2.1.19	Dealing with water during services work:					
C2.1.19.1	Dealing with surface water	Lump sum	1	5,000.00	5,000	00
C2.1.19.2	Dealing with subsurface water	Lump sum	1	10,000.00	10,000	00
C2.1.22	Existing services that intersect or adjoin a trench:					
C2.1.22.1	Services that intersect a trench (angles between centre-lines in plan 45° to 90°):					
	(a) Electrical line	No	1	15,000.00	15,000	00
	(b) Fibre pipe	No	2	15,000.00	30,000	00
	(c) Water pipe	No	4	20,000.00	80,000	00
C2.1.25	Removal of existing services:					
C2.1.25.1	Streetlight cables and ducts	m	4,030	100.00	403,000	00
PC2.1.25.4	Streetlight masts/ posts	No	90	2,000.00	180,000	00
C2.1.26	Disposal of existing service materials:					
C2.1.26.1	Streetlight cables and ducts	m	4,030	100.00	403,000	00
PC2.1.26.4	Streetlight masts/ posts	No	90	200.00	18,000	00
C2.1.27	Demolition of existing manholes, access chambers and other service structures consisting of:					
C2.1.27.1	Unreinforced concrete	m³	5	400.00	2,000	00
C2.1.27.2	Reinforced concrete	m³	5	500.00	2,500	00
C2.1/ 12.7.1	Establishment on site for: (Pipe Jacking, Horizontal directional drilling, Pipe Ramming, or Micro-tunnelling)	Lump sum	1	100,000.00	100,000	00
Total Carried Forward To Summary					2,936,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C2.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C2.2	DRY SERVICES					
C2.2.1	Supply, lay and prove ducts:					
C2.2.1.1	U-PVC normal duty utility duct (SANS 286 Class C):					
	(a) 110 mm dia. OD	m	2,960	100.00	296,000	00
	(b) 160 mm dia. OD	m	1,000	110.00	110,000	00
C2.2.4	Bedding for ducts compacted to 90% of MDD (100% for sand) using material:					
C2.2.4.1	Selected from the excavated trench material	m³	245	250.00	61,250	00
C2.2.5	Concrete for bedding and encasement of ducts:					
C2.2.5.2	Concrete encasement of ducts (C12/15-38)	m³	285	1,500.00	427,500	00
C2.2.6	Duct accessories (markers, marking, draw wires and end caps, etc.):					
C2.2.6.1	Duct markers	No	120	300.00	36,000	00
C2.2.6.3	Draw wires (2,5 mm galvanized)	m	10,940	5.00	54,700	00
C2.2.6.4	End caps or plugs:					
	(a) U-PVC 110 mm dia. ID	No	200	50.00	10,000	00
	(b) U-PVC 160 mm dia. ID	No	80	50.00	4,000	00
C2.2/ 2.4.3	Cable laying accessories:					
C2.2/ 2.4.3.1	Electrical warning tape (plastic)	m	1,900	10.00	19,000	00
Total Carried Forward To Summary					1,018,450	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C3.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C3.1	DRAINS					
C3.1.1	Excavation for open drains:					
C3.1.1.1	Excavating all material situated within the following depth ranges below the surface level using conventional methods:					
	(a) 0 m to 1,5 m	m ³	3,750	50.00	187,500	00
C3.1.1.2	Extra over sub-item C3.1.1.1 for excavation in hard and boulder material irrespective of depth	m ³	375	150.00	56,250	00
C3.1.2	Clearing, shaping and disposal of accumulated sediment in existing unlined open drains:					
C3.1.2.1	Using conventional methods	m ³	200	50.00	10,000	00
C3.1.2.2	Using labour enhanced construction methods	m ³	200	100.00	20,000	00
C3.1.3	Excavation, clearing and disposal of accumulated sediment in existing lined drains and drainage systems:					
C3.1.3.3	Using labour enhanced construction methods:					
	(a) Manholes and inlet and outlet structures	m ³	134	100.00	13,400	00
	(b) Culvert barrels	m ³	213	100.00	21,300	00
C3.1.4	Excavation and disposal of material for subsoil drainage systems:					
C3.1.4.1	Excavating in all material situated within the following depth ranges below the surface:					
	(a) 0 m to 1,5 m	m ³	12,433	120.00	1,491,960	00
C3.1.6	Construction of banks and dykes:					
C3.1.6.1	Banks and dykes using conventional methods (Type 3 berm as per drawing 33532.00-123-03)	m ³	3,500	200.00	700,000	00
C3.1.6.2	Banks and dykes using labour enhanced construction methods (Type 1 or 2 berm as per drawing 33532.00-123-03)	m ³	2,000	120.00	240,000	00
C3.1.7	Natural permeable material in subsoil drainage systems (approved crushed stone):					
C3.1.7.2	Crushed stone obtained from commercial sources (20 mm Grade A)	m ³	2,360	500.00	1,180,000	00
C3.1.8	Natural permeable material in subsoil drainage systems (approved natural sand):					
C3.1.8.2	Natural sand from commercial sources (Grade A)	m ³	10,070	350.00	3,524,500	00
Total Carried Forward					7,444,910	00

BILL OF QUANTITIES
SCHEDULE A: ROADWORKS
SECTION C3.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					7,444,910	00
C3.1.9	Pipes in subsoil drainage systems:					
C3.1.9.1	U-PVC pipes and fittings, normal duty, complete with couplings					
	(a) 150 mm slotted	m	16,580	75.00	1,243,500	00
	(b) 150 mm non-perforated	m	1,658	70.00	116,060	00
C3.1.11	Geotextiles:					
C3.1.11.1	Grade A synthetic needle punched non-woven fibre filter fabric	m²	29,275	20.00	585,500	00
C3.1.13	Concrete outlet structures, manhole boxes, junction boxes and cleaning eyes for subsoil drainage systems:					
C3.1.13.1	Outlet structures (Head and Wing walls as per drawing 33532.00-123-04)	No	67	3,700.00	247,900	00
C3.1.13.3	Junction boxes (as per drawing 33532.00-123-04)	No	2	1,500.00	3,000	00
C3.1.13.4	Cleaning eyes (as per drawing 33532.00-123-04)	No	207	2,600.00	538,200	00
C3.1.14	Caps for subsoil drain pipes:					
C3.1.14.1	Concrete caps	No	67	200.00	13,400	00
C3.1.15	Repairing or replacing existing drainage systems	Prov sum	1	50,000.00	50,000	00
C3.1.16	Loading and hauling of material in excess of 1,0 km	m³-km	37,500	6.00	225,000	00
C3.1.18	Backfilling of drains with selected material compacted to 93 % of MDD prior to construction of concrete lining and / or stone pitched lining	m³	5,906	350.00	2,067,100	00
C3.1.19	Exposing of existing subsoil drains	m³	100	2,000.00	200,000	00
C3.1.20	Breaking into existing drainage structures and install subsoil drain pipe	No	10	900.00	9,000	00
C3.1.22	Test flushing of subsoil drain pipe systems	No	67	6,500.00	435,500	00
C3.1.23	Subsoil drain outlet marker (as per drawing 33532.00-123-04)	No	67	450.00	30,150	00
C3.1.24	Submission of as built drawings by the Contractor	Prov sum	1	50,000.00	50,000	00
Total Carried Forward To Summary					13,259,220	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C3.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C3.2	CULVERTS					
C3.2.1	Excavation for culvert structures:					
C3.2.1.1	Excavating in all material situated within the following depth ranges below the surface level:					
	(a) 0 m to 1,5 m	m³	24,290	90.00	2,186,100	00
	(b) Exceeding 1,5 m and up to 3,0 m	m³	6,956	110.00	765,160	00
C3.2.1.4	Extra over sub-item C3.2.1.1 for excavation in hard or boulder material, irrespective of depth	m³	3,125	350.00	1,093,750	00
C3.2.2	Backfilling:					
C3.2.2.1	Using the excavated material	m³	14,360	230.00	3,302,800	00
C3.2.2.2	Using imported selected material:					
	(b) From sources on site (G7)	m³	3,590	300.00	1,077,000	00
C3.2.2.3	Extra over sub-items C3.2.2.1 and C3.2.2.2 for soil cement backfilling:					
	(b) With dry mixture (CEM II 32,5 N) of 3% cement	m³	1,200	300.00	360,000	00
	(c) Variation in cement	kg	6,000	150.00	900,000	00
C3.2.2.4	Extra over sub-items C3.2.2.1 and C3.2.2.2 for screed layers (C12/15-20 concrete)	m³	150	1,500.00	225,000	00
C3.2.3	Concrete pipe culverts:					
C3.2.3.2	On Class B bedding (Spigot and socket Class 100D)					
	(a) 375 mm dia.	m	3,520	750.00	2,640,000	00
	(b) 450 mm dia.	m	400	1,000.00	400,000	00
	(c) 600 mm dia.	m	3,800	1,500.00	5,700,000	00
	(d) 900 mm dia.	m	3,800	2,000.00	7,600,000	00
C3.2.3.5	Provision of skew ends of pipe culvert (Spigot and socket Class 100D):					
	(a) 600 mm	No	10	3,500.00	35,000	00
	(b) 900 mm	No	10	5,000.00	50,000	00
C3.2.7	Cast-in-situ concrete and formwork:					
C3.2.7.1	In Class A bedding, screeds, concrete backfill and the encasing for pipes, including formwork, (C25-30-20 concrete)	m³	100	2,500.00	250,000	00
Total Carried Forward					26,584,810	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C3.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					26,584,810	00
C3.2.7.2	In complete in-situ floor slabs for rectangular culverts, manholes and catchpits including formwork, joints and Class U2 surface finish (C25/30-20 concrete) (installed at a standard depth of 1,0 m)	m³	391	1,800.00	703,800	00
C3.2.7.3	In walls, excluding formwork but including Class U2 surface finish (C25/30-20 concrete)	m³	700	1,800.00	1,260,000	00
C3.2.7.4	In roof slabs for rectangular culverts, excluding formwork but including Class U2 surfacing finish and joints (C25/30-20 concrete)	m³	400	1,800.00	720,000	00
C3.2.7.5	In inlet and outlet structures including kerbs, chutes and downpipes, skewed ends, catchpits, manholes, thrust and anchor blocks, excluding formwork but including Class U2 surfacing finish (C25/30-20 concrete)	m³	264	1,800.00	475,200	00
C3.2.7.6	Formwork of concrete under items C3.2.7.3 to 5 above (Class F2 finish)	m²	10,000	300.00	3,000,000	00
C3.2.10	Reinforcement:					
C3.2.10.2	High-tensile steel bars (Y12 Rebar)	t	146	20,000.00	2,920,000	00
C3.2.10.3	Welded steel fabric:					
	(a) Mesh ref 617	kg	67,117	15.00	1,006,755	00
	(b) Mesh ref 888	kg	439	15.00	6,585	00
C3.2.12	Demolition of concrete members or elements:					
C3.2.12.1	Full member or element (manhole and grid inlet)	m³	16	400.00	6,400	00
C3.2.12.2	Partial member or element (head walls)	m³	894	400.00	357,600	00
C3.2.15	Manholes and catch pits, with prefabricated elements:					
C3.2.15.4	Extra over item C3.2.7.2 for variations in the depths of all types of concrete manholes with prefabricated, or in-situ concrete or brickwork wall combinations deeper than 1,0 m designated for tendering purposes	m	250	900.00	225,000	00
C3.2.16	Brickwork (engineering bricks):					
C3.2.16.2	230 mm thick	m²	3,000	150.00	450,000	00
C3.2.17	Plaster	m²	3,000	15.00	45,000	00
C3.2.18	Benching	m³	346	1,500.00	519,000	00
C3.2.19	Accessories:					
C3.2.19.1	Manhole frames (Type 2A frame as per drawing 33532.00-123-02)	No	220	600.00	132,000	00
C3.2.19.2	Inlet grids or covers (as per drawing 33532.00C-123-02)	No	380	1,200.00	456,000	00
Total Carried Forward					38,868,150	00

BILL OF QUANTITIES
SCHEDULE A: ROADWORKS
SECTION C3.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					38,868,150	00
C3.2.19.4	Manhole covers or gratings (Type 2A, 400 KN, Class D400)	No	220	1,750.00	385,000	00
C3.2.19.5	Inlet channel frames (Regtangular medium, Class B125)	No	380	450.00	171,000	00
C3.2.19.7	Step irons (150 mm wide x 115 mm long with 50 mm thread length)	No	5,318	50.00	265,900	00
C3.2.19.8	Inlet grid frames (inlet grid as per drawing 33532.00-123-01-V1)	No	5	3,500.00	17,500	00
C3.2.19.9	Inlet grids or covers (inlet grid as per drawing 33532.00-123-01-V1)	No	5	3,500.00	17,500	00
C3.2.22	Cutting of concrete pipes:					
C3.2.22.1	375 mm	No	40	120.00	4,800	00
C3.2.22.2	450 mm	No	10	120.00	1,200	00
C3.2.22.3	600 mm	No	10	150.00	1,500	00
C3.2.22.4	900 mm	No	10	200.00	2,000	00
C3.2.22.5	1 050 mm	No	10	0.00	0	00
C3.2.23	Breaking into existing drainage structures and building in pipes or culverts of the following size (900 mm pipe and all box culverts)	No	40	160.00	6,400	00
C3.2.24	Compaction of bedding for inlets, outlets, manholes and catchpits:					
C3.2.24.1	Preparation and compaction of in-situ bedding material to 90 % of MDD (150 mm deep)	m³	274	150.00	41,100	00
C3.2.24.2	Extra-over sub-item C3.2.24.1 for compaction to 93 % of MDD (150 mm deep)	m³	200	50.00	10,000	00
C3.2.27	Repair with epoxy mortar	ℓ	150	110.00	16,500	00
PC3.2.28	Removal and disposal of existing culverts as per drawing 33532.00-121-01 to 33532.00-121-09					
PC3.2.28.1	450 mm dia. concrete culvert	m	90	350.00	31,500	00
PC3.2.28.2	600 mm dia. concrete culvert	m	250	500.00	125,000	00
PC3.2.28.3	900 mm dia. concrete culvert	m	90	900.00	81,000	00
PC3.2.29	Provision of drainage structure for the temporary deviation for the construction of:					
PC3.2.29.1	Bridge B447	Lump sum	1	0.00	0	00
PC3.2.29.2	Bridge B0619	Lump sum	1	0.00	0	00
PC3.2.29.3	Major Culvert C9519	Lump sum	1	0.00	0	00
Total Carried Forward					40,046,050	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C3.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					40,046,050	00
PC3.2.29.4	Major Culvert C9520	Lump sum	1	0.00	0	00
PC3.2.30	Provision of design and drawings of temporary drainage structures as described in item PC3.2.29 by an ECSA registered Professional Engineer or Technologist for the construction of:					
PC3.2.30.1	Bridge B447	Lump sum	1	0.00	0	00
PC3.2.30.2	Bridge B0619	Lump sum	1	0.00	0	00
PC3.2.30.3	Major Culvert C9519	Lump sum	1	0.00	0	00
PC3.2.30.4	Major Culvert C9520	Lump sum	1	0.00	0	00
C3.2/ 1.7.2	Hauling:					
C3.2/ 1.7.2.2	Hauling material to spoil and off-loading it at a designated spoil area:					
	(b) Soil and gravel material	m³-km	250,000	6.00	1,500,000	00
	(c) Boulders and hard material	m³-km	62,500	6.00	375,000	00
Total Carried Forward To Summary					41,921,050	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C3.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C3.3	CONCRETE KERBING AND CHANNELING, ASPHALT BERMS, CHUTES, DOWNPIPES, CONCRETE, STONE PITCHED AND GABION LININGS FOR OPEN DRAINS					
C3.3.1	Concrete kerbing:					
C3.3.1.1	Prefabricated kerbing:					
	(a) Figure 4 (BK2) on concrete bedding as per drawing 33532.00-190-04	m	15,000	180.00	2,700,000	00
	(b) Figure 10 (E3) on concrete bedding as per drawing 33532.00-190-04	m	16,995	150.00	2,549,250	00
	(c) Figure 4 (BK2) for kerb inlet	m	758	200.00	151,600	00
	(d) Warning and directional tactile paver	m ²	120	180.00	21,600	00
C3.3.2	Concrete kerbing-channeling combination:					
C3.3.2.1	Prefabricated kerbing-channeling:					
	(a) Figure 4 and Figure 14 on concrete bedding as per drawing 33532.00-190-04	m	16,910	300.00	5,073,000	00
	(b) Double Figure 14 on concrete bedding as per drawing 33532.00-190-04	m	200	280.00	56,000	00
C3.3.3	Extra over items C3.3.1 and C3.3.2 for concrete kerbing or concrete kerbing and channeling on curves:					
C3.3.3.1	On curves of radii more than or equal to 5,0 m but less than 20,0 m	m	686	300.00	205,800	00
C3.3.3.2	On curves with radii more than or equal to 1,0 m but less than 5,0 m	m	100	350.00	35,000	00
C3.3.3.3	On curves with radii less than 1,0 m	m	65	450.00	29,250	00
C3.3.4	Extra over item C3.3.2 for drop kerbs at pedestrian crossings and driveways	m	370	300.00	111,000	00
C3.3.6	Concrete chutes:					
C3.3.6.1	Prefabricated concrete chutes (as per drawing 33532.00-123-03)	m	250	300.00	75,000	00
C3.3.8	Linings for open drains:					
C3.3.8.1	Cast-in-situ concrete lining (C25/30-20 concrete as per drawing 33532.00-123-03):					
	(a) Type F	m ³	750	1,850.00	1,387,500	00
	(b) Type A	m ³	150	1,850.00	277,500	00
	(c) Type E	m ³	585	1,850.00	1,082,250	00
Total Carried Forward					13,754,750	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C3.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					13,754,750	00
C3.3.8.2	Class U2 surface finish to cast-in-situ concrete:					
	(a) Type F	m²	7,500	25.00	187,500	00
	(b) Type A	m²	409	25.00	10,225	00
	(c) Type E	m²	4,380	25.00	109,500	00
C3.3.8.3	Stone pitched lining (200 mm thickness):					
	(a) Grouted stone pitching (Type E)	m²	500	200.00	100,000	00
C3.3.9	Formwork to cast-in-situ concrete lining for open drains (Class F2 surface finish):					
C3.3.9.2	To sides with formwork on the internal face and external face (each face measured)	m²	3,360	100.00	336,000	00
C3.3.9.3	To ends of slabs	m²	720	170.00	122,400	00
C3.3.10	Sealed joints in concrete and stone pitched linings of open drains (Polysulphide sealant as per drawing 33532.00-123-03)					
C3.3.10.1	Expansion	m	1,225	10.00	12,250	00
C3.3.10.2	Construction	m	6,125	5.00	30,625	00
C3.3.12	Reinforcement:					
C3.3.12.3	Welded steel fabric (Ref: 395)	kg	48,380	16.00	774,080	00
C3.3.13	Polymer film sheeting (0,15 mm thick) for concrete-lined open drains	m²	12,250	10.00	122,500	00
C3.3.14	Cutting bituminous surfacing and pavement layers for concrete kerbing, channeling or concrete-lined drains	m	350	20.00	7,000	00
C3.3.15	Energy dissipaters in outlet structures:					
C3.3.15.1	Precast concrete blocks in outlet structures	No	720	50.00	36,000	00
C3.3.15.2	Stones set in outlet structures	m²	80	50.00	4,000	00
C3.3.16	Demolition and removal of existing kerbs and / or channel (300 mm maximum size)	m³	1,350	95.00	128,250	00
C3.3/ 1.7.2	Hauling:					
C3.3/ C1.7.2.2	Hauling material to spoil and off-loading it at a designated spoil area:					
	(c) Boulders, hard material and concrete	m³-km	8,100	6.00	48,600	00
Total Carried Forward To Summary					15,783,680	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C4.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C4.1	BORROW MATERIALS					
C4.1.3	Construction and maintenance of temporary haul and access roads:					
C4.1.3.1	Temporary unsealed roads	km	5	130,000.00	650,000	00
C4.1.4	Removing of the overburden:					
C4.1.4.2	In quarries:					
	(a) Soft material	m	30	4,500.00	135,000	00
	(b) Hard material (by blasting)	m	35	1,000.00	35,000	00
C4.1.6	Providing crushing, screening and related plants:					
C4.1.6.3	Multiple-stage crushing and screening plant	No	2	400,000.00	800,000	00
C4.1.6.4	Screening plant	No	1	250,000.00	250,000	00
C4.1.7	Producing the material by:					
C4.1.7.3	Multiple-stage crushing including screening					
	(a) G5A 37.5 mm maximum aggregate size (subbase)	m ³	97,400	200.00	19,480,000	00
	(b) G5A 20 mm maximum aggregate size (for BSM1)	m ³	60,400	220.00	13,288,000	00
	(c) G7 50 mm maximum aggregate size	m ³	42,000	180.00	7,560,000	00
	(d) G9 50 mm maximum aggregate size	m ³	32,400	160.00	5,184,000	00
	(e) Pioneer layer	m ³	5,000	60.00	300,000	00
	(f) Drainage blanket	m ³	14,700	100.00	1,470,000	00
C4.1.7.4	Screening only	m ³	18,000	50.00	900,000	00
C4.1.8	Moving and re-erecting the crushing, screening and related plants on the site:					
C4.1.8.3	Multiple-stage crushing and screening plant	No	3	150,000.00	450,000	00
C4.1.8.4	Screening plant	No	1	80,000.00	80,000	00
C4.1.10	Compacting the floor of the stockpile sites	m ³	16,500	15.00	247,500	00
C4.1.11	Constructing a platform for the stockpile site	m ³	5,000	25.00	125,000	00
C4.1.12	Stockpiling the material:					
C4.1.12.1	Material from a producing plant	m ³	200,000	18.00	3,600,000	00
C4.1.12.2	Material directly from the excavation	m ³	320,000	20.00	6,400,000	00
C4.1.13	Removing surplus material from the stockpile	m ³	5,000	18.00	90,000	00
Total Carried Forward					61,044,500	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C4.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					61,044,500	00
C4.1.14	Removing the fill platform and temporary banks at the stockpile sites upon completion:					
C4.1.14.1	Fill platform	m³	5,500	23.00	126,500	00
C4.1.14.2	Temporary banks	m³	500	23.00	11,500	00
C4.1.15	Shaping and finishing the borrow pit and quarry areas, and the stockpile sites:					
C4.1.15.1	Shaping and finishing the borrow pit and quarry areas, and the stockpile sites:					
	(b) Quarries	ha	2.5	10,000.00	25,000	00
	(c) Stockpile sites	ha	4	8,000.00	32,000	00
C4.1.16	Personnel:					
C4.1.16.1	Materials manager	month	27	40,000.00	1,080,000	00
C4.1.16.2	Excavation controller	month	27	30,000.00	810,000	00
C4.1.16.3	Stockpile controller	month	27	20,000.00	540,000	00
C4.1.17	Weighbridge facility:					
C4.1.17.1	Providing, erecting and removal of a weighbridge facility	Lump sum	1	750,000.00	750,000	00
C4.1.17.2	Operating the weighbridge	month	27	5,000.00	135,000	00
C4.1.19	Excavating hard material	m³	150,000	35.00	5,250,000	00
C4.1.20	Producing the material by:					
C4.1.20.2	Multi-stage crushing and screening					
	(a) G5A 37.5 mm maximum aggregate size	m³	150,000	200.00	30,000,000	00
C4.1.21	Stockpiling the crushed material	m³	150,000	18.00	2,700,000	00
C4.1/ 1.7.2	Hauling:					
C4.1/ 1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:					
	(a) Soil, gravel, crushed stone and pavement layer material	m³-km	50,000	6.00	300,000	00
C4.1/ 11.5.5	Providing temporary fences and gates:					
C4.1/ 11.5.5.1	Stock-proof fence	km	8	3,800.00	30,400	00
C4.1/ 11.5.5.5	Temporary gates (Government pattern, 3,85 m x 1,4 m)	No	10	4,500.00	45,000	00
Total Carried Forward To Summary					102,879,900	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C4.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C4.2	CUT MATERIALS					
C4.2.1	Compiling and implementing M&U plans for the cuttings:					
C4.2.1.1	Cuttings exceeding 5 000 m ³ up to 10 000 m ³	No	4	10,000.00	40,000	00
C4.2.1.4	Cuttings exceeding 50 000 m ³ up to 100 000 m ³	No	1	10,000.00	10,000	00
C4.2.1.5	Cuttings larger than 100 000 m ³	No	2	25,000.00	50,000	00
C4.2.2	Additional material investigations during the supplementary exploration:					
C4.2.2.1	Cost of additional trial pits and / or drilling and laboratory testing	Prov sum	1	150,000.00	150,000	00
C4.2.2.2	Handling costs and profit in respect of item C4.2.2.1	%	150,000.00	5.00	7,500	00
C4.2.3	Excavating of materials in cuttings, material obtained from:					
C4.2.3.1	Soft excavation	m ³	50,300	35.00	1,760,500	00
C4.2.3.2	Boulder excavation class A	m ³	17,600	45.00	792,000	00
C4.2.3.3	Boulder excavation class B	m ³	17,600	60.00	1,056,000	00
C4.2.3.4	Hard excavation (other than by blasting)	m ³	26,000	65.00	1,690,000	00
C4.2.3.5	Hard excavation (by blasting)	m ³	449,000	40.00	17,960,000	00
C4.2.4	Excavating of materials in box cuts, material obtained from:					
C4.2.4.1	Soft excavation	m ³	5,700	35.00	199,500	00
C4.2.4.2	Boulder excavation class A	m ³	4,700	45.00	211,500	00
C4.2.4.3	Boulder excavation class B	m ³	4,700	60.00	282,000	00
C4.2.4.4	Hard excavation (other than by blasting)	m ³	10,000	65.00	650,000	00
C4.2.4.5	Hard excavation (by blasting)	m ³	14,500	40.00	580,000	00
C4.2.7	Removal of unsuitable stable cut material to spoil:					
C4.2.7.1	In layer thicknesses of 200 mm and less	m ³	500	50.00	25,000	00
C4.2.9	Excavate material to spoil in sites designated by the Contractor, material obtained from:					
C4.2.9.1	Soft excavation, overburden and unsuitable material	m ³	18,800	115.00	2,162,000	00
C4.2.9.2	Boulder excavation class A	m ³	2,400	180.00	432,000	00
C4.2.9.3	Boulder excavation class B	m ³	2,400	200.00	480,000	00
Total Carried Forward					28,538,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C4.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					28,538,000	00
C4.2.10	Backfilling of the unavoidable overbreak in hard and boulder excavation:					
C4.2.10.1	Compliant gravel material	m³	415	55.00	22,825	00
C4.2.10.2	Soil cement (stiff mix with 3% cement)	m³	415	550.00	228,250	00
C4.2.11	Breaking down oversize material	m³	13,600	120.00	1,632,000	00
C4.2.12	Finishing the side slopes:					
C4.2.12.1	Cuttings:					
	(a) In soft material	m²	4,600	9.00	41,400	00
	(b) In boulder material class A and B	m²	3,300	10.00	33,000	00
	(c) In hard material	m²	16,600	10.00	166,000	00
C4.2/ 1.7.2	Hauling:					
C4.2/ 1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:					
	(a) Soil, gravel, crushed stone and pavement layer material	m³-km	275,000	6.00	1,650,000	00
	(b) Boulders and hard material	m³-km	30,500	6.00	183,000	00
Total Carried Forward To Summary					32,494,475	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C4.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C4.3	EXISTING ROAD MATERIALS					
C4.3.1	Additional material investigations:					
C4.3.1.1	Cost of additional trial pits, sampling of asphalt and laboratory testing	Prov sum	1	100,000.00	100,000	00
C4.3.1.2	Handling cost and profit in respect of item C4.3.1.1	%	100,000.00	5.00	5,000	00
C4.3.3	Removal of bituminous seal surfacing (thickness not exceeding 30 mm)	m ²	151,000	10.00	1,510,000	00
C4.3.5	Providing the milling machine on the site:					
C4.3.5.2	Large milling machine with a cutting width exceeding 1,2 m	No	6	15,000.00	90,000	00
C4.3.7	Milling and removal of existing asphalt layers with an average milling depth (Employer takes ownership):					
C4.3.7.1	Not exceeding 50 mm	m ³	8,200	120.00	984,000	00
C4.3.8	Excavating material by milling:					
C4.3.8.1	Crushed stone material	m ³	11,000	110.00	1,210,000	00
C4.3.8.3	Natural gravel material	m ³	7,200	60.00	432,000	00
C4.3.9	Excavating material by using conventional road construction equipment:					
C4.3.9.2	Crushed stone and macadam materials	m ³	15,900	38.00	604,200	00
C4.3.9.4	Natural gravel and sand materials	m ³	15,000	25.00	375,000	00
C4.3.9.5	Coarse fill and rock fill	m ³	500	60.00	30,000	00
C4.3.13	Lifting of existing paving blocks (60 mm interlocking concrete paving block):					
C4.3.13.2	Using labour enhanced methods of construction	m ²	1,800	15.00	27,000	00
C4.3.14	Removing of existing road edging and services structures:					
C4.3.14.1	Removing of existing road edging using construction equipment:					
	(a) Kerbing and edge beams:					
	(i) In-situ concrete kerbing and edge beams	m ³	180	45.00	8,100	00
	(b) Kerb inlets	No	2	1,500.00	3,000	00
	(c) Grid inlets	No	2	1,500.00	3,000	00
C4.3.15	Stockpiling of road layer materials:					
C4.3.15.1	Asphalt material	m ³	8,200	10.00	82,000	00
Total Carried Forward					5,463,300	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C4.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					5,463,300	00
C4.3.15.2	Crushed stone material	m³	14,500	10.00	145,000	00
C4.3.15.4	Natural gravel material	m³	14,700	10.00	147,000	00
C4.3.16	Stacking paving blocks and road edging:					
C4.3.16.1	Paving blocks (60 mm concrete block paving)	No	60,000	0.50	30,000	00
C4.3.16.2	Precast concrete kerbing (Fig. 14, 1,0 m length)	No	150	5.00	750	00
C4.3.20	Spoiling of paving blocks and road edging in spoil sites designated by the Contractor:					
C4.3.20.1	Paving blocks	m³	30	25.00	750	00
C4.3.20.2	Precast and in-situ concrete kerbing, edge beams and channels at precast kerbing	m³	580	25.00	14,500	00
C4.3.20.3	Kerb and grid inlets, and other services structures	No	4	250.00	1,000	00
C4.3/ 1.7.2	Hauling:					
C4.3/ 1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:					
	(a) Soil, gravel, crushed stone and pavement layer material	m³-km	377,000	6.00	2,262,000	00
	(b) Boulders and hard material	m³-km	42,000	6.00	252,000	00
C4.3/ 5.5.9	Temporarily blading layer material to windrow	m³	11,100	20.00	222,000	00
Total Carried Forward To Summary					8,538,300	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C4.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C4.4	COMMERCIAL MATERIALS					
C4.4.2	Commercial materials identified by the Contractor from commercial, private or other non-commercial suppliers:					
C4.4.2.1	Pavement layer material:					
	(q) Natural or crushed gravel material for the wearing course of an unsealed road	m³	240	350.00	84,000	00
C4.4.4	Cementitious stabilising agents:					
C4.4.4.1	Cement	t	7,050	1,700.00	11,985,000	00
C4.4.4.2	Road lime	t	470	1,750.00	822,500	00
C4.4.5	Bituminous stabilising agents:					
C4.4.5.1	Penetration grade bitumen (70/100)	t	3,650	11,400.00	41,610,000	00
C4.4.6	Fillers for bituminous stabilisation:					
C4.4.6.1	CEM II 32.5N	t	750	1,700.00	1,275,000	00
C4.4.6.2	Road lime	t	750	1,750.00	1,312,500	00
C4.4.7	Sampling and material testing by a commercial laboratory for the stabilisation designs:					
C4.4.7.1	Cost of sampling and material testing	Prov sum	1	100,000.00	100,000	00
C4.4.7.2	Handling cost and profit in respect of item C4.4.7.1	%	100,000.00	10.00	10,000	00
Total Carried Forward To Summary					57,199,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C5.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C5.1	ROADBED					
C5.1.1	Roadbed construction and compaction:					
C5.1.1.2	Compaction of in-situ material to 93% of MDD	m ³	18,200	31.00	564,200	00
C5.1.1.5	Compaction of in-situ sand roadbed to 95% of MDD	m ³	2,100	38.00	79,800	00
C5.1.3	Excavate material to spoil sites designated by the Contractor:					
C5.1.3.1	Excavate material to spoil from roadbed construction, material obtained from:					
	(a) Soft excavation	m ³	49,000	120.00	5,880,000	00
	(b) Boulder excavation Class A	m ³	2,800	130.00	364,000	00
	(c) Boulder excavation Class B	m ³	2,800	130.00	364,000	00
C5.1.4	Removal of unsuitable material to spoil:					
C5.1.4.1	In layer thicknesses of 200 mm and less:					
	(a) Stable material	m ³	1,100	35.00	38,500	00
C5.1.5	In-situ treatment of roadbed in hard material:					
C5.1.5.1	In-situ treatment by ripping	m ³	16,700	55.00	918,500	00
C5.1.5.2	In-situ treatment by drilling and blasting	m ³	66,600	58.00	3,862,800	00
C5.1.5.3	In-situ treatment by drilling and splitting the material using non-explosive, rock-breaking products	m ³	4,150	350.00	1,452,500	00
C5.1.6	Roller-pass compaction:					
C5.1.6.1	Grid rollers	m ²	295,000	0.21	61,950	00
C5.1.6.2	Pad foot vibratory rollers	m ²	295,000	0.21	61,950	00
C5.1.6.3	Smooth drum vibratory rollers	m ²	200,000	0.21	42,000	00
C5.1.6.7	High energy impact compactor / roller (HEIC)	m ²	19,600	0.50	9,800	00
C5.1.7	Construction of a roadbed trial section:					
C5.1.7.1	Non wetting-up collapsing soil trial section at in-situ moisture content using conventional rollers and / or HEIC	m ³	68	180.00	12,240	00
C5.1.7.4	Inactive and normal clay:					
	(b) By lime modification	m ³	68	150.00	10,200	00
C5.1.7.6	Roller-pass compaction	m ³	38	150.00	5,700	00
Total Carried Forward					13,728,140	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C5.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					13,728,140	00
C5.1.8	Construction of the roadbed in collapsing soil:					
C5.1.8.1	Non wetting-up collapsing soil roadbed construction at in-situ moisture content using conventional rollers	m³	1,800	35.00	63,000	00
C5.1.8.2	Non wetting-up collapsing soil roadbed construction at in-situ moisture content using HEIC	m³	4,200	45.00	189,000	00
C5.1.9	Construction of roadbed comprising normal and inactive clay:					
C5.1.9.2	By lime modification	m³	8,200	41.00	336,200	00
C5.1.11	Construction of roadbed comprising a pioneer layer	m³	5,000	48.00	240,000	00
C5.1.13	Construction of a levelling layer:					
C5.1.13.2	Over a constructed pioneer layer compacted to 90 % MDD	m³	2,000	20.00	40,000	00
C5.1/ 1.7.1	Loading:					
C5.1/ 1.7.1.1	Loading from stockpile using machines and some hand labour where necessary	m³	55,000	15.00	825,000	00
C5.1/ 1.7.2	Hauling:					
C5.1/ 1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:					
	(a) Soil, gravel, crushed stone and pavement layer material	m³-km	480,000	6.00	2,880,000	00
C5.1/ 5.2.2	Fill construction:					
C5.1/ 5.2.2.1	Normal fill material in compacted layer thicknesses of 200 mm and less:					
	(b) Compacted to 93% of MDD	m³	60,500	30.00	1,815,000	00
Total Carried Forward To Summary					20,116,340	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C5.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C5.2	FILL					
C5.2.1	Compiling and implementing M&U plans:					
C5.2.1.1	For fills more than 10 000 m³:					
	(a) km 0 to km 5,5	No	1	5,000.00	5,000	00
	(b) km 16,94 to km 17,11	No	1	5,000.00	5,000	00
	(c) km 17,14 to km 17,44	No	1	5,000.00	5,000	00
C5.2.1.2	For fills 1,0 km in length when less than 10 000 m³:					
	(a) km 6,0 to km 7,1	No	1	2,500.00	2,500	00
	(b) km 7,4 to km 8,46	No	1	2,500.00	2,500	00
	(c) km 8,68 to km 9,84	No	1	2,500.00	2,500	00
	(d) km 23 to km 26,32	No	1	2,500.00	2,500	00
C5.2.2	Fill construction:					
C5.2.2.1	Normal fill material in compacted layer thicknesses of 200 mm and less:					
	(b) Compacted to 93% of MDD	m³	139,000	30.00	4,170,000	00
	(c) Roller-pass compaction	m²	23,750	0.30	7,125	00
C5.2.2.4	Rock fill material all as per Clause A5.2.7.6	m³	6,000	35.00	210,000	00
C5.2.2.7	Drainage blanket layer	m³	14,700	35.00	514,500	00
C5.2.3	Side-cut to fill compacted to 93% of MDD in compacted layer thicknesses of 200 mm and less	m³	15,500	25.00	387,500	00
C5.2.4	Correcting rock fills that are deficient in fine material, extra over C5.2.2.4	m³	600	25.00	15,000	00
C5.2.5	Fill in sidewalk:					
C5.2.5.1	Fill material in sidewalk compacted to 93% of MDD	m³	61,500	35.00	2,152,500	00
C5.2.6	Fill material in shoulder widening:					
C5.2.6.1	Fill material in shoulder widening compacted to 93% of MDD	m³	10,200	32.00	326,400	00
C5.2.7	Construction of a trial section:					
C5.2.7.1	Normal fill	m³	135	25.00	3,375	00
C5.2.7.3	Rock fill	m³	225	35.00	7,875	00
C5.2.7.5	Roller-pass compaction	m³	450	0.50	225	00
Total Carried Forward					7,819,500	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C5.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					7,819,500	00
C5.2.8	Breaking down oversize fill material on the road:					
C5.2.8.1	By normal grid rolling as per clause A5.3.7.3b) (i) to (vii)	m²-pass	30,000	0.21	6,300	00
C5.2.8.3	By pad foot vibratory roller	m²-pass	30,000	0.21	6,300	00
C5.2.8.4	By vibratory roller	m²-pass	30,000	0.21	6,300	00
C5.2.9	Removal of oversize material	m³	3,200	0.00	0	00
C5.2.10	Finishing off rock fill slopes:					
C5.2.10.1	Finishing off rock fill slopes with soft material	m³	1,000	32.00	32,000	00
C5.2.11	Finishing-off fill slopes, medians and interchange areas:					
C5.2.11.1	Fill slopes	m²	96,500	8.00	772,000	00
C5.2/ 1.7.1	Loading:					
C5.2/ 1.7.1.1	Loading from stockpile using machines and some hand labour where necessary	m³	117,000	15.00	1,755,000	00
C5.2/ 1.7.2	Hauling:					
C5.2/ 1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:					
	(a) Soil, gravel, crushed stone and pavement layer material	m³-km	641,000	6.00	3,846,000	00
C5.2/ 12.6.17	Geotextile (Grade C non-woven needle punched for rockfill)	m²	103,000	45.00	4,635,000	00
Total Carried Forward To Summary					18,878,400	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C5.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C5.3	ROAD PAVEMENT LAYERS					
C5.3.1	Compiling and implementing M&U plans for the construction of all the pavement layers	No	6	10,000.00	60,000	00
C5.3.2	Construction of pavement layers:					
C5.3.2.1	Construction of layers using conventional construction methods:					
	(a) Lower selected subgrade layer (150 mm thick, existing surfacing, macadam and gravels) compacted to 93% of MDD	m ³	69,200	30.00	2,076,000	00
	(c) Upper selected subgrade layer (150 mm thick, G7) compacted to 95% of MDD	m ³	67,000	35.00	2,345,000	00
	(g) Gravel wearing course layer (150 mm thick) compacted to 95% of MDD	m ³	240	35.00	8,400	00
	(h) Gravel shoulder layer (150 mm thick) compacted to 95% of MDD	m ³	2,550	45.00	114,750	00
	(dd) PMPL BSM1 layer (150 mm thick, compacted to 100% of MDD)	m ³	60,400	60.00	3,624,000	00
	(ee) G5A crushed rock / boulder lower subbase layer (chemically stabilised) (C4, 150 mm thick) compacted to 95% of MDD	m ³	16,250	50.00	812,500	00
	(ff) G5A crushed rock / boulder upper subbase layer (chemically stabilised) (C4, 150 mm thick) compacted to 97% of MDD	m ³	16,250	55.00	893,750	00
	(gg) G5A crushed rock / boulder subbase layer (chemically stabilised) (C4, 200 mm thick) compacted to 96% of MDD	m ³	65,000	55.00	3,575,000	00
	(hh) G5A sidewalk subbase (ustabilised) 150 mm thick compacted to 95% of MDD	m ³	11,900	50.00	595,000	00
C5.3.5	Breaking down oversize layer material on the road:					
C5.3.5.1	By normal grid rolling as per clause A5.3.7.3b)	m ² -pass	30,000	0.21	6,300	00
C5.3.5.3	By pad foot vibratory roller	m ² -pass	30,000	0.21	6,300	00
C5.3.5.4	By vibratory roller	m ² -pass	30,000	0.21	6,300	00
C5.3.6	Removal of oversize material	m ³	1,000	40.00	40,000	00
C5.3.7	Recombining recovered material	m ³	114,000	25.00	2,850,000	00
C5.3.9	Construction of a trial section:					
C5.3.9.1	Construction of a trial section using conventional methods of construction:					
	(b) Crushed stone subbase layer (150 mm and 200 mm thick) trial section	m ³	68	300.00	20,400	00
Total Carried Forward					17,033,700	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C5.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					17,033,700	00
C5.3.9.2	(d) PMPL layer (150 mm thick) trial section	m³	68	1,500.00	102,000	00
	Construction of a trial section using labour enhancement methods:					
C5.3.10	(d) G5A sidewalk subbase	m³	35	250.00	8,750	00
	Removal of a completed trial section:					
C5.3.10.1	Stabilised layer	m³	68	50.00	3,400	00
C5.3.10.2	PMPL layer	m³	68	60.00	4,080	00
C5.3.10.4	Sidewalk subbase	m³	35	80.00	2,800	00
C5.3.11	Riding quality measurements:					
C5.3.11.3	Using an inertial profilometer	km	145	5,000.00	725,000	00
C5.3.12	Surface regularity payment adjustments	Prov sum	1	250,000.00	250,000	00
C5.3/ 1.7.1	Loading:					
C5.3/ 1.7.1.1	Loading from stockpile using machines and some hand labour where necessary	m³	299,000	15.00	4,485,000	00
C5.3/ 1.7.2	Hauling:					
C5.3/ 1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:					
C5.3/ 5.5.9	(a) Soil, gravel, crushed stone and pavement layer material	m³-km	1,635,000	6.00	9,810,000	00
	Temporarily blading layer material to windrow	m³	10,400	20.00	208,000	00
Total Carried Forward To Summary					32,632,730	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C5.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C5.4	STABILISATION					
C5.4.2	Chemical stabilisation:					
C5.4.2.1	Chemical stabilisation (150 mm and 200 mm thick) of pavement layers (subbase C4)	m ³	97,400	30.00	2,922,000	00
C5.4.3	Stabilised crushed stone PMPL layer (150 mm thick BSM1 base)	m ³	60,400	50.00	3,020,000	00
C5.4.5	Cementitious stabilisation agents for pavement layers:					
C5.4.5.2	Addition of cementitious stabilisation agents for pavement layers and spreading the agent using bags and labour enhancement methods:					
	(a) Cement (CEM II 32.5 N, C4 subbase layer)	t	7,050	35.00	246,750	00
C5.4.9	Filler for bituminous stabilisation:					
C5.4.9.1	Filler for bituminous stabilisation:					
	(a) Cement (CEM II, 32,5N)	t	750	35.00	26,250	00
	(b) Lime	t	750	35.00	26,250	00
C5.4.10	Provision and application of water for curing	kℓ	975	20.00	19,500	00
C5.4.11	Curing by covering with the subsequent layer	m ²	108,500	5.00	542,500	00
C5.4.12	Curing with a membrane:					
C5.4.12.3	Spray grade emulsion (30% for upper stabilised subbase)	ℓ	434,000	6.50	2,821,000	00
C5.4.12.5	Stable grade emulsion (15% anionic for BSM)	ℓ	320,000	4.50	1,440,000	00
C5.4.13	Trial section for a PMPL layer (3,7 m wide)	m ²	555	51.00	28,305	00
C5.4.14	Trial section for a chemically stabilised layer	m ³	85	38.00	3,230	00
PC5.4.18	Addition of bituminous stabilisation for a PMPL layer:					
PC5.4.18.1	Penetration grade bitumen (70/100)	ℓ	3,650,000	1.80	6,570,000	00
Total Carried Forward To Summary					17,665,785	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C9.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C9.1	ASPHALT LAYERS					
C9.1.1	Asphalt mix designs:					
C9.1.1.2	Sand skeletal mixes:					
	(a) Continuously graded base or surfacing:					
	(i) Asphalt surfacing (Sa-V14 (PG64V-16) (EMB) level II)	Lump sum	1	150,000.00	150,000	00
C9.1.2	Construction of trial sections:					
C9.1.2.1	Asphalt layers (sand skeletal, PG64-16 (EMB), 50 mm by paver)	m ²	700	950.00	665,000	00
C9.1.2.2	Removal of trial section where so instructed by the Engineer	m ²	700	70.00	49,000	00
C9.1.3	Application of bond coat:					
C9.1.3.1	Stable – grade 30% net bitumen emulsion as specified. Applied with a calibrated distributor	ℓ	71,000	7.00	497,000	00
C9.1.5	Asphalt surfacing:					
C9.1.5.1	New construction:					
	(e) Sand skeletal mix – continuously graded as defined (50 mm thick, PG64-16 (EMB) and design level II)	m ²	129,000	230.00	29,670,000	00
C9.1.7	Placing and compacting asphalt in restricted areas:					
C9.1.7.1	Extra over payment items C9.1.4.1 and C9.1.5.1 (50 mm thick, PG64V-16, design level II by paver)	m ²	10,000	65.00	650,000	00
C9.1.8	Surfacing of bridge decks:					
C9.1.8.1	Levelling course: Continuously graded (PG64V-16 (EMB) and design level II) and nominal maximum particle size	t	60	2,000.00	120,000	00
C9.1.8.2	Surfacing (50 mm thick, (PS64V-16) (EMB) sand skeletal, 14 mm nominal maximum particle size by paver)	t	300	2,600.00	780,000	00
C9.1.9	Application of rolled in chippings (14 mm nominal size):					
C9.1.9.1	By means of chip spreader	t	790	5.00	3,950	00
C9.1.10	Variation rates:					
C9.1.10.1	Bitumen (PG64V-16) (EMB)	t	45	12,000.00	540,000	00
C9.1.10.2	Aggregate	t	740	350.00	259,000	00
C9.1.10.3	Active filler (lime unless stated in Contract Documentation)	t	15	1,500.00	22,500	00
Total Carried Forward					33,406,450	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C9.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					33,406,450	00
C9.1.10.5	Rolled-in chippings	t	80	350.00	28,000	00
C9.1.10.6	Bituminous bond coat – net bitumen (stable grade emulsion)	t	7	5,500.00	38,500	00
C9.1.12	Asphalt reinforcing - complete (Glass fibre strands mesh 25 x 25 mm with a minumum UTS of 100 kN/ m)	m²	125	200.00	25,000	00
C9.1.13	Coring of asphalt layers:					
C9.1.13.1	100 mm diameter	No	190	250.00	47,500	00
C9.1.13.2	150 mm diameter	No	50	300.00	15,000	00
C9.1.14	Surface regularity testing as described in Clause A9.1.8.4:					
C9.1.14.1	Establishment of equipment: (a) Inertial laser Profilometer or other Profilometer type for final surfacing, e.g. ARRB Walking or Face Dipstick for base (Contractor to specify.....)	No	1	22,000.00	22,000	00
C9.1.14.2	Profiler Surveys utilising equipment as specified - Base layers and surfacing layers	km	105	1,200.00	126,000	00
PC9.1.15	Milling of bridge decks and keys adjacent to bridge decks:					
C9.1.15.1	Provision of an appropriate sized milling machine	No	1	10,000.00	10,000	00
C9.1.15.2	Milling of bridge decks and keys to bridge deck approaches	m³	160	600.00	96,000	00
C9.1.15.3	Cleaning of milled surfaces	m²	3,200	5.00	16,000	00
Total Carried Forward To Summary					33,830,450	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C10.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C10.1	GENERAL REQUIREMENTS FOR SURFACE TREATMENTS					
C10.1.9	Bituminous binder variations:					
C10.1.9.2	60% Stable-grade emulsion	ℓ	10,900	10.00	109,000	00
C10.1.9.5	Homogeneous modified binder (SC-E2 70-73(t)) cold applied	ℓ	7,900	15.00	118,500	00
C10.1.9.7	Homogeneous modified binder (SC-E2) hot applied	ℓ	11,900	16.50	196,350	00
C10.1.9.11	Precoating fluid (Bituminous)	ℓ	1,050	5.00	5,250	00
C10.1.9.12	Anionic spray grade emulsion (65%)	ℓ	5,300	14.00	74,200	00
C10.1.10	Aggregate variation (Grade A):					
C10.1.10.5	20 mm aggregate	m³	350	380.00	133,000	00
C10.1.14	Precoating of aggregate using a frontend loader:					
C10.1.14.2	Product containing no low flashpoint solvent (Bituminous)	ℓ	46,500	9.00	418,500	00
C10.1.22	Bituminous single seal and slurry, including a cover spray if specified:					
C10.1.22.1	Bituminous single seal with 20 mm aggregate and first slurry using:					
	(a) S-E2 tack coat, Grade A aggregate and medium grade slurry	m²	159,000	58.00	9,222,000	00
	(b) SC-E2 (70-73(t)) tack coat, Grade A aggregate and medium grade slurry	m²	106,000	55.00	5,830,000	00
C10.1.22.4	Extra over C10.1.22.1 for application of second slurry (fine grade slurry)	m²	264,000	13.00	3,432,000	00
C10.1.24	Variation in the rate of application of the fine slurry:					
C10.1.24.1	Fine grade	m³	150	2,400.00	360,000	00
C10.1.25	Variation in active filler content	t	2	1,700.00	3,400	00
C10.1.26	Trial sections for all seal types specified (10 mm and 20 mm with slurry seal)	Lump sum	1	150,000.00	150,000	00
Total Carried Forward To Summary					20,052,200	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C11.1	PITCHING, STONEWORK, CAST IN SITU CONCRETE FOR PROTECTION AGAINST EROSION					
C11.1.2	Stone pitching:					
C11.1.2.2	Grouted stone pitching with mortar	m ²	208	700.00	145,600	00
C11.1.5	Concrete pitching or paving:					
C11.1.5.1	Cast-in-situ concrete pitching or paving (C25/30-20, 100 mm thick, sidewalks and median)	m ²	67,600	250.00	16,900,000	00
C11.1.5.3	Welded steel fabric used for cast-in-situ pitching or paving (Ref 395)	kg	267,200	30.00	8,016,000	00
C11.1.6	Concrete edge beams (C20/25-20)	m ³	250	2,500.00	625,000	00
C11.1.7	Provision of approved herbicide and ant poison:					
C11.1.7.1	Provision of materials	PC sum	1	50,000.00	50,000	00
C11.1.7.2	Contractor's charges and profit added to the prime cost sum	%	50,000.00	5.00	2,500	00
Total Carried Forward To Summary					25,739,100	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C11.2	NON-STRUCTURAL GABIONS					
C11.2.1	Foundation trench excavation:					
C11.2.1.1	Excavating all material situated within the following depth ranges below the surface level:					
	(a) 0 m to 1,5 m	m ³	208	75.00	15,600	00
C11.2.1.2	Extra over sub-item C11.2.1.1 for excavation in hard material, irrespective of depth	m ³	50	100.00	5,000	00
C11.2.1.3	Excavating soft material within 1,5 m below the surface level using labour enhanced construction methods:	m ³	50	100.00	5,000	00
C11.2.2	Surface preparation for bedding the gabion boxes and mattresses	m ²	2,380	5.00	11,900	00
C11.2.3	Gabion boxes and mattresses:					
C11.2.3.2	PVC coated gabion boxes (2,0 m x 1,0 m x 1,0 m, 80 x 80 mm mesh size)	m ³	211	1,700.00	358,700	00
C11.2.3.4	PVC-coated gabion mattresses (2,0 m x 1,0 m x 0,3 m)	m ³	760	1,700.00	1,292,000	00
C11.2.4	Geotextile (Grade A, needle punched non-woven geofabric)	m ²	2,380	12.00	28,560	00
Total Carried Forward To Summary					1,716,760	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C11.4	ROAD RESTRAINT SYSTEMS					
C11.4.1	Erecting of guardrails at 3,81 m spacing:					
PC11.4.1.1	Complete galvanized system compliant to SANS 1350:					
	(a) On timber posts (as per drawing 33532.00-190-01)	m	17,000	420.00	7,140,000	00
	(d) Extra over C11.4.1.1(a) and C11.4.1.1(b) for excavating holes of posts using labour enhanced methods (soft and intermediate)	m	3,400	50.00	170,000	00
	(e) Extra over C11.4.1.1(a) for adding the second rail at the back as per drawing 33532.00-190-01	m	14,500	150.00	2,175,000	00
C11.4.1.2	Terminal sections for 3,81 m guardrails comprising of:					
	(a) End wings to SANS 1350	No	6	500.00	3,000	00
	(b) Bullnoses to SANS 1350	No	60	750.00	45,000	00
	(d) End treatments where single guardrail sections are specified (as per drawing 33532.00-190-01)					
	(i) Type A	No	20	10,000.00	200,000	00
	(ii) Type B	No	20	5,000.00	100,000	00
	(f) Bridge adaptors (including extra rails and posts) (as per drawing 33532.00-190-01)	No	8	10,000.00	80,000	00
	(g) Extra over C11.4.1.2(d) and C11.4.1.2(e) for excavating holes for posts using labour enhanced methods (soft and intermediate)	No	45	50.00	2,250	00
C11.4.4	Extra over for horizontally curved guardrails:					
C11.4.4.1	Extra over C11.4.1 and C11.4.11 for horizontally curved guardrails factory bent to a radius of less than 45 m	m	200	65.00	13,000	00
C11.4.5	Additional guardrail posts for 3,81 m systems:					
C11.4.5.1	Timber	No	250	80.00	20,000	00
C11.4.5.3	Extra over C11.4.5.1 and C11.4.5.2 for excavating holes of posts using labour enhanced methods	No	100	100.00	10,000	00
C11.4.6	Reflective plates:					
C11.4.6.1	Steel plates	No	2,400	25.00	60,000	00
C11.4.7	Removing existing guardrails	m	930	95.00	88,350	00
C11.4.13	Steel base plates for guardrail posts on structures	No	10	1,250.00	12,500	00
C11.4.14	Nailing of gang nail plates on top of timber guardrail posts	No	5,200	75.00	390,000	00
Total Carried Forward					10,509,100	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					10,509,100	00
C11.4.15	Disposal of existing guardrails:					
C11.4.15.1	Straight or curved longitudinal guardrails	m	630	70.00	44,100	00
C11.4.15.2	End treatments with single guardrails	m	300	70.00	21,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C11.5	FENCING					
C11.5.1	Supply and erect new fencing material for new fences and for supplementing material in existing fences which are being repaired or removed:					
C11.5.1.1	Zinc-coated barbed wire (High tensile grade, 3,2 x 2,5 mm oval (SANS 675), fully galvanised)	km	85	3,500.00	297,500	00
C11.5.1.2	Zinc-coated smooth wire (High tensile grade, 3,0 mm (SANS 675), fully galvanised)	km	1.6	1,500.00	2,400	00
C11.5.1.3	Diamond mesh	m ²	400	25.00	10,000	00
C11.5.1.7	Standards:					
	(a) Wooden, 2 000 x 100 mm dia. notched	No	120	120.00	14,400	00
	(b) Steel, 1 850 x 2,5 kg/m, "Y" section	No	140	120.00	16,800	00
	(c) Steel, 2 600 x 2,5 kg/m, "Y" section	No	1,480	120.00	177,600	00
C11.5.1.8	Droppers:					
	(a) Wooden, 1 400 x 136 mm dia.	No	1,000	30.00	30,000	00
	(b) Steel, 1 200 x 0,56 kg/m, Ridgeback Pattern (SANS 121/ISO 1461)	No	680	30.00	20,400	00
C11.5.1.9	Straining posts, stays and anchors:					
	(a) Vertical:					
	(i) Steel straining postss (2 130 x 100 dia. x 3,0 mm mild steel tubing with steel cap and 230 x 230 x 3,0 mm base plate, fully galvanised (SANS 121/ ISO 1461) (without holes for wires))	No	45	220.00	9,900	00
	(ii) Timber straining posts (2 100 x 125 mm, notched and anchored in concrete complying with CK582)	No	75	220.00	16,500	00
	(iii) Steel straining posts (2 800 x 100 dia. x 3,0 mm mild steel tubing with steel cap and 230 x 230 x 3,0 mm base plate, fully galvanised (SANS 121/ ISO 1461) (without holes for wires))	No	140	220.00	30,800	00
	(b) Inclined:					
	(i) Steel stays and anchors (2 130 x 60 dia. x 3,0 mm, mild steel tubing with 230 x 230 x 3,0 mm base plate, fully galvanised (SANS 121/ ISO 1461)	No	35	30.00	1,050	00
	(ii) Steel stays and anchors (3 050 x 75 dia. x 3,0 mm, mild steel tubing with 230 x 230 x 3,0 mm base plate, fully galvanised (SANS 121/ ISO 1461)	No	115	30.00	3,450	00
Total Carried Forward					630,800	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					630,800	00
	(iii) Wire stays and anchors (4,0 mm dia. mild steel (SANS 675), fully galvanised (4 strands, double and twisted to take strain)	No	90	30.00	2,700	00
	(c) Horizontal:					
	(i) Steel stays and anchors (2 400 x 60 dia. x 3,0 mm mild steel tubing bent and flattened, fully galvanised (SANS 121/ ISO 1461) Ends pressed flat to ± 8,0 mm)	No	15	50.00	750	00
	(ii) Timber stays and anchors (2 000 x 100 mm dia., complying with CK 582)	No	35	50.00	1,750	00
C11.5.2	New gates:					
C11.5.2.1	3 600 mm farm gate as shown on drawings	No	5	3,500.00	17,500	00
C11.5.2.2	4 200 mm farm gate as shown on drawings	No	10	3,500.00	35,000	00
C11.5.2.3	5 000 mm double swing farm gate as shown on drawings	No	5	3,500.00	17,500	00
C11.5.3	Moving existing fences and gates:					
C11.5.3.1	Fences:					
	(a) Stock-proof fences	km	0.5	10,000.00	5,000	00
	(c) Pedestrian fences	km	0.7	15,000.00	10,500	00
	(e) Game fences	km	1	15,000.00	15,000	00
	(f) Electrical fences	km	0.2	20,000.00	4,000	00
	(g) Palasade fences	km	0.2	20,000.00	4,000	00
C11.5.3.2	Gates	No	18	1,000.00	18,000	00
C11.5.4	Dismantling existing fences and gates:					
C11.5.4.1	Fences:					
	(a) Stock-proof fences	km	2.8	5,000.00	14,000	00
	(c) Pedestrian fences	km	3.1	7,000.00	21,700	00
	(f) Electrical fences	km	0.1	10,000.00	1,000	00
	(g) Palasade fences	km	0.2	10,000.00	2,000	00
C11.5.4.2	Gates:					
	(a) Stock proof	No	6	1,500.00	9,000	00
	(b) Electrical	No	4	2,000.00	8,000	00
	(c) Palasade	No	1	3,000.00	3,000	00
Total Carried Forward					821,200	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					821,200	00
	(d) Pedestrian	No	7	2,000.00	14,000	00
C11.5.5	Providing temporary fences and gates:					
C11.5.5.1	Stock-proof fence	km	0.2	20,000.00	4,000	00
C11.5.5.3	Pedestrian fence	km	0.6	30,000.00	18,000	00
C11.5.5.5	Temporary gates (4 200 mm farm gate)	No	2	3,500.00	7,000	00
C11.5.6	Ringbolts for anchoring fencing to structures	No	35	1,500.00	52,500	00
C11.5.7	Drilling and blasting holes for posts and anchors	No	300	130.00	39,000	00
C11.5.8	Posts fixed horizontally to the bottom of wire mesh for the closing of openings under fences:					
C11.5.8.1	Timber posts (100 mm diameter)	m	100	75.00	7,500	00
C11.5.9	Repairing existing fences (9 strand stock proof)	km	2	15,000.00	30,000	00
C11.5.10	Disposal of existing fencing materials:					
C11.5.10.1	Stock-proof fences	km	2.3	1,000.00	2,300	00
C11.5.10.2	Pedestrian fences	km	2.4	2,000.00	4,800	00
C11.5.10.3	Electrical fences	km	0.1	5,000.00	500	00
C11.5/1.7.2	Hauling:					
C11.5/1.7.2.2	Hauling material to spoil and off-loading it at a designated spoil area:					
	(a) Cleared and grubbed material (organic matter and all other unsuitable or waste material)	m³-km	2,500	6.00	15,000	00
Total Carried Forward To Summary					1,015,800	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.6

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C11.6	ROAD SIGNS					
C11.6.1	Road signboards with painted or coloured semi-matt background. Symbols, lettering and borders in semi- matt black or in Class I retro-reflective material, where the sign board is constructed from:					
C11.6.1.3	Prepainted galvanized steel plate:					
	(a) Area 0 to 0,5 m ²	m ²	5	900.00	4,500	00
	(b) Area exceeding 0,5 m ² but not 2,0 m ²	m ²	40	950.00	38,000	00
	(c) Area exceeding 2,0 m ² but not 10 m ²	m ²	150	1,000.00	150,000	00
	(d) Area exceeding 10 m ²	m ²	40	1,200.00	48,000	00
C11.6.1.4	Prepainted galvanized steel profiles (200 mm high panels):					
	(b) Area exceeding 0,5 m ² but not 2,0 m ²	m ²	30	950.00	28,500	00
	(c) Area exceeding 2,0 m ² but not 10 m ²	m ²	150	1,000.00	150,000	00
	(d) Area exceeding 10 m ²	m ²	40	1,200.00	48,000	00
C11.6.1.7	Regulatory signs, permanent:					
	(b) 900 mm diameter (galvanised steel plate symbol retro-reflective Class III)	No	113	1,000.00	113,000	00
	(c) 1 200 mm diameter (galvanised steel plate symbol retro-reflective Class III)	No	30	1,200.00	36,000	00
C11.6.1.8	Regulatory signs, temporary:					
	(c) 1 200 mm diameter (galvanised steel plate symbol retro-reflective Class II)	No	20	1,100.00	22,000	00
C11.6.1.9	Warning signs, permanent:					
	(b) 1 200 mm size (prepainted galvanised steel plate, background Class III, symbol semi-matt)	No	45	750.00	33,750	00
	(c) 1 500 mm size (prepainted galvanised steel plate, background Class III, symbol semi-matt)	No	12	1,000.00	12,000	00
C11.6.2	Extra over on item C11.6.1 for using:					
C11.6.2.1	Background of retro-reflective material:					
	(b) Class III	m ²	455	200.00	91,000	00
Total Carried Forward					774,750	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.6

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					774,750	00
C11.6.2.2	Lettering, symbols, numbers, arrows, emblems and borders of retro-reflective material:					
	(a) Class III	m²	220	300.00	66,000	00
C11.6.3	Road sign supports (overhead road sign structures excluded):					
C11.6.3.2	Timber:					
	(a) 100 mm dia.	m	1,700	150.00	255,000	00
	(b) 125 mm dia.	m	345	150.00	51,750	00
	(c) 150 mm dia.	m	140	180.00	25,200	00
	(d) 175 mm dia.	m	70	210.00	14,700	00
	(e) 200 mm dia.	m	12	240.00	2,880	00
C11.6.4	Kilometre markers:					
C11.6.4.1	Kilometre markers on posts (steel post as per drawing 33532.00-190-05)	No	135	600.00	81,000	00
C11.6.4.2	Replace marker boards on existing kilometre posts	m²	10	280.00	2,800	00
C11.6.5	Excavation and backfilling for road sign supports (not applicable to kilometre posts):					
C11.6.5.2	Excavating soft or intermediate material and backfilling using labour enhanced construction methods	m³	100	300.00	30,000	00
C11.6.5.3	Extra over item C11.6.5.1 and 2 for cement-treated soil backfill	m³	100	220.00	22,000	00
C11.6.5.4	Extra over item C11.6.5.1 for hard material excavation	m³	50	500.00	25,000	00
C11.6.6	Dismantling, storing and re-erecting road signs with a surface area of:					
C11.6.6.1	Area 0 to 0,5 m²	m²	10	1,500.00	15,000	00
C11.6.6.2	Area exceeding 0,5 m² but not 2,0 m²	m²	50	1,500.00	75,000	00
C11.6.6.3	Exceeding 2,0 m² but not 10 m²	m²	80	1,500.00	120,000	00
C11.6.8	Danger plates at culverts / structures:					
C11.6.8.2	Size 200 x 800 mm (steel post)	No	200	500.00	100,000	00
C11.6.8.3	Size 300 x 1200 mm (steel post)	No	20	600.00	12,000	00
C11.6.9	Installation of traffic signals:					
C11.6.9.1	Specialist installation of traffic signals	PC sum	1	200,000.00	200,000	00
C11.6.9.2	Handling cost, profit and all other charges of sub item C11.6.9.1	%	200,000.00	5.00	10,000	00
Total Carried Forward					1,883,080	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.6

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					1,883,080	00
C11.6.10	Disposing of road signs with a surface area of:					
C11.6.10.1	Area 0 to 0,5 m²	m²	30	200.00	6,000	00
C11.6.10.2	Area exceeding 0,5 m² but not 2,0 m²	m²	80	200.00	16,000	00
C11.6.10.3	Exceeding 2,0 m² but not 10 m²	m²	110	200.00	22,000	00
						</

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.7

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C11.7	ROAD MARKINGS AND ROAD STUDS					
C11.7.1	Road marking:					
C11.7.1.14	Labour enhanced hand painted kerb markings (any colour) (water borne)	m ²	400	125.00	50,000	00
C11.7.2	Retro-reflective road marking:					
C11.7.2.1	White lines broken or unbroken (water borne):					
	(a) 100 mm wide	km	35	4,000.00	140,000	00
	(b) 150 mm wide	km	25	4,500.00	112,500	00
	(c) 200 mm wide	km	2	5,000.00	10,000	00
	(d) 300 mm wide	km	0.25	6,500.00	1,625	00
	(e) 500 mm wide	km	0.2	8,000.00	1,600	00
C11.7.2.2	Yellow lines broken or unbroken (water borne 150 mm wide)	km	38	4,500.00	171,000	00
C11.7.2.4	White lettering and symbols (water borne)	m ²	400	75.00	30,000	00
C11.7.2.5	Yellow lettering and symbols (water borne)	m ²	150	75.00	11,250	00
C11.7.2.7	Transverse lines, painted island and arrestor bed markings (any colour) (water borne)	m ²	1,750	100.00	175,000	00
C11.7.3	Thermoplastic road marking:					
C11.7.3.1	Thermoplastic road marking, broken or unbroken:					
	(a) White:					
	(i) 100 mm wide	km	35	10,000.00	350,000	00
	(ii) 150 mm wide	km	25	12,000.00	300,000	00
	(iii) 200 mm wide	km	2	13,000.00	26,000	00
	(iv) 300 mm wide	km	0.25	14,000.00	3,500	00
	(v) 500 mm wide	km	0.2	16,000.00	3,200	00
	(b) Yellow:					
	(i) 150 mm wide	km	38	10,000.00	380,000	00
	(d) White lettering and symbols	m ²	400	280.00	112,000	00
	(e) Yellow lettering and symbols	m ²	150	280.00	42,000	00
	(f) Transverse lines, painted island and arrestor bed markings (any colour)	m ²	1,750	280.00	490,000	00
Total Carried Forward					2,409,675	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.7

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					2,409,675	00
C11.7.5	Variations in rate of application:					
C11.7.5.1	White paint	ℓ	800	45.00	36,000	00
C11.7.5.2	Yellow paint	ℓ	750	45.00	33,750	00
C11.7.5.4	Retro-reflective beads	kg	1,000	25.00	25,000	00
C11.7.5.5	Thermoplastic material, all colours	kg	4,500	50.00	225,000	00
C11.7.7	Road studs:					
C11.7.7.1	Permanent road studs compliant to SANS 1442:					
	(a) Hot dip galvanised stud complete with 43 elements (RSA 1)					
	(i) Yellow/ Red	No	3,360	150.00	504,000	00
	(ii) Red/ Red	No	2,300	150.00	345,000	00
	(iii) White/ Red	No	2,110	150.00	316,500	00
C11.7.7.3	Temporary road studs compliant to SANS 1442 or 1463 (RSA-T)	No	1,100	75.00	82,500	00
C11.7.7.7	Installation only of surface bonded road studs with anchor shanks	No	3,100	10.00	31,000	00
C11.7.8	Setting out and premarking the lines (excluding traffic island markings, lettering and symbols)	km	80	1,000.00	80,000	00
C11.7.9	Re-establishing the painting unit during the defects notification period and at other instances on instruction of the Engineer	No	2	25,000.00	50,000	00
C11.7.11	Removal of existing road studs	No	450	15.00	6,750	00
Total Carried Forward To Summary					4,145,175	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.8

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C11.8	LANDSCAPING AND PLANTING PLANTS					
C11.8.1	Trimming:					
C11.8.1.1	Machine trimming	m ²	10,600	2.10	22,260	00
C11.8.1.2	Hand trimming	m ²	96,500	0.80	77,200	00
C11.8.2	Trimming using machines for trimming or shaping (alternative to subitem C11.8.1.1):					
C11.8.2.1	Bulldozer	h	100	950.00	95,000	00
C11.8.2.2	Motor grader	h	100	950.00	95,000	00
C11.8.3	Preparing the areas for grassing:					
C11.8.3.1	Ripping	h	100	850.00	85,000	00
C11.8.3.2	Scarifying for loosening topsoil	h	100	850.00	85,000	00
C11.8.3.3	Topsoiling within the road reserve where the following materials are used:					
	(a) Topsoil obtained from within the road reserve or borrow areas	m ³	30,050	5.00	150,250	00
C11.8.3.5	Providing and applying chemical fertilisers and / or soil-improvement material:					
	(a) Lime	t	8	1,050.00	8,400	00
	(b) Superphosphate	t	6	4,950.00	29,700	00
	(c) Limestone ammonium nitrate	t	4	4,950.00	19,800	00
	(d) 2:3:2 (22)	t	4	4,500.00	18,000	00
	(e) 3:2:1 (25)	t	4	4,500.00	18,000	00
C11.8.4	Grassing:					
C11.8.4.2	Sodding by using the following types of sods:					
	(a) Nursery sods (Buffalo)	m ²	1,500	20.00	30,000	00
	(b) Veld sods	m ²	1,500	15.00	22,500	00
C11.8.4.3	Hydroseeding:					
	(a) Providing an approved seed mixture for hydroseeding	kg	800	95.00	76,000	00
	(c) Hydroseeding	ha	20	2,600.00	52,000	00
C11.8.4.5	Hand sowing	m ²	20,000	0.65	13,000	00
C11.8.5	Watering the grass when established by topsoiling only	kℓ	36	5,000.00	180,000	00
Total Carried Forward					1,077,110	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.8

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					1,077,110	00
C11.8.6	Watering the already planted grass, trees and shrubs during the growing season	kl	18	5,000.00	90,000	00
C11.8.7	Mowing the grass	ha	20	2,500.00	50,000	00
C11.8.10	Unspecified work for landscaping	Prov sum	1	250,000.00	250,000	00
C11.8.11	Weeding all grass-seeded areas and the grass when established by topsoiling only	ha	20	1,000.00	20,000	00
C11.8.12	Removal of undesirable vegetation	m²	5,000	2.00	10,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C11.9

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C11.9	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS					
C11.9.1	Finishing the road and road reserve:					
C11.9.1.1	Dual carriageway road	km	8	20,000.00	160,000	00
C11.9.1.2	Single carriageway road	km	19	10,000.00	190,000	00
C11.9.2	Treatment of old roads and temporary deviations:					
C11.9.2.1	Conventional construction methods	km	27	5,000.00	135,000	00
Total Carried Forward To Summary					485,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C12.5

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C12.5	SHOTCRETE					
C12.5.1	Establishment on site	Lump sum	1	400,000.00	400,000	00
C12.5.2	Surface preparation for shotcreting	m ²	2,000	55.00	110,000	00
C12.5.3	Supply and installation of reinforcement:					
C12.5.3.1	Welded steel mesh fabric (Ref. 395)	m ²	2,000	200.00	400,000	00
C12.5.4	Shotcrete (of specified thickness or volume):					
C12.5.4.1	Flash / base coat (unreinforced) (20 mm thickness)	m ²	2,000	250.00	500,000	00
C12.5.4.2	Intermediate coat/s (50 mm thickness and one layer)	m ²	2,000	500.00	1,000,000	00
C12.5.4.3	Final coat (50 mm thickness, pigmentation and finish)	m ²	2,000	500.00	1,000,000	00
C12.5.5	Removal to spoil of material trimmed from slope	m ³ -km	800	150.00	120,000	00
C12.5.6	Edge finishing of shotcrete	m	400	200.00	80,000	00
C12.5.7	Geopipe collectors and weepholes:					
C12.5.7.1	50 mm diameter U-PVC weephole piping (140 mm in length, normal duty)	No	200	20.00	4,000	00
Total Carried Forward To Summary					3,614,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C12.8

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C12.8	GROUND DRAINAGE					
C12.8.1	Establishment on site for:					
C12.8.1.2	Horizontal drains	Lump sum	1	250,000.00	250,000	00
C12.8.2	Provision of access to drain positions (horizontal lower and elevated slope position)	Lump sum	1	100,000.00	100,000	00
C12.8.3	Moving to, and setting up the equipment for drilling the holes at each well / horizontal / sand drain position (lower and elevated positions)	No	50	1,000.00	50,000	00
C12.8.6	Drill holes for horizontal drains (10 degrees from horizontal, 75 mm) to the required depth	m	300	500.00	150,000	00
C12.8.10	Installation of slotted drainage pipes for horizontal drains (50 mm)	m	300	200.00	60,000	00
Total Carried Forward To Summary					610,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C12.10

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C12.10	HARD EXCAVATION BY BLASTING					
C12.10.1	Excavation in hard rock using controlled blasting techniques	m ³	563,500	40.00	22,540,000	00
C12.10.2	Pre-splitting - base rate for holes @ 750 mm c/c	m ²	8,300	150.00	1,245,000	00
C12.10.4	Smooth blasting - base rate for holes @ 1500 mm c/c	m ²	8,300	155.00	1,286,500	00
C12.10.8	Ground vibration, air blast and fly rock monitoring	Lump sum	1	20,000.00	20,000	00
Total Carried Forward To Summary					25,091,500	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SECTION C20.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C20.1	TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP					
C20.1.1	Special tests on elastomeric bearings (150% vertical load and 150% shear distortion)	No	11	5,000.00	55,000	00
C20.1.2	Special tests requested by the Engineer:					
C20.1.2.1	Employer's contribution to concrete durability tests:					
	(a) Tests for water sorptivity	PC sum	1	150,000.00	150,000	00
	(i) Handling costs and profit in respect of item C20.1.2.1(a)	%	150,000.00	5.00	7,500	00
	(b) Tests for oxygen permeability	PC sum	1	200,000.00	200,000	00
	(i) Handling costs and profit in respect of item C20.1.2.1(b)	%	200,000.00	5.00	10,000	00
	(c) Tests for chloride conductivity	PC sum	1	150,000.00	150,000	00
	(i) Handling costs and profit in respect of item C20.1.2.1(c)	%	150,000.00	5.00	7,500	00
	(d) Tests for concrete cover	PC sum	1	150,000.00	150,000	00
	(i) Handling costs and profit in respect of item C20.1.2.1(d)	%	150,000.00	5.00	7,500	00
C20.1.3	Providing testing equipment:					
C20.1.3.1	Core drill	No	2	500.00	1,000	00
C20.1.4	Special tests using Automated Road condition assessment instruments operated by service providers as requested by the Engineer for acceptance control in terms of Clause A20.1.3.6(b)(iii):					
C20.1.4.1	Using Highspeed Inertial Non-Contact laser profilers (Clause A20.1.5.5(c)(ii))	PC sum	1	75,000.00	75,000	00
	(a) Handling cost and profit in respect of item C20.1.4.1	%	75,000.00	5.00	3,750	00
C20.1.4.4	Surface macro texture (Clause A20.1.5.5(b))	PC sum	1	75,000.00	75,000	00
	(a) Handling cost and profit in respect of item C20.1.4.4	%	75,000.00	5.00	3,750	00
PC20.1.5	Financial contribution for an independent site laboratory	month	27	-200,000.00	-5,400,000	00
PC20.1.6	Payment of independent site laboratory					
C20.1.6.1	Direct payment by contractor	PC sum	1	10,000,000.00	10,000,000	00
	(a) Handling cost and profit in respect of item C20.1.6.1	%	10,000,000.00	5.00	500,000	00
Total Carried Forward To Summary					5,996,000	00

BILL OF QUANTITIES

SCHEDULE A: ROADWORKS

SUMMARY OF SECTIONS

Section	Description	Amount (Rand)
SECTION C1.2	GENERAL REQUIREMENTS AND PROVISIONS	8,390,400.00
SECTION C1.3	CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS	93,280,000.00
SECTION C1.4	FACILITIES FOR THE ENGINEER	5,283,880.00
SECTION C1.5	ACCOMMODATION OF TRAFFIC	66,295,959.00
SECTION C1.6	CLEARING AND GRUBBING	6,120,800.00
SECTION C2.1	GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES	2,936,000.00
SECTION C2.2	DRY SERVICES	1,018,450.00
SECTION C3.1	DRAINS	13,259,220.00
SECTION C3.2	CULVERTS	41,921,050.00
SECTION C3.3	CONCRETE KERBING AND CHANNELING, ASPHALT BERMS, CHUTES, DOWNPIPES, CONCRETE, STONE PITCHED AND GABION LININGS FOR OPEN DRAINS	15,783,680.00
SECTION C4.1	BORROW MATERIALS	102,879,900.00
SECTION C4.2	CUT MATERIALS	32,494,475.00
SECTION C4.3	EXISTING ROAD MATERIALS	8,538,300.00
SECTION C4.4	COMMERCIAL MATERIALS	57,199,000.00
SECTION C5.1	ROADBED	20,116,340.00
SECTION C5.2	FILL	18,878,400.00
SECTION C5.3	ROAD PAVEMENT LAYERS	32,632,730.00
SECTION C5.4	STABILISATION	17,665,785.00
SECTION C9.1	ASPHALT LAYERS	33,830,450.00

Total Carried Forward

578,524,819.00

BILL OF QUANTITIES**SCHEDULE A: ROADWORKS****SUMMARY OF SECTIONS**

Section	Description	Amount (Rand)
Brought Forward		578,524,819.00
SECTION C10.1	GENERAL REQUIREMENTS FOR SURFACE TREATMENTS	20,052,200.00
SECTION C11.1	PITCHING, STONEMWORK, CAST IN SITU CONCRETE FOR PROTECTION AGAINST EROSION	25,739,100.00
SECTION C11.2	NON-STRUCTURAL GABIONS	1,716,760.00
SECTION C11.4	ROAD RESTRAINT SYSTEMS	10,574,200.00
SECTION C11.5	FENCING	1,015,800.00
SECTION C11.6	ROAD SIGNS	1,927,080.00
SECTION C11.7	ROAD MARKINGS AND ROAD STUDS	4,145,175.00
SECTION C11.8	LANDSCAPING AND PLANTING PLANTS	1,497,110.00
SECTION C11.9	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS	485,000.00
SECTION C12.5	SHOTCRETE	3,614,000.00
SECTION C12.8	GROUND DRAINAGE	610,000.00
SECTION C12.10	HARD EXCAVATION BY BLASTING	25,091,500.00
SECTION C20.1	TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP	5,996,000.00
Total Carried Forward To Summary Of Schedules		<u>680,988,744.00</u>

SCHEDULE B1

STRUCTURES: BRIDGE B0593

BILL OF QUANTITIES

SCHEDULE B1: STRUCTURES: BRIDGE B0593

SECTION C11.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C11.2	NON-STRUCTURAL GABIONS					
C11.2.1	Foundation trench excavation:					
C11.2.1.1	Excavating all material situated within the following depth ranges below the surface level:					
	(a) 0 m to 1,5 m	m ³	10	100.00	1,000	00
	(b) Exceeding 1,5 m and up to 3,0 m	m ³	5	150.00	750	00
C11.2.1.2	Extra over sub-item C11.2.1.1 for excavation in hard material, irrespective of depth	m ³	5	400.00	2,000	00
C11.2.1.3	Excavating soft material within 1,5 m below the surface level using labour enhanced construction methods:	m ³	15	350.00	5,250	00
C11.2.2	Surface preparation for bedding the gabion boxes and mattresses	m ²	50	50.00	2,500	00
C11.2.3	Gabion boxes and mattresses:					
C11.2.3.2	PVC coated gabion boxes (1,0 m x 1,0 m x 1,0 m, white 2,7 mm dia. mesh wire and 80 mm x 80 mm mesh size)	m ³	10	1,500.00	15,000	00
C11.2.3.4	PVC-coated gabion mattresses (300 mm thick, with 2,7 mm dia. mesh and 80 mm x 80 mm mesh size)	m ³	5	1,700.00	8,500	00
C11.2.4	Geotextile (Grade A needle punched non-woven filter geofibre)	m ²	100	25.00	2,500	00
Total Carried Forward To Summary					37,500	00

BILL OF QUANTITIES

SCHEDULE B1: STRUCTURES: BRIDGE B0593

SECTION C13.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.1	FOUNDATIONS					
C13.1.1	Provision of designs and drawings of temporary works by an ECSA-registered Professional Engineer or Technologist or Geotechnical Engineer (lateral support to excavations of spread footings):	Lump sum	1	50,000.00	50,000	00
C13.1.2	Additional foundation investigations:					
C13.1.2.1	Provisional sum allowed for additional foundation investigations	Prov sum	1	50,000.00	50,000	00
C13.1.2.2	Handling costs and profit in respect of item C13.1.2.1	%	50,000.00	10.00	5,000	00
C13.1.3	Excavation:					
C13.1.3.1	Excavating soft material situated within the following successive depth ranges:					
	(a) 0 m up to 1,5 m	m ³	792	100.00	79,200	00
	(b) > 1,5 m and < 3,0 m	m ³	686	150.00	102,900	00
	(c) > 3,0 m and < 4,5 m	m ³	236	200.00	47,200	00
C13.1.3.2	Extra over subitem C13.1.3.1 for excavation in hard material irrespective of depth	m ³	683	400.00	273,200	00
C13.1.3.3	Extra over subitem C13.1.3.1 for additional excavation required by the Engineer after excavation is complete	m ³	20	250.00	5,000	00
C13.1.3.4	Extra over subitem C13.1.3.1 for excavation by hand	m ³	50	350.00	17,500	00
C13.1.3.5	Extra over subitem C13.1.3.1 for excavation in restricted areas	m ³	1,200	100.00	120,000	00
C13.1.4	Excavation by labour enhanced methods:					
C13.1.4.1	Excavate in soft material situated within the following successive depth ranges:					
	(a) 0 m up to 1,5 m	m ³	200	200.00	40,000	00
C13.1.4.2	Extra over item C13.1.3.1(a) for excavation in intermediate material	m ³	100	230.00	23,000	00
C13.1.4.3	Extra over item C13.1.3.1(a) for additional excavation required by the Engineer after excavation is complete	m ³	20	250.00	5,000	00
C13.1.6	Access and drainage:					
C13.1.6.1	Access	Lump sum	1	150,000.00	150,000	00
C13.1.6.2	Drainage	Lump sum	1	150,000.00	150,000	00
PC13.1.7	Backfill to excavations utilising:					
C13.1.7.1	Material from excavation	m ³	1,100	150.00	165,000	00
Total Carried Forward					1,283,000	00

BILL OF QUANTITIES

SCHEDULE B1: STRUCTURES: BRIDGE B0593

SECTION C13.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					1,283,000	00
PC13.1.7.2	Imported material:					
	(a) Clean sand compacted to 100% MDD	m³	1,660	220.00	365,200	00
	(b) G7 granular material	m³	32	370.00	11,840	00
C13.1.7.3	Soil cement	m³	270	500.00	135,000	00
C13.1.9	Fill within a restricted area (extra over item C5.2.2)	m³	1,028	100.00	102,800	00
C13.1.10	Haul in excess of 1,0 km on excavated material and on material imported for backfill,	m³-km	550	10.00	5,500	00
C13.1.12	Overbreak in excavation in hard material:	m²	400	160.00	64,000	00
C13.1.14	Foundation fill consisting of:					
C13.1.14.4	Mass concrete (Class C12/15-20)	m³	10	2,000.00	20,000	00
C13.1.14.5	Concrete blinding (75 mm thick, Class C12/15-20)	m³	41	2,400.00	98,400	00
C13.1.20	Dowel bars:					
C13.1.20.1	Drilling and preparation of holes (40 mm dia. 1,6 m long)	m	50	450.00	22,500	00
C13.1.20.2	Supply and installation of dowel bars (Y32, Hot Dipped Galvanised fixed with an approved epoxy grout)	kg	400	220.00	88,000	00
C13.1.23	Lateral support for excavations:					
C13.1.23.1	Excavation or fill at (abutments and wingwalls):					
	(a) 0 to 2,5 m depth	m²	620	3,000.00	1,860,000	00
	(b) 2,5 m to 5,0 m depth	m²	415	5,000.00	2,075,000	00
Total Carried Forward To Summary					6,131,240	00

BILL OF QUANTITIES

SCHEDULE B1: STRUCTURES: BRIDGE B0593

SECTION C13.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.2	FALSEWORK, FORMWORK AND CONCRETE FINISH					
C13.2.2	Vertical formwork to provide:					
C13.2.2.1	Class F1 surface finish to:					
	(a) Abutment footings	m ²	140	500.00	70,000	00
	(b) Approach slabs	m ²	65	500.00	32,500	00
	(c) Pier footings	m ²	190	500.00	95,000	00
C13.2.2.2	Class F2 surface finish to:					
	(a) Abutments	m ²	435	600.00	261,000	00
	(b) Earwings	m ²	40	600.00	24,000	00
	(c) Wingwalls	m ²	135	600.00	81,000	00
	(d) Deck edges	m ²	80	600.00	48,000	00
C13.2.2.3	Class F3 surface finish to:					
	(a) Piers	m ²	668	700.00	467,600	00
C13.2.3	Horizontal formwork to provide:					
C13.2.3.2	Class F2 surface finish to:					
	(a) Deck soffit	m ²	1,000	2,800.00	2,800,000	00
C13.2.4	Inclined formwork to provide:					
C13.2.4.1	Class F1 surface finish to:					
	(a) Abutment corbel	m ²	54	450.00	24,300	00
C13.2.4.2	Class F2 surface finish to:					
	(a) Deck edges	m ²	115	2,000.00	230,000	00
C13.2.6	Formwork to form open joints:					
C13.2.6.1	Between wingwalls and abutments (10 mm)	m ²	15	450.00	6,750	00
C13.2.10	Provision of designs and drawings of falsework and formwork by an ECSA registered Professional Engineer or Technologist (deck, abutments and piers)	Lump sum	1	100,000.00	100,000	00
Total Carried Forward To Summary					4,240,150	00

BILL OF QUANTITIES

SCHEDULE B1: STRUCTURES: BRIDGE B0593

SECTION C13.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.3	STEEL REINFORCEMENT					
C13.3.1	Reinforcement for:					
C13.3.1.1	Abutment footings:					
	(b) High-yield-stress-steel bars (450 MPa)	t	45	17,000.00	765,000	00
C13.3.1.2	Pier footings:					
	(b) High-yield-stress-steel bars (450 MPa)	t	48	17,000.00	816,000	00
C13.3.1.3	Abutments:					
	(b) High-yield-stress-steel bars (450 MPa)	t	30	17,000.00	510,000	00
C13.3.1.4	Wingwalls:					
	(b) High-yield-stress-steel bars (450 MPa)	t	9	17,000.00	153,000	00
C13.3.1.5	Piers:					
	(a) Mild-steel bars (250 MPa)	t	1.5	17,000.00	25,500	00
	(b) High-yield-stress-steel bars (450 MPa)	t	28	17,000.00	476,000	00
C13.3.1.6	Deck:					
	(a) Mild-steel bars (250 MPa)	t	2.5	17,000.00	42,500	00
	(b) High-yield-stress-steel bars (450 MPa)	t	228	17,000.00	3,876,000	00
C13.3.1.7	Parapet:					
	(a) Mild-steel bars (250 MPa)	t	1.1	17,000.00	18,700	00
	(b) High-yield-stress-steel bars (450 MPa)	t	7.6	17,000.00	129,200	00
C13.3.4	Extra-over item C13.3.1 (a), (b), etc. for galvanising of reinforcement	t	1	16,000.00	16,000	00
Total Carried Forward To Summary					6,827,900	00

BILL OF QUANTITIES

SCHEDULE B1: STRUCTURES: BRIDGE B0593

SECTION C13.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.4	CONCRETE					
C13.4.1	Cast-in-situ concrete (class of concrete and use or position in structure stated):					
C13.4.1.2	Durable concrete (Class D):					
	(a) Abutment footings, D32/40-20-XC4	m ³	271	2,500.00	677,500	00
	(b) Pier footings, D32/40-20-XC4	m ³	215	2,500.00	537,500	00
	(c) Abutments, D32/40-20-XC4	m ³	288	2,500.00	720,000	00
	(d) Piers, D32/40-20-XC4	m ³	236	2,500.00	590,000	00
	(e) Wingwalls, D32/40-20-XC4	m ³	36	2,500.00	90,000	00
	(f) Deck, D32/40-20-XC4	m ³	715	2,500.00	1,787,500	00
	(g) Approach slabs, D32/40-20-XC4	m ³	54	2,500.00	135,000	00
C13.4.3	Extra over item C13.4.1 for the protection of concrete from adverse environmental conditions, if required:					
C13.4.3.2	Durable concrete (Class D):					
	(a) Abutment footings, D32/40-20-XC4	m ³	271	100.00	27,100	00
	(b) Pier footings, D32/40-20-XC4	m ³	215	100.00	21,500	00
	(c) Abutments, D32/40-20-XC4	m ³	288	100.00	28,800	00
	(d) Piers, D32/40-20-XC4	m ³	236	100.00	23,600	00
	(e) Wingwalls, D32/40-20-XC4	m ³	36	100.00	3,600	00
	(f) Deck, D32/40-20-XC4	m ³	715	100.00	71,500	00
	(g) Approach slabs, D32/40-20-XC4	m ³	54	100.00	5,400	00
C13.4.5	Curing and surface protection of cast-in-situ concrete, as and where specifically required:					
C13.4.5.1	Top of foundation using an approved curing compound (tenderer to specify compound)	m ²	380	40.00	15,200	00
C13.4.5.2	Substructure using an approved curing compound (tenderer to specify compound)	m ²	1,103	40.00	44,120	00
C13.4.5.3	Top of deck using an approved curing compound (tenderer to specify compound)	m ²	1,000	100.00	100,000	00
Total Carried Forward					4,878,320	00

BILL OF QUANTITIES

SCHEDULE B1: STRUCTURES: BRIDGE B0593

SECTION C13.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					4,878,320	00
C13.4.5.4	Sides of deck using an approved curing compound (tenderer to specify compound)	m²	195	40.00	7,800	00
C13.4.14	Controlled demolition of concrete from structural elements:					
C13.4.14.1	Deck of Bridge B375	m³	460	1,500.00	690,000	00
C13.4.14.2	Piers of Bridge B375	m³	234	1,500.00	351,000	00
C13.4.14.3	Abutments of Bridge B375	m³	35	1,500.00	52,500	00
C13.4.14.4	Footings of Bridge B375	m³	80	1,500.00	120,000	00
C13.4.14.5	Parapet of Bridge B375	m³	70	1,500.00	105,000	00
Total Carried Forward To Summary					6,204,620	00

BILL OF QUANTITIES

SCHEDULE B1: STRUCTURES: BRIDGE B0593

SECTION C13.6

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.6	BEARINGS					
C13.6.1	Bearings:					
C13.6.1.1	Bearings (Elastomeric bearings as per drawing 33532.00-215-01-02):					
	(a) Type 1 (300 mm x 300 mm x 61 mm)	No	47	1,200.00	56,400	00
	(b) Type 2 (350 mm x 350 mm x 61 mm)	No	9	1,800.00	16,200	00
Total Carried Forward To Summary					72,600	00

BILL OF QUANTITIES

SCHEDULE B1: STRUCTURES: BRIDGE B0593

SECTION C13.7

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.7	JOINTS					
C13.7.2	Filled joints:					
C13.7.2.2	Rigid foam of expanded polythylene joint former for:					
	(a) 10 mm joints between wingwalls and abutments	m	25	200.00	5,000	00
	(b) 10 mm joints between abutment walls and seating	m	160	200.00	32,000	00
	(c) 5 mm joints between abutment walls and columns	m	120	200.00	24,000	00
	(d) 5 mm joints between pier walls and columns	m	160	200.00	32,000	00
C13.7.4	Sealing joints with:					
C13.7.4.1	Sealant (Polyurethane sealant including backing chord) for:					
	(a) 10 mm joints between wingwalls and abutments	m	25	80.00	2,000	00
	(b) 10 mm joints between abutment walls and seating	m	160	80.00	12,800	00
	(c) 5 mm joints between abutment walls and columns	m	120	80.00	9,600	00
	(d) 5 mm joints between pier walls and columns	m	160	80.00	12,800	00
C13.7.5	Supply and installation of Agrément South Africa certified proprietary expansion joints:					
C13.7.5.1	Claw and other modular joints in nosings:					
	(a) Steel Claw Joint with max 25 mm movement as per drawing 33532.00-25-01-01	m	68	10,000.00	680,000	00
C13.7.5.3	Provision of Engineering Drawings of proprietary joints and certification after installation by an ECSA registered professional Engineer of technologist	Lump sum	1	25,000.00	25,000	00
C13.7.6	Joint terminations in:					
C13.7.6.1	Barriers and Parapets (steel claw joint)	No	4	2,000.00	8,000	00
C13.7.7	Cover plates (non-metallic) in barriers, parapets and sidewalks where specified on the drawings in:					
C13.7.7.1	Barriers and Parapets (steel claw joint)	No	4	50.00	200	00
C13.7.8	Additional water tests for joints ordered by the Engineer	No	2	1,500.00	3,000	00
PC13.7.11	PVC sleeve, bituthene wrapping and tape-cap for expansion joint tie	No	60	25.00	1,500	00
Total Carried Forward To Summary					847,900	00

BILL OF QUANTITIES

SCHEDULE B1: STRUCTURES: BRIDGE B0593

SECTION C13.8

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.8	ANCILLARY STRUCTURAL ELEMENTS					
C13.8.1	Concrete barriers and parapets (as per drawing 33532.00-201-05-01):					
C13.8.1.2	Parapets	m	128	5,000.00	640,000	00
C13.8.2	End blocks (3,0 m long)	No	4	10,000.00	40,000	00
C13.8.6	Service ducts in structures:					
C13.8.6.1	U-PVC 110 mm dia.	m	145	100.00	14,500	00
C13.8.6.2	Joint in ducts at bridge deck expansion joints	No	4	200.00	800	00
C13.8.7	Numbers for structures: (as per drawing 33532.00-215-01-01):					
C13.8.7.1	Number plates	No	2	1,500.00	3,000	00
C13.8.10	Drainage pipes and weep holes:					
C13.8.10.1	Drainage pipes:					
	(b) U-PVC 75 mm dia. in deck	No	55	160.00	8,800	00
C13.8.10.2	Weep holes:					
	(b) U-PVC 50 mm dia. in abutments	No	40	50.00	2,000	00
C13.8.12	Synthetic-fibre filter fabric (Grade B double cusped HDPE sheet on filter elements behind abutment)	m ²	72	150.00	10,800	00
C13.8.15	Drainage strips (HDPE 200 mm wide DN3 behind abutments)	m	160	85.00	13,600	00
C13.8.16	Perforated drainage pipes:					
C13.8.16.1	65 mm dia., wrapped in Grade B synthetic fibre filter fabric	m	80	110.00	8,800	00
Total Carried Forward To Summary					742,300	00

BILL OF QUANTITIES**SCHEDULE B1: STRUCTURES: BRIDGE B0593****SUMMARY OF SECTIONS**

Section	Description	Amount (Rand)
SECTION C11.2	NON-STRUCTURAL GABIONS	37,500.00
SECTION C13.1	FOUNDATIONS	6,131,240.00
SECTION C13.2	FALSEWORK, FORMWORK AND CONCRETE FINISH	4,240,150.00
SECTION C13.3	STEEL REINFORCEMENT	6,827,900.00
SECTION C13.4	CONCRETE	6,204,620.00
SECTION C13.6	BEARINGS	72,600.00
SECTION C13.7	JOINTS	847,900.00
SECTION C13.8	ANCILLARY STRUCTURAL ELEMENTS	742,300.00
Total Carried Forward To Summary Of Schedules		<hr/> 25,104,210.00 <hr/>

SCHEDULE B2

STRUCTURES: BRIDGE B0594

BILL OF QUANTITIES

SCHEDULE B2: STRUCTURES: BRIDGE B0594

SECTION C11.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C11.2	NON-STRUCTURAL GABIONS					
C11.2.1	Foundation trench excavation:					
C11.2.1.1	Excavating all material situated within the following depth ranges below the surface level:					
	(a) 0 m to 1,5 m	m ³	200	100.00	20,000	00
	(b) Exceeding 1,5 m and up to 3,0 m	m ³	50	150.00	7,500	00
C11.2.1.3	Excavating soft material within 1,5 m below the surface level using labour enhanced construction methods:	m ³	100	350.00	35,000	00
C11.2.2	Surface preparation for bedding the gabion boxes and mattresses	m ²	600	50.00	30,000	00
C11.2.3	Gabion boxes and mattresses:					
C11.2.3.2	PVC coated gabion boxes (1,0 m x 1,0 m x 1,0m with 2,7 mm dia. mesh wire and 80 mm x 80 mm mesh size)	m ³	10	1,500.00	15,000	00
C11.2.3.4	PVC-coated gabion mattresses (300 mm thick with 2,7 mm dia. mesh wire and 80 mm x 80 mm mesh size)	m ³	185	1,700.00	314,500	00
C11.2.4	Geotextile (Grade A needle punched non-woven filter geofabric)	m ²	1,100	25.00	27,500	00
Total Carried Forward To Summary					449,500	00

BILL OF QUANTITIES

SCHEDULE B2: STRUCTURES: BRIDGE B0594

SECTION C12.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C12.1	PILING					
C12.1.1	Additional foundation investigations	Prov sum	1	50,000.00	50,000	00
C12.1.2	Access and drainage:					
C12.1.2.1	Access	Lump sum	1	100,000.00	100,000	00
C12.1.2.2	Drainage by pumping or other means	Lump sum	1	150,000.00	150,000	00
C12.1.3	Establishment on site for piling (900 mm dia. auger piles at abutments and piers)	Lump sum	1	300,000.00	300,000	00
C12.1.4	Moving to, and setting up equipment at each position for installing piles (900 mm dia. auger pile)	No	60	3,500.00	210,000	00
C12.1.5	Augered holes for piles with a diameter of (900 mm dia.) through material situated within the following successive depth ranges:					
C12.1.5.1	Augered holes:					
	(a) 0 m up to 10 m provided for in pay item C12.1.6	m	400	1,200.00	480,000	00
	(b) Exceeding 10 m and up to 15 m	m	140	1,200.00	168,000	00
C12.1.6	Extra over item C12.1.5 irrespective of the depth, to form augered and bored pile holes through identified materials consisting of:					
C12.1.6.1	Coarse gravel with a matrix content of less than 40%	m	75	500.00	37,500	00
C12.1.6.2	Boulders (R3 with a max size of 300 mm)	m	50	4,500.00	225,000	00
C12.1.6.3	Rock formation:					
	(a) Medium hard greywacke	m	120	1,000.00	120,000	00
	(b) Hard greywacke	m	100	2,000.00	200,000	00
	(c) Very hard greywacke	m	75	3,000.00	225,000	00
C12.1.8	Forming augered or bored pile holes through unidentified materials	Prov sum	1	80,000.00	80,000	00
C12.1.9	Forming augered or bored pile holes through obstructions	Prov sum	1	50,000.00	50,000	00
C12.1.11	Installing and removing temporary casings in augered holes for piles of (900 mm dia.)	m	540	2,000.00	1,080,000	00
C12.1.15	Steel reinforcement in cast-in-situ piles:					
C12.1.15.1	Mild-steel bars (250 MPa)	t	2	17,000.00	34,000	00
C12.1.15.2	High-yield-stress-steel bars (450 MPa)	t	69	17,000.00	1,173,000	00
C12.1.16	Cast-in-situ concrete in piles, underreams, bulbous bases and sockets (D24/30-XC4(100)-20)	m ³	340	2,500.00	850,000	00
Total Carried Forward					5,532,500	00

BILL OF QUANTITIES

SCHEDULE B2: STRUCTURES: BRIDGE B0594

SECTION C12.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					5,532,500	00
C12.1.17	Extra over item C12.1.16 for concrete cast underwater	m³	300	400.00	120,000	00
C12.1.24	Stripping / cutting the pile heads (900 mm dia. auger pile)	No	60	900.00	54,000	00
C12.1.25	Establishment on site for the load testing of piles	Lump sum	1	200,000.00	200,000	00
C12.1.26	Load tests on piles (compression test, 900 mm diameter, auger piles, 1 800 kN working load)	No	2	60,000.00	120,000	00
C12.1.27	Establishment on site for core drilling	Lump sum	1	60,000.00	60,000	00
C12.1.28	Moving equipment to and assembling at each location where cores are to be drilled	No	60	2,400.00	144,000	00
C12.1.29	Drilling the cores (85 mm dia.) in:					
C12.1.29.1	Concrete	m	400	1,400.00	560,000	00
C12.1.29.2	Founding formation:					
	(a) Irrespective of hardness	m	60	1,400.00	84,000	00
C12.1.30	Standing time for pile-installation frame	h	20	6,000.00	120,000	00
C12.1.31	Pile Integrity Testing on augered / bored piles:					
C12.1.31.1	Providing and installing (80 mm dia.) mild steel tubes for “Cross Hole Sonic Logging” in all designated piles	m	1,120	300.00	336,000	00
C12.1.31.2	Carrying out of Impact Frequency Response (IFR) measurements or Sonic Tapping tests and interpretation of results (per pile diameter)	No	60	1,000.00	60,000	00
C12.1.31.3	Cross-Hole Sonic Logging tests and interpreted results (per pile diameter)	m	400	250.00	100,000	00
C12.1.31.4	Base integrity tests (per designated pile)	No	60	2,500.00	150,000	00
Total Carried Forward To Summary					7,640,500	00

BILL OF QUANTITIES

SCHEDULE B2: STRUCTURES: BRIDGE B0594

SECTION C13.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.1	FOUNDATIONS					
C13.1.1	Provision of designs and drawings of temporary works by an ECSA-registered Professional Engineer or Technologist or Geotechnical Engineer	Lump sum	1	50,000.00	50,000	00
C13.1.2	Additional foundation investigations:					
C13.1.2.1	Provisional sum allowed for additional foundation investigations	Prov sum	1	40,000.00	40,000	00
C13.1.2.2	Handling costs and profit in respect of item C13.1.2.1	%	40,000.00	10.00	4,000	00
C13.1.3	Excavation:					
C13.1.3.1	Excavating soft material situated within the following successive depth ranges:					
	(a) 0 m up to 1,5 m	m ³	550	100.00	55,000	00
	(b) > 1,5 m and < 3,0 m	m ³	290	150.00	43,500	00
C13.1.3.2	Extra over subitem C13.1.3.1 for excavation in hard material irrespective of depth	m ³	200	400.00	80,000	00
C13.1.3.3	Extra over subitem C13.1.3.1 for additional excavation required by the Engineer after excavation is complete	m ³	50	250.00	12,500	00
C13.1.3.4	Extra over subitem C13.1.3.1 for excavation by hand	m ³	30	350.00	10,500	00
C13.1.3.5	Extra over subitem C13.1.3.1 for excavation in restricted areas	m ³	70	200.00	14,000	00
C13.1.6	Access and drainage:					
C13.1.6.1	Access	Lump sum	1	50,000.00	50,000	00
C13.1.6.2	Drainage	Lump sum	1	100,000.00	100,000	00
PC13.1.7	Backfill to excavations utilising:					
C13.1.7.1	Material from excavation	m ³	480	150.00	72,000	00
PC13.1.7.2	Imported material:					
	(a) Clean sand compacted to 100% MDD	m ³	2,880	220.00	633,600	00
	(b) G7 granular material	m ³	33	370.00	12,210	00
C13.1.9	Fill within a restricted area (extra over item C5.2.2)	m ³	1,252	100.00	125,200	00
C13.1.10	Haul in excess of 1,0 km on excavated material and on material imported for backfill,	m ³ -km	750	10.00	7,500	00
C13.1.14	Foundation fill consisting of:					
C13.1.14.5	Concrete blinding (75 mm thick, class C12/15-20)	m ³	25	2,400.00	60,000	00
Total Carried Forward To Summary					1,370,010	00

BILL OF QUANTITIES

SCHEDULE B2: STRUCTURES: BRIDGE B0594

SECTION C13.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.2	FALSEWORK, FORMWORK AND CONCRETE FINISH					
C13.2.2	Vertical formwork to provide:					
C13.2.2.1	Class F1 surface finish to:					
	(a) Abutment pile cap	m ²	85	500.00	42,500	00
	(b) Approach slabs	m ²	10	500.00	5,000	00
	(c) Wingwalls	m ²	105	500.00	52,500	00
	(d) Pier pile cap	m ²	80	500.00	40,000	00
	(e) Abutments	m ²	105	500.00	52,500	00
C13.2.2.2	Class F2 surface finish to:					
	(a) Abutments	m ²	105	600.00	63,000	00
	(b) Piers	m ²	390	600.00	234,000	00
	(c) Earwings	m ²	8	600.00	4,800	00
	(d) Wingwalls	m ²	170	600.00	102,000	00
	(e) Deck edges	m ²	20	600.00	12,000	00
C13.2.3	Horizontal formwork to provide:					
C13.2.3.2	Class F2 surface finish to:					
	(a) Deck soffit	m ²	390	1,600.00	624,000	00
C13.2.4	Inclined formwork to provide:					
C13.2.4.1	Class F1 surface finish to:					
	(a) Abutment corbel	m ²	14	450.00	6,300	00
C13.2.4.2	Class F2 surface finish to:					
	(a) Deck edges and haunches	m ²	180	1,600.00	288,000	00
C13.2.6	Formwork to form open joints:					
C13.2.6.1	Between wingwalls and abutments (10 mm)	m ²	25	450.00	11,250	00
C13.2.10	Provision of designs and drawings of falsework and formwork by an ECSA registered Professional Engineer or Technologist (deck, abutments and piers)	Lump sum	1	80,000.00	80,000	00
Total Carried Forward To Summary					1,617,850	00

BILL OF QUANTITIES

SCHEDULE B2: STRUCTURES: BRIDGE B0594

SECTION C13.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.3	STEEL REINFORCEMENT					
C13.3.1	Reinforcement for:					
C13.3.1.1	Abutment pile caps:					
	(a) Mild-steel bars (250 MPa)	t	0.5	17,000.00	8,500	00
	(b) High-yield-stress-steel bars (450 MPa)	t	12	17,000.00	204,000	00
C13.3.1.2	Pier pile caps:					
	(a) Mild-steel bars (250 MPa)	t	0.5	17,000.00	8,500	00
	(b) High-yield-stress-steel bars (450 MPa)	t	11	17,000.00	187,000	00
C13.3.1.3	Wingwall pile caps:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	22	17,000.00	374,000	00
C13.3.1.4	Abutments:					
	(a) Mild-steel bars (250 MPa)	t	2	17,000.00	34,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	38	17,000.00	646,000	00
C13.3.1.5	Wingwalls:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	14	17,000.00	238,000	00
C13.3.1.6	Piers:					
	(a) Mild-steel bars (250 MPa)	t	2	17,000.00	34,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	18	17,000.00	306,000	00
C13.3.1.7	Deck:					
	(a) Mild-steel bars (250 MPa)	t	2	17,000.00	34,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	60	17,000.00	1,020,000	00
C13.3.1.8	Parapet and End Blocks:					
	(a) Mild-steel bars (250 MPa)	t	0.5	17,000.00	8,500	00
	(b) High-yield-stress-steel bars (450 MPa)	t	4.5	17,000.00	76,500	00
C13.3.1.9	Parapet and End Blocks:					
	(a) Mild-steel bars (250 MPa)	t	0.5	17,000.00	8,500	00
	(b) High-yield-stress-steel bars (450 MPa)	t	5	17,000.00	85,000	00
C13.3.4	Extra-over item C13.3.1 (a), (b), etc. for galvanising of reinforcement	t	0.6	16,000.00	9,600	00
Total Carried Forward To Summary					3,316,100	00

BILL OF QUANTITIES

SCHEDULE B2: STRUCTURES: BRIDGE B0594

SECTION C13.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.4	CONCRETE					
C13.4.1	Cast-in-situ concrete (class of concrete and use or position in structure stated):					
C13.4.1.2	Durable concrete (Class D):					
	(a) Abutment pile caps, D32/40-20-XC4	m ³	75	2,500.00	187,500	00
	(b) Wingwall pile caps, D32/40-20-XC4	m ³	220	2,500.00	550,000	00
	(c) Pier pile caps, D32/40-20-XC4	m ³	60	2,500.00	150,000	00
	(d) Abutments, D32/40-20-XC4	m ³	195	2,500.00	487,500	00
	(e) Piers, D32/40-20-XC4	m ³	98	2,500.00	245,000	00
	(f) Wingwalls, D32/40-20-XC4	m ³	85	2,500.00	212,500	00
	(g) Deck, D32/40-20-XC4	m ³	317	2,500.00	792,500	00
	(h) Approach slabs, D32/40-20-XC4	m ³	40	2,500.00	100,000	00
C13.4.3	Extra over item C13.4.1 for the protection of concrete from adverse environmental conditions, if required:					
C13.4.3.2	Durable concrete (Class D):					
	(a) Abutment pile caps, D32/40-20-XC4	m ³	75	100.00	7,500	00
	(b) Wingwall pile caps, D32/40-20-XC4	m ³	220	100.00	22,000	00
	(c) Pier pile caps, D32/40-20-XC4	m ³	60	100.00	6,000	00
	(d) Abutments, D32/40-20-XC4	m ³	195	100.00	19,500	00
	(e) Piers, D32/40-20-XC4	m ³	98	100.00	9,800	00
	(f) Wingwalls, D32/40-20-XC4	m ³	85	100.00	8,500	00
	(g) Deck, D32/40-20-XC4	m ³	317	100.00	31,700	00
	(h) Approach slabs, D32/40-20-XC4	m ³	40	100.00	4,000	00
C13.4.5	Curing and surface protection of cast-in-situ concrete, as and where specifically required:					
C13.4.5.1	Top of foundation using an approved curing compound (tenderer to specify compound)	m ²	115	40.00	4,600	00
					
C13.4.5.2	Substructure using an approved curing compound (tenderer to specify compound)	m ²	784	40.00	31,360	00
					
Total Carried Forward					2,869,960	00

BILL OF QUANTITIES

SCHEDULE B2: STRUCTURES: BRIDGE B0594

SECTION C13.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					2,869,960	00
C13.4.5.3	Top of deck using an approved curing compound (tenderer to specify compound)	m²	520	100.00	52,000	00
C13.4.5.4	Sides of deck using an approved curing compound (tenderer to specify compound)	m²	55	40.00	2,200	00
C13.4.5.5	Parapets using an approved curing compound (tenderer to specify compound)	m²	170	40.00	6,800	00
C13.4.14	Controlled demolition of concrete from structural elements:					
C13.4.14.1	Deck of Bridge B447	m³	189	1,500.00	283,500	00
C13.4.14.2	Piers of Bridge B447	m³	185	1,500.00	277,500	00
C13.4.14.3	Abutments and wingwalls of Bridge B447	m³	187	1,500.00	280,500	00
C13.4.14.4	Footings of Bridge B447	m³	20	1,500.00	30,000	00
C13.4.14.5	Parapet of Bridge B447	m³	10	1,500.00	15,000	00
Total Carried Forward To Summary					3,817,460	00

BILL OF QUANTITIES

SCHEDULE B2: STRUCTURES: BRIDGE B0594

SECTION C13.7

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.7	JOINTS					
C13.7.2	Filled joints:					
C13.7.2.2	Rigid foam of expanded polythylene joint former for: (a) 10 mm joints between wingwalls and abutments	m	20	200.00	4,000	00
C13.7.4	Sealing joints with:					
C13.7.4.1	Sealant (Polythane sealant including backing chord) for: (a) 10 mm joints between wingwalls and abutments	m	60	80.00	4,800	00
PC13.7.11	PVC sleeve, bituthene wrapping and tape-cap for expansion joint tie	No	4	25.00	100	00
Total Carried Forward To Summary					8,900	00

BILL OF QUANTITIES

SCHEDULE B2: STRUCTURES: BRIDGE B0594

SECTION C13.8

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.8	ANCILLARY STRUCTURAL ELEMENTS					
C13.8.1	Concrete barriers and parapets (as per drawing 33532.00-201-05-01):					
C13.8.1.2	Parapets	m	74	5,000.00	370,000	00
C13.8.2	End blocks (3,0 m long)	No	4	10,000.00	40,000	00
C13.8.6	Service ducts in structures:					
C13.8.6.1	U-PVC 110 mm dia.	m	74	100.00	7,400	00
C13.8.7	Numbers for structures: (as per drawing 33532.00-215-01-10):					
C13.8.7.1	Number plates	No	2	1,500.00	3,000	00
C13.8.10	Drainage pipes and weep holes:					
C13.8.10.1	Drainage pipes:					
	(b) U-PVC 75 mm dia. in deck	No	37	160.00	5,920	00
C13.8.10.2	Weep holes:					
	(b) U-PVC 50 mm dia. in abutments	No	60	50.00	3,000	00
C13.8.12	Synthetic-fibre filter fabric (Grade B double cusped HDPE sheet on filter elements behind abutment)	m ²	192	150.00	28,800	00
C13.8.15	Drainage strips (HDPE 200 mm wide DN3 behind abutments)	m	320	85.00	27,200	00
C13.8.16	Perforated drainage pipes:					
C13.8.16.1	65 mm dia., wrapped in Grade B synthetic fibre filter fabric	m	40	110.00	4,400	00
Total Carried Forward To Summary					489,720	00

BILL OF QUANTITIES

SCHEDULE B2: STRUCTURES: BRIDGE B0594

SUMMARY OF SECTIONS

Section	Description	Amount (Rand)
SECTION C11.2	NON-STRUCTURAL GABIONS	449,500.00
SECTION C12.1	PILING	7,640,500.00
SECTION C13.1	FOUNDATIONS	1,370,010.00
SECTION C13.2	FALSEWORK, FORMWORK AND CONCRETE FINISH	1,617,850.00
SECTION C13.3	STEEL REINFORCEMENT	3,316,100.00
SECTION C13.4	CONCRETE	3,817,460.00
SECTION C13.7	JOINTS	8,900.00
SECTION C13.8	ANCILLARY STRUCTURAL ELEMENTS	489,720.00
Total Carried Forward To Summary Of Schedules		<hr/> 18,710,040.00 <hr/>

SCHEDULE B3

STRUCTURES: BRIDGE B0619

BILL OF QUANTITIES

SCHEDULE B3: STRUCTURES: BRIDGE B0619

SECTION C13.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.1	FOUNDATIONS					
C13.1.2	Additional foundation investigations:					
C13.1.2.1	Provisional sum allowed for additional foundation investigations	Prov sum	1	10,000.00	10,000	00
C13.1.2.2	Handling costs and profit in respect of item C13.1.2.1	%	10,000.00	10.00	1,000	00
C13.1.3	Excavation:					
C13.1.3.1	Excavating soft material situated within the following successive depth ranges:					
	(a) 0 m up to 1,5 m	m ³	550	100.00	55,000	00
	(b) > 1,5 m and < 3,0 m	m ³	1,575	150.00	236,250	00
	(c) > 3,0 m and < 4,5 m	m ³	1,230	200.00	246,000	00
C13.1.3.2	Extra over subitem C13.1.3.1 for excavation in hard material irrespective of depth	m ³	340	400.00	136,000	00
C13.1.3.3	Extra over subitem C13.1.3.1 for additional excavation required by the Engineer after excavation is complete	m ³	170	250.00	42,500	00
C13.1.3.4	Extra over subitem C13.1.3.1 for excavation by hand	m ³	170	350.00	59,500	00
C13.1.3.5	Extra over subitem C13.1.3.1 for excavation in restricted areas	m ³	340	100.00	34,000	00
C13.1.6	Access and drainage:					
C13.1.6.1	Access	Lump sum	1	25,000.00	25,000	00
C13.1.6.2	Drainage	Lump sum	1	25,000.00	25,000	00
PC13.1.7	Backfill to excavations utilising:					
C13.1.7.1	Material from excavation	m ³	340	150.00	51,000	00
PC13.1.7.2	Imported material:					
	(a) Clean sand compacted to 100% MDD	m ³	970	220.00	213,400	00
	(b) G7 granular material	m ³	36	370.00	13,320	00
C13.1.7.3	Soil cement	m ³	170	500.00	85,000	00
C13.1.9	Fill within a restricted area (extra over item C5.2.2)	m ³	340	100.00	34,000	00
C13.1.10	Haul in excess of 1,0 km on excavated material and on material imported for backfill,	m ³ -km	2,043	10.00	20,430	00
C13.1.14	Foundation fill consisting of:					
PC13.1.14.1	Rock fill wrapped in geotextile (Grade C)	m ³	1,759	450.00	791,550	00
C13.1.14.3	Compacted granular material	m ³	520	220.00	114,400	00
Total Carried Forward					2,193,350	00

BILL OF QUANTITIES

SCHEDULE B3: STRUCTURES: BRIDGE B0619

SECTION C13.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					2,193,350	00
C13.1.14.5	Concrete blinding (75 mm blinding - C12/15-20)	m³	78	2,400.00	187,200	00
</						

BILL OF QUANTITIES

SCHEDULE B3: STRUCTURES: BRIDGE B0619

SECTION C13.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.2	FALSEWORK, FORMWORK AND CONCRETE FINISH					
C13.2.2	Vertical formwork to provide:					
C13.2.2.1	Class F1 surface finish to:					
	(a) Base slab and wingwall bases	m ²	114	500.00	57,000	00
	(b) Apron slab and cut-off beams	m ²	90	500.00	45,000	00
	(c) Culvert cell walls (outside)	m ²	169	500.00	84,500	00
	(d) Back of wingwalls	m ²	16	500.00	8,000	00
	(e) Culvert deck slab	m ²	59	500.00	29,500	00
C13.2.2.2	Class F2 surface finish to:					
	(a) Culvert cell walls (inside and front)	m ²	431	600.00	258,600	00
	(b) Front of wingwalls	m ²	16	600.00	9,600	00
	(c) Culvert deck slab	m ²	30	600.00	18,000	00
C13.2.3	Horizontal formwork to provide:					
C13.2.3.1	Class F2 surface finish to:					
	(a) Culvert deck slab	m ²	619	750.00	464,250	00
C13.2.6	Formwork to form open joints at:					
C13.2.6.1	Between cells (10 mm)	m ²	46	450.00	20,700	00
C13.2.6.2	Between wingwalls and culvert (10 mm)	m ²	3.5	450.00	1,575	00
Total Carried Forward To Summary					996,725	00

BILL OF QUANTITIES

SCHEDULE B3: STRUCTURES: BRIDGE B0619

SECTION C13.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.3	STEEL REINFORCEMENT					
C13.3.1	Reinforcement for:					
C13.3.1.1	Culvert base slab and wingwall bases:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	39	17,000.00	663,000	00
C13.3.1.2	Apron slab and cut-off beams:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	1.3	17,000.00	22,100	00
	(c) Welded steel fabric	kg	912	23.00	20,976	00
C13.3.1.3	Culvert cell walls:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	18.5	17,000.00	314,500	00
C13.3.1.4	Wingwalls:					
	(a) Mild-steel bars (250 MPa)	t	0.05	17,000.00	850	00
	(b) High-yield-stress-steel bars (450 MPa)	t	0.7	17,000.00	11,900	00
C13.3.1.5	Culvert deck slab:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	53	17,000.00	901,000	00
C13.3.4	Extra-over item C13.3.1 (a), (b), etc for galvanizing of reinforcement	t	0.5	16,000.00	8,000	00
Total Carried Forward To Summary					2,010,326	00

BILL OF QUANTITIES

SCHEDULE B3: STRUCTURES: BRIDGE B0619

SECTION C13.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.4	CONCRETE					
C13.4.1	Cast-in-situ concrete (class of concrete and use or position in structure stated):					
C13.4.1.2	Durable concrete (Class D):					
	(a) Culvert base slab and wingwall bases, D25/30-20-XC4	m ³	263	2,500.00	657,500	00
	(b) Apron slab and cut-off beams, D25/30-20-XC4	m ³	29	2,500.00	72,500	00
	(c) Culvert cell walls, D25/30-20-XC4	m ³	91	2,500.00	227,500	00
	(d) Wingwalls, D25/30-20-XC4	m ³	5	2,500.00	12,500	00
	(e) Culvert deck slab, D25/30-20-XC4	m ³	248	2,500.00	620,000	00
C13.4.5	Curing and surface protection of cast-in-situ concrete, as and where specifically required:					
C13.4.5.1	Top of base slab and wingwall bases using an approved curing compound (tenderer to specify compound)	m ²	635	40.00	25,400	00
					
C13.4.5.2	Top of apron slab using an approved curing compound (tenderer to specify compound)	m ²	124	40.00	4,960	00
					
C13.4.5.3	Culvert cell walls using an approved curing compound (tenderer to specify compound)	m ²	600	40.00	24,000	00
					
C13.4.5.4	Wingwalls using an approved curing compound (tenderer to specify compound)	m ²	38	40.00	1,520	00
					
C13.4.5.5	Culvert deck slab using an approved curing compound (tenderer to specify compound)	m ²	1,356	40.00	54,240	00
					
C13.4.13	Complete demolition and disposal of existing structural concrete elements or parts of existing structures:					
C13.4.13.1	Existing culverts and wingwalls	m ³	200	1,500.00	300,000	00
Total Carried Forward To Summary					2,000,120	00

BILL OF QUANTITIES

SCHEDULE B3: STRUCTURES: BRIDGE B0619

SECTION C13.7

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.7	JOINTS					
C13.7.2	Filled joints:					
C13.7.2.2	Rigid foam of expanded Polyurethane joint former for:					
	(a) 10 mm joints between cells	m	46	200.00	9,200	00
	(b) 10 mm joints between wingwalls and cells	m	3	200.00	600	00
C13.7.4	Sealing joints with:					
C13.7.4.1	Sealant (10 mm x 10 mm Polyurethane sealant including backing chord) at:					
	(a) Culvert cells	m	185	80.00	14,800	00
	(b) Wingwalls	m	20	80.00	1,600	00
PC13.7.11	PVC sleeve, bituthene wrapping and tape-cap for expansion joint tie	No	160	25.00	4,000	00
Total Carried Forward To Summary					30,200	00

BILL OF QUANTITIES

SCHEDULE B3: STRUCTURES: BRIDGE B0619

SECTION C13.8

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.8	ANCILLARY STRUCTURAL ELEMENTS					
C13.8.7	Numbers for structures: (as per drawing 33532.00-215-01-20):					
C13.8.7.1	Number plates (Type 1):					
	(a) Mounted onto structure	No	2	1,500.00	3,000	00
	(b) Mounted on type 2 mounting block	No	2	3,000.00	6,000	00
C13.8.9	Precast no-fines concrete units (200 mm x 200 mm x 100mm pre-cast no fines concrete block (C16/20-20))	No	50	300.00	15,000	00
C13.8.10	Drainage pipes and weep holes:					
C13.8.10.1	Drainage pipes:					
	(b) 75 mm dia. heavy duty U-PVC scupper drain	No	50	160.00	8,000	00
C13.8.10.2	Weep holes:					
	(b) 50 mm dia. U-PVC weepholes	No	100	50.00	5,000	00
C13.8.12	Synthetic-fibre filter fabric:					
C13.8.12.1	Grade B double cusped HDPE sheet on filter elements behind cell walls and wingwalls	m ²	136	50.00	6,800	00
C13.8.12.2	Pre-impregnated with a bituminous emulsion or similar approved bonded across butt-joints (2,0 mm x 150 mm wide, 340 g/m ²)	m ²	20	60.00	1,200	00
C13.8.12.3	Wrapped around 200 mm x 200 mm x 100 mm precast no-fines concrete block (1,8 mm minimum thickness)	m ²	11	50.00	550	00
C13.8.12.4	Non-woven needle punched geotextile wrapped around rockfill (Grade C)	m ²	2,370	180.00	426,600	00
C13.8.15	Drainage strips (HDPE 200 mm wide DN3 behind culvert walls and wingwalls)	m	228	85.00	19,380	00
C13.8.16	Perforated drainage pipes:					
C13.8.16.1	65 mm dia. wrapped in grade B synthetic fibre filter fabric	m	105	110.00	11,550	00
Total Carried Forward To Summary					503,080	00

BILL OF QUANTITIES

SCHEDULE B3: STRUCTURES: BRIDGE B0619

SECTION C13.9

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.9	STRUCTURAL STEELWORK FOR MINOR STRUCTURES					
C13.9.1	Structural steel:					
C13.9.1.1	Guardrail posts, capping plates and base plates	t	0.75	30,000.00	22,500	00
C13.9.2	Anchor bolts:					
C13.9.2.2	25 mm dia. u-bolt group (complete with nuts, washers and 50 x 50 x 5,0 angles as per drawing 33532.00-215-01-31	No	13	250.00	3,250	00
C13.9.3	Corrosion protection:					
C13.9.3.2	Galvanizing: (a) Thickness as per SANS 121	t	0.75	16,000.00	12,000	00
Total Carried Forward To Summary					37,750	00

BILL OF QUANTITIES**SCHEDULE B3: STRUCTURES: BRIDGE B0619****SUMMARY OF SECTIONS**

Section	Description	Amount (Rand)
SECTION C13.1 FOUNDATIONS		2,380,550.00
SECTION C13.2 FALSEWORK, FORMWORK AND CONCRETE FINISH		996,725.00
SECTION C13.3 STEEL REINFORCEMENT		2,010,326.00
SECTION C13.4 CONCRETE		2,000,120.00
SECTION C13.7 JOINTS		30,200.00
SECTION C13.8 ANCILLARY STRUCTURAL ELEMENTS		503,080.00
SECTION C13.9 STRUCTURAL STEELWORK FOR MINOR STRUCTURES		37,750.00
Total Carried Forward To Summary Of Schedules		<hr/> 7,958,751.00 <hr/>

SCHEDULE B4

STRUCTURES: MAJOR CULVERT C9519

BILL OF QUANTITIES

SCHEDULE B4: STRUCTURES: MAJOR CULVERT C9519

SECTION C13.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.1	FOUNDATIONS					
C13.1.2	Additional foundation investigations:					
C13.1.2.1	Provisional sum allowed for additional foundation investigations	Prov sum	1	10,000.00	10,000	00
C13.1.2.2	Handling costs and profit in respect of item C13.1.2.1	%	10,000.00	10.00	1,000	00
C13.1.3	Excavation:					
C13.1.3.1	Excavating soft material situated within the following successive depth ranges:					
	(a) 0 m up to 1,5 m	m ³	1,300	100.00	130,000	00
	(b) > 1,5 m and < 3,0 m	m ³	1,300	150.00	195,000	00
	(c) > 3,0 m and < 4,5 m	m ³	450	200.00	90,000	00
C13.1.3.2	Extra over subitem C13.1.3.1 for excavation in hard material irrespective of depth	m ³	305	400.00	122,000	00
C13.1.3.3	Extra over subitem C13.1.3.1 for additional excavation required by the Engineer after excavation is complete	m ³	153	250.00	38,250	00
C13.1.3.4	Extra over subitem C13.1.3.1 for excavation by hand	m ³	153	350.00	53,550	00
C13.1.3.5	Extra over subitem C13.1.3.1 for excavation in restricted areas	m ³	305	100.00	30,500	00
C13.1.6	Access and drainage:					
C13.1.6.1	Access	Lump sum	1	25,000.00	25,000	00
C13.1.6.2	Drainage	Lump sum	1	25,000.00	25,000	00
PC13.1.7	Backfill to excavations utilising:					
C13.1.7.1	Material from excavation	m ³	305	150.00	45,750	00
PC13.1.7.2	Imported material:					
	(a) Clean sand compacted to 100% MDD	m ³	1,081	220.00	237,820	00
	(b) G7 granular material	m ³	35	370.00	12,950	00
C13.1.7.3	Soil cement	m ³	153	500.00	76,500	00
C13.1.9	Fill within a restricted area (extra over item C5.2.2)	m ³	1,081	100.00	108,100	00
C13.1.10	Haul in excess of 1,0 km on excavated material and on material imported for backfill,	m ³ -km	1,634	10.00	16,340	00
C13.1.14	Foundation fill consisting of:					
C13.1.14.1	Rock fill wrapped in geotextile (Grade C)	m ³	2,020	450.00	909,000	00
C13.1.14.3	Compacted granular material	m ³	475	220.00	104,500	00
Total Carried Forward					2,231,260	00

BILL OF QUANTITIES

SCHEDULE B4: STRUCTURES: MAJOR CULVERT C9519

SECTION C13.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					2,231,260	00
C13.1.14.5	Concrete blinding (75 mm blinding - C12/15-20)	m³	72	2,400.00	172,800	00

BILL OF QUANTITIES

SCHEDULE B4: STRUCTURES: MAJOR CULVERT C9519

SECTION C13.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.2	FALSEWORK, FORMWORK AND CONCRETE FINISH					
C13.2.2	Vertical formwork to provide:					
C13.2.2.1	Class F1 surface finish to:					
	(a) Base slab and wingwall bases	m ²	91	500.00	45,500	00
	(b) Apron slab and cut-off beams	m ²	72	500.00	36,000	00
	(c) Culvert cell walls (outside)	m ²	135	500.00	67,500	00
	(d) Back of wingwalls	m ²	13	500.00	6,500	00
	(e) Culvert deck slab and headwall	m ²	47	500.00	23,500	00
C13.2.2.2	Class F2 surface finish to:					
	(a) Culvert cell walls (inside and front)	m ²	345	600.00	207,000	00
	(b) Front of wingwalls	m ²	13	600.00	7,800	00
	(c) Culvert deck slab	m ²	24	600.00	14,400	00
C13.2.3	Horizontal formwork to provide:					
C13.2.3.1	Class F2 surface finish to:					
	(a) Culvert deck slab	m ²	495	750.00	371,250	00
C13.2.6	Formwork to form open joints at:					
C13.2.6.1	Culvert cells (10 mm)	m ²	37	450.00	16,650	00
C13.2.6.2	Between wingwalls and culvert (10 mm)	m ²	2.5	450.00	1,125	00
Total Carried Forward To Summary					797,225	00

BILL OF QUANTITIES

SCHEDULE B4: STRUCTURES: MAJOR CULVERT C9519

SECTION C13.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.3	STEEL REINFORCEMENT					
C13.3.1	Reinforcement for:					
C13.3.1.1	Culvert base slab and wingwall bases:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	34	17,000.00	578,000	00
C13.3.1.2	Apron slabs and cut-off beams:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	1	17,000.00	17,000	00
	(c) Welded steel fabric	kg	700	23.00	16,100	00
C13.3.1.3	Culvert cell walls:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	14	17,000.00	238,000	00
C13.3.1.4	Wingwalls:					
	(a) Mild-steel bars (250 MPa)	t	0.04	17,000.00	680	00
	(b) High-yield-stress-steel bars (450 MPa)	t	0.9	17,000.00	15,300	00
C13.3.1.5	Culvert deck slab:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	41	17,000.00	697,000	00
C13.3.4	Extra-over item C13.3.1 (a), (b), etc for galvanizing of reinforcement	t	0.4	16,000.00	6,400	00
Total Carried Forward To Summary					1,636,480	00

BILL OF QUANTITIES

SCHEDULE B4: STRUCTURES: MAJOR CULVERT C9519

SECTION C13.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.4	CONCRETE					
C13.4.1	Cast-in-situ concrete (class of concrete and use or position in structure stated):					
C13.4.1.2	Durable concrete (Class D):					
	(a) Culvert base slab and wingwall bases, D25/30-XC4(100)-20	m³	210	2,500.00	525,000	00
	(b) Apron slab and cut-off beams, D25/30-XC4(100)-20	m³	23	2,500.00	57,500	00
	(c) Culvert cell walls, D25/30-XC4(100)-20	m³	73	2,500.00	182,500	00
	(d) Wingwalls, D25/30-XC4(100)-20	m³	4	2,500.00	10,000	00
	(e) Culvert deck slab, D25/30-XC4(100)-20	m³	198	2,500.00	495,000	00
C13.4.5	Curing and surface protection of cast-in-situ concrete, as and where specifically required:					
C13.4.5.1	Top of base slab and wingwall bases using an approved curing compound (tenderer to specify compound)	m²	508	40.00	20,320	00
C13.4.5.2	Top of apron slab using an approved curing compound (tenderer to specify compound)	m²	99	40.00	3,960	00
C13.4.5.3	Culvert cell walls using an approved curing compound (tenderer to specify compound)	m²	480	40.00	19,200	00
C13.4.5.4	Wingwalls using an approved curing compound (tenderer to specify compound)	m²	30	40.00	1,200	00
C13.4.5.5	Culvert deck slab using an approved curing compound (tenderer to specify compound)	m²	1,085	40.00	43,400	00
C13.4.9	Manufacturing precast concrete members (precast number plate mounting blocks as per drawing 33532.00-215-01-30)	No	2	2,000.00	4,000	00
C13.4.11	Transporting and erecting precast concrete members (precast number plate mounting blocks, 2,65 kg)	No	2	1,650.00	3,300	00
C13.4.13	Complete demolition and disposal of existing structural concrete elements or parts of existing structures:					
C13.4.13.1	Existing culverts and wingwalls	m³	100	1,500.00	150,000	00
Total Carried Forward To Summary					1,515,380	00

BILL OF QUANTITIES

SCHEDULE B4: STRUCTURES: MAJOR CULVERT C9519

SECTION C13.7

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.7	JOINTS					
C13.7.2	Filled joints:					
C13.7.2.2	Rigid foam of expanded Polyurethane joint former for:					
	(a) 10 mm joints between cells	m	37	200.00	7,400	00
	(b) 10 mm joint wingwalls and cells	m	2.5	200.00	500	00
C13.7.4	Sealing joints with:					
C13.7.4.1	Sealant (10 mm x 10 mm Polyurethane sealant including backing chord) at:					
	(a) Culvert cells	m	148	80.00	11,840	00
	(b) Wingwalls	m	16	80.00	1,280	00
PC13.7.11	PVC sleeve, bituthene wrapping and tape-cap for expansion joint tie	No	164	25.00	4,100	00
Total Carried Forward To Summary					25,120	00

BILL OF QUANTITIES

SCHEDULE B4: STRUCTURES: MAJOR CULVERT C9519

SECTION C13.8

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.8	ANCILLARY STRUCTURAL ELEMENTS					
C13.8.7	Numbers for structures: (as per drawing 33532.00-215-01-30):					
C13.8.7.1	Number plates (Type 1)					
	(a) Mounted on to structure	No	2	1,500.00	3,000	00
	(b) Mounted on type 2 mounting block	No	2	3,000.00	6,000	00
C13.8.9	Precast no-fines concrete units (200 mm x 200 mm x 100mm pre-cast no fines concrete block (C16/20-20))	No	40	300.00	12,000	00
C13.8.10	Drainage pipes and weep holes:					
C13.8.10.1	Drainage pipes:					
	(b) 75 mm dia. heavy duty U-PVC scupper drain	No	40	160.00	6,400	00
C13.8.10.2	Weep holes:					
	(b) 50 mm dia. U-PVC weepholes	No	80	50.00	4,000	00
C13.8.12	Synthetic-fibre filter fabric:					
C13.8.12.1	Grade B double cusped HDPE sheet on filter elements behind cell walls and wingwalls	m ²	109	50.00	5,450	00
C13.8.12.2	Pre-impregnated with a bituminous emulsion or similar approved bonded across butt-joints (2,0 mm x 150 mm wide, 340 g/m ²)	m ²	16	60.00	960	00
C13.8.12.3	Wrapped around 200 mm x 200 mm x 100 mm precast no-fines concrete block (1,8 mm minimum thickness)	m ²	8.5	50.00	425	00
C13.8.12.4	Non-woven needle punched geotextile wrapped around rockfill (Grade C)	m ²	1,896	60.00	113,760	00
C13.8.15	Drainage strips (HDPE 200 mm wide DN3 behind culvert walls and wingwalls)	m	182	85.00	15,470	00
C13.8.16	Perforated drainage pipes:					
C13.8.16.1	65 mm dia. wrapped in grade B synthetic fibre filter fabric	m	84	110.00	9,240	00
Total Carried Forward To Summary					176,705	00

BILL OF QUANTITIES

SCHEDULE B4: STRUCTURES: MAJOR CULVERT C9519

SECTION C13.9

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.9	STRUCTURAL STEELWORK FOR MINOR STRUCTURES					
C13.9.1	Structural steel:					
C13.9.1.1	Guardrail posts, capping plates and base plates	t	0.6	30,000.00	18,000	00
C13.9.2	Anchor bolts:					
C13.9.2.2	25 mm dia. u-bolt group (complete with nuts, washers and 50 x 50 x 5,0 angles as per drawing 33532.00-215-01-31)	No	10	250.00	2,500	00
C13.9.3	Corrosion protection:					
C13.9.3.2	Galvanizing:					
	(a) Thickness as per SANS 121	t	0.7	16,000.00	11,200	00
Total Carried Forward To Summary					31,700	00

BILL OF QUANTITIES**SCHEDULE B4: STRUCTURES: MAJOR CULVERT C9519****SUMMARY OF SECTIONS**

Section	Description	Amount (Rand)
SECTION C13.1 FOUNDATIONS		2,404,060.00
SECTION C13.2 FALSEWORK, FORMWORK AND CONCRETE FINISH		797,225.00
SECTION C13.3 STEEL REINFORCEMENT		1,636,480.00
SECTION C13.4 CONCRETE		1,515,380.00
SECTION C13.7 JOINTS		25,120.00
SECTION C13.8 ANCILLARY STRUCTURAL ELEMENTS		176,705.00
SECTION C13.9 STRUCTURAL STEELWORK FOR MINOR STRUCTURES		31,700.00
Total Carried Forward To Summary Of Schedules		<hr/> 6,586,670.00 <hr/>

SCHEDULE B5

STRUCTURES: MAJOR CULVERT C9520

BILL OF QUANTITIES

SCHEDULE B5: STRUCTURES: MAJOR CULVERT C9520

SECTION C11.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C11.2	NON-STRUCTURAL GABIONS					
C11.2.1	Foundation trench excavation:					
C11.2.1.1	Excavating all material situated within the following depth ranges below the surface level: (a) 0 m to 1,5 m	m ³	30	100.00	3,000	00
C11.2.1.2	Extra over sub-item C11.2.1.1 for excavation in hard material, irrespective of depth	m ³	3	400.00	1,200	00
C11.2.2	Surface preparation for bedding the gabion boxes and mattresses	m ²	46	50.00	2,300	00
C11.2.3	Gabion boxes and mattresses:					
C11.2.3.2	PVC coated gabion boxes (1,0 m x 1,0 m x 1,0 m, white 2,7 mm dia. mesh wire and 80 mm x 80 mm mesh size)	m ³	16	1,500.00	24,000	00
C11.2.3.4	PVC-coated gabion mattresses (300 mm thick, with 2,7 mm dia. mesh and 80 mm x 80 mm mesh size)	m ³	13	1,700.00	22,100	00
C11.2.4	Geotextile (Grade A needle punched non-woven filter geofibre)	m ²	81	25.00	2,025	00
PC11.2.5	Grouting of gabion boxes using 1:3 cement sand mortar					
PC11.2.5.1	Fill voids in gabion boxes	m ³	7	1,200.00	8,400	00
Total Carried Forward To Summary					63,025	00

BILL OF QUANTITIES

SCHEDULE B5: STRUCTURES: MAJOR CULVERT C9520

SECTION C13.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.1	FOUNDATIONS					
C13.1.2	Additional foundation investigations:					
C13.1.2.1	Provisional sum allowed for additional foundation investigations	Prov sum	1	10,000.00	10,000	00
C13.1.2.2	Handling costs and profit in respect of item C13.1.2.1	%	10,000.00	10.00	1,000	00
C13.1.3	Excavation:					
C13.1.3.1	Excavating soft material situated within the following successive depth ranges:					
	(a) 0 m up to 1,5 m	m ³	330	100.00	33,000	00
	(b) > 1,5 m and < 3,0 m	m ³	485	150.00	72,750	00
	(c) > 3,0 m and < 4,5 m	m ³	485	200.00	97,000	00
C13.1.3.2	Extra over subitem C13.1.3.1 for excavation in hard material irrespective of depth	m ³	150	400.00	60,000	00
C13.1.3.3	Extra over subitem C13.1.3.1 for additional excavation required by the Engineer after excavation is complete	m ³	75	250.00	18,750	00
C13.1.3.4	Extra over subitem C13.1.3.1 for excavation by hand	m ³	75	350.00	26,250	00
C13.1.3.5	Extra over subitem C13.1.3.1 for excavation in restricted areas	m ³	150	100.00	15,000	00
C13.1.6	Access and drainage:					
C13.1.6.1	Access	Lump sum	1	25,000.00	25,000	00
C13.1.6.2	Drainage	Lump sum	1	25,000.00	25,000	00
PC13.1.7	Backfill to excavations utilising:					
C13.1.7.1	Material from excavation	m ³	130	150.00	19,500	00
PC13.1.7.2	Imported material:					
	(a) Clean sand compacted to 100% MDD	m ³	450	220.00	99,000	00
	(b) G7 granular material	m ³	21	370.00	7,770	00
C13.1.7.3	Soil cement	m ³	65	500.00	32,500	00
C13.1.9	Fill within a restricted area (extra over item C5.2.2)	m ³	450	100.00	45,000	00
C13.1.10	Haul in excess of 1,0 km on excavated material and on material imported for backfill,	m ³ -km	940	10.00	9,400	00
C13.1.14	Foundation fill consisting of:					
PC13.1.14.1	Rock fill wrapped in geotextile (Grade C)	m ³	400	450.00	180,000	00
C13.1.14.3	Compacted granular material	m ³	150	220.00	33,000	00
Total Carried Forward					809,920	00

BILL OF QUANTITIES

SCHEDULE B5: STRUCTURES: MAJOR CULVERT C9520

SECTION C13.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					809,920	00
C13.1.14.5	Concrete blinding (75 mm blinding - C12/15-20)	m³	24	2,400.00	57,600	00

BILL OF QUANTITIES

SCHEDULE B5: STRUCTURES: MAJOR CULVERT C9520

SECTION C13.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.2	FALSEWORK, FORMWORK AND CONCRETE FINISH					
C13.2.2	Vertical formwork to provide:					
C13.2.2.1	Class F1 surface finish to:					
	(a) Base slab and wingwall bases	m ²	79	500.00	39,500	00
	(b) Apron slab and cut-off beams	m ²	53	500.00	26,500	00
	(c) Culvert cell walls (outside)	m ²	81	500.00	40,500	00
	(d) Back of wingwalls	m ²	20.3	500.00	10,150	00
	(e) Culvert deck slab and headwall	m ²	34	500.00	17,000	00
C13.2.2.2	Class F2 surface finish to:					
	(a) Culvert cell walls (inside and front)	m ²	187	600.00	112,200	00
	(b) Front of wingwalls	m ²	21	600.00	12,600	00
	(c) Culvert deck slab	m ²	11.4	600.00	6,840	00
C13.2.3	Horizontal formwork to provide:					
C13.2.3.1	Class F2 surface finish to:					
	(a) Culvert deck slab	m ²	152	750.00	114,000	00
C13.2.6	Formwork to form open joints at:					
C13.2.6.1	Culvert cells (10 mm)	m ²	18	450.00	8,100	00
C13.2.6.2	Between wingwalls and culvert (10 mm)	m ²	2.5	450.00	1,125	00
Total Carried Forward To Summary					388,515	00

BILL OF QUANTITIES

SCHEDULE B5: STRUCTURES: MAJOR CULVERT C9520

SECTION C13.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.3	STEEL REINFORCEMENT					
C13.3.1	Reinforcement for:					
C13.3.1.1	Culvert base slab and wing wall bases:					
	(a) Mild-steel bars (250 MPa)	t	0.25	17,000.00	4,250	00
	(b) High-yield-stress-steel bars (450 MPa)	t	7.2	17,000.00	122,400	00
C13.3.1.2	Apron slab and cut-off beams:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	0.3	17,000.00	5,100	00
	(c) Welded steel fabric	kg	513	23.00	11,799	00
C13.3.1.3	Culvert cell walls:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	15.5	17,000.00	263,500	00
C13.3.1.4	Wingwalls:					
	(a) Mild-steel bars (250 MPa)	t	0.06	17,000.00	1,020	00
	(b) High-yield-stress-steel bars (450 MPa)	t	1.4	17,000.00	23,800	00
C13.3.1.5	Culvert deck slab:					
	(a) Mild-steel bars (250 MPa)	t	1	17,000.00	17,000	00
	(b) High-yield-stress-steel bars (450 MPa)	t	8.8	17,000.00	149,600	00
C13.3.4	Extra-over item C13.3.1 (a), (b), etc for galvanizing of reinforcement	t	0.35	16,000.00	5,600	00
Total Carried Forward To Summary					638,069	00

BILL OF QUANTITIES

SCHEDULE B5: STRUCTURES: MAJOR CULVERT C9520

SECTION C13.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.4	CONCRETE					
C13.4.1	Cast-in-situ concrete (class of concrete and use or position in structure stated):					
C13.4.1.2	Durable concrete (Class D):					
	(a) Culvert base slab and wingwall bases, D25/30-XC4(100)-20	m ³	62	2,500.00	155,000	00
	(b) Apron slab and cut-off beams, D25/30-XC4(100)-20	m ³	17	2,500.00	42,500	00
	(c) Culvert cell walls, D25/30-XC4(100)-20	m ³	36	2,500.00	90,000	00
	(d) Wingwalls, D25/30-XC4(100)-20	m ³	6.7	2,500.00	16,750	00
	(e) Culvert deck slab, D25/30-XC4(100)-20	m ³	53	2,500.00	132,500	00
C13.4.5	Curing and surface protection of cast-in-situ concrete, as and where specifically required:					
C13.4.5.1	Top of base and wingwall bases using an approved curing compound (tenderer to specify compound)	m ²	170	40.00	6,800	00
					
C13.4.5.2	Top of apron slab using an approved curing compound (tenderer to specify compound)	m ²	70	40.00	2,800	00
					
C13.4.5.3	Culvert cell walls using an approved curing compound (tenderer to specify compound)	m ²	268	40.00	10,720	00
					
C13.4.5.4	Wingwalls using an approved curing compound (tenderer to specify compound)	m ²	45	40.00	1,800	00
					
C13.4.5.5	Culvert deck slab using an approved curing compound (tenderer to specify compound)	m ²	340	40.00	13,600	00
					
C13.4.13	Complete demolition and disposal of existing structural concrete elements or parts of existing structures:					
C13.4.13.1	Existing culverts and wingwalls	m ³	79	1,500.00	118,500	00
Total Carried Forward To Summary					590,970	00

BILL OF QUANTITIES

SCHEDULE B5: STRUCTURES: MAJOR CULVERT C9520

SECTION C13.7

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.7	JOINTS					
C13.7.2	Filled joints:					
C13.7.2.2	Rigid foam of expanded Polyurethane joint former for:					
	(a) 10 mm joints between cells	m	18	200.00	3,600	00
	(b) 10 mm joint wingwalls and cells	m	2.5	200.00	500	00
C13.7.4	Sealing joints with:					
C13.7.4.1	Sealant (10 mm x 10 mm approved sealant) at:					
	(a) Culvert cells	m	93	80.00	7,440	00
	(b) Wingwalls	m	20.5	80.00	1,640	00
PC13.7.11	PVC sleeve, bituthene wrapping and tape-cap for expansion joint tie	No	189	25.00	4,725	00
Total Carried Forward To Summary					17,905	00

BILL OF QUANTITIES

SCHEDULE B5: STRUCTURES: MAJOR CULVERT C9520

SECTION C13.8

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.8	ANCILLARY STRUCTURAL ELEMENTS					
C13.8.7	Numbers for structures: (as per drawing 33532.00-215-01-40):					
C13.8.7.1	Number plates (Type 1)					
	(a) Mounted on to structure	No	2	1,500.00	3,000	00
	(b) Mounted on type 2 mounting block	No	2	3,000.00	6,000	00
C13.8.9	Precast no-fines concrete units (200 mm x 200 mm x 100mm pre-cast no fines concrete block (C16/20-20))	No	18	300.00	5,400	00
C13.8.10	Drainage pipes and weep holes:					
C13.8.10.1	Drainage pipes:					
	(b) 75 mm dia. heavy duty U-PVC scupper drain	No	18	160.00	2,880	00
C13.8.10.2	Weep holes:					
	(b) 50 mm dia. U-PVC weepholes	No	50	50.00	2,500	00
C13.8.12	Synthetic-fibre filter fabric:					
C13.8.12.1	Grade B double cusped HDPE sheet on filter elements behind cell walls and wingwalls	m ²	77	50.00	3,850	00
C13.8.12.2	Pre-impregnated with a bituminous emulsion or similar approved bonded across butt-joints (2,0 mm x 150 mm wide, 340 g/m ²)	m ²	10	60.00	600	00
C13.8.12.3	Wrapped around 200 mm x 200 mm x 100 mm precast no-fines concrete block (1,8 mm minimum thickness)	m ²	3	50.00	150	00
C13.8.12.4	Non-woven needle punched geotextile wrapped around rockfill (Grade C)	m ²	580	60.00	34,800	00
C13.8.15	Drainage strips (HDPE 200 mm wide DN3 behind culvert walls and wingwalls)	m	128	85.00	10,880	00
C13.8.16	Perforated drainage pipes:					
C13.8.16.1	65 mm dia. wrapped in grade B synthetic fibre filter fabric	m	49	110.00	5,390	00
Total Carried Forward To Summary					75,450	00

BILL OF QUANTITIES

SCHEDULE B5: STRUCTURES: MAJOR CULVERT C9520

SECTION C13.9

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.9	STRUCTURAL STEELWORK FOR MINOR STRUCTURES					
C13.9.1	Structural steel:					
C13.9.1.1	Guardrail posts, capping plates and base plates	t	0.34	30,000.00	10,200	00
C13.9.2	Anchor bolts:					
C13.9.2.2	25 mm dia. u-bolt group (complete with nuts, washers and 50 x 50 x 5,0 angles as per drawing 33532.00-215-01-31)	No	6	250.00	1,500	00
C13.9.3	Corrosion protection:					
C13.9.3.2	Galvanizing:					
	(a) Thickness as per SANS 121	t	0.4	16,000.00	6,400	00
Total Carried Forward To Summary					18,100	00

BILL OF QUANTITIES

SCHEDULE B5: STRUCTURES: MAJOR CULVERT C9520

SUMMARY OF SECTIONS

Section	Description	Amount (Rand)
SECTION C11.2	NON-STRUCTURAL GABIONS	63,025.00
SECTION C13.1	FOUNDATIONS	867,520.00
SECTION C13.2	FALSEWORK, FORMWORK AND CONCRETE FINISH	388,515.00
SECTION C13.3	STEEL REINFORCEMENT	638,069.00
SECTION C13.4	CONCRETE	590,970.00
SECTION C13.7	JOINTS	17,905.00
SECTION C13.8	ANCILLARY STRUCTURAL ELEMENTS	75,450.00
SECTION C13.9	STRUCTURAL STEELWORK FOR MINOR STRUCTURES	18,100.00
Total Carried Forward To Summary Of Schedules		<hr/> 2,659,554.00 <hr/>

SCHEDULE B6

STRUCTURES: RETAINING WALL W2099

BILL OF QUANTITIES
SCHEDULE B6: STRUCTURES: RETAINING WALL W2099
SECTION C13.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.1	FOUNDATIONS					
C13.1.2	Additional foundation investigations:					
C13.1.2.1	Provisional sum allowed for additional foundation investigations	Prov sum	1	10,000.00	10,000	00
C13.1.2.2	Handling costs and profit in respect of item C13.1.2.1	%	10,000.00	10.00	1,000	00
C13.1.3	Excavation:					
C13.1.3.1	Excavating soft material situated within the following successive depth ranges:					
	(a) 0 m up to 1,5 m	m ³	650	100.00	65,000	00
	(b) > 1,5 m and < 3,0 m	m ³	550	150.00	82,500	00
	(c) > 3,0 m and < 4,5 m	m ³	250	200.00	50,000	00
C13.1.3.2	Extra over subitem C13.1.3.1 for excavation in hard material irrespective of depth	m ³	435	400.00	174,000	00
C13.1.3.3	Extra over subitem C13.1.3.1 for additional excavation required by the Engineer after excavation is complete	m ³	75	250.00	18,750	00
C13.1.3.4	Extra over subitem C13.1.3.1 for excavation by hand	m ³	75	350.00	26,250	00
C13.1.6	Access and drainage:					
C13.1.6.1	Access	Lump sum	1	25,000.00	25,000	00
C13.1.6.2	Drainage	Lump sum	1	40,000.00	40,000	00
C13.1.7	Backfill to excavations utilising:					
C13.1.7.1	Material from excavation	m ³	580	150.00	87,000	00
PC13.1.7.2	Imported material:					
	(b) G7 granular material	m ³	640	370.00	236,800	00
C13.1.7.3	Soil cement	m ³	145	500.00	72,500	00
C13.1.9	Fill within a restricted area (extra over item C5.2.2)	m ³	1,160	100.00	116,000	00
C13.1.10	Haul in excess of 1,0 km on excavated material and on material imported for backfill,	m ³ -km	1,500	10.00	15,000	00
C13.1.14	Foundation fill consisting of:					
C13.1.14.5	Concrete blinding (75 mm blinding - C12/15-20)	m ³	31	2,400.00	74,400	00
C13.1.23	Lateral support for excavations:					
C13.1.23.1	Excavation for retaining wall:					
	(a) 0 to 2,5 m depth	m ²	289	3,000.00	867,000	00
	(b) 2,5 to 5,0 m depth	m ²	289	5,000.00	1,445,000	00
Total Carried Forward To Summary					3,406,200	00

BILL OF QUANTITIES

SCHEDULE B6: STRUCTURES: RETAINING WALL W2099

SECTION C13.2

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.2	FALSEWORK, FORMWORK AND CONCRETE FINISH					
C13.2.2	Vertical formwork to provide:					
C13.2.2.1	Class F1 surface finish to:					
	(a) Footing	m ²	361	500.00	180,500	00
	(b) Back of retaining wall	m ²	508	500.00	254,000	00
C13.2.2.2	Class F3 surface finish to:					
	(a) Front of retaining wall	m ²	500	700.00	350,000	00
C13.2.6	Formwork to form open joints at:					
C13.2.6.1	10 mm joints between retaining wall panels	m ²	58	450.00	26,100	00
C13.2.10	Provision of designs and drawings of falsework and formwork by an ECSA registered Professional Engineer or Technologist (description of member to which applicable)	Lump sum	1	15,000.00	15,000	00
Total Carried Forward To Summary					825,600	00

BILL OF QUANTITIES

SCHEDULE B6: STRUCTURES: RETAINING WALL W2099

SECTION C13.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.3	STEEL REINFORCEMENT					
C13.3.1	Reinforcement for:					
C13.3.1.1	Retaining wall:					
	(a) Mild-steel bars (250 MPa)	t	1.1	17,000.00	18,700	00
	(b) High-yield-stress-steel bars (450 MPa)	t	73	17,000.00	1,241,000	00
C13.3.1.2	Barriers:					
	(a) Mild-steel bars (250 MPa)	t	0.5	17,000.00	8,500	00
	(b) High-yield-stress-steel bars (450 MPa)	t	26	17,000.00	442,000	00
C13.3.4	Extra-over item C13.3.1 (a), (b), etc. for galvanising of reinforcement	t	1	16,000.00	16,000	00
Total Carried Forward To Summary					1,726,200	00

BILL OF QUANTITIES

SCHEDULE B6: STRUCTURES: RETAINING WALL W2099

SECTION C13.4

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.4	CONCRETE					
C13.4.1	Cast-in-situ concrete (class of concrete and use or position in structure stated):					
C13.4.1.2	Durable concrete (Class D):					
	(a) Footing, D25/30-XC4(100)-20	m ³	374	2,500.00	935,000	00
	(b) Retaining wall, D25/30-XC4(100)-20	m ³	208	2,500.00	520,000	00
C13.4.5	Curing and surface protection of cast-in-situ concrete, as and where specifically required:					
C13.4.5.1	Top of retaining wall footing using an approved curing compound (tenderer to specify compound)	m ²	981	40.00	39,240	00
C13.4.5.2	Retaining wall using an approved curing compound (tenderer to specify compound)	m ²	347	40.00	13,880	00
C13.4.13	Complete demolition and disposal of existing structural concrete elements or parts of existing structures:					
C13.4.13.1	Existing retaining walls	m ³	200	1,500.00	300,000	00
Total Carried Forward To Summary					1,808,120	00

BILL OF QUANTITIES

SCHEDULE B6: STRUCTURES: RETAINING WALL W2099

SECTION C13.7

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.7	JOINTS					
C13.7.2	Filled joints:					
C13.7.2.1	Rigid foam of expanded Polyurethane joint former for:					
	(a) 10 mm joints between panels	m	58	200.00	11,600	00
C13.7.4	Sealing joints with:					
C13.7.4.1	Sealant (10 mm x 10 mm Polythane sealant including backing chord)	m	149	80.00	11,920	00
Total Carried Forward To Summary					23,520	00

BILL OF QUANTITIES

SCHEDULE B6: STRUCTURES: RETAINING WALL W2099

SECTION C13.8

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.8	ANCILLARY STRUCTURAL ELEMENTS					
C13.8.1	Concrete barriers and parapets (as per drawing 33532.00-201-07-61 and 33532.00-201-07-62):					
C13.8.1.1	Barriers:					
	(a) Cast in-situ Barrier	m	88	15,000.00	1,320,000	00
C13.8.7	Numbers for structures: (as per drawing 33532.00-201-06-51):					
C13.8.7.1	Number plates (Type 1):					
	(a) Mounted on structure	No	1	1,500.00	1,500	00
	(b) Mounted on Type 2 mounting block	No	1	3,000.00	3,000	00
C13.8.10	Drainage pipes and weep holes:					
C13.8.10.2	Weep holes:					
	(b) 50 mm dia. U-PVC weepholes	No	100	50.00	5,000	00
C13.8.12	Synthetic-fibre filter fabric:					
C13.8.12.1	Grade B double cusped HDPE sheet on filter elements behind retaining walls	m ²	274	50.00	13,700	00
C13.8.12.2	2,0 mm x 150 mm wide, 340 g/m ² pre-impregnated with bituminous emulsion or similar approved	m ²	14	60.00	840	00
C13.8.15	Drainage strips (HDPE 200 mm wide DN3 behind retaining wall)	m	457	85.00	38,845	00
C13.8.16	Perforated drainage pipes:					
C13.8.16.1	65 mm dia. wrapped in grade B synthetic fibre filter fabric	m	116	110.00	12,760	00
Total Carried Forward To Summary					1,395,645	00

BILL OF QUANTITIES**SCHEDULE B6: STRUCTURES: RETAINING WALL W2099**

SUMMARY OF SECTIONS

Section	Description	Amount (Rand)
SECTION FOUNDATIONS C13.1		3,406,200.00
SECTION FALSEWORK, FORMWORK AND CONCRETE FINISH C13.2		825,600.00
SECTION STEEL REINFORCEMENT C13.3		1,726,200.00
SECTION CONCRETE C13.4		1,808,120.00
SECTION JOINTS C13.7		23,520.00
SECTION ANCILLARY STRUCTURAL ELEMENTS C13.8		1,395,645.00
Total Carried Forward To Summary Of Schedules		9,185,285.00

SCHEDULE C
ELECTRICAL AND LIGHTING

BILL OF QUANTITIES

SCHEDULE C: ELECTRICAL AND LIGHTING

SECTION C1.3

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C1.3	CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS					
C1.3.1	The Contractor's general obligations:					
C1.3.1.1	Fixed obligations	Lump sum	1	450,000.00	450,000	00
Total Carried Forward To Summary					450,000	00

BILL OF QUANTITIES

SCHEDULE C: ELECTRICAL AND LIGHTING

SECTION C2.1

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C2.1	GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES					
PC2.1.6	Trench excavation (in soft material):					
C2.1.6.1	Trench excavation (in soft material):					
	(a) Excavating soft material situated within the following depth ranges below the surface level:					
	(i) Trenches for electrical cable as shown in drawing up to 1,0 m deep	m ³	8,200	110.00	902,000	00
	(ii) Bases for Kiosks/Minisubs as shown in drawing up to 1,0 m deep	m ³	27	280.00	7,560	00
	(iii) Planting of poles in all material types					
	(1) For 13,5 m pole: 1,8 m depth	m ³	19	235.00	4,465	00
C2.1.7	Extra over items C2.1.6, C2.1.8 and C2.1.16 for excavating in:					
C2.1.7.1	Hard material irrespective of depth	m ³	1,460	97.00	141,620	00
PC2.1.11	Backfilling of trenches:					
C2.1.11.2	Backfill compacted to 90% (100% for sand) of MDD or complying with the DCP requirements of Clause A2.1.8.2c) (areas not subject to traffic loads) using material:					
	(a) From the excavated trench material	m ³	5,740	85.00	487,900	00
	(f) Using imported selected material	m ³	2,460	330.00	811,800	00
	(g) Extra over sub items C2.1.11.2(a) and (b) for soil cement backfilling (5% cement)	m ³	1,200	170.00	204,000	00
	(h) Using concrete (class C16/20-20) backfilling	m ³	2,460	1,800.00	4,428,000	00
	(i) Bedding using sieved material from excavations	m ³	410	160.00	65,600	00
	(j) Minisubs/Kiosks cast in situ concrete (class C16/20-20) for minisubs/kiosks footings	m ³	27	1,800.00	48,600	00
	(k) Backfilling of holes for planting of poles, using soil cement backfilling (5%) for 13.5 m pole	m ³	19	245.00	4,655	00
Total Carried Forward To Summary					7,106,200	00

BILL OF QUANTITIES

SCHEDULE C: ELECTRICAL AND LIGHTING

SECTION C13.9

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
C13.9	STRUCTURAL STEELWORK FOR MINOR STRUCTURES					
PC13.9.1	Structural steel:					
C13.9.1.3	Structure: Street lighting Poles and Masts: Design, Supply and Installation					
	(a) 13,5 m lighting pole (12 m m-h)	No	52	9,300.00	483,600	00
	(b) Single spigot for lighting pole	No	52	435.00	22,620	00
	(c) 18 m mid-hinge lighting mast with double spigot	No	82	55,000.00	4,510,000	00
	(d) Attic Stock:					
	(i) Supply attic stock of 13,5 m lighting pole	No	6	9,000.00	54,000	00
	(ii) Supply attic stock of single spigot for lighting pole	No	6	400.00	2,400	00
	(iii) Supply attic stock of 18 m lighting mast	No	8	50,000.00	400,000	00
PC13.9.3	Corrosion protection:					
C13.9.3.2	Galvanising:					
	(c) Hot-dip galvanizing:					
	(i) 13,5 m lighting pole (12 m m-h)	No	52	117.00	6,084	00
	(ii) Single spigot for lighting pole	No	52	117.00	6,084	00
	(iv) 18 m mid-hinge lighting mast with double spigot	No	82	117.00	9,594	00
Total Carried Forward To Summary					5,494,382	00

BILL OF QUANTITIES

SCHEDULE C: ELECTRICAL AND LIGHTING

SECTION F-ELEC

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
F-ELEC	ELECTRICAL DISTRIBUTION AND EARTHING INFRASTRUCTURE					
	Note: Trenching, bedding and backfill for for electrical cables measured under C2.1 of Civil Works. Separate rates shall be provided for material & Labour					
	ELECTRICAL CABLES (Section F 2.4.5)					
1	3-Core XLPE MV 11kV Aluminium (AL) underground Supply Cable					
	Supply and installation of 11kV 3 Core Cross-linked Polyethylene (XLPE) stranded Al cables SWA layed in trench or drawn into ducts					
	(a) 35 mm ²	m			Rate Only	
	(b) 50 mm ²	m			Rate Only	
	Supply and installation of PVC PVC SWA PVC 600V/1000V stranded Cu and Al cables laid in trench or drawn into ducts					
2	3-core PVC PVC SWA PVC 600 V/ 1 000 V Cable:					
	(a) 4,0 mm ² Cu	m	100	37.10	3,710	00
	(b) 6,0 mm ² Cu	m	100	74.60	7,460	00
3	4-core PVC PVC SWA PVC 600 V/ 1 000 V Cable:					
	(b) 25 mm ² Cu	m	9,050	170.00	1,538,500	00
	(c) 35 mm ² 4 core Al with ECC (integral Earth Continuity Conductor)	m	200	97.50	19,500	00
4	Earth Cables					
	(b) 16 mm ² bare copper earth wire	m	9,050	28.00	253,400	00
	(c) 25 mm ² bare copper earth wire	m	200	40.00	8,000	00
5	Cable terminations					
	Supply and installation of 11kV XLPE cable terminations at minisubs					
	(a) 35 mm ² 3 core Cu	No			Rate Only	
	(b) 50 mm ² 3 core Cu	No			Rate Only	
6	Supply and installation of PVC/PVC/SWA/PVC 600V/1000V cable terminations at minisubs/kiosks and lighting masts					
	(a) 4,0 mm ² 3 or 4 core Cu	No	10	97.00	970	00
	(b) 6,0 mm ² 3 or 4 core Cu	No	10	106.00	1,060	00
Total Carried Forward					1,832,600	00

BILL OF QUANTITIES

SCHEDULE C: ELECTRICAL AND LIGHTING

SECTION F-ELEC

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					1,832,600	00
7	(c) 16 mm² 4 core Cu	No	10	159.00	1,590	00
	(d) 25 mm² 4 core Cu	No	404	195.00	78,780	00
	(e) 35 mm² 4 core Al with ECC (integral Earth Continuity Conductor)	No	10	205.00	2,050	00
	Cable warning tape and route marks					
	(a) Plastic cable warning tape	m	8,200	2.30	18,860	00
8	(b) Cable route markers	No	50	145.00	7,250	00
	3-core 11 kV XLPE Cable joints:					
	Supply and installation of PVC/PVC/SWA/PVC 600V/1000V cable joints					
	(c) 4,0 mm² 3 core Cu	No	5	189.00	945	00
	(d) 6,0 mm² 3 core Cu	No	5	195.00	975	00
	(e) 4,0 mm² 3 or 4 core Cu	No	5	190.00	950	00
	(f) 6,0 mm² 3 or 4 core Cu	No	5	297.00	1,485	00
	(g) 16 mm² 4 core Cu	No	5	297.00	1,485	00
	(h) 25 mm² 4 core Cu	No	5	420.00	2,100	00
	(i) 35 mm² 4 core Al with ECC (integral Earth Continuity Conductor)	No	5	420.00	2,100	00
	(l) 4,0 mm² bce Cadweld	No	5	270.00	1,350	00
	(m) 6,0 mm² bce Cadweld	No	5	274.00	1,370	00
	(n) 10 mm² bce Cadweld	No	5	325.00	1,625	00
	(o) 16 mm² bce Cadweld	No	5	328.00	1,640	00
	(p) 25 mm² bce Cadweld	No	5	385.00	1,925	00
	(q) 35 mm² bce Cadweld	No	5	390.00	1,950	00
	9	SUPPLY AUTHORITY APPLICATION FOR SUPPLY (Section F 2.5)				
Application for Power and Connection Fees						
(a) Submission of application for electrical connection by supply authority		PC sum	1	10,000.00	10,000	00
(b) Provisional Sum for Connection Fees payable to supply authority		Prov sum	1	400,000.00	400,000	00
(c) Contractor's handling cost, profit and all other charges in respect of Subitem 9(b) Sum for Connection Fees payable to supply authority		%	400,000.00	5.00	20,000	00
Total Carried Forward					2,391,030	00

BILL OF QUANTITIES

SCHEDULE C: ELECTRICAL AND LIGHTING

SECTION F-ELEC

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					2,391,030	00
10	The unit of measure shall be a % markup on the payment of connection fees to supply authority in respect of handlings costs, profit and all other charges.					
	ELECTRICAL KIOSKS AND MINIATURE SUBSTATIONS (Section F 2.7)					
	LV Electrical Distribution Kiosk (Section F 2.7.5)					
	Supply and installation of electrical distribution kiosks as specified in Part C3 Section F 2.7.5, including manufacturing drawings, steelwork, electrical equipment and wiring as specified.					
	(a) Electrical LV Distribution Kiosk (SLK 1)	No	1	68,850.00	68,850	00
11	(b) Electrical LV Distribution Kiosk (SLK 2)	No	1	68,850.00	68,850	00
	(c) Electrical LV Distribution Kiosk (SLK 3)	No	1	68,850.00	68,850	00
	(d) Electrical LV Distribution Kiosk (SLK 4)	No	1	68,850.00	68,850	00
	Mini-substation (11kV /410V/ 230V) Delta/Star (Section F 2.7.1 – 2.7.4)					
	Supply and installation of fully equipped (including MV SF6 switchgear, Transformer LV circuits and metering equipment) and painted miniature substations as specified in Part C3 Section F 2.7.1 - .4, including manufacturing drawings, steelwork, electrical equipment and wiring as specified.					
12	(a) 200 kVA Minisub	No			Rate Only	
	Miniature Circuit Breakers in Masts/Poles (Section F 2.10.1)					
13	(b) MCB 10A Single phase plus neutral 6kA	No	140	250.00	35,000	00
	Earthing and Lightning Protection (Section F 2.8)					
	Supply, installation and testing of Earthing, Bonding and Lightning protection of installation as specified in Part C3 Section F Paragraph 2.8					
	(a) Earthing of minisub as specified (Section F 2.8.1)	No			Rate Only	
	(b) Earthing of electrical distribution kiosk as specified (Section F 2.8.2)	No	4	9,565.00	38,260	00
	(c) Lightning protection of masts and poles as specified (Section F 2.8.3)	No	140	5,460.00	764,400	00
	(d) Lightning finials for masts as specified (Section F 2.8.6)	No	140	2,260.00	316,400	00
	(e) Supply and installation of additional 2,4 m earth electrodes including Cadweld connections of earth conductors (Section F 2.8.4.1)	No	50	615.00	30,750	00
	Total Carried Forward					3,851,240

BILL OF QUANTITIES

SCHEDULE C: ELECTRICAL AND LIGHTING

SECTION F-ELEC

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					3,851,240	00
14	(f) Supply and installation of additional 1,6 m earth electrodes including Cadweld connections of earth conductors (Section F 2.8.4.1)	No	30	360.00	10,800	00
	(g) 70 mm² Bare Copper Earth Cable (Section F 2.8.4.2)	m	100	155.00	15,500	00
	(h) Surge Arrestors in masts and poles (Section F 2.8.5)	No	140	650.00	91,000	00
	MINISUB AND KIOSK SECURITY MEASURES (Section F 2.9)					
	(a) 5,5 m x 3,0 m steel mesh enclosure (Section F 2.9.1)	No		103,000.00	Rate Only	
	(b) 3,0 m x 1,5 m steel mesh enclosure (Section F 2.9.1)	No	4	46,500.00	186,000	00
	(c) Electronic Security System Electronic Controller (Section F 2.9.2)	No	4	5,000.00	20,000	00
	(d) Vibration Sensors (Section F 2.9.2):					
	(i) Lighting Masts/Poles	No	140	500.00	70,000	00
	(ii) LV Distribution Kiosks/ Minisubs	No	4	500.00	2,000	00
	(iii) Underground Sleeves	No	50	500.00	25,000	00
	(e) Tilt Sensors (Section F 2.9.2)	No	120	300.00	36,000	00
	(f) Magnetic sensors (Section F 2.9.2)	No	30	200.00	6,000	00
	(g) 0,5 mm² 4 Pair Instrumentation Cable (Section F 2.9.2)	m	3,700	8.00	29,600	00
15	(h) 0,5 mm² 4 Pair Instrumentation Cable terminations (Section F 2.9.2)	No	1,062	5.00	5,310	00
	(i) Sensor communication (RF or other) module (Section F 2.9.2)	No	2	3,000.00	6,000	00
	(j) Gateway Communication Device (Section F 2.9.2)	No	2	10,000.00	20,000	00
	(k) Battery Back-up System complete (Section F 2.9.2)	No	2	15,000.00	30,000	00
	Note: Concrete works for security enclosure measured under B2200 of Civil Works					
	Testing, Labelling and Documentation					
	Full testing, commissioning, setting to work and handing over of the entire installation including all necessary test certificates.					
	(a) Soil resistivity tests by specialist subcontractor (per test)	No	50	3,240.00	162,000	00
Total Carried Forward					4,566,450	00

BILL OF QUANTITIES

SCHEDULE C: ELECTRICAL AND LIGHTING

SECTION F-ELEC

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					4,566,450	00
	(c) Testing and Commissioning of the complete installation	Lump sum	1	14,000.00	14,000	00
	(d) Issuing of Certificates of Compliance for the complete Electrical Installation.	Lump sum	1	8,500.00	8,500	00
	(e) Labelling of masts/poles all electrical equipment (Section F 3.6)	Lump sum	1	50,000.00	50,000	00
	(f) Provision of as-built documentation	Lump sum	1	24,000.00	24,000	00
Total Carried Forward To Summary					4,662,950	00

BILL OF QUANTITIES

SCHEDULE C: ELECTRICAL AND LIGHTING

SECTION F-LUM

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
F-LUM	LUMINAIRES AND LIGHTING MANAGEMENT SYSTEM					
	NOTE: POLES AND MASTS PLUS INSTALLATION ARE MEASURED IN SECTION 6700					
1	Supply and installation of Streetlight Luminaires as specified in Part C3 Section F 2.11					
	(a) Supply of LED luminaire, with bottom entry, individual photocell, 7-pin nema socket outlet complete with all accessories as per specifications minimum specifications: - 265 W/ 160 LED fitting with optical lense - 38 354 luminaire output flux (lm) - 4 000K colour rendering - IP 66 Rated	No	216	10,400.00	2,246,400	00
	(b) Attic Stock: Supply attic stock of above	No	22	9,800.00	215,600	00
	(c) Luminaire installation on 13,5 m pole (12 m m-h)	No	52	130.00	6,760	00
	(d) Luminaire installation on 18 m mast	No	164	210.00	34,440	00
2	Testing, Commissioning and Switching on of Lighting Installation					
	(a) Full testing, commissioning, setting to work, switching on and handing over of the entire installation including all necessary test certificates	Lump sum	1	40,000.00	40,000	00
3	Documentation as specified in Part C3 Section F 2.10.4 e)	Lump sum	1	15,000.00	15,000	00
4	Any other items as may be necessary to complete the installation	Lump sum	1	50,000.00	50,000	00
Total Carried Forward To Summary					2,608,200	00

BILL OF QUANTITIES

SCHEDULE C: ELECTRICAL AND LIGHTING

SECTION G-MAINT

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
F-MAIN	MAINTENANCE OF LIGHTING INSTALLATION					
1	Maintenance of Lighting Installation as specified in Part C3 Setion F 2.13 for masts, poles, electrical cables, kiosks/equipment, luminaires and lighting management system Scope includes Responsive and Preventive Maintenance and Maintenance Plan (a) Maintenance during Defects Liability Period	Prov sum	1	100,000.00	100,000	00
Total Carried Forward To Summary					100,000	00

BILL OF QUANTITIES**SCHEDULE C: ELECTRICAL AND LIGHTING**

SUMMARY OF SECTIONS

Section	Description	Amount (Rand)
SECTION C1.3	CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS	450,000.00
SECTION C2.1	GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES	7,106,200.00
SECTION C13.9	STRUCTURAL STEELWORK FOR MINOR STRUCTURES	5,494,382.00
SECTION F-ELEC	ELECTRICAL DISTRIBUTION AND EARTHING INFRASTRUCTURE	4,662,950.00
SECTION F-LUM	LUMINAIRES AND LIGHTING MANAGEMENT SYSTEM	2,608,200.00
SECTION G-MAINT	MAINTENANCE OF LIGHTING INSTALLATION	100,000.00
Total Carried Forward To Summary Of Schedules		<hr/> 20,421,732.00 <hr/>

SCHEDULE D

**SMALL CONTRACTOR DEVELOPMENT,
TRAINING AND COMMUNITY LIAISON**

BILL OF QUANTITIES

SCHEDULE D: SMALL CONTRACTOR DEVELOPMENT, TRAINING AND COMMUNITY LIAISON

SECTION D1000

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
D1000	TRAINING, COACHING, GUIDANCE, MENTORING AND ASSISRANCE					
D10.01	Target Group Participation:					
	(a) Contract Participation Performance bonus	PC sum	1	5,500,000.00	5,500,000	00
D10.02	Stakeholder and Community Liaison and Social Facilitation:					
	(a) Cost of liaison, social facilitation and PLC support	PC sum	1	400,000.00	400,000	00
	(b) Handling cost and profit in respect of sub-item D10.02(a)	%	400,000.00	5.00	20,000	00
D10.03	Tender Process for Targeted Enterprises:					
	(a) Contractor's charge for the management and execution of the Targeted Enterprise procurement process:					
	(i) Procurement process for the totality of all tenders concluded for the appointment of Targeted Enterprise subcontractors of CIDB 1 and 2 contractor grading	No	50	5,000.00	250,000	00
	(ii) Procurement process for the totality of all tenders concluded for the appointment of Targeted Enterprise subcontractors of CIDB 3 and 4 contractor grading	No	10	5,000.00	50,000	00
	(iii) Procurement process for the totality of all tenders concluded for the appointment of Targeted Enterprise subcontractors of CIDB 5 and higher contractor grading	No	5	5,000.00	25,000	00
	(iv) Procurement process for the totality of all tenders concluded for the appointment of Targeted Enterprise suppliers	No	50	5,000.00	250,000	00
	(b) Targeted Enterprise Procurement Coordinator	Person. Month	30	30,000.00	900,000	00
D10.04	Responsibilities of the Contractor towards Targeted Enterprises:					
	(a) Contractor's establishment, management, management support, assistance, coaching, guidance, mentoring and supervision of Targeted Enterprises	month	30	25,000.00	750,000	00
	(b) Targeted Enterprise Construction Manager	Person. Month	30	55,000.00	1,650,000	00
	(c) Targeted Enterprise Site Supervisors	Person. Month	195	15,000.00	2,925,000	00
Total Carried Forward					12,720,000	00

BILL OF QUANTITIES
SCHEDULE D: SMALL CONTRACTOR DEVELOPMENT, TRAINING AND COMMUNITY LIAISON

SECTION D1000

Item	Description	Unit	Quantity	Rate	Amount	
					R	c
Brought Forward					12,720,000	00
D10.05	Construction Works by Targeted Enterprises: (a) Payments associated with the construction works carried out by Targeted Enterprise subcontractors of CIDB 1 and 2 contractor grading designation appointed in terms of Section D (b) Handling costs and profit in respect of payment associated with sub-item D10.05(a) (c) Fluctuation between the main contractor's rates and that of the Targeted Enterprise subcontractors (d) Preliminary and General Obligations of Targeted Enterprise sub-contractors appointed in terms of Section D	Prov sum % Prov sum Lump sum	1 7,500,000.00 1 1	7,500,000.00 5.00 23,000,000.00 3,000,000.00	7,500,000 375,000 23,000,000 3,000,000	00 00 00 00
D10.06	Training, coaching, guidance, mentoring and assistance: (a) Training Costs: (i) Accredited NQF training (ii) Accredited generic skills training (iii) Community skills training (iv) Handling cost and profit in respect of subitems D10.06(a)(i), (ii) and (iii) (b) Student experiential training: (i) Student stipends (ii) Provision of experiential training (c) Other costs during training (food, etc) (d) Training venue	 Prov sum Prov sum Prov sum % PC sum Person. Month Prov sum Lump sum	 1 1 1 3,500,000.00 1 30 1 1	 1,500,000.00 1,500,000.00 500,000.00 5.00 300,000.00 6,000.00 50,000.00 100,000.00	 1,500,000 1,500,000 500,000 175,000 300,000 180,000 50,000 100,000	 00 00 00 00 00 00 00 00
D10.08	Marketing and communications: (a) Provisional of marketing and communications strategy for the contract (b) Handling costs and profit in respect of payment associated with sub-item D10.08(a)	Prov sum %	1 1,000,000.00	1,000,000.00 5.00	1,000,000 50,000	00 00
Total Carried Forward To Summary					51,950,000	00

BILL OF QUANTITIES

SCHEDULE D: SMALL CONTRACTOR DEVELOPMENT, TRAINING AND COMMUNITY LIAISON

SUMMARY OF SECTIONS

Section	Description	Amount (Rand)
SECTION D1000	TRAINING, COACHING, GUIDANCE, MENTORING AND ASSISRANCE	51,950,000.00
Total Carried Forward To Summary Of Schedules		51,950,000.00

SCHEDULE B1

STRUCTURES: BRIDGE B0593

SCHEDULE B2

STRUCTURES: BRIDGE B0594

SCHEDULE B3

STRUCTURES: BRIDGE B0619

SCHEDULE B4

STRUCTURES: MAJOR CULVERT C9519

SCHEDULE B5

STRUCTURES: MAJOR CULVERT C9520

SCHEDULE B6

STRUCTURES: RETAINING WALL W2099

SCHEDULE C
ELECTRICAL AND LIGHTING

SCHEDULE D

**SMALL CONTRACTOR DEVELOPMENT,
TRAINING AND COMMUNITY LIAISON**

CALCULATION OF TENDER SUM

C2.3 SUMMARY OF PRICING SCHEDULE

SCHEDULE A:	ROADWORKS (from page C3-75)	R
SCHEDULE B:	ROADWORKS	
SCHEDULE B1:	STRUCTURES: BRIDGE B0593 (from page C3-87)	R
SCHEDULE B2:	STRUCTURES: BRIDGE B0594 (from page C3-99)	R
SCHEDULE B3:	STRUCTURES: BRIDGE B0619 (from page C3-109)	R
SCHEDULE B4:	STRUCTURES: MAJOR CULVERT C9519 (from page C3-119)	R
SCHEDULE B5:	STRUCTURES: MAJOR CULVERT C9520 (from page C3-130)	R
SCHEDULE B6:	STRUCTURES: RETAINING WALL W2099 (from page C3-138)	R
SCHEDULE C:	ELECTRICAL AND LIGHTING (from page C3-150)	R
SCHEDULE D:	SMALL CONTRACTOR DEVELOPMENT, TRAINING AND COMMUNITY LIAISON (from page C3-154)	R
SUBTOTAL A		R
CONTRACT SKILLS DEVELOPMENT GOAL: 0.25% of Subtotal A		R
SUBTOTAL B		R
VALUE ADDED TAX:		
15% of Subtotal B		R
<hr/>		
TOTAL CARRIED TO C.1.1.1: FORM OF OFFER		R
<hr/>		

SIGNED BY TENDERER:

PART C3: SCOPE OF WORKS

PART C3: SCOPE OF WORKS

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SECTION B: SPECIFICATION DATA	C3-193
SECTION C: ENVIRONMENTAL MANAGEMENT PLAN	C3-250
SECTION D: STAKEHOLDER AND COMMUNITY LIAISON, AND TARGETED LABOUR AND TARGETED ENTERPRISES UTILISATION AND DEVELOPMENT	C3-269
SECTION E: REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS	C3-320
SECTION F: PROJECT SPECIFICATION AMENDMENTS TO THE STANDARD SPECIFICATIONS FOR ELECTRICAL AND LIGHTING	C3-352

SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL R.101-080-2019/1

FOR THE IMPROVEMENT OF NATIONAL ROAD R101 SECTION 8 FROM BELA BELA (KM 0.0) TO
MODIMOLLE (KM 26.8)

SECTION A1: STANDARD AMENDMENTS ISSUED BY COTO

Notes to tenderer:

- 1. 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 24 March 2023 no amendments have been issued by COTO.

**SECTION A2: PROJECT SPECIFICATION AMENDMENTS TO THE COTO STANDARD
SPECIFICATIONS**

Notes to tenderer:

1. 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.
2. The number of each clause and each payment item in this part of the project specifications follows the numbering format of the standard specifications.

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COTO CHAPTER 1: GENERAL

SECTION 1.1: GENERAL PREAMBLE

PART A: SPECIFICATIONS

A1.1.2 DEFINITIONS

Replace the Definition for "Site / Site of the Works" with the following:

"Site / Site of the Works - shall mean the entire road reserve (both new and existing), inclusive of road junctions and property accesses, required for construction of the Works as defined by the limits of construction given in the Contract Documentation. It shall also include areas within statutory building lines where work has to be carried out and any additional lengths of road required for the placement of advanced warning road signs and/or traffic accommodation measures beyond the limits of construction as shown on the drawings. The Site shall also include areas outside of the road reserve required for Construction camps, Engineer's site facilities, Borrow pit areas or quarry areas, haulage and access roads, temporary deviations, storage areas, spoil areas and stockpile areas. The exact extent of the limits of the construction will be verified once the Site is handed over to the Contractor."

PART C: MEASUREMENT AND PAYMENT

C1.1.3 PAYMENT

C1.1.3.5 Payment for materials on the Site

In the last sentence of the 1st paragraph, delete the following:

" , or, in the case of crushed stone which has not been purchased but has been produced on the site, at 80% of a fair evaluation of such crushed material".

Add the following new subclauses:

"C1.1.3.9 Reduced payments for substandard work

Where provision for reduced payments for sub-standard work is made in the Contract Documentation, acceptance of reduce payment for substandard work may be accepted by the Engineer subject to prior approval by the Employer.

C1.1.3.10 Procurement of sub-services and omitted rates (Second tier procurement)

Second tier procurement include the procurement of any work where either the particulars of the work is not scheduled and priced, or where the process of procurement of the sub-service provider is specified elsewhere in the contract specification. It include the procurement of work where rates have been omitted or where allowance for the work is made under a Provisional sum or Prime sum item or where allowance for the work is made under a Provisional sum or Prime sum item but the particulars of the work is not scheduled, or where work is instructed under clause 13[Variations and Adjustments] or where work is to be performed by Targeted Enterprises.

The following procurement methods is to be followed as appropriate:

- (i) **Where the particulars of the work is not scheduled but existing rates for similar work exist in the contract and the work can therefore be executed by the contractor or his sub-contractor at the existing contract rates.**

No separate procurement process is required. The work is to be quantified and scheduled utilising existing rates and approved through the Works Authorisation process.

- (ii) **Where the payment calculation is based on a formula specified in the contract document, or**

where the payment rate is pre-determined or fixed by the client.

No separate procurement process is required. The work is to be quantified and approved through the Works Authorisation process.

- (iii) **Where the supplier is not selected by the contractor and actual cost is reimbursable and/or no procurement process is possible.**

No separate procurement process is required. The work is invoiced by supplier on completion and approved through the Works Authorisation process at the end of the contract.

- (iv) **Where there are omitted items as part of the existing scheduled scope of work and no existing rates for similar work exist in the contract, or where there are no existing rates for the materials to be supplied and suitable rates for material to be determined.**

A proposal for a new rate shall be submitted by the contractor and evaluated by the engineer, by comparing with either adjusted relevant rates in the contract, or by comparing with similar rates on similar contracts, or by comparing three informal quotes to substantiate the rate. The new agreed rate is approved through the Works Authorisation process.

- (v) **Where the particulars of the work is not scheduled and the estimated cost of the work (including VAT and excluding Contract Price Adjustment) is equal or less than R1,000,000.00 and there are no existing rates for similar work and the contractor's proposal submitted in terms of FIDIC Variation 13.1 is not accepted and the work is to be performed by a sub-contractor.**

A minimum of three quotations shall be obtained from Targeted Enterprises (as defined in Section D1000). The following is the minimum requirements for this process:

- Prequalification for BEE level 1 or 2 and EME or QSE (Approval to deviate must be granted by the Employer, based on market research)
- Quotation to include form of quotation, CSD registration, CIDB (where applicable),

A Works Authorisation shall be approved prior to execution of the work.

- (vi) **Where the particulars of the work is not scheduled and the estimated cost of the work is more than R1,000,000.00 (including VAT and excluding Contract Price Adjustment) and there are no existing rates for similar work and the contractor's proposal submitted in terms of FIDIC Variation 13.1 is not accepted and the work is to be performed by a sub-contractor.**

The work is to be procured through a tender process. The following is the minimum requirements for this process:

- Prequalification for BEE level 1 or 2 and EME or QSE (Approval to deviate must be granted by the Employer, based on market research)
- Tenders to close at the relevant site offices at a specific date and time
- Tender documents to include form of Offer, CSD registration, Tax compliance, CIDB (where applicable), SBD1, SBD 4, SBD 6.2, BEE certificate, Form A2.2
- Tenders to be evaluated on price and preference
- Evaluation by contractor for review by engineer

A Works Authorisation shall be approved prior to execution of the work.

- (vii) **Where the particulars of the work is identified by the contractor to be performed by subcontractors who are Targeted Enterprises to form part of the specified Contract Participation Goals for Targeted Enterprises.**

The work is to be procured as per the process specified in clause D1007.

- (viii) **Where the work is unforeseen, urgent and the relevant procurement method as indicated above will result in a delay to the contract and payment for a claim for extension of time and/or cost, or where the above procurement methods are not applicable or cannot fully be complied with.**

The Employer will determine the most appropriate procurement process to be followed and approved through the Works Authorisation process.”

SECTION 1.2: GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS

A1.2.3 GENERAL

A1.2.3.15 Routine maintenance

Add the following new paragraphs:

“The Contractor’s responsibility for routine maintenance on this contract is indicated in the Contract Documentation.”

The backfilling for patching shall be done as indicated in the Contract Documentation.

The riding quality of gravel deviations shall comply with the requirements indicated in the Contract Documentation.”

Add the following new subclause after A1.2.3.23:

"A1.2.3.24 Reference Manuals, other specifications and test methods

In various chapters of this Standard Specification, reference is made to Manuals, other specifications and test methods. If not otherwise indicated in the Contract Documentation, the latest published Manual, other specification and test methods at time of close of tender will apply. Any changes to be implemented on a project as a result of revisions to manuals, other specifications and test methods, will be handled in terms of the Conditions of Contract.

Certain TRH and TMH documents are published as Sabita Manuals/TRH or Sabita Manuals/TMH publications. Where reference is made to the TRH or TMH document, it shall be read as referring to the latest version of the Sabita Manual/TRH publication or Sabita Manual/TMH publication, respectively.”

A1.2.7 EXECUTION OF THE WORKS

A1.2.7.1 Programme of work

(a) General

Add the following new paragraphs:

“The contractor shall note that the examination of a road with a view to rehabilitation is normally undertaken a considerable period of time before the commencement of the contract, and that conditions may subsequently change. The engineer will make further examinations during the period of contract, and, depending on the results of such examinations, the quantities of any items of work may be drastically increased or decreased.

The contractor shall base his initial programme for road rehabilitation on the scope of the work as described in the project specifications on the quantities contained in the Pricing Schedule (Part C2).”

PART C: MEASUREMENT AND PAYMENT

(ii) Items that will not be measured separately

Replace the wording of item 8 with the following:

“8. The design of all temporary work and the construction of all temporary work, unless otherwise indicated in the Contract Documentation.”

Item	Unit
------	------

C1.2.7 Road safety audits

In the wording of item C1.2.7.2, replace “C1.2.6.1” with “C1.2.7.1”.

In the wording of item C1.2.7.4, replace “C1.2.6.3” with “C1.2.7.3”.

In the 4th paragraph of the item description, replace “C1.2.7.2” with “C1.2.7.3”.

Add the following new pay items:

Item	Description	Unit
------	-------------	------

C1.2.10 Dispute Adjudication Board (DAB)

C1.2.10.1 Employer's contribution to DAB (50%)prime cost (PC) sum

The unit of measurement for item C1.2.10.1 is the prime cost sum. Payment of the prime cost sum shall be in terms of Fidic Clause 13.5 for 50% of the amounts invoiced from the appointed DAB. No sum for overhead charges and profit in terms of Fidic Clause 13.5(ii) is payable for this item.”

SECTION 1.3: CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
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C1.3.1 The Contractor's general obligations

Delete subitem C1.3.1.3 and replace with the following:

“C1.3.1.3 Time related obligations:

(a) Mobilisation period month

(b) Execution of the works month”

Add the following pay subitems:

“C1.3.1.4 Suspension Cost

(a) De-establishment Number

(b) Re-establishment Number

(c) Suspension period month

(d) Engineer's cost prime cost sum (PC) sum

Under the heading “Item C1.3.1.3”, delete the 2nd paragraph and replace with the following:

“The contract rate shall include full compensation for that part of the Contractor's general obligations which are mainly a function of construction time. The contract rate shall be deemed to include, leasing costs, hire costs or cost of ownership per month for Contractor's Equipment. The contract rate will be paid monthly, pro rata for parts of a month, from the Commencement Date in terms of the Contract Documentation until the end of the Mobilisation Period for item C1.3.1.3(a). For item C1.3.1.3(b) the contract rate will be paid monthly, pro rata for parts of a month, from the end of Mobilisation Period until the end of the original Contract Period specified for completion of the Works.”

Add the following new paragraphs:

“Item C1.3.1.4

The rates tendered under subitem C1.3.1.4 shall represent full compensation for all Costs for Suspension of Work and all Costs during Suspension of Works period, and no other Costs (including other monthly costs) shall be payable.

Payment of subitems C1.3.1.4(a) and C1.3.1.4(b) shall be made for the number of de-establishments and re-establishments of all Personnel and Goods (Contractor's Equipment, Materials, Plant and Temporary Works) as instructed by the Engineer. Payment of subitems C1.3.1.4(a) and C1.3.1.4(b) shall not apply during the Mobilisation Period.

Payment of subitem C1.3.1.4(c) shall be made monthly, pro rata for parts of a month, from the date on which the Contractor has suspended progress of all of the Works in terms of Conditions of Contract clause 8.8 and commenced with de-establishment of the site, until permission or instruction to proceed in terms of Conditions of Contract clause 8.12 is given. Payment of subitem C1.3.1.4(c) shall not apply during the Mobilisation Period.

The Prime Sum in subitem C1.3.1.4(d) is provided to cover the cost of the Engineer during the period of suspension of the works. The amounts certified by the Employer shall be made to the Engineer, within 30 days of it being certified by the Employer.”

Item

Unit

Add the following pay item:

“C1.3.3 Contractors additional obligations:

C1.3.3.1 Photos and video footage using a drone

The rate tendered for subitem C1.3.3.1 shall include full compensation for collecting aerial drone imagery and video of the entire project site, monthly for the full duration of the Contract. The images and video captured during the drone surveys should have a Ground Sample Distance of less than 2.5cm/pixel. The imagery and video data collected should be sufficient to generate a 3D model of the entire project area using drone photogrammetry.

The native and raw images and video captured by the drone surveys shall be delivered to the Engineer monthly on a suitable high-capacity USB media storage device and a 3D model generated every 6 months. The rate shall also include for all personnel, equipment, software, surveying (including establishing and maintaining ground control points) and other costs, disbursements, overheads and profit.”

SECTION 1.5: ACCOMMODATION OF TRAFFIC

PART A: SPECIFICATIONS

A1.5.7 EXECUTION OF THE WORKS

A1.5.7.10 Construction of temporary deviations

(a) General

Delete the last paragraph and replace with the following: "The proposed location, layout, temporary drainage, earthworks, pavement layers, surfacing and ancillary works details of all temporary deviations, including the signage and road marking required, shall be agreed with the Engineer before construction of any temporary deviation commences."

(b) Drainage works for temporary deviations

In the 2nd paragraph in the 1st sentence delete "specified" and replace with: "approved".

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
------	-------------	------

C1.5.4 Construction of temporary deviations

In the last sentence of the item description, after the words "...include full compensation for the", add the following: "design and the".

Item	Description	Unit
------	-------------	------

C1.5.7 Temporary traffic control facilities:

Amend item C1.5.7.1 as follows:

"PC1.5.7.1 Delineators including mounting bases and ballast:

- (c) Reboundable delineators, double sided (800 mm x 200 mm, TW401 and TW402, 20 kg base) number (No)

The unit shall be the number of heavy reboundable delineators including a base that weighs 20 kg. The tendered rate shall include full compensation for providing, erecting, moving to new positions for the duration of the contract as well as removing from site."

Amend the unit of the following pay item to be the same as the description:

Item	Description	Unit
------	-------------	------

"C1.5.7.5 Provision of illuminated traffic signs:

- (f) Mobile variable message sign with a speed measuring and display capabilityNumber (No)"

SECTION 1.6: CLEARING AND GRUBBING

PART C: MEASUREMENT AND PAYMENT

(iii) Items to be measured and paid for using items specified elsewhere in the specifications

In Table C1.6-1 for the Preparation of topsoil stockpile sites activity, delete reference to "Chapter 11" and replace with "Chapter 4".

Amend the description of the pay item as follows:

Item	Description	Unit
"PC1.6.4	Removal of buildings and structures:	
PC1.6.4.1	Remove objects from road reserve as part of access management..... Provisional sum (Prov sum)	

The provisional sum is provided to cover the cost of the Contractor to remove all objects, advertising signs and decorative entrances from the road reserve, to relocate electric and other type gates where accesses are closed. This includes the cost for removing and backfilling the exposed holes with at least G9-quality material and topsoil, moving including haul, and reinstating the existing gate in working order with all its furnishings in the new position. To reinstate similar surfacing at each access which could include but is not limited to paving blocks, slurry or gravel. The sum shall further include provision for all materials, supervision, labour equipment, tools and incidentals necessary for completing the specified work."

Item	Description	Unit
C1.6.9	Conservation of topsoil	

Add the following pay subitem:

"C1.6.9.3	Excavate topsoil material to spoil in sites designated by the Contractor..... .. cubic meter (m ³)	
-----------	--	--

The tendered rates shall include full compensation for hauling, excavating and loading, and for off-loading and disposing the material at designated sites identified by the contractor."

COTO CHAPTER 2: SERVICES

SECTION 2.1: GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
------	-------------	------

C2.1.25 Removal of existing services

Add the following pay subitem:

“C2.1.25.4 Streetlight masts/postsNumber (No)

The unit of measurement for item C2.1.25.4 shall be the number of streetlight masts/posts removed including dismantling, removal of all fittings, accessories, off-loading and storing the recovered material on site as agreed with the Engineer.”

C2.1.26 Disposal of existing service materials:

Add the following pay subitem:

“C2.1.26.4 Streetlight masts/postsNumber (No)

The unit of measurement for item C2.1.26.4 shall be the number. The tendered rate shall include full compensation for disposing of existing material including loading, removal from site, transporting the material over an unlimited haul distance and off-loading the material at the disposal site.”

COTO CHAPTER 3: DRAINAGE

SECTION 3.1: DRAINS

PART C: MEASUREMENT AND PAYMENT

Amend the second sentence of the pay item as follows:

Item	Description	Unit
C3.1.24	Submission of as built drawings by the Contractor	Provisional sum

"The drawings must contain the location, co-ordinates of in- and outlets, length and depth and must be provided to the Engineer prior to the end of defects liability period."

SECTION 3.2: CULVERTS

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
C3.2.2	Backfilling	

C3.2.2.3 Extra over sub-items C3.2.2.1 and C3.2.2.2 for soil cement backfilling

In sub-item (a), delete "of 3% cement".

In sub-item (b), delete "of 3% cement".

Item	Description	Unit
C3.2.13	Removing and relaying existing culverts	

In the 2nd paragraph of the item description, delete the wording:

"transporting for a haul distance within 5,0 km without additional payment,"

and replace with the following:

"transporting over a distance of less than and up to 1,0 km,"

Item	Description	Unit
------	-------------	------

Add the following pay items:

"C3.2.28 Removal and disposal of existing culverts as per drawing 33532.00-121-01 to 33532.00-121-09"

C3.2.28.1 450 mm dia. concrete culvert meter (m)

C3.2.28.2 600 mm dia. Concrete culvert meter (m)

C3.2.28.3 900 mm dia. concrete culvert meter (m)

C3.2.29 Provision of drainage structure for the temporary deviation for the construction of:

C3.2.29.1 Bridge B447 Lump sum

C3.2.29.2 Bridge B0619 Lump sum

C3.2.29.3 Major Culvert C9519 Lump sum

C3.2.29.4 Major Culvert C9520 Lump sum

The unit of measurement for each drainage structure provided for the individual temporary bypasses shall be the lump sum and shall be paid in two payments of 80% on submission of the drainage structure designs and the second 20% on complete removal of the drainage structure.

The tendered rates shall include full compensation for all labour, all construction plant and materials required, all excavation, breaking into any identified obstruction, building the temporary culvert including wingwalls, inlet/outlet structures and scour protection measures into the newly formed bypass, backfilling and compacting to at least 93% of MDD density and the complete demolition, hauling and disposal. The temporary drainage structures shall consist of a minimum proposed opening cross-sectional area as listed in section A3.2.4 (*Specification Data*).

Item	Description	Unit
C3.2.30	Provision of design and drawings of temporary drainage structures as described in item PC3.2.29 by an ECSA registered Professional Engineer or Technologist for the construction of:	
C3.2.30.1	Bridge B447.....	Lump sum
C3.2.30.2	Bridge B0619.....	Lump sum
C3.2.30.3	Major Culvert C9519	Lump sum
C3.2.30.4	Major Culvert C9520	Lump sum

The unit of measurement shall be the lump sum and shall be paid in two payments of 50% on submission of the drainage structure designs and the second 50% on complete construction of the drainage structure including scour protection required.

The tendered rates shall include full compensation for procuring and provision of all drawings for the temporary drainage structures and design by an ECSA registered professional including inspections, supervision where applicable, all labour, material, travelling and incidentals and the signing off on the construction of the temporary drainage structure including submission of all certificates as specified. The design of each temporary structure must include the hydraulic analysis (as per the SANRAL Drainage Manual, 6th edition) as well as any structural design where applicable.”

SECTION 3.3: CONCRETE KERBING AND CHANNELING, ASPHALT BERMS, CHUTES, DOWNPIPES, AS WELL AS CONCRETE, STONE PITCHED AND GABION LININGS FOR OPEN DRAINS

PART C: MEASUREMENT AND PAYMENT

Add the new sub pay item with description and provision as follows:

Item	Description	Unit
C3.3.1	Concrete kerbing	
C3.3.1.1	Prefabricated kerbing (Refer to drawing 33829.00-113-01 and -02):	
	(d) Warning and directional tactile paver.....	square metre (m ²)

The unit of measurement for item C3.3.1.1(d) shall be the square metre of precast warning and directional tactile pavers complete as specified and complying with *Guidelines for Pedestrian and Public Transport Facilities on National Roads*.

The tendered rate for each square metre of the pavers shall include full compensation for the necessary excavation and preparation of bedding, backfilling, procuring, furnishing and installing all materials for prefabricated kerbing or pavers, protecting work against staining, supporting the kerbs with in-situ cast concrete or grout, and filling and pointing all construction or contraction joints, and producing and sealing all expansion joints, all complete as specified.

All concrete shall conform to the required specification.”

COTO CHAPTER 4: EARTHWORKS AND PAVEMENT LAYERS: MATERIALS

SECTION 4.1: BORROW MATERIALS

PART A: SPECIFICATIONS

A4.1.7 EXECUTION OF THE WORKS

A4.1.7.2 Borrow pit and quarry operations

(b) Classes of excavation

(iv) Hard excavation

In the 2nd bullet after: "Ripping with a bulldozer" add the following:

"Ripping shall be carried out on typically moderately weathered soft rock (soft rock as defined in Section 12.1 Table A12.1.7-1) that can be efficiently ripped by a bulldozer with a weight of at least 35 tons and minimum nett power of 220 kW."

SECTION 4.2: CUT MATERIALS

PART A: SPECIFICATIONS

A4.2.3 GENERAL

A4.2.3.2 Contractor prepared plans for cuttings

In 1st paragraph at the end of the last sentence, add the following as part of the last sentence:

" , unless otherwise indicated in the Contract Documentation."

SECTION 4.4: COMMERCIAL MATERIALS

PART A: SPECIFICATIONS

A4.4.7 EXECUTION OF THE WORKS

A4.4.7.1 Selection (design) of the stabilising agent content

(c) Cementitious stabilising agent for chemical stabilisation

Step 2: Determine the Initial Consumption of Stabiliser (ICS) of the material.

Add the following after the 1st paragraph:

"The ICS shall be determined for more than one stabilizer agent and the stabilizer agent to be utilised in Step 3 shall be selected by the Engineer based on the ICS results."

COTO CHAPTER 5: EARTHWORKS AND PAVEMENT LAYERS: CONSTRUCTION

SECTION 5.3: ROAD PAVEMENT LAYERS

PART A: SPECIFICATION

A5.3.8 WORKMANSHIP

A5.3.8.4 Construction tolerances for pavement layers

Add the following as a new sub-clause:

“(f) Surface texture

The maximum volumetric texture depth (measured as described in SANS 3001-BT11) of the base, shall be as specified in Table A5.3.8-7, for the different seal types to be placed on the base.

Table A5.3.8-7: Maximum texture of base

Surfacing type	Max texture depth of the base
Single seal with 10 mm aggregate	0,8
Single seal with 10 mm aggregate (with cover spray)	1,0
Single seal with 14 mm aggregate	0,8
Single seal with 14 mm aggregate (with cover spray)	1,5
Single seal with 14 mm aggregate (with Bitumen rubber)	1,2
Double seal with 10 mm aggregate and sand	1,0
Double seal with 14 mm aggregate and sand	1,5
Cape Seal with 10 mm aggregate and one layer of slurry	1,5
Cape Seal with 14 mm aggregate and one layer of slurry	2,0
Cape Seal with 20 mm aggregate and two layers of slurry	2,5
Double seal with 14 mm aggregate and a layer of 7 mm aggregate	1,5
Double seal with 14 mm aggregate and a layer of 5 mm aggregate	1,5
Double seal with 20 mm aggregate and a layer of 10 mm aggregate	2,0
Double seal with 20 mm aggregate and a layer of 7 mm aggregate	2,0
Double seal with 20 mm aggregate and two layers of 7 mm aggregate	1,5
Other surfacing type (as indicated in the Contract Documentation)	As specified in the Contract Documentation”

A5.3.8.5 Surface regularity

Add the following to the 1st paragraph:

“The surface regularity shall be assessed on the final prepared layer after all excess fines have been swept off the surface.”

(c) By using a profiler

*In the paragraph following Table A3.5.8--6, delete the following: " for payment items *** _____ ", and replace with the following: "for payment items as specified in the Contract Documentation".*

SECTION 5.4**STABILISATION****PART C: MEASUREMENT AND PAYMENT**

Item	Description	Unit
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Add the following pay item:

“C5.4.18 Addition of bituminous stabilisation for a PMPL layer:

C5.4.18.1	Penetration grade bitumen (70/100)	litre (ℓ)
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The unit of measurement shall be the litre of bitumen that is foamed. For foamed bitumen, the rate shall also include for foaming the bitumen in the plant, including the water and any other additive that may be required to achieve the minimum foaming characteristics and for injecting the foamed bitumen into the material being processed.”

COTO CHAPTER 8: PRETREATMENT AND REPAIR OF EXISTING LAYERS

SECTION 8.1: PRIME COAT

PART A: SPECIFICATION

A8.1.5 MATERIALS

A8.1.5.1 Bituminous material

In Table A8.1.5-1 Delete “the excavated area” in the table caption and heading.

A8.1.8 WORKMANSHIP

A8.1.8.2 Testing

Replace the last sentence of the 1st paragraph with the following: “Unless agreed in advance and in writing, the Contractor shall only spray when the Engineer’s representative is present.”

COTO CHAPTER 9: ASPHALT LAYERS

SECTION 9.1: ASPHALT LAYERS

PART A: SPECIFICATION

A9.1.5 MATERIALS

A9.1.5.4 Aggregates

(a) Aggregate properties

In the 1st paragraph, delete the 2nd sentence: “Coarse and fine aggregate shall be clean and free from decomposed materials, vegetable matter or any other deleterious substances, and shall meet the requirements listed in Table A9.1.5-1 below unless otherwise specifically stated in the Contract Documentation.”, and replace with the following:

“Coarse and fine aggregate shall be clean from excess dust and free from decomposed materials, vegetable matter and any other deleterious substances such as clay lumps and organic matter and shall meet the requirements listed in Table A9.1.5-1 below unless otherwise specifically stated in the Contract Documentation.”

A9.1.8 WORKMANSHIP

A9.1.8.4 Surface regularity

(a) Measured using inertial laser profilometers

In the 6th paragraph add the following prior to “The applicable Full Payment Bracket ...”:

“For the Asphalt Base the values in Payment Bracket 6 in Table A9.1.8-3 shall be applied as the payment adjustment factors for the Asphalt Base on the contract or section, and for the Asphalt Surfacing”.

In the 6th paragraph add the following after “...assessment of the base as per Clause A5.3.8.5c) of Chapter 5 for granular bases”:

“, and this clause A9.1.8.4a) for Asphalt bases.”

In the 7th paragraph, delete: “under 1”.

Add the following after the 8th paragraph:

“Where the asphalt surfacing is placed on a surface, other than a granular or asphalt base, constructed by the Contractor through mill and replace or patching, the surface regularity of the replaced or patched surface shall be measured before the surfacing is placed. Should the IRI values per 100m section so determined be better than the IRI values of the original surfacing for the particular 100m section, the measured values shall be used for the $IRI_{b Ave}$ in the above calculation. Should the IRI values per 100m section so determined be worse than the IRI values of the original surfacing for the particular 100m section, the IRI values of the original surfacing shall be used for the $IRI_{b Ave}$ in the above calculation.”

In the 9th paragraph, delete: “surfacing”.

For Table A9.1.8-3, delete “surfacing” in the heading and add the following additional Payment Bracket to Table A9.1.8-3

“Target IRI _{100m Ave} (m/km)	Payment Bracket 9
< 0.80	1.050
0.81 to 0.90	1.050
0.91 to 1.00	1.050
1.01 to 1.10	1.050
1.11 to 1.20	1.050
1.21 to 1.30	1.050
1.31 to 1.40	1.050
1.41 to 1.50	1.050
1.51 to 1.60	1.050
1.61 to 1.70	1.025
1.71 to 1.80	1.010
1.81 to 1.90	1.000
1.91 to 2.00	0,990
2.01 to 2.10	0,975
2.11 to 2.20	0,955
2.21 to 2.30	0,930
2.31 to 2.40	0,900
2.41 to 2.50	0.865
>2.51	Reject”

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
C9.1.9	Application of rolled-in chippings (State nominal size)	

Delete the 1st paragraph of the item description: “The unit of measurement shall be the ton of specified size of rolled-in chippings applied at the approved application rate, measured loose in hauling vehicles. The tendered rate shall include full compensation for the procuring, furnishing, pre-coating, spreading and rolling in of the chippings and for any additional costs resulting from the construction of the asphalt surfacing with rolled-in chippings.”, and replace with the following:

“The unit of measurement shall be the square metre of specified size of rolled-in chippings applied at the approved application rate. The tendered rate shall include full compensation for the procuring, furnishing, pre-coating, spreading and rolling in of the chippings and for any additional costs resulting from the construction of the asphalt surfacing with rolled-in chippings.”

Change the item description as follows:

Item	Description	Unit
C9.1.15	Milling of bridge decks and keys adjacent to bridge decks and intersections	

Change the unit of the following subitem to match item description:

“C9.1.15.1 Provision of an appropriate sized milling machineLump sum”

Change the item description as follows:

“C9.1.15.2 Milling of bridge decks and keys to bridge deck approaches
and intersections cubic metre (m³)

Change the first sentence of the second paragraph description as follows:

The rate tendered under payment item PC9.1.15.2 shall include full compensation to mill off existing asphalt on bridge decks or to mill an appropriate keyway into existing pavement layers at the approach to bridge decks and to intersections.”

COTO CHAPTER 10: SURFACE TREATMENTS

SECTION 10.1: GENERAL REQUIREMENTS FOR SURFACE TREATMENTS

PART A: SPECIFICATION

A10.1.3 GENERAL

A10.1.3.2 Weather limitations

Delete the 1st sentence of the 2nd paragraph, and replace with the following:
“No seal work will be allowed in the Seal Embargo Period defined in the Contract Documentation, unless otherwise specified in the Contract Documentation.”.

A10.1.3.14 Nominal rates of application for tender purposes

In the 1st sentence of the 2nd paragraph, after the wording: “...used in the various types of seals”, add the following: “, as specified in the Contract Documentation”.

(e) Nominal binder application and aggregate spread rates for Cape seals (Slurry component)

In Table A10.1.3-7 in the last row of the 1st column, delete “1” and replace with “10”.

(g) Cover sprays

Replace the 1st paragraph with the following: “The nominal application rate of a diluted emulsion cover spray (50/50) as specified, shall for tender purposes be 0,8 l/m² residual cold bitumen.”

A10.1.5 MATERIALS

A10.1.5.7 Precoating fluid

Add the following new paragraph: “The precoating fluid shall be a low viscosity bitumen-based product containing petroleum cutters and a chemical adhesion agent. It shall comply with the specifications as provided in the SABITA Manual 30: Requirements for stone precoating fluids.”

A10.1.6 CONSTRUCTION EQUIPMENT

A10.1.6.1 Binder distributor

In the last paragraph replace the 1st sentence with the following: “The transverse distribution of spray flares shall be field verified according to SANS 3001-BT25 and Clause A20.1.5.9 of Chapter 20 and by visual observations to ensure a uniform transverse distribution of binder.”

A10.1.6.2 Chip spreaders

In the last paragraph delete the 2nd bullet and replace with the following:
“- of spreading Grade C aggregate, Graded aggregate and Sand- or Grit seals.”

PART C: MEASUREMENT AND PAYMENT

Add a new sub-item as follows:

“Item	Description	Unit
C10.1.9.12	Anionic spray grade emulsion (65%)	litre (ℓ)”

PART D: GUARANTEES AND COMPLIANCE CERTIFICATES

D10.1.5 VISUALLY ASSESSED PROPERTIES

D10.1.5.4 Acceptance criteria

In note 3 below Table D10.1.5-3, delete “May 2016” and replace with “Latest version”.

COTO CHAPTER 11: ANCILLARY ROAD WORKS

SECTION 11.2: NON-STRUCTURAL GABIONS

PART A: SPECIFICATION

A11.2.5 MATERIALS

A11.2.5.2 Materials

Add the following as a new sub-clause:

“(h) Cement mortar

The mortar mix shall contain 1 part cement for every 3 parts of sand, based on dry mixed weight.”

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
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Add the following pay item:

“C11.2.5 Grout using cement mortar (1:3 cement sand ratio):

C11.2.5.1	Fill voids in gabion boxes	cubic metre (m ³)
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The unit of measurement shall be the cubic metre of cement mortar used to fill the voids of the gabion boxes as specified.

The tendered rate shall include full compensation for procurement and/or preparation of the cement sand mortar, placement of the cement sand mortar and any material wastage.”

SECTION 11.4: ROAD RESTRAINT SYSTEMS

PART A: SPECIFICATION

A11.4.1 SCOPE

Delete the last paragraph, and replace with the following:

“Moveable vehicle restraint systems required for traffic accommodation during construction and truck mounted attenuators are also specified in Clauses A1.5.6.1, A1.5.6.3 and A1.5.7.11 of Chapter 1.”.

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
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C11.4.2 Performance based vehicle restraint systems

Where the Concrete barrier system is utilised as temporary restraint systems for Traffic Accommodation and scheduled under C1.5 in the Pricing Schedule, the unit of measure shall be metre.month.

SECTION 11.6: ROAD SIGNS

PART A: SPECIFICATION

A11.6.7 EXECUTION OF THE WORKS

A11.6.7.5 Erecting road signs

(b) Excavation and backfilling

*In the 1st sentence of the 2nd paragraph, before "Section A13.4 of Chapter 13", add the following:
"Section A13.2, Section A13.3 and".*

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
C11.6.1	Road signboards with painted or coloured semi-matt background. Symbols, lettering and borders in semi- matt black or in Class I retro-reflective material, where the sign board is constructed from:	

Add the following new pay items:

Item	Description	Unit
C11.6.1.8	Regulatory signs, temporary:	
(d)	1 200 mm x 2 800 mm size (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III)	Number (No)

Item	Description	Unit
C11.6.1.10	Warning signs, temporary:	
(e)	1 200 mm x 1 600 mm size (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III)	Number (No)
(f)	1 200 mm x 2 800 mm size (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III)	Number (No)
(g)	2 400 mm x 400 mm size (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III)	Number (No)

Add the following new pay item:

"C11.6.1.13	Moveable barricade/road sign combination (1,4 mm thick prepainted galvanised steel, background Class III and symbol retro-reflective Class III)	number (No)
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The unit of measurement for item C11.6.1.13 shall be the number of moveable barricades, complete with road signs provided.

The tendered rate for item C11.6.1.13 shall include full compensation for providing and erecting each moveable barricade and signs and shall also include full compensation for moving the barricade as and when required."

Item	Unit
C11.6.12 Mounted on stands:	
PC11.6.12.1 Road signs, R- and TR-series	square metre (m ²)
PC11.6.12.2 Road signs, TW-series	square metre (m ²)
PC11.6.12.3 Road signs, TGS- and TG-series	square metre (m ²)
The unit of measurement for item PC11.6.12.1 to PC11.6.12.3 shall be the square meter of each sign provided, and, as may be applicable, completely erected.	
In addition, the rate shall also include moving the signs as may be necessary to new positions as required in terms of the works."	

SECTION 11.7: ROAD MARKINGS AND ROAD STUDS

PART A: SPECIFICATION

A11.7.5 MATERIALS

A11.7.5.2 Materials

(a) Marking materials

(iii) Thermoplastic road marking material

In the 4th paragraph, delete "mcd/m².lux" and replace with "mcd/m²/lux".

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
C11.7.3	Thermoplastic road marking	
<i>Amend the retro-reflective luminance unit to be "mcd/m²/lux".</i>		
<i>Add new sub-items to the following pay item:</i>		
Item	Description	Unit
C11.7.3.1	Thermoplastic road marking, broken or unbroken	
(d)	White lettering and symbols	square metre (m ²)
(e)	Yellow lettering and symbols	square metre (m ²)
(f)	Transverse lines, painted island and arrestor bed markings (any colour)	square metre (m ²)

The unit of measurement for items PC11.7.3.1(d) to (f) painting of the lettering, symbols, transverse lines or painted island and arrestor bed markings per required colour shall be square metres of area and the quantity to be paid shall be the actual surface area of lettering. These markings must be completed in accordance with the relevant SARTSM manual and Contract Documentation.

The tendered rate shall include full compensation for establishing specialist teams and equipment, and for procuring and furnishing all material, including the retro-reflective beads and the necessary labour and equipment, and for marking, protecting and maintenance as specified, including the setting-out of lettering, symbols, and transverse lines, painted island and arrestor bed markings. Full payment of the tendered rate will be applicable upon approved completion of the application of the thermoplastic road marking."

COTO CHAPTER 12: GEOTECHNICAL APPLICATIONS

SECTION 12.5: SHOTCRETE

PART A: SPECIFICATION

A12.5.7 EXECUTION OF THE WORKS

Preconstruction trial panels

Add "A12.5.7.21" before the heading "Preconstruction trial panels".

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
------	-------------	------

C12.5.4 Shotcrete (of specified thickness or volume):

Amend the unit for item C12.5.4.4 Dental shotcrete, to "cubic metre (m³)".

SECTION 12.6: MECHANICALLY STABILISED EARTH AND GABIONS

PART A: SPECIFICATION

A12.6.8 WORKMANSHIP

A12.6.8.1 MSE Walls

(b) Concrete facings

Replace the letter "W" with "durability" in the first sentence.

SECTION 12.10: HARD EXCAVATION BY BLASTING

PART A: SPECIFICATION

A12.10.5 MATERIALS

A12.10.5.1 Explosives

(b) Controlled bulk blasting

Add the following at the end of the 2nd paragraph:

"The use of pumped emulsions for controlled bulk blasting will only be permitted if emulsion ingress into rock fissures is prevented and the emulsion is encapsulated and separated from the blast hole."

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
------	-------------	------

C12.10.1 Excavation in hard rock using controlled blasting techniques

Add the following at the end of the pay item specification:

"Where the excavated material is not to be utilised in earthworks or layerworks, the volume measured for payment shall be the tight volume of excavated material."

Add the following new pay item:

"Item	Description	Unit
-------	-------------	------

C12.10.8	Ground vibration, air blast and fly rock monitoring	lump sum
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The unit of measurement for the monitoring as required shall be the lump sum.

The tendered rate shall include for the monitoring of all blasts as per the specification and shall include the services of an independent specialist, providing and operating all equipment necessary to successfully monitor all blasting operations and for compilation of all reports.”

SECTION 12.11: GEOSYNTHETICS

PART A: SPECIFICATION

A12.11.5 MATERIALS

Add the following sub-clause:

“A12.11.5.4 Grade Classification

The Grade classification for Geosynthetics is specified in the Contract Documentation.”

COTO CHAPTER 13: STRUCTURES

SECTION 13.1: FOUNDATIONS

PART B: LABOUR ENHANCEMENT

B13.1.7 EXECUTION OF THE WORKS

B13.1.7.4 Utilisation of excavated material

Delete reference to: "100 m" and replace with "50 m".

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
C13.1.7	Backfill to excavations utilising:	
C13.1.7.2	Imported material	
(a)	Clean sand compacted to 100% of MDD.....	cubic metre (m ³)
(b)	G7 granular material	cubic metre (m ³)

Amend the description of the third paragraph as follows:

The tendered ate shall include full compensation for furnishing and placing all materials within the entire excavation, transporting the material within *unlimited haul distance*, and preparing, processing, shaping, watering, mixing, and compacting the material to the specified densities."

SECTION 13.3: STEEL REINFORCEMENT

PART A: SPECIFICATION

A13.3.8 WORKMANSHIP

A13.3.8.4 Tolerances

(b) Concrete cover

Delete reference to "Clause A13.4.8.1(a)(iv)" and replace with: "Clause A13.4.8.1(a)(v)".

SECTION 13.4: CONCRETE

PART A: SPECIFICATION

A13.4.2 DEFINITIONS

Fresh phase of concrete

Add the following at the end of the definition of "Fresh phase of concrete":

"This is also known as the plastic phase."

Add the following definition between "Fresh phase of concrete" and "Hardened phase of concrete":

"Hydration or curing phase – this is concrete that is no longer a semi-liquid but has not yet reached a solid state."

A13.4.7 EXECUTION OF THE WORKS

A13.4.7.12 Placing and Compaction

(b) Placing

Delete the 3rd sentence of the 1st paragraph and replace with the following:

“The Contractor shall not be permitted to pour unless the specific method statement for that pour has been accepted by the Engineer.”

SECTION 13.7: JOINTS

PART C: MEASUREMENT AND PAYMENT

Add the following new pay item:

Item	Description	Unit
“C13.7.11	PVC sleeve, bituthene wrapping and tape-cap for expansion joint ties.....	Number (No)

The unit of measurement shall be the number of PVC sleeves, bituthene wrapping and tape caps installed as specified.

The tendered rate shall include full compensation for supplying, transporting, handling and storing all material, providing all labour, plant and equipment to fix the PVC sleeves, bituthene wrapping and tape-cap specified materials, and for waste material.”

SECTION 13.8: ANCILLARY STRUCTURAL ELEMENTS

PART A: SPECIFICATION

A13.8.7 EXECUTION OF THE WORKS

A13.8.7.2 Drainage for structures

(d) Crushed stone in drainage strips behind walls

Delete “19 mm nominal size” and replace with “20 mm nominal size”.

COTO CHAPTER 14: REPAIR AND REHABILITATION OF STRUCTURES

SECTION 14.2: CORROSION SURVEY METHODS AND TESTING OF NEAR SURFACE CONCRETE PROPERTIES

PART C: MEASUREMENT AND PAYMENT

Item	Description	Unit
C14.2.1	Delamination Survey	

Add the following at the end of the pay item specification:

“The tendered rate for delamination survey using extracted core samples, shall also include the establishment of coring equipment, the moving of the coring equipment, the coring of samples and the filling and repairing of the cored holes.”

Item	Description	Unit
C14.2.3	Concrete compressive strength	

Add the following at the end of the pay item specification:

“The tendered rate for concrete compressive strength testing using extracted core samples, shall also include the establishment of coring equipment, the moving of the coring equipment, the coring of samples and the filling and repairing of the cored holes.”

SECTION 14.3: DEMOLITION AND REMOVAL OF STRUCTURAL CONCRETE

PART A: SPECIFICATION

A14.3.7 EXECUTION OF THE WORKS

A14.3.7.3 Demolition of entire structural members

(a) Concrete members

Add the following after the 3rd paragraph:

“If the concrete is to be re-used and not removed to a disposal site, the requirements shall be indicated in the Contract Documentation.”

COTO CHAPTER 20: QUALITY ASSURANCE

SECTION 20.1: TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP

PART A: SPECIFICATION

A20.1.2 DEFINITIONS

Independent site laboratory

In the definition of "Independent site laboratory", add the following:

"Independent Site laboratory in COTO is equivalent to the combined laboratory in the Employer documentation."

A20.1.4 PUBLISHED TEST METHODS

A20.1.4.8 Testing of asphalt

Add the following new paragraph:

"Sabita Manual 39: Laboratory Testing Protocols for Binders and Asphalt, shall be implemented together with the asphalt tests listed."

Delete reference to: "Sabita Manual 35 for Design and Use of Asphalt in Road Pavements: Determining the Richness Modulus of EME asphalt mixes."
and replace with "Sabita Manual 33 for Design Procedure for High Modulus Asphalt (EME): Determining the Richness Modulus of EME asphalt mixes."

A20.1.7 ACCEPTANCE CONTROL BY STATISTICAL JUDGEMENT PRINCIPLES

A20.1.7.2 Taking samples

(a) Stratified random sampling

Add the following new paragraph:

"Where the SARDS Laboratory module is used, the sampling locations must be as per the software. The Engineer may specify additional sampling locations."

(b) Minimum samples per lot

Add the following new paragraph:

"Where the SARDS Laboratory module is used, the number of samples per lot must be as per the software, as a minimum. The Engineer may specify additional numbers of samples. The Number of samples must be sufficient to meet the requirements of TMH5."

PART C: MEASUREMENT AND PAYMENT

C20.1.5 Financial contribution for an independent site/commercial laboratory

Delete reference to: "/commercial".

Add the following new pay item:

"Item	Description	Unit
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C20.1.6 Payment of independent site laboratory

C20.1.6.1	Direct payment by contractor	prime cost (PC) sum
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(a)	Handling cost and profit in respect of item C20.1.6.1 ...	percentage (%)
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The contractor shall pay the appointed site laboratory monthly for the amount as certified by the Engineer.

The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost item. The percentage shall cover all the Contractors' sourcing, handling, profit, and payment of the service provider in providing the services. The Contractor shall forfeit his mark-up when the service provider is not paid in time."

SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL R.101-080-2019/1
FOR THE IMPROVEMENT OF NATIONAL ROAD R101 SECTION 8 FROM BELA BELA (KM 0.0) TO
MODIMOLLE (KM 26.8)

SECTION B: SPECIFICATION DATA

Notes to tenderer:

1. In certain clauses, 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. Details of such alternatives or additional requirements applicable to this contract are contained in this Section B: Specification Data.
2. The number of each clause and each payment item in this part of the project specifications follows the numbering format of the COTO standard specifications. Where, however, a clause has been amended under Section A2, the clause number is prefixed with a "P" in this Section.

COTO CHAPTER 1:GENERAL

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
1			GENERAL	
	A1.1		GENERAL PREAMBLE	
		PA1.1.2	DEFINITIONS	
			Conditions of Contract	The Conditions of Contract for Construction for Building and Engineering Works designed by the Employer as published by the International Federation of Consulting Engineers First Edition 1999, shall apply.
			Site / Site of the Works	The limits of construction is provided in Drawing number 33532.00-100-01 and 33532.00-100-15.
	C1.1		GENERAL PREAMBLE	
	A1.2		GENERAL REQUIREMENTS AND PROVISIONS	
		A1.2.3	GENERAL	
			A1.2.3.3 Environmental management	The requirements of the Environmental Officer are indicated in Section C.
			A1.2.3.4 Extension of time for delays caused by rainfall	
			(c) Method 3 (Critical path method without consequential delays)	Method 3 (Critical path method without consequential delays) is specified. The value of "N" is 40. In calculations of payment for approved extensions of time granted for delays caused by rainfall, payment will be made utilising the applicable payment items for which the unit of measurement is "month" but excluding payment items with negative rates and non-applicable payment items such as pay item C1.3.1.4.
			A1.2.3.5 Handing-over of the Site of the Works	The conditions for handing-over of the Site of the Works are as follows: (a) Sequence (i) Cuttings of major horizontal realignment sections: The material from cuttings will require blasting and crushing for fill and pavement layerworks along Road R101 and adjacent SANRAL projects. (ii) Construction of deviations as in b) below. (iii) Construction of Bela Bela (km 0.00 to km 5.54) and Modimolle (km 23.00 to km 26.36) urban sections. (iv) Construction of Bridge B375 km 16.69 to km 17.54 and Bridge B447. (v) Rural section km 9.84 to km 16.69 (vi) Service road.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA															
				<p>(vii) Rural sections km 5.54 to km 9.84 and km 17.54 to km 23.00</p> <p>(b) Temporary deviations</p> <p>(i) Bela Bela (km 0.00 to km 5.54) and Modimolle (km 23.00 to km 26.36) urban sections (new full width)</p> <p>(ii) Construction of Bridge B375 km 16.69 to km 17.5 (new full width).</p> <p>(iii) Rural sections km 5.54 to km 16.69 and km 17.54 to km 23.00 (shoulder widening).</p> <p>(c) Half or partial width sections</p> <p>(i) Rural section km 16.69 to km 17.54 at Bridge B 375.</p> <p>(ii) Rural intersection km 9.84 to km 10.20</p> <p>(iii) Rural and urban intersections and tie-inns.</p> <p>(d) Unrestricted sections Not required.</p> <p>(e) Other Not applicable.</p>															
			A1.2.3.9 Monthly reports	<p>Other information to be included in monthly progress reports are as follows:</p> <p>(a) Information as required in terms of Conditions of Contract Clause 4.21.</p> <p>(b) Aerial progress footage (images and video)</p> <p>(i) Bridge deck construction</p> <p>(ii) Road construction.</p> <p>(c) Integrated Transport Information System (ITIS).</p>															
			A1.2.3.10 Notices, signs and advertisements	<p>Details of the contract sign board is provided in Drawing 33532.00-190-05.</p>															
			A1.2.3.12 Ownership of assets and disposal of non-usable assets	<p>The Non-usable assets to be disposed by the Contractor is listed in the following disposal plan:</p> <p>Disposal plan</p> <table><tr><td>Asset description</td><td>Estimated quantity</td><td>Disposal requirement</td></tr><tr><td>Guardrail and posts</td><td>200 m</td><td>SANRAL</td></tr><tr><td>Road signs</td><td>100 number</td><td>RRM</td></tr><tr><td>Fencing</td><td>4 km</td><td>Contractor's choice</td></tr><tr><td>Electrical cables and posts</td><td>70 poles, 3 km cables</td><td>Municipality</td></tr></table>	Asset description	Estimated quantity	Disposal requirement	Guardrail and posts	200 m	SANRAL	Road signs	100 number	RRM	Fencing	4 km	Contractor's choice	Electrical cables and posts	70 poles, 3 km cables	Municipality
Asset description	Estimated quantity	Disposal requirement																	
Guardrail and posts	200 m	SANRAL																	
Road signs	100 number	RRM																	
Fencing	4 km	Contractor's choice																	
Electrical cables and posts	70 poles, 3 km cables	Municipality																	
			A1.2.3.13 Prevention of damage to nearby properties and services	<p>Structures that could be affected by excessive ground vibrations is listed in the following table:</p> <table><tr><td>Structure</td><td>Type</td><td>Location</td></tr></table>	Structure	Type	Location												
Structure	Type	Location																	

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA		
				Buildings	Residential	Km 7.4 LHS (PTN 6 of 464-KR)
				Buildings	Lodge	Km 9.7 LHS (PTN 35 of 451-KR)
				Buildings	Residential / Lodge	Km 11.5 LHS (PTN 3 of 452-KR)
				Buildings	Residential	Km 15.0 RHS (PTN 201 and PTN 202 of 787-KR)
				Buildings	Residential	Km 15.5 LHS (PTN 46 of 708-KR)
				Buildings	Residential	Km 17.0 LHS (PTN 33 of 708-KR)
				Services	Overhead	Various
			PA1.2.3.15 Routine maintenance	The Contractor shall be responsible for the routine maintenance responsibilities as listed in pay item C1.2.3. The Contractor shall take over the specified maintenance responsibility on the date of Access to site. The backfilling for patching shall be done in accordance with the requirements of Chapter 8.		
			A1.2.3.18 Stakeholder liaison	Additional requirements related to structured engagement with project Stakeholders and affected Communities, as well as guidance on the selection and the enhanced utilisation and development of Targeted Labour and Targeted Enterprises is provided in Section D1000.		
			A1.2.3.20 Road safety audits	A Work zone traffic management audit as well as a Pre-opening stage road safety audit, shall be carried out.		
			A1.2.3.22 Wayleaves/Agreements and Permits	The Contractor shall be responsible for applying for the following wayleaves: (a) Eskom (b) Bela Bela and Modimolle Local municipalities (c) Optic fibre (DFA, MTN, Liquid Telecom) (d) Telkom.		
			A1.2.4.2 Designs and drawings for temporary works provided by the Contractor	The following major temporary works are highlighted and shall be designed and executed by the Contractor on temporary deviations: (a) Bridge B447 (B0594) (km 17,13) (b) Bridge B0619 (km 0,809) (c) Major culvert C9519 (km 5,181) (d) Major culvert C9520 (km 22,024) Lump sum payment items have been provided under section C1.5.4.		

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				No additional payment shall be made, nor shall any claim for additional payment be considered for construction of temporary works as defined under this clause, which is not listed in the table above, and will not relieve the contractor from any other responsibilities stated under this clause.
		A1.2.7	EXECUTION OF THE WORKS	
			PA1.2.7.1 Programme of work	
			(a) General	<p>A scheme 2 programme shall apply.</p> <p>The following intra-programme dates shall apply:</p> <ul style="list-style-type: none"> The urban sections between km 0.00 to km 6.00 and km 23.00 to km 26.36 shall be completed within a maximum period of 12 months since Access to Site was granted.
			(b) Scheme 2	<p>The programme shall be drawn up or be compatible with MS Projects 2009.</p> <p>Additional schedules, other than required in terms of Conditions of Contract Clause 8.3, to be provided are not applicable.</p>
			A1.2.7.4 Work on, over, under or adjacent to utilities	Contractor shall obtain the latest work permit and conditions/restrictions from the service owner.
	A1.3		CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS	
		A1.3.3	GENERAL	
			A1.3.3.1 Construction camps	The Contractor to identify suitable and approved location for the site camp.
	A1.4		FACILITIES FOR THE ENGINEER	
		A1.4.3	GENERAL	<p>Site facilities must be provided by the Contractor. The facilities must comply with the areas and requirements as specified in the payment items in Chapter 1.4.</p> <p>The facilities may be established in an existing building if it is satisfactory to the Engineer.</p>
		A1.4.7	EXECUTION OF THE WORKS	
			A1.4.7.1 Offices and laboratories	
			(a) General	The site laboratory shall be supplied with three-phase electricity.
			(f) Ablution unit	Separate shower and change room.
			A1.4.7.3 Services	

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA		
			(b) Water, electricity and gas	A generator shall be provided on site to ensure uninterrupted three phase electricity is supplied to the laboratory and Engineers Site offices if electricity is not available from a power supply authority.		
	A1.5		ACCOMMODATION OF TRAFFIC			
		A1.5.3	GENERAL			
			A1.5.3.2 General requirements			
			A1.5.3.3 Lane width	Refer set of drawings no. 33532.00-119 for temporary deviations to have minimum 3,2 m lanes.		
		A1.5.6	CONSTRUCTION EQUIPMENT			
			A1.5.6.1 Traffic control facilities			
			(a) Barriers	Concrete temporary barrier shall be H4b-W6 compliant, and it is measured under Chapter 11.		
			A1.5.6.2 Illuminated traffic signs and safety devices			
			(d) Sign mounted flashing lights	Refer to drawing no. 33532.00-119 for signs TW336-WA at advance warning areas.		
		A1.5.7	EXECUTION OF THE WORKS			
			A1.5.7.3 Accommodation of traffic where the road is constructed in half or partial widths	The length of the half or partial width construction sections where the traffic can only pass in one direction at a time shall not exceed 2 km.		
			A1.5.7.10 Construction of temporary deviations			
			(d) Earthworks and pavement layers for temporary deviations	Description	Thickness	Material
				Base	150 mm	G5A
				Subbase (C4)	150 mm	G5A
				USSG	200 mm	G7*
				Fill	Vary	Normal/coarse**
				Roadbed	150 mm	Rip and re-compact
			*Only where in-situ roadbed is not suitable. **Coarse fill only at deviation Bridge B447.			
			(e) Surfacing of temporary deviations	Bituminous single seal with 10 mm aggregate and slurry (SC-E1 70-73 (t) tack coat, grade A seal stone and fine slurry, medium grade).		
	C1.5		ACCOMMODATION OF TRAFFIC			
			PART C: MEASUREMENT AND PAYMENT			

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			C1.5.8 Traffic safety officer and C1.5.9 Traffic safety vehicle	The rate will be per month irrespective of the number of traffic safety officers and traffic safety vehicles used and only paid until the Due Completion Date.
	A1.6		CLEARING AND GRUBBING	
		A1.6.7	EXECUTION OF THE WORKS	
			A1.6.7.2 Clearing	<p>Removal of trees on along the route a will be measured under Schedule B, Item C1.6.3.1.</p> <p>Application to remove some of indigenous trees (Marula) will be required from Department of Forest Fisheries and Environment.</p> <p>Removal of trees in forests and plantations are applicable at new road alignments (km 10,3; km 11,3; km 15,4), stockpile areas and temporary deviation at Bridge B447.</p>
	A1.7		LOADING AND HAULING	
		A1.7.7	EXECUTION OF THE WORKS	The Contractor must provide the Engineer with the certified carrying capacity of each vehicle before any construction materials can be transported.

COTO CHAPTER 2:SERVICES

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
2			SERVICES	
	A2.1		GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES	
		A2.1.1	SCOPE	
			A2.1.1.1 Installation of new services	New services to be installed include associated power cables and/or Fibre Cables as instructed by the Engineer.
			A2.1.1.2 Location, identification, protection and relocation of existing services	Services drawings 33532.00-101 series showing the layout of existing services and are included in Volume 4: Roadworks drawings. The Contractor is to liaise with the specific service providers in order to establish the relocation or decommission of those affected services or laying of new services.
		A2.1.3	GENERAL	
			A2.1.3.1 Installation of new services	
			A2.1.3.2 Location, identification, protection and relocation of existing services	
			(a) Existing as-built records	Contractor to consult the relevant existing services drawings and to obtain valid/up to date wayleaves for all services from service owners as per Table 4.3 to 4.5 in Part C4: Project Information.
			(b) Location of existing services	<p>The Contractor is to obtain co-ordinates from the Service Owners of the affected services.</p> <p>Ground penetrating radar and/or hand excavations shall be carried out by the Contractor to locate the services on site.</p> <p>A lead time of 6 months should be allowed for relocation and removal of services with all service providers. The Contractor must use the mobilisation period to start engaging with the Service Owners.</p>
			(d) Protection of services	
			<i>(i) Service owners</i>	The Contractor should consult the relevant Service Owners for lead times and notice periods for laying and/or relaying any particular service.
			<i>(ii) Protection</i>	The Contractor should consult the relevant Service Owners for details of required protective measures for the construction of permanent work for existing devices.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			<i>(iv) Relocation</i>	Relocation of affected services to take place as far as is practical at the beginning of the Contract but may be sequenced in a manner such that the production of other tasks is not delayed. The Contractor is to use the lead time up to Site Establishment to make suitable arrangements with the relevant Service Owners, as well as co-ordinate programme requirements with the Engineer.
			A2.1.3.3 Safety, Method Statements, safeguarding the works and accommodation of traffic	The Contractor should consult the relevant Service Owners for details of required protective measures for the construction of permanent work for existing devices.
			(a) Safety and Method Statements	Contractor to obtain and adhere to any safety requirements and if required provide method statements for installation of services over and above Clause A1.2.3.6 of Chapter 1.
			(c) Accommodation of traffic	Contractor and Service Owner to programme service relocations such that traffic is not impacted. Where this cannot be achieved, the Contractor should submit to the Engineer a traffic accommodation plan for this specific purpose and is to facilitate traffic accommodation.
			A2.1.3.5 Programming for services	
			(a) Trenching and installation sequence	For services, where the Service Owner requires underground crossing of the carriageways and the final earthworks level is greater than 5,0 m from the existing ground surface level, excavation for trenching may be required before the mass earthworks are completed, depending on the level requirements of the Service Owner.
			A2.1.3.6 Provision of record drawings and details	The surveyor is to be registered with PLATO.
			A2.1.3.9 Limitations and restrictions	
			(e) Working widths	Corridor widths are to be specified by the Service Owner and submitted to the Engineer for review.
		A2.1.4	DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS	
			A2.1.4.1 Temporary works	Temporary works relating to relocation of services as directed by the Engineer shall be designed and installed by the Contractor as required to construct the permanent works.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			A2.1.4.2 Alternative designs	
			(b) Alternative design approvals	Design requirements to be determined by the Service Owners.
			A2.1.4.3 Designs	The Contractor will not be responsible for designs of service installations which form part of the permanent works in the road reserve.
		A2.1.5	MATERIALS	
			A2.1.5.1 Trench backfill material	Trench backfills to be approved by the Engineer before backfilling commences.
			A2.1.5.2 Soil cement and stabilised trench backfill material	
			(a) Soil cement backfill	Minimum of G5B material.
			(b) Cement stabilised backfill	Minimum of G5B material or as per requirement of the relevant Service Owners.
		A2.1.6	CONSTRUCTION EQUIPMENT	
			A2.1.6.1 Excavation equipment	760 mm base width for excavating for cable ducts and 1 000 mm base width for U-PVC drainage pipes. Trench excavations to be to suitable width as per requirement of the relevant Service Owners.
		A2.1.7	EXECUTION OF THE WORKS	
			A2.1.7.1 Trenching for Services	
			(f) Safe placement of excavated material	Contractor to make use of available and approved stockpile areas for temporary placement of excavated material for services if required. The Contractor is to plan per section, suitable stockpile areas as per the guidelines of the Engineer.
			(h) Excavation	760 mm trench width for excavating for cable ducts installation. Where indicated by the Engineer, the trench width where ducts or pipes are to be encased in concrete or soil cement shall be 600 mm for ducts or pipes less than 200 mm in diameter and up to 1 000 mm for larger pipe diameters. Increased trench widths are to be approved by the Engineer prior to excavation.
			(j) Excavation using Labour Enhanced Construction Methods	Labour enhanced construction methods will be utilised where necessary.
			(k) Excavations outside the normal trench profile	Identify excavations outside the normal trench profile for services are to be taken into account by the Service Owners and Contractor where applicable and included in the relevant cost for service relocation.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			(l) Timbering and shoring	
			<i>(ii) Contract Specific Shoring Requirements</i>	The Contractor will be responsible for supplying adequate shoring and shall include these costs of the relevant service relocation, where the Contractor is to implement service relocation; or where the Service Owner requires such assistance for service relocation.
			(m) Soil cement backfilling	Soil cement backfill (4% cement) should be used for the bases of overhead service poles and anchor poles and for any other type of backfill indicated.
			(n) Erosion protection with sandbags	Sandbags shall be used in trenches to prevent the ingress of water and should be included in the rates provided.
			(p) Preparation of the bottom of trenches	Required levels as per Service Owner requirements.
			(r) Dealing with water	
			<i>(i) Contractor's obligations for dealing with water</i>	The Party responsible for service relocation (be it the Service Owner or the Contractor) shall include temporary works to control water inflow into excavations.
			A2.1.7.2 Reinstatement of existing roads and existing road furniture	
			(a) General	Where pavement layers are affected/to be reinstated, the Service Owner and/or Contractor is to allow for reinstatement of the material layer types as per the existing design of the pavement, under suitable compaction, unless otherwise indicated by the Engineer.
			(b) Reinstatement of existing road carriageways and other paved areas	Where pavement layers are affected/to be reinstated, the Service Owner and/or Contractor is to allow for reinstatement of the material layer types as per the existing design of the pavement/carriageway, under suitable compaction, unless otherwise indicated by the Engineer.
			(d) Reinstatement of unpaved areas	Topsoil shall be stockpiled and reinstated once excavations are backfilled and services have been installed.
			A2.1.7.3 Railway reserves, bridge and other special crossings	The Party responsible for the service relocation (Service Owner and/or Contractor) shall provide method statements to the Engineer for review, where the relocation of a service requires the crossing of railway reserves, bridges or other structures.
			A2.1.7.6 Ownership, removal and disposal of existing service materials	Existing service material (ducts, pipes, cables etc) recovered when existing services are removed remains the property of the existing Service Owner.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				<p>Removal of such services should be done in a manner such as to prevent damage.</p> <p>Where required/specified by the existing Service Owner, the Contractor shall become the owner of specific recovered service materials and shall be responsible for the disposal of the materials and for providing the Engineer with a full record of the disposal of the materials for control purposes.</p>
		A2.1.8	WORKMANSHIP	
			A2.1.8.2 Compaction	
			(a) Relative density compaction control	<p>Relative density compaction control shall be used over and above any road carriageways or lined drains or under any paved footways, sidewalks or walkways.</p> <p>DCP control or relative density compaction control shall be used for trenches in embankments, fills or cut slopes.</p>
			<i>(ii) Areas subjected to vehicle traffic loads or within the road prism</i>	<p>For areas over and above any road carriageways, lined drains or any paved footways, sidewalks or walkways where layers are backfilled in thickness (after compaction) that do not exceed 150 mm and the material shall be compacted to a minimum of 93% of MDD or a minimum of 100% of MDD where sand is used.</p>
			(c) DCP compaction control	<p>DCP acceptance shall be values less than 15 mm/blow.</p>
	B2.1		GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES PART B: LABOUR ENHANCEMENT	
		B2.1.1	SCOPE	<p>Labour enhanced construction methods should be used.</p>
	C2.1		GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES PART C: MEASUREMENT AND PAYMENT	
			<i>(ii) Notes on measurement and pay items</i>	<p>Separate pay items for trenching for relocation of services or installation of new services is not applicable. The cost for such activities is to be included as part of the total cost for relocation of services.</p> <p>For service relocations, the Contractor shall request quotations from the Service Owners, arrange for such installations to take place and facilitate the installation process. Quotations</p>

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				shall be all inclusive of each activity required to complete the work. The Contractor is required to relocate affected water mains and should submit an all inclusive cost to the Engineer for the relocation of the affected water pipes.
	D2.1		GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES PART D: GUARANTEES AND COMPLIANCE CERTIFICATES	
		D2.1.1.1	Proprietary products and materials (Guarantees and compliance certificates)	All performance requirements to be as per the Service Owner requirements to be included in the relevant total cost to complete the required works.
	A2.2		DRY SERVICES	
		A2.2.1	SCOPE	All existing dry services are indicated in the service drawing 33532.00-101 series. Drawings for street lighting ducts and manholes are as shown on the 32532.00-420 series.
			A2.2.1.1 General note	In certain SANS documents referred to in this Section the term "specified in the scope of work" is used. For the purposes of this specification the term shall be deemed to mean "specified in the Contract Documentation".
		A2.2.5	MATERIALS	160 mm OD, U-PVC normal duty utility duct (SANS 286 Class C).
			A2.2.5.1 Ducts and sleeves	
			(a) Unplasticised Polyvinyl Chloride (U-PVC) ducts	160 mm OD, U-PVC normal duty utility duct (SANS 286 Class C).
			(h) Draw wires and marker tapes	As per service owners requirements or 2.5 mm galvanised draw wires.
			A2.2.5.4 Cable duct markers	Concrete markers as per streetlight drawing series in Volume 4.
			A2.2.5.5 Concrete	Concrete encasement of ducts (C12/15-38).
		A2.2.7	EXECUTION OF THE WORKS	
			A2.2.7.2 Duct installation by methods other than by micro or mini trenching	
			(a) Trench widths for duct installations	550 mm minimum trench width for excavating for cable ducts.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			(d) Concrete bedding and encasement	
			<i>(ii) Concrete encasement</i>	Concrete encasement of ducts (C12/15-20) and dimensions as per streetlight drawings in Volume 4.
			A2.2.7.4 Duct markers	
			(b) Route markers	Concrete markers as per streetlight drawing series.
			(c) Road crossing markers	Crossings to be marked on kerbs and concrete markers are to be placed where kerb markings are not possible, at 1.0 m from the road reserve.

COTO CHAPTER 3:DRAINAGE

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
3			DRAINAGE	
	A3.1		DRAINS	
		A3.1.5	MATERIALS	
			A3.1.5.2 Subsoil Drainage Materials (A) PIPES	U-PVC Normal duty 110 mm OD slotted pipes.
		A3.1.7	EXECUTION OF THE WORKS	
			A3.1.7.4 Subsoil drainage (a) Construction of subsoil drainage systems	
			<i>(ii) With polymer film lining to trenches for subsoil drainage systems</i>	As shown on drawing 33532.00-123 series.
			A3.1.7.5 Manholes, outlet structures and cleaning eyes	All structures are as shown on drawing 33532.00-123 series.
	A3.2		CULVERTS	
		A3.2.3	GENERAL	
			A3.2.3.1 Types of culverts	Prefabricated reinforced concrete pipes to be spigot and socket type and class 100D on Class B bedding.
		A3.2.4	DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS	
			Temporary structures in temporary bypass	<p>The following major temporary works are highlighted and shall be designed and executed by the Contractor on temporary deviations:</p> <ul style="list-style-type: none"> (a) Bridge B447 (b) Bridge B0619 (c) Major Culvert C9519 (d) Major Culvert C9520 <p>Lumps sum payment items have been provided under section C1.5.4.</p> <p>The temporary structures must be designed and constructed to accommodate the design flow for a return period of 1:5 or 1:2 years including scour and erosion protection within the waterway and embankments to the deviation. This protection should be adequate to accommodate a 1:20 year design flood peak and submergence of the structure in this event should be considered in the design. The proposed opening cross-sectional area required and the design flows for each new structure are as follows:</p>

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA			
				Structure Number	1:20 year flood peak	1:5 year flood peak	Opening area for 1:5 year flow
				B447	182 m³/s	70 m³/s	28 m²
				C9519	31 m³/s	12 m³/s	7 m²
				C9520	38 m³/s	11 m³/s	8 m²
				Structure Number	1:20 year flood peak	1:2 year flood peak	Opening area for 1:2 year flow
				B0619	143 m³/s	12 m³/s	7 m²
		A3.2.5	MATERIALS				
			A3.2.5.2 Culvert materials				
	A3.3		CONCRETE KERBING AND CHANNELING, ASPHALT BERMS, CHUTES, DOWNPIPES, AS WELL AS CONCRETE, STONE PITCHED AND GABION LININGS FOR OPEN DRAINS				
		A3.3.7	EXECUTION OF THE WORKS				
			A3.3.7.1 Drainage structures				
			(a) Prefabricated concrete kerbing and channelling	As shown on drawing 33532.00-190-04.			
			(f) Cast in situ chutes on cut slopes	As shown on drawing 33532.00-123-03.			
			(i) Stone pitched open drains	As shown on drawing 33532.00-123-03.			
			(o) Demolition of existing kerb and channel and concrete lined drains	Also includes the removal of existing stone pitched drains.			

COTO CHAPTER 4: EARTHWORKS AND PAVEMENT LAYERS: MATERIALS

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
4			EARTHWORKS AND PAVEMENT LAYERS: MATERIALS	
	A4.1		BORROW MATERIALS	
		A4.1.3	GENERAL	
			A4.1.3.1 Employer identified borrow pits and quarries	No specific borrow pits or quarries have been identified by the Employer for use on this project. Three major cuttings on the new road alignment have been identified as the main source for supplying additional materials.
			A4.1.3.2 Contractor identified borrow pits and quarries	Refer to Volume 6 for potential commercial sources.
			A4.1.3.4 Contractor prepared plans for borrow materials	Refer Volume 6 for materials utilisation.
		A4.1.5	MATERIALS	
			A4.1.5.3 Pioneer layer	The pioneer layer shall predominantly consist of blasted rock and boulders (shape not completely rounded or polished), generally in the size range 100 mm to 500 mm, and a lack of material finer than 50 mm.
			A4.1.5.4 Sand, normal and coarse fill material in the earthworks layers (Table A4.1.5-2)	The CBR and swell for depth more than 10 m is not applicable. Fill material shall be: Normal fill for permanent works and coarse fill at temporary deviation at Bridge B447.
			A4.1.5.5 Rock fill material in the earthworks layers	Refer Volume 6 for materials utilisation.
			A4.1.5.12 Wearing course gravel material	Gravel wearing course shall comply with provisions of "Rural and urban roads" of Table A4.1.5-11.
		A4.1.7	EXECUTION OF WORKS	
			A4.1.7.1 Haul and access roads	
			(c) Construction requirements of new temporary unsealed roads	The Contractor will be responsible for the construction and maintenance of all required haul roads.
			(d) Reinstatement of the temporary unsealed roads	The Contractor will be responsible for the reinstatement of all constructed haul roads.
			A4.1.7.2 Borrow pit and Quarry operations	Refer Volume 6 for materials utilisation.
			(a) General control at the borrow pits and quarries	Full time materials manager with expertise level as junior foreman will be required where material will be sourced from hard rock cuttings.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			(b) Classes of excavations	
			<i>(i) Soft excavation</i>	The reference construction equipment shall be hydraulic crawler excavator with minimum nett horsepower (flywheel power) of 190 kW, equipped with a heavy-duty bucket. A minimum continuous production rate of 160 m ³ /h of the excavated material will be taken as the benchmark for the excavator's capacity and efficiency.
			<i>(iv) Hard excavation</i>	<p>The reference construction equipment shall be hydraulic crawler excavator with minimum nett horsepower (flywheel power) of 190 kW, equipped with a heavy-duty bucket. A minimum continuous production rate of 160 m³/h of the excavated material will be taken as the benchmark for the excavator's capacity and efficiency.</p> <p>If the minimum production rate of 160 m³/h is not achieved the material will be classified as hard.</p>
			(h) Selection and excavation of material in quarries	Full time materials manager with expertise level as junior foreman will be required where material will be sourced from hard rock cuttings.
			(l) Use of the borrow material	Refer Volume 6 for materials utilisation.
			(m) Closing of the borrow pits and quarries	Closing shall also comply with requirements set in the Environmental Management Plan.
			A4.1.7.3 Stockpiles	
			(b) Stockpiling of the material	Full time stockpile controller with expertise level as junior foreman will be required.
			(c) Reinstatement of stockpiles site	Reinstatement shall also comply with requirements set in the Environmental Management Plan.
	C4.1		BORROW MATERIALS PART C: MEASUREMENT AND PAYMENT	
		C4.1.17	Weighbridge facility	The Lump Sum shall be irrespective of the number of weighbridges/facilities that may be required to execute the Works.
		C4.1.19	Excavating hard material	Weighing of materials for measurement and payment purposes shall be carried out by a temporary weighbridge facility erected on the site.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
	A4.2		CUT MATERIALS	
		PA4.2.3	GENERAL	
			A4.2.3.2 Contractor prepared plans for cuttings	M&U plan will be required for box cut excavations.
		A4.2.7	EXECUTION OF WORKS	
			A4.2.7.1 Excavation operations	
			(a) Control at the cuttings, designated excavations and box cuts	Full time materials manager with expertise level as junior foreman, will be required.
			(b) Classes of excavation	<p>The reference construction equipment shall be hydraulic crawler excavator with minimum nett horsepower (flywheel power) of 190 kW, equipped with a heavy-duty bucket. A minimum continuous production rate of 160 m³/h of the excavated material will be taken as the benchmark for the excavator's capacity and efficiency for soft material.</p> <p>If the minimum production rate of 160 m³/h is not achieved the material will be classified as hard.</p>
			(h) Excavation of material in cuttings	<p>See drawing 33829.00-103-01 for cutting slopes. No additional payment will be made for cutting benches and shall be included in the rates provided. Cuttings will not be measured under Item C4.2.6.</p> <p>A full-time excavation controller with expertise level as junior foreman will be required.</p>
			(i) Excavation of material in box cuts	<p>Drawings with cross-section of cuts are included in Volume 4. Stepping for the sides of box cuts will be as instructed by the Engineer on site.</p> <p>No additional payment will be made for cutting of benches and shall be included in the rates provided.</p>
			(k) Selection and the use of the cut material	Refer to Volume 6 for materials utilisation.
			(n) Finishing of the side slopes of cuttings and designated excavations (<i>para 1</i>)	Slopes within soft material shall be finished to a slope not steeper than 1 (vertical): 1,5 (horizontal). In hard excavation with rock face the slope shall vary and is indicated on drawing 33532.00-103 series.
	A4.3		EXISTING ROAD MATERIALS	
		A4.3.3	GENERAL	
			A4.3.3.1 Employer identified existing road materials	It is the intention of the Employer to optimally reuse all the existing pavement materials. The envisaged process will entail the reuse of

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				existing materials in combination with fresh materials from excavations in cuttings. The planned reuse of the material is detailed in Volume 6 materials utilisation.
		A4.3.5	MATERIALS	
			A4.3.5.2 Reclaimed Asphalt Material	The existing asphalt surfacing will be milled off and placed at approved stockpile areas for later reuse in the layerworks upon approval by the Engineer.
			A4.3.5.3 Bituminous Seal surfacings	The existing seal surfacing will be milled off and placed at approved stockpile areas for later reuse in the layerworks upon approval by the Engineer.
		A4.3.7	EXECUTION OF THE WORKS	
			A4.3.7.4 Milling	All loose areas exposed by milling to be removed by mechanical brooming.
			A4.3.7.7 Excavation of crushed stone, macadam, cemented and gravel materials	The crushed stone, macadam and gravel materials shall be milled off or excavated to stockpile for later use in the LSSG. A part time excavation controller with expertise level as junior foreman will be required.
			A4.3.7.9 Removal of existing pavement blocks	The existing paving blocks on sidewalks will be removed and stockpiled for the Local municipality to use or disposed at an approved spoil area.
			A4.3.7.12 Stockpiling of material	
			(a) Preparation of the stockpile site	The stockpile floor does not require stabilisation.
	A4.4		COMMERCIAL MATERIALS	
		A4.4.3	GENERAL	
			A4.4.3.1 Employer identified commercial materials	
			(a) Materials from commercial suppliers	Refer to Volume 6 for materials utilisation.
			(b) Materials from private or non-commercial suppliers	No private owned sources have been identified.
			(c) Materials from the Employer's own sources	No Employer's owned sources are available.
	C4.4		COMMERCIAL MATERIALS PART C: MEASUREMENT AND PAYMENT	
		C4.4.5	Bituminous stabilising agents	Measurements shall be based on dipstick readings where the dipstick has been calibrated to the tanker, and the quantity measured at the applicable temperature.

COTO CHAPTER 5: EARTHWORKS AND PAVEMENT LAYERS: CONSTRUCTION

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
5			EARTHWORKS AND PAVEMENT LAYERS: CONSTRUCTION	
	A5.1		ROADBED	
		A5.1.2	DEFINITIONS	
			Batter	Slopes of 1 (vertical): 1,5 (horizontal) for soft material. In hard excavation with rock face the slope shall vary and is indicated on drawing 33532.00-103 series.
			Roller-pass (high-energy impact compactor or roller HEIC)	HEIC equipment is required and provisions of this clause will apply.
		A5.1.3	GENERAL	
			A5.1.3.1 Roadbed material Investigation	A combination of roadbed treatments will be used due to the variability of the subgrade conditions along certain portions of the road. These are summarised below and discussed in Volume 6 materials utilisation.
		A5.1.5	MATERIALS	
			A5.1.5.2 Topsoil	Topsoil will be sourced from cut widenings, box cuts and realignments.
			A5.1.5.3 Collapsing soil material	Refer Volume 6 materials utilisation.
		A5.1.6	CONSTRUCTION EQUIPMENT	High Energy Impact Compactors (HEIC) shall be equipped with functioning continuous impact response metering and GPS.
		A5.1.7	EXECUTION OF WORKS	
			A5.1.7.1 Clearing and grubbing	The entire roadbed shall be cleared and grubbed as specified in Section A1.6 of Chapter 1 ahead of any topsoil being removed. Material to be spoiled at Contractor's designated sites.
			A5.1.7.2 Removal and conservation of topsoil from roadbed	Topsoil will be stockpiled to a maximum height of 2.0 m and comply with all provisions of the environmental management plan. Refer Volume 6 materials utilisation for further details on depth of topsoil removal.
			A5.1.7.3 Normal roadbed treatment	
			(a) Construction overview	The roadbed will be ripped to a depth of 150 mm and compacted to 93% MDD. When the roadbed to be treated is located on a slope that is steeper than 1 (one) vertical to 10 (ten) horizontal, the roadbed treatment shall be benched as specified in Clause A5.2.7.3. No additional payment shall be made for

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				construction of benches and shall be included in the rates provided.
			(b) Removal of unsuitable roadbed material	Unsuitable material will be removed to a depth of 1.0 m below the roadbed and spoiled at designated sites identified by the contractor or in 200 mm layers as instructed by the Engineer. Refer Volume 6 materials utilisation for further details on removal of unsuitable roadbed material.
			(c) Percentage of Max Dry density (MDD)	The minimum depth of specified roadbed treatment is 150 mm deep compacted to 93% of MDD.
			(e) Compaction of collapsible soil	
			<i>(i) General</i>	The material can be compacted in situ using conventional or HEIC rollers as determined during the trial section.
			<i>(ii) Soil collapse construction</i>	The measurable criteria to confirm that soil collapse has taken place, such as percentage of MDD, the in-situ measured CBR (by DCP), the amount of collapse settlement, and so forth, shall be specified by the Engineer on site.
			<i>(iii) Non wetting-up roadbed collapse</i>	The material can be compacted in-situ using conventional rollers and/or HEIC rollers as determined during the trial section.
			(f) Hard material	
			<i>(i) In situ treatment by ripping</i>	The requirements of Clause A5.1.7.3 (f)(i) shall apply.
			<i>(ii) In situ treatment by drilling and rock breaking</i>	The requirements of Clause A5.1.7.3 (f)(ii) shall apply.
			(g) Inactive clay and normal clay	
			<i>(ii) Lime modification</i>	Mixing should be limited to a depth of 200 mm.
			<i>(iii) Removal of material</i>	To a depth of 1000 mm or as specified by the Engineer in layers of 200 mm thick.
			(i) Construction of a pioneer layer	Where fill is to be constructed across water-logged or soft clayey ground, that exhibits excessive movement under normal compaction equipment and haulage trucks (unstable material), and such conditions preclude the effective compaction of the bottom fill layers, or the effective removal of the material to spoil, a pioneer layer shall be constructed directly over this material. The levelling layer on pioneer and rockfill shall consist of a G7 minimum quality.
		A5.1.8	WORKMANSHIP	
			A5.1.8.2 Compaction requirements	Randomly generated locations will be used for the in-situ density tests.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
	C5.1		ROADBED PART C: MEASUREMENT AND PAYMENT	No additional payment shall be made, nor shall any claim for additional payment be considered for construction of benches as per payment item C5.1.12 and shall be included in the rates provided in this section.
		C5.1.13	Construction of a levelling layer	The volume of the levelling layer can be computed as 70% of the loose volume in the haul trucks.
	A5.2		FILL	
		A5.2.3	GENERAL	
			A5.2.3.1 Fill Dimensions and shape	Fill embankments shall be constructed to 1 (vertical): 1.5 (horizontal).
			A5.2.3.2 Fill adjacent to existing fill	The provisions of Clause A5.2.7.4 shall apply.
			A5.2.3.3 Fill layer thickness	Normal fill shall be compacted in layers not exceeding 200 mm, after compaction.
			A5.2.3.4 Fill compaction classification	
			(a) MDD compaction	
			<i>(ii) Normal fill and Coarse Fill</i>	93% of MDD.
			<i>(iii) Fill widening</i>	93% of MDD.
			A5.2.3.5 Fill in restricted area	No additional payment shall be made for fills in restricted areas.
		A5.2.5	MATERIALS	
			A5.2.5.2 Use of fill materials	Material to be used for fill shall be: Normal Fill on the permanent works and coarse fill at the temporary deviation at Bridge B447.
		A5.2.7	EXECUTION OF THE WORKS	
			A5.2.7.3 Benching for fill construction	Clause A5.2.7.3 and Method A shall apply. No additional payment will be made for cutting of benches and shall be included in the rates provided.
			A5.2.7.4 Widening of fills	Clause A5.2.7.4 shall apply.
			A5.2.7.11 Drainage blanket layer in cuttings	Drainage blankets are required in selected hard rock cuttings or where high-water seepage is encountered.
		A5.2.8	WORKMANSHIP	
			A5.2.8.2 Materials Quality and compaction requirements	The compaction of fill materials shall comply with the requirements specified in Clause A5.2.3.4 and summarised in Table A5.2.8-1.
			Table A5.2.8-1	Fill embankments will be compacted to 93% of MDD.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
	C5.2		FILL	
			<i>(ii) Notes on measurement and pay items</i>	<p>(a) No additional payment shall be made, nor shall any claim for additional payment be considered, for cutting of benches and shall be included in the rates provided.</p> <p>(b) Payment under item 5.2.6 will be the area of fill constructed adjacent to the pavement layers and will not include fill under pavement layers as indicated on drawings in Volume 4.</p>
	A5.3		ROAD PAVEMENT LAYERS	
		A5.3.3	GENERAL	
			A5.3.3.3 Requirements prior to the construction of any pavement layer	All the provisions of Section A5.3.3.3 shall be applicable.
			A5.3.3.4 Compaction of pavement layer material	<p>No shorter period for compaction shall apply.</p> <p>Compaction as specified in Clause A5.3.5.2(a) will be applicable.</p>
			A5.3.3.7 Joints between pavement layers	
			(a) Location of joints	Pavement layers shall be staggered such that final manifestation of surfacing coincide with the centreline road marking.
			(b) Longitudinal joints	All the provisions of Section A5.3.3.7(b) shall be applicable.
			(c) Transverse Joints	All the provisions of Section A5.3.3.7(c) shall be applicable.
			A5.3.3.8 Pavement Layer Drainage	The subsoil will be constructed as shown in drawing 33532.00-123-05.
		A5.3.5	MATERIALS	
			A5.3.5.1 Material information	<p>Permanent Works:</p> <p>BSM 1 Base layer The 150 mm thick BSM1 foam layer must be constructed using crushed G5A material from hard rock cuttings.</p> <p>Upper C4 subbase layer The 150 mm thick (from km 0.0 to km 6.0) and 200 mm thick (km 6.0 to km 26.8) upper C4 layer must be constructed using crushed G5A material from hard rock cuttings.</p> <p>Lower C4 subbase Layer The 150 mm thick (from km 0.0 to km 6.0) must be constructed using crushed G5A material from hard rock cuttings.</p>

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				<p>G7 Upper selected layer full road width The 150 mm thick upper selected G7 layer must be constructed from km 0.0 to km 26.8 using crushed hard rock material from the cuttings.</p> <p>G9 Lower selected layer full road width The 150 mm thick lower selected G9 layer must be constructed from km 0.0 to km 26.8 using a combination of material from existing pavement layers and the crushed hard rock material from the cuttings.</p> <p>Temporary deviation: Base layer The 150 mm thick base G5A layer must be constructed from km 0.0 to km 26.8 using crushed hard rock material from the cuttings.</p> <p>Subbase C4 layer The 150 mm thick (from km 0.0 to km 26.8) must be constructed using crushed G5A material from hard rock cuttings.</p> <p>Upper selected layer The 150 mm thick upper selected G7 layer must be constructed from km 0.0 to km 5.54 using material from commercial sources.</p>
			A5.3.5.2 Pavement Layer thickness and compaction requirements	<p>BSM 1 Base</p> <ul style="list-style-type: none"> 150 mm thick compacted to 100% MDD <p>C4 Upper subbase</p> <ul style="list-style-type: none"> 150 mm thick compacted to 97% MDD (km 0.0 to km 6.0) 200 mm thick compacted to 96% MDD (km 6.0 to km 26.30) <p>C4 Lower subbase</p> <ul style="list-style-type: none"> 150 mm thick compacted to 95% MDD (km 0.0 to km 6.0) <p>G7 upper selected</p> <ul style="list-style-type: none"> 150 mm thick compacted to 95% MDD <p>G9 Lower selected</p> <ul style="list-style-type: none"> 150 mm thick compacted to 93% MDD
			(a) Pavement layer thickness requirements	<p>BSM 1 Base</p> <ul style="list-style-type: none"> 150 mm thick <p>C4 Upper subbase</p> <ul style="list-style-type: none"> 150 mm thick (km 0.0 to km 6.0) 200 mm thick (km 5.54 to km 26.30) <p>C4 Lower subbase</p> <ul style="list-style-type: none"> 150 mm thick (km 0.0 to km 6.0) <p>G7 upper selected</p> <ul style="list-style-type: none"> 150 mm thick

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				G9 Lower selected <ul style="list-style-type: none"> 150 mm thick
			(b) Gravel and soil pavement layer compaction requirements (G4B to G9 material)	G7 upper selected <ul style="list-style-type: none"> 150 mm thick compacted to 95% MDD G9 Lower selected <ul style="list-style-type: none"> 150 mm thick compacted to 93% MDD Refer to tables in Clause A5.3.5.2(a).
			(c) Crushed stone pavement layer compaction requirements (G1 to G4A and G5A material)	Refer to tables in Clause A5.3.5.2.
		A5.3.7	EXECUTION OF WORKS	
			A5.3.7.1 Controlling pavement layer thickness	
			(b) Minimum pavement layer thickness in transition areas	In accordance with provisions of Section A5.3.7.1.
			A5.3.7.2 Combining Materials	Seal and asphalt surfacing, Macadam, crushed stone, and gravels from existing road pavement layers with G9 material.
			A5.3.7.3 Construction of gravel pavement layers	
			(a) Construction	The position for the longitudinal construction joints shall always be below the future road markings except if it is indicated otherwise on the drawings or by the Engineer.
			A5.3.7.9 Construction of a Plant Mix Paver Laid (PMPL) layer	
			(b) Compacting a PMPL layer	
			<i>(i) Crushed stone</i>	100 % of MDD.
			A5.3.7.12 Construction of trial sections	
			(a) Trial Sections	The trial sections shall be maximum of 150 m in length and minimum of 3.0 m wide.
		A5.3.8	WORKMANSHIP	
			PA5.3.8.4 Construction tolerances for pavement layers	The provisions of Clause A5.3.8.4 shall apply.
			(d) Width tolerances	All road and pavement material layer widths and edges are indicated on the drawings and should be agreed and confirmed in writing on site before construction commences.
			(f) Surface texture	Maximum texture depth for 20 mm Cape Seals/ seal with slurry is 2.5 mm.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			PA5.3.8.5 Surface regularity	Surface regularity shall be assessed on all layers by using method (c) profiler.
			(c) By using a profiler	<p>Payment adjustment for base layer shall be 1.71 to 1.80.</p> <p>The adjustments will be calculated by multiplying the full payment value for each 100 m section of pay items listed below, by the adjustment factor derived from Table A5.3.8-6:</p> <ul style="list-style-type: none"> Base: C5.3.2.1 (aa)
	C5.3		ROAD PAVEMENT LAYERS PART C: MEASUREMENT AND PAYMENT	
		C5.3.1	Compiling and implementing M&U plans for the construction of all the pavement layers	One plan will be required for each layer.
	A5.4		STABILISATION	
		A5.4.3	GENERAL	
			A5.4.3.2 Work in restricted areas	No additional payment will be made for treatment and stabilization in restricted areas.
		A5.4.5	MATERIALS	
			A5.4.5.3 Cementitious stabilising agents	<p>CEM II 32.5N shall be the cementitious stabilising agent used on this project at a nominal application rate of 3%.</p> <p>These nominal contents shall then be verified or adjusted, based on the laboratory test results and/or after the construction of a trial section.</p>
			A5.4.5.4: Bituminous stabilising agents	2.5% net binder using 70/100 penetration grade bitumen for BSM1-foam base layer.
		A5.4.7	EXECUTION OF THE WORKS	
			A5.4.7.1 Construction of a trial section	The Contractor shall allow sufficient time to test and assess all aspects of the trial sections as per the provisions of Clause A.5.4.7, prior to construction of the layer.
			A5.4.7.5 PMPL stabilized material	<p>150 mm Bitumen Stabilised Material (BSM 1-foam) using nominal 1% lime or cement as stabilising agent.</p> <p>These nominal contents shall then be verified or adjusted, based on the laboratory test results and/or after the construction of a trial section.</p>
			A5.4.7.7: Protection and curing of chemically stabilised layers	The lower subbase shall be cured using the subsequent stabilised layer.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			A5.4.7.7 (c)	<p>Spray grade emulsion for the subbase will be applied at 1.0 ℓ/ m² or as directed by the Engineer.</p> <p>Stable grade emulsion will be applied at 0.7 ℓ/ m² or as directed by the Engineer.</p> <p>The curing membrane shall be covered with the subsequent layer or surfacing within a maximum of 30 days after the membrane was applied.</p>

COTO CHAPTER 8:PRETREATMENT AND REPAIR OF EXISTING LAYERS

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
8			PRETREATMENT AND REPAIR OF EXISTING LAYERS	
	A8.1		PRIME COAT	
		A8.1.3	GENERAL	
			A8.1.3.1 Weather limitations	The limiting moisture contents for treated layers before priming shall be 50% of OMC.
		A8.1.5	MATERIALS	
			PA8.1.5.1 Bituminous material	The priming material shall be one of the following as specified in Part C: Measurement and Payment: C8.1.1.2 – MC-30 cut-back bitumen C8.1.1.3 – Inverted bitumen emulsion. Prime shall only be used for Temporary Works.
		A8.1.7	EXECUTION OF THE WORKS	
			A8.1.7.5 Opening to traffic	A blinding layer shall be applied as and when instructed by the Engineer.

COTO CHAPTER 9: ASPHALT LAYERS

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
9			ASPHALT LAYERS	
	A9.1		ASPHALT LAYERS	
		A9.1.2	DEFINITIONS	
			Asphalt mix types	Sa-H14 (PG64V-16 (EMB)) Sand skeleton mix (i.e. continuously graded mix) Designated: "Sa" Asphalt mix: Hot-mix asphalt NMPS mix size: "14" mm For use in: Heavy traffic loading conditions ("V") Binder: PG64V-16 Binder Modifier: Elastomer Modified (EMB) <i>(For example, a "Sa-E14" mix is thus a Sand Skeleton mix of Nominal Maximum Particle Size 14 mm to be used in Heavy traffic loading and speed conditions.)</i>
			Asphalt mixes Cold mix asphalt (CA)	No cold mix asphalts will be used for permanent works on this project.
			Aggregate	Grading Class 2 will be applicable to this project.
		A9.1.3	GENERAL	
			A9.1.3.1 Nominal mix proportions and application rates	
			Table A9.1.3-2: Nominal Mix Proportions of Sand Skeletal Mixes for Tender Purposes Bitumen (type and grade according to Contract Documentation) (%)	Continuously Graded base and surfacing: conventional and homogenous modified bitumen: Sa-H14 (PG64V-16 (EMB)) Nominal Maximum Particle Size (NMPS): 14 mm Aggregate % 93.5% PG64V-16 (EMB) 5.5% Active Filler: 1% Nominal thickness: 50 mm
			(b) Bond coat and rolled-in chippings	Bond coat: <ul style="list-style-type: none"> Asphalt Pavements <ul style="list-style-type: none"> 0.55 litre/m² stable grade emulsion (30% net bitumen) Bridge Decks and Concrete Pavements <ul style="list-style-type: none"> 0.4 litre/m² stable grade emulsion (30% net bitumen) Rolled-in chippings: 14 mm applied at 6 kg/ m ²

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
		A9.1.4	DESIGN BY THE CONTRACTOR	
			A9.1.4.1 Mix Designs	Sa-H14 (PG64V-16 (EMB)) Level II Mix Design Asphalt mix: Hot-mix asphalt Sand skeletal mix (i.e. continuously graded mix) NMPS: 14 mm For use in: Heavy traffic loading and speed conditions ("V")
			A9.1.4.2 Mix design requirements	Sa-H14 (PG64V-16 (EMB)) Level II Mix Design Sand skeletal mix (i.e. continuously graded mix) Asphalt mix: Hot-mix asphalt NMPS: 14 mm For use in: Very Heavy traffic loading and speed conditions ("V") Binder: PG64V-16 Binder Modifier: Elastomer Modified (EMB) 50 mm nominal thickness
		A9.1.5	MATERIALS	
			A9.1.5.2 Bituminous binders for asphalt mixes	PG64V-16 Elastomer Modified Binder: <ul style="list-style-type: none"> Maximum pavement Design temperature Tmax = 64°C Minimum grading temperature = -16°C Traffic Speed 20 to 80 km/h E80 Axles = 10 to 30 million
			A9.1.5.3 Bitumen bond coat	Bond Coat: Stable grade 30% net bitumen emulsion.
			PA9.1.5.4 Aggregates	
			(a) Aggregate Properties	Aggregate shall be clean as amended Clause PA9.1.5.4 in Section A2.
			A9.1.5.5 Fillers	In no instance shall more than 2% by mass of active filler be used in the mixes.
			Table A9.1.5-7: Filler requirements	<p>Filler shall comprise the material predominantly passing the 0.075 mm sieve and shall consist of either inert material (crushed rock fines) or an approved active filler or a combination thereof.</p> <p>Active filler shall consist of either hydrated lime, Portland cement, Portland blast furnace cement, fly-ash or a combination of these materials. Active fillers shall conform to the relevant SANS specification for the particular material".</p> <p>Baghouse fines and limestone dust will not be applicable to this contract.</p>
			A9.1.5.8 Mix properties	Mix design level II is applicable.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			A9.1.5.9 Asphalt Reinforcing	Asphalt reinforcing shall be glass fibre grids 25 x 25 mm with a minimum UTS of 100 kN/m used at the interface of the flexible pavement and bridge deck.
		A9.1.6	CONSTRUCTION EQUIPMENT	
			A9.1.6.5 Rollers	Only oscillating type vibratory compaction equipment may be used on bridge decks.
		A9.1.7	EXECUTION OF THE WORKS	
			A9.1.7.7 Compaction	The asphalt is to be compacted to a minimum of 93% voidless density but not more than 97% of voidless density.
			A9.1.7.9 Applying rolled-in chippings	Nominal size of 14 mm Grade A precoated chippings at 6 kg/m ² .
			A9.1.7.11 Surfacing of bridge decks	<p>The surfacing on the bridge decks shall consist of the following asphalt mixture:</p> <p>Sa-H14 (PG64V-16 (EMB))</p> <p>Level II Mix Design</p> <p>Sand skeletal mix (i.e. continuously graded mix)</p> <p>Asphalt mix: Hot-mix asphalt</p> <p>NMPS: 14 mm</p> <p>For use in: Very heavy traffic loading and speed conditions ("V")</p> <p>Binder: PG64V-16</p> <p>Binder Modifier: Elastomer Modified (EMB)</p> <p>50 mm nominal layer thickness</p>
		A9.1.8	WORKMANSHIP	
			A9.1.8.8 Sampling	
			(b) Coring of completed layers	The Contractor shall provide suitable coring equipment capable of cutting 100 mm or 150 mm diameter cores from the completed asphalt layers.
	C9.1		ASPHALT LAYERS: PART C: MEASUREMENT AND PAYMENT	
			<i>(ii) Note on measurement and pay items</i>	Milling of longitudinal or transverse keys at intersections, access or tie-inns shall be measured and paid under item PC9.1.15.2.

COTO CHAPTER 10: SURFACE TREATMENTS

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
10			SURFACE TREATMENTS	
	A10.1		GENERAL REQUIREMENTS FOR SURFACE TREATMENTS	
		A10.1.3	GENERAL	<p>The following seals will be constructed as part of this contract:</p> <ul style="list-style-type: none"> • Temporary shoulder widening and bypass for traffic accommodation: <ul style="list-style-type: none"> o 10 mm Seal with slurry o Binder: SC-E2; 70-73(t) o One layer of slurry • Final surfacing: <ul style="list-style-type: none"> o 20 mm Seal with slurry o Binder: <ul style="list-style-type: none"> – Hot applied: S-E2 – Cold applied: SC-E2; 70-73(t) o Two layers of slurry
			PA10.1.3.2 Weather limitations	<p>The following binder type may be used during the embargo period (middle April to middle September):</p> <ul style="list-style-type: none"> • SC-E2; 70-73(t)
			PA10.1.3.14 Nominal rates of application for tender purposes	The following Seal types are to be utilised.
			d) Nominal binder application and aggregate spread rates for Cape seals	<p>Nominal rates in accordance with Table A10.1.3-6 shall be used in the following applications:</p> <ul style="list-style-type: none"> • Cape seal: 10 mm and 20 mm <ul style="list-style-type: none"> o Hot applied homogeneous modified bitumen. o Homogeneous modified emulsion during the embargo period.
			e) Nominal binder application and aggregate spread rates for Cape seals (Slurry component)	<p>Nominal rates in accordance with Table A10.1.3-7 shall be used in the following applications:</p> <ul style="list-style-type: none"> • Cape seal: 10 mm • Cape seal: 20 mm
			A10.1.3.16 Precoating fluid	<p>Nominal rates in accordance with Table A10.1.3-9 on stockpile using a frontend loader, shall be used in the following applications:</p> <ul style="list-style-type: none"> • Cape seal: 10 mm • Cape seal: 20 mm

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
		A10.1.5	MATERIALS	
			A10.1.5.10 Single sized aggregate	
			(a) Grading	The Aggregate Grade is indicated in the Pricing Schedule
			(c) Homogeneous cold applied modified binders	<p>(i) The cationic emulsion shall comply with requirements of SANS 4001-BT1:2012.</p> <p>(ii) The Contractor shall specify the type of polymer utilised in the relevant pay items.</p> <p>(iii) The modified binder shall be:</p> <ul style="list-style-type: none"> • Class SC-E2; 70-73(t) <p>The volatile solvent flux added to the bitumen, shall be approved by the Engineer prior to any blending.</p>
			(d) Homogeneous hot applied modified binders (summer grades)	<p>(i) The base bitumen shall comply with the requirements of SANS 4001-BT1.</p> <p>(ii) The Contractor shall specify the type of polymer utilised in the relevant pay items.</p> <p>(iii) This product shall conform to a binder class S-E2 and shall comply with the requirements of the latest published TG1.</p>
			A10.1.5.3 Bituminous binders for cover sprays	Diluted 60 % anionic stable-grade emulsion (50/50) in accordance with Clause A8.2.3.2 of Chapter 8.
			A10.1.5.4 Bituminous binders for slurry seals	Slurry seal: 60 % anionic stable-grade emulsion.
			A10.1.5.8 Cutting back of bitumen in a dedicated plant	The cutting back of bitumen shall not be allowed.
			A10.1.5.9 Heating and storing of bituminous binders	
			(g) Bituminous binders for Cape seals	<p>The bituminous binders used for the Cape seals shall be as follows:</p> <ul style="list-style-type: none"> • Hot applied: S-E2 • Cold applied: SC-E2; 70-73(t) <p>The heating and storage temperatures and time limits shall be in accordance with the latest published TG1.</p>
			A10.1.5.10 Single sized aggregate	
			(a) Grading	The aggregate grade is indicated in the Pricing Schedule (Grade A).
			A10.1.5.17 Aggregate and fillers for slurry seals	
			(a) Aggregate	The aggregate used in the slurry shall be as specified for the following applications:

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				<ul style="list-style-type: none"> • 10 mm Cape seal: <ul style="list-style-type: none"> ○ Fine Slurry-Medium Grade • 20 mm Cape seal: <ul style="list-style-type: none"> ○ 1st layer: Fine Slurry-Medium Grade ○ 2nd layer: Fine Slurry-Fine Grade
	C10.1		GENERAL REQUIREMENTS FOR SURFACE TREATMENTS PART C: MEASUREMENT AND PAYMENT	
		C10.1.22	Bituminous single seal and slurry, including cover spray if specified:	Cover spray to be included and to be anionic bitumen emulsion.

COTO CHAPTER 11: ANCILLARY ROAD WORKS

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
11			ANCILLARY ROAD WORKS	
	A11.1		PITCHING, STONework, CAST IN SITU CONCRETE FOR PROTECTION AGAINST EROSION	
		A11.1.5	MATERIALS	
			A11.1.5.6 Geotextiles	Grade A synthetic needle punched non-woven fibre geotextile
	A11.2		NON-STRUCTURAL GABIONS	
		A11.2.5	MATERIALS	
			(f) Geotextile behind and below gabions	Grade A needle punched non-woven filter geofabric.
			(g) Assembly	As shown on drawing 32300.00-123-01-01.
	A11.4		ROAD RESTRAINT SYSTEMS	
		PA11.4.1	SCOPE	The concrete barriers will become the property of the Employer and will be transported to storage areas as directed by the Engineer. Hauling of concrete barriers to storage areas will be paid for separately.
		A11.4.4	DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS	The temporary longitudinal barrier system shall be H4b-W6 compliant and certified in terms of EN1317 or AASHTO MASH or NCHRP350 as alternative where no MASH product is available.
		A11.4.5	MATERIALS	
			A11.4.5.2 Materials	
			(a) Steel guardrails for erection on timber posts	Guardrail to be installed as shown on drawing 33532.00-190-01. A double guardrail will be installed in the urban sections.
			(c) Guardrail posts	Saligna (Bluegum) wood type, pressure impregnated in accordance with SANS 100005 with creosote which complies with SANS 538 or SANS 539.
		A11.4.7	EXECUTION OF THE WORKS	
			A11.4.7.2 Construction of guardrails on timber posts	Guardrail to be installed as shown on drawing 33532.00-190-01.
	A11.5		FENCING	
		A11.5.4	DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS	

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
		A11.5.5	MATERIALS	
			A11.5.5.2 Straining posts, stays, standards and droppers	<p>Timber: Shall comply with SANS 457-3 and shall be treated in accordance with SANS 100005 with creosote which complies with SANS 538 or SANS 539.</p> <p>Steel: Shall be fully galvanised and comply with SANS 121/ISO1461/CKS82.</p> <p>Fencing to be installed as shown on drawing 33532.00-190-08.</p>
		A11.5.7	EXECUTION OF THE WORKS	
			A11.5.7.11 Temporary fencing and gates	Erection of Stock-proof fences around stockpile, crushing areas and at localized deviations.
	A11.6		ROAD SIGNS	
		A11.6.5	MATERIALS	
			A11.6.5.2 Materials	
			(a) Structural steel	All steel members shall be pre-painted hot-dip galvanized steel.
		A11.6.7	EXECUTION OF THE WORKS	
			A11.6.7.1 Classification of Materials	Overbreak in width or depth, shall be in filled by the Contractor and shall not be measurable for payment.
			A11.6.7.2 Manufacturing of road signboards and supports	
			(d) Galvanizing	Supports will not require painting.
			PA11.6.7.5 Erecting road signs	
			(a) Position	<p>Permanent signs positions as shown on the 33532.00-114-01 to 33532.00-114-08 drawings and as per SARTSM.</p> <p>Temporary sign positions as shown on the 32300.00-119 drawings and as per SARTSM.</p>
			(b) Excavation and backfilling	<p>Soil-cement mixture shall be used in the foundation of supports.</p> <p>Concrete backfill, if required due to site conditions, will be as per Engineer's instruction.</p>
			A11.6.7.7 Dismantling, storing and re-erecting existing road signs	Dismantling of road signs include the sign panel and supports. No re-erecting is required, unless ordered by the Engineer.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA																		
	C11.6		ROAD SIGNS PART C: MEASUREMENT AND PAYMENT																			
			(ii) Notes on measurement and pay items	Excavations will be measured from the ground surface, defined as the level after any bulk earthworks have been carried out.																		
	A11.7		ROAD MARKINGS AND ROAD STUDS																			
		A11.7.5	MATERIALS																			
			PA11.7.5.2 Materials																			
			(a) Marking materials																			
			(ii) Retro-reflective road marking	Water borne paint.																		
			(iii) Thermoplastic road marking material	Thermoplastic paint shall not be applied earlier than 6 months after the date of issue of Taking- over Certificate, unless otherwise approved by the Engineer.																		
			(b) Road studs	Temporary plastic road studs with shaft (RSA- T). Permanent road studs to be hot-dip galvanized road studs with shaft complete with 43 elements (RSA-1).																		
	A11.8		LANDSCAPING AND PLANTING PLANTS																			
		A11.8.5	MATERIALS																			
			A11.8.5.2 Materials																			
			(b) Fertiliser/soil- improvement material	Fertilizer/soil-improvement material to be used as per items included under pay item C11.8.3.5.																		
			(d) Grass seeds	<div>The grass seed mixture will be mixed and applied as follows:</div> <table><tr><th>Description</th><th>kg</th></tr><tr><td>Anthepora pubescenes (Borseltjie)</td><td>7</td></tr><tr><td>Cenchrus ciliaris (Blue buffalo)</td><td>4</td></tr><tr><td>Eragrostis curvula (Oulands)</td><td>4</td></tr><tr><td>Digitaria eriantha (Smutsfinger)</td><td>8</td></tr><tr><td>Cynodon dactylon (Kweek)</td><td>7</td></tr><tr><td>Eragrostis teff (Teff)</td><td>2</td></tr><tr><td>Chloris gayana (Rhodes)</td><td>8</td></tr><tr><td>Application rate:</td><td>40kg/ha</td></tr></table>	Description	kg	Anthepora pubescenes (Borseltjie)	7	Cenchrus ciliaris (Blue buffalo)	4	Eragrostis curvula (Oulands)	4	Digitaria eriantha (Smutsfinger)	8	Cynodon dactylon (Kweek)	7	Eragrostis teff (Teff)	2	Chloris gayana (Rhodes)	8	Application rate:	40kg/ha
Description	kg																					
Anthepora pubescenes (Borseltjie)	7																					
Cenchrus ciliaris (Blue buffalo)	4																					
Eragrostis curvula (Oulands)	4																					
Digitaria eriantha (Smutsfinger)	8																					
Cynodon dactylon (Kweek)	7																					
Eragrostis teff (Teff)	2																					
Chloris gayana (Rhodes)	8																					
Application rate:	40kg/ha																					
			(e) Trees and shrubs	The contractor is required to investigate all indigenous plant to be affected. The following protective trees were observed:																		

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				<ul style="list-style-type: none"> • Marula Tree; • Leadwood;
			<ul style="list-style-type: none"> • Grass sods 	The provisions of this clause shall apply.
			<ul style="list-style-type: none"> • Nursery grown sods 	Buffalo grass sods is specified.
			(g) Manure	Chicken manure is specified.
		A11.8.7	EXECUTION OF THE WORKS	
			A11.8.7.3 Grassing	
			(c) Hydroseeding	<p>The types and mixtures of seeds to be used shall be agreed on by the Engineer and the Contractor before any seed of his choice is specified by the Contractor.</p> <p>Topsoil thickness shall be 75 mm with a 15 mm tolerance allowed.</p> <p>The rate of application shall be not less than 38 kg of seed mixture per hectare.</p>
			A11.8.7.7 General	
			(d) Proprietary brand materials used for erosion prevention	Dustex will be applied in accordance with suppliers' requirements.

COTO CHAPTER 12:GEOTECHNICAL APPLICATIONS

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
12			GEOTECHNICAL APPLICATIONS	
	A12.1		PILING	
		A12.1.3	A12.1.3.1 Method Statements	<p>Piling contractor to have completed at least 5 major piling projects each of a minimum value of R3 million Rand.</p> <p>Piling contractor to own the appropriate piling rig for the installation of the 610 mm diameter down-the-hole hammer drilled piles.</p> <p>Piling contractor to provide a method statement before the commencement of the piling works. Site supervisors to have a minimum of 10 years' experience. Piling rig operators to have a minimum of 5 years' experience.</p>
			A12.1.3.2 Materials and materials design	Materials are as indicated on drawing 33532.00-201 series.
			A12.1.3.4 Pile type and piling layout	Pile type and piling layout as per drawing 33532.00-201 series.
		A12.1.5	MATERIALS	
			A12.1.5.2 Concrete and grout	Concrete for piles to be D32/40-XC4(100)-20.
			A12.1.5.6 Reinforcement steel	The type of bar for steel reinforcement will be as indicated on the drawings.
			A12.1.5.10 Steel tubes	4,0 mm wall thickness.
		A12.1.6	CONSTRUCTION EQUIPMENT	
			A12.1.6.1 General	Depth, position, and rock type varies along bridges. Refer to summarised borehole logs on long section and detailed borehole logs.
			A12.1.6.2 Installation equipment	Computer-controlled monitoring and control systems needed as applicable for rota piles.
		A12.1.7	EXECUTION OF WORKS	
			A12.1.7.1 Test Piles	Three test piles to be chosen by the Engineer on site. Test piles to form part of completed structure.
			A12.1.7.5 Construction Tolerances	Construction tolerances are as specified in Clause A12.1.8.1.
			A12.1.7.6 Piling Materials	<p>Boulders identified have a maximum size of 300 mm. The identified rock formations are:</p> <ul style="list-style-type: none"> • Medium hard greywacke • Hard greywacke • Very hard greywacke

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			A12.1.7.7 Cast in situ concrete piles	
			(b) Formation of holes for piles	The drilling hole dimensions and elevations is specified on the drawings.
		A12.1.8.	WORKMANSHIP	
			A12.1.8.1 Tolerances	A maximum construction tolerance for pile positioning is 100 mm.
			A12.1.8.2 Concrete and grout	Concrete for piles to be D32/40-XC4(100)-20.
			A12.1.8.3 Core drilling	Cores to be taken for last 1,0 m depth to bottom of pile with a diameter of 85 mm.
			A12.1.8.4 Load tests on piles	
			(a) Static load testing	
			<i>(ii) Loading</i>	Loading is as indicated on the drawings. 10 mm allowable settlement.
			(c) Pile Integrity testing	Pile integrity test using Cross Hole Sonic Logging or Low Strain Impact Integrity Tests or Low Strain Dynamic Tests, should be undertaken on all piles as shown on the drawing <u>or as indicated by the Engineer.</u>
	A12.5		SHOTCRETE	
		A12.5.3	GENERAL	
			A12.5.3.1 Method Statements	<p>No work to commence without the Engineer's approval.</p> <p>Minimum experience of 8 years as a shotcrete company and 8 years for the shotcrete Foreman. Other shotcrete personnel should have at minimum 5 years of experience. All trial sections to be inspected by the Engineer. A minimum of 1 trial section per 150 m² of provisioned shotcrete is required. Trial sections should be carried out to the required design thickness on the cut face with a minimum area of 2,0 m².</p> <p>Plant shall be fully capable of producing low variability shotcrete, with suitable mixture ratios, to meet the required strength. Honeycombing of the shotcrete will not be acceptable.</p>
			A12.5.3.2 Materials and materials design approvals	<p>Shotcrete to be minimum 30 MPa (SP25).</p> <p>The Contractor is to submit to the Engineer: Shotcrete mix designs, indicating the type of admixtures and curing compounds; and construction method statements as per Table A12.5.3-1.</p>

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
		A12.5.4	DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS	
			A12.5.4.1 General	Shotcrete application is to be carried out on slopes and/or at elevated positions. The Contractor is to ensure plant suitability.
			A12.5.4.2 Shotcreting	Plant shall be fully capable of producing low variability shotcrete, with suitable mixture ratios, to meet the required strength. Honeycombing of the shotcrete will be unacceptable. Shotcrete to be minimum 30 MPa (SP25), high adhesion, low shrinkage.
		A12.5.5	MATERIALS	
			A12.5.5.8 Reinforcement	As per relevant drawings.
			A12.5.5.9 Compressive strength, ultimate flexural strength and energy absorption capacity	Shotcrete thicknesses and reinforcement as per relevant design drawings. Energy absorption using fibre reinforcement is not a requirement.
			A12.5.5.10 Drainage systems, geopipe collectors and weepholes	250 mm wide geocomposite (wick) drains are to include 4,0 mm thick drainage core wrapped in grade A needle punched non-woven geofabric. Vertically hung wick drains are to be fed through the specified weep holes, comprising 50 mm ID U-PVC pipes, placed 1,0 m above the bottom of cut prior to shotcrete application on the cut face. For stability mitigation measures: Wick drains are to be placed between rock/soil face and shotcrete at a minimum horizontal spacing of 3,0 m.
		A12.5.7	EXECUTION OF THE WORKS	
			A12.5.7.1 Mix design	Shotcrete to be minimum 30 MPa (SP25), high adhesion, low shrinkage.
			A12.5.7.3 Surface and slope preparation	Geocomposite band drains to be 250 mm wide geocomposite (wick) drains to be installed on all cut faces prior to shotcrete application.
			A12.5.7.17 Aesthetic appearance	Vegetation may be planted on the finished slope where stability mitigation measures are deemed a requirement by the Engineer.
	C12.5		SHOTCRETE	
			<i>(ii) Notes on measurement and pay items</i>	No additional payment shall be made, nor shall any claim for additional payment be considered, for specified work at any elevated height above the final road surface.
	D12.5		SHOTCRETE	Shotcrete to be minimum 30 MPa (SP25), high adhesion, low shrinkage. Use of propriety add-

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				mixtures may not detract from the long-term strength specified.
		D12.5.2	GENERAL	The Contractor may implement the use of propriety systems, processes, and materials only on approval of the Engineer.
	A12.8		GROUND DRAINAGE	
		A12.8.1	SCOPE	Dewatering of excavations shall not be regarded as temporary works and payment will be made in this regard. This will be applicable during the river bridge works.
			A12.8.7.4 Vertical band / Wick drains	
			(a) General	250 mm wide geocomposite (wick) drains are to include 4,0 mm thick drainage core wrapped in grade A needle punched non-woven geofabric.
	D12.8		GROUND DRAINAGE	Propriety products, processes and materials shall be suitable to achieve a design life of 100 years.
	A12.9		SLOPE PROTECTION MEASURES	
		A12.9.3	GENERAL	
			A12.9.3.2 Method Statements	No works can commence without the Engineer's approval of the relevant method statement as per Table A12.9.3-1. The Contractor shall have, and demonstrate by previous work done, a minimum of 5 years experience for installation of slope protection rock barriers.
		A12.9.4	DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS	500 kJ Energy rating. Design by propriety product specialist and approved by Engineer.
		A12.9.5	MATERIALS	
			A12.9.5.3 Catch fences	High tensile strength catch fences, inclusive of posts, anchors, connectors and cables.
		A12.9.7	EXECUTION OF THE WORKS	
			A12.9.7.1 General	
			(a) Method statements	No works may commence without the Engineer's approval.
			(c) Traffic control and lane closure	The Works shall comply with the requirements of Clause A1.5.
			(d) Cordoning off the works area	As directed by the Engineer or Health and Safety Officer.
			(f) Access for inspections,	Setting out to be carried out on site as required after cut slope assessment by Engineer.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			mapping, setting out and testing	
			A12.9.7.2 Process	
			(b) Anchoring of slope protection installations	As provided by the Propriety Product Specialist and approved by the Engineer.
			(e) Installation of catch fences shallow landslide fences and debris flow fences	As specified by the Propriety Product Specialist and approved by the Engineer.
	D12.9		SLOPE PROTECTION MEASURES	
		D12.9.2	GENERAL	Maximum elongation 5,5 m. Corrosion protection to comprise zinc-aluminium (95% Zn/5% Al) and coating to be minimum 150 g/m ² galvanised.
	A12.10		HARD EXCAVATION BY BLASTING	
		A12.10.2	DEFINITIONS	
			Pre-splitting	The Contractor shall arrange the spacing in such a way that the required particle size is archived.
		A12.10.3	GENERAL	
			A12.10.3.1 Method Statements	The Contractor shall prepare detailed method statements as per Table A12.10.3-1 for each facet of the work describing key aspects such as construction methodology, key plant, materials, personnel as well as any programme constraints of the envisaged construction process.
			A12.10.3.2 Materials, design and process approvals	The Contractor shall comply with the requirements of Table A12.10.3-1 and shall furthermore give the Engineer at least 24hrs written notification in respect of requests for required inspection(s).
		A12.10.7	EXECUTION OF THE WORKS	
			A12.10.7.3 Process	
			(b) Drilling	The Engineer's approval of the setting out shall be obtained one day prior to drilling of any blast holes.
	A12.11		GEOSYNTHETICS	
		A12.11.3	GENERAL	Relevant standards: SANS 1525 – ISO 10319 SANS 13431 – ISO 13431 SANS 12224 – EN 12224

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA																				
		A12.11.5	MATERIALS																					
			A12.11.5.1 General	Supplier to provide quality control test documentation for each product supplied, indicating conformance to standards mentioned above.																				
			PA12.11.5.4 Grade Classification	<p>Table A12.11.5-1 shall be used for determining the grade of the geosynthetics:</p> <p>TABLE A12.11.5-1: Grade Classification of Geosynthetics</p> <table><tr><th>Property</th><th>Grade A</th><th>Grade B</th><th>Grade C</th></tr><tr><td>Penetration load (CBR) (minimum), N Test Method: SANS 12236: 2013</td><td>2 600</td><td>1 700</td><td>9 800</td></tr><tr><td>Puncture resistance (maximum), mm Test Method: SANS 13433: 2013</td><td>19</td><td>27</td><td>3</td></tr><tr><td>Water percolation (minimum), l/m²/s Test Method: SANS 11058: 2013</td><td>54</td><td>77</td><td>20</td></tr><tr><td>Tensile strength (minimum) kN/m Test Method: SANS 1525: 2013</td><td>14</td><td>9</td><td>55</td></tr></table>	Property	Grade A	Grade B	Grade C	Penetration load (CBR) (minimum), N Test Method: SANS 12236: 2013	2 600	1 700	9 800	Puncture resistance (maximum), mm Test Method: SANS 13433: 2013	19	27	3	Water percolation (minimum), l/m²/s Test Method: SANS 11058: 2013	54	77	20	Tensile strength (minimum) kN/m Test Method: SANS 1525: 2013	14	9	55
Property	Grade A	Grade B	Grade C																					
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Tensile strength (minimum) kN/m Test Method: SANS 1525: 2013	14	9	55																					
	D12.11		GEOSYNTHETICS	Design life of materials is to exceed 100 years.																				

COTO CHAPTER 13:STRUCTURES

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
13			STRUCTURES	
	A13.1		FOUNDATIONS	
		A13.1.3	GENERAL	
			A13.1.3.2 Channel preservation	
			(a) Work on, over, in or adjacent to watercourses	
			<i>(i) General</i>	Flow of streams/ivers to be maintained at all times.
			A13.1.3.4 Method Statements	No permanent works can commence without the Engineer's approval.
			A13.1.3.5 Hold points	The following recommended absolute minimum hold points will require the engineer's approval and signoff: <ul style="list-style-type: none"> • Setting out • Completed excavations • Installed Reinforcing • Concrete pouring • Removal of shuttering
		A13.1.5	MATERIALS	
			A13.1.5.8 Soil cement	Requirements for soil cement are as per specifications given in A4.1.5.14
		A13.1.7	EXECUTION OF THE WORKS	
			A13.1.7.1 Work access and drainage	
			(a) General	Contractor to prepare a method statement setting out the proposed approach and methodology for providing the necessary access and drainage. The contractor may not commence with construction of the accesses until written permission has been obtained from the Engineer.
			A13.1.7.2 Excavation	
			(a) General	The expected excavation profile is indicated on the drawings indicating size and depth of the foundations.
			(g) The safety and protection of excavations	Contractor shall take all necessary precautions to safeguard stability and safety of excavations adjacent to road formations. Adequate lateral support must be provided in order not to undermine adjacent roads. The contractor shall give due attention to: Execution of excavation work under supervision of Contractor's Competent Person (CCP): <ul style="list-style-type: none"> • Stability of excavations and need to provide sufficient suitable shoring or bracing

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				<ul style="list-style-type: none"> • Provision of an effective barrier or fence along the perimeter to safeguard workers and where appropriate, vehicles • Prevention of run-off and surface drainage water from entering the excavations
			A13.1.7.5 Backfill and fill near structures	
			(a) General	Backfill behind reinforced concrete retaining walls and abutments shall only take place when passive backfill is in place and until the concrete is more than 14 days old. Backfill to Bridge B0594 can only take place once the deck has been constructed and achieved the minimum required strength.
			(b) Backfill	Level of backfill as indicated on the drawings.
			(d) Fill within restricted area	Limit of restricted backfill as indicated on the drawings.
			A13.1.7.6 Foundation fill	<p>Expected material to founding depth and anticipated bearing pressure are indicated on the general arrangement drawings for each structure.</p> <p>Crushed stone foundation fill to have a maximum dimension of 300 mm</p> <p>Blinding thickness and strength are as specified on the drawings.</p>
			A13.1.7.8 Foundation dowels	As indicated on the drawings.
	B13.1		FOUNDATIONS	
		B13.1.7	EXECUTION OF THE WORKS	
			B13.1.7.2 Excavation	
			(a) General	Borehole profiles are indicated on the drawings.
	D13.1		FOUNDATIONS	
	A13.2		FALSEWORK, FORMWORK AND CONCRETE FINISH	
		A13.2.3	GENERAL	
			A13.2.3.1 Method Statements	<p>The method statements shall be prepared and submitted to the Engineer for approval 3 weeks before the commencement of the anticipated facet of work.</p> <p>No permanent works can commence without the Engineer's approval.</p>
			A13.2.3.2 Hold points and approvals	The hold points requiring the Engineer's approval will be agreed as part of the approval process of the Contractor Quality Management Plan.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
		A13.2.5	MATERIALS	
			A13.2.5.3 Formwork	
			(a) Tongue-and-groove boarding	Width of tongue and groove boarding to be approved by the Engineer before use.
		A13.2.7	EXECUTION OF THE WORKS	
			A13.2.7.2 Formwork	
			(a) General	All edges to have a 25 mm x 25 mm chamfers unless noted otherwise.
			(b) Formed surfaces: Classes of finish	
			<i>(i) General</i> 3. Class F3 surface finish	Steel formwork may be used to create the desired F3 finish.
			(d) Formwork for open joints	Formwork for open joints shall apply to distances between opposite concrete surfaces less than 150 mm.
			A13.2.7.3 Removing the Falsework and Formwork	
			(b) Technical criteria for falsework and formwork removal	A minimum of 75% of the design strength of the concrete must be achieved before the stripping of formwork and falsework removal. The falsework for Bridge B0593 must be designed to achieve the construction sequence and traffic accommodation as per drawings 33532.00-215-02-01/02.
	D13.2		FALSEWORK, FORMWORK AND CONCRETE FINISH	
		D13.2.3	PERFORMANCE GUARANTEE REQUIREMENTS	
			D13.2.3.2 Performance specifications	Certification for erection of falsework and formwork must be provided by a suitably experienced ECSA Registered Professional Engineer or Technologist.
	A13.3		STEEL REINFORCEMENT	
		A13.3.3	GENERAL	
			A13.3.3.1 Method Statements	Method statement for approval by the Engineer must be provided 3 weeks minimum prior to any facet of the work.
			A13.3.3.2 Hold points and approvals	Should there be any discrepancy or ambiguity faced by the contractor regarding the installation of reinforcement, a hold point is deemed necessary which requires the Engineer's approval.
		A13.3.5	MATERIALS	
			A13.3.5.1 Steel bars	Type of bars indicated on the drawings.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
		A13.3.7	EXECUTION OF THE WORKS	
			A13.3.7.3 Placing and fixing	Position of reinforcement as indicated on the drawings.
			A13.3.7.4 Cover and supports	Cover to reinforcement as indicated on the drawings.
			A13.3.7.5 Laps and joints	Laps and joints to reinforcement as indicated on the drawings.
		A13.3.8	WORKMANSHIP	
			A13.3.8.2 Welding	Welding of reinforcement will not be permitted.
			PA13.3.8.4 Tolerances	
			(c) Spacing between bars	Spacing cannot be less than maximum size of aggregate used in concrete plus 5,0 mm.
	D13.3		STEEL REINFORCEMENT	
		D13.3.3	PERFORMANCE GUARANTEE REQUIREMENTS	
			D13.3.3.2 Performance specifications	All steel reinforcement must comply with the specifications set out in SANS 920:2011. A certificate must accompany each batch of reinforcement from an approved recognised laboratory. The Engineer may also request independent tests to confirm the compliance of the reinforcement used.
	A13.4		CONCRETE	
		A13.4.3	GENERAL	
			A13.4.3.1 Method Statements	The method statements shall be prepared and submitted to the Engineer for approval 3 weeks before the commencement of the anticipated facet of work. No permanent works can commence without the Engineer's approval.
			A13.4.3.2 Hold points and approvals	The hold points requiring the Engineer's approval will be agreed as part of the approval process of the Contractor Quality Management Plan.
		A13.4.5	MATERIALS	
			A13.4.5.1 Cementitious binder	
			A13.4.5.2 Aggregates	
			(a) Coarse aggregates	The aggregate crushing value to be determined using the 10% FACT.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
		A13.4.7	EXECUTION OF THE WORKS	
			PA13.4.7.12 Placing and Compaction	
			(a) Placing	
			(h) Curing and surface protection	Curing shall take place for a minimum of 14 days and when the concrete has reached a strength of 80% of the design strength.
			(i) Pipes, ferrules and conduits	A minimum of 30 mm cover is required over pipes and conduits. All holes for ferrules shall be filled using an approved shrinkage compensated grout. A method statement for the filling of ferrule holes shall be approved by the Engineer.
	D13.4		CONCRETE	
		D13.4.3	PERFORMANCE GUARANTEE REQUIREMENTS	
			D13.4.3.1 Performance specifications	Compliance certificates for all materials used for each concrete mix must be made available by the contractor for the Engineer's approval. Statistical analysis for concrete strength and durability indices of concrete samples will be carried out as per Chapter 20.
	A13.6		BEARINGS	
		A13.6.4	DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS	
			A13.6.4.1 Design of elastomeric bearings	
			(a) Technical data	Technical data for elastomeric bearings as indicated on the drawings.
			A13.6.4.2 Design of proprietary bearings	
		A13.6.5	MATERIALS	
			A13.6.5.1 Bearings in structures	
			(c) Elastomer	
			<i>(i) General</i>	Elastomer shore hardness to be 60°.
			(g) Proprietary mortars	
			<i>(iii) Mortar Thickness under bearings</i>	Maximum epoxy mortar thickness on the drawings not to exceed 20 mm.
	D13.6		BEARINGS	
		D13.6.3	PERFORMANCE GUARANTEE REQUIREMENTS	
			D13.6.3.2 Performance specifications	Each elastomeric bearing type to be tested in accordance with the requirements of EN

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				1337-3 Section 8. All bearings to be certified accordingly.
	A13.7		JOINTS	
		A13.7.3	GENERAL	
			A13.7.3.1 Method Statements	<p>The method statements shall be prepared and submitted to the Engineer for approval 3 weeks before the commencement of the anticipated facet of work.</p> <p>No permanent works can commence without the Engineer's approval.</p>
		A13.7.4	DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS	
			A13.7.4.1 Design and manufacture of proprietary joints	<p>Anticipated displacements of expansion joints are indicated on drawing 33532.00-215 series.</p> <p>Manufacture of cover plates are specified on drawing as above.</p>
		A13.7.7	EXECUTION OF THE WORKS	
			A13.7.7.1 Filled and unfilled joints	
			(b) Filled joints	Dimensions and filler material to be used for filled joints are indicated on drawing 33532.00-215 series.
			(c) Unfilled joints	Dimensions of unfilled joints are indicated on drawing 33532.00-215 series.
			(d) Concrete nosings forming the edges of expansion joints shall be constructed as follows	<p>Reinforcing steel shall be bent, fixed and placed in the concrete nosing as indicated on drawing 33532.00-215 series.</p> <p>Traffic will not be permitted to pass over a joint before the concrete in the nosing has aged for 10 days.</p>
	D13.7		JOINTS	
		D13.7.3	PERFORMANCE GUARANTEE REQUIREMENTS	
			D13.7.3.2 Performance specifications	Joints to be Agrément South Africa approved.
	A13.8		ANCILLARY STRUCTURAL ELEMENTS	
		A13.8.7	EXECUTION OF THE WORKS	
			A13.8.7.1 Barriers, parapets, railings and sidewalks	
			(a) Concrete barriers and parapets	Service ducts complete with inspection eyes in parapets and end blocks are as indicated on drawing as above.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			(d) Numbers for structures	
			<i>(i) Number plates</i>	Positions and the method of fixing are as indicated on the drawings.
			PA13.8.7.2 Drainage for structures	
			(a) Weep holes, drainage pipes and channels	Material for drainage pipes is as indicated on the drawings.
			(c) Synthetic filter fabric	Cuspated HDPE sheet wrapped in Grade A geotextile as specified in Clause PA12.11.5.4 non-woven needle punched geofabric. The placement of filter fabric is as indicated on drawing 33532.00-215 series.

COTO CHAPTER 20:QUALITY ASSURANCE

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
20			QUALITY ASSURANCE	
	A20.1		TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP	
		A20.1.3	TESTING METHODS	
			A20.1.3.3 The Costs of Testing	
			(a) Material and workmanship for quality control	Testing will be undertaken by an independent site laboratory as indicated under A20.1.3.3(a)(i)3.

SANRAL STANDARD SPECIFICATION SECTIONS

SECTION	CL	SUB-CLAUSE	SPECIFICATION DATA
SECTION C		ENVIRONMENTAL MANAGEMENT PLAN	
	C1004	ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS	
		(d) The Designated / Dedicated Environmental Officer (DEO)	DEO means: Full time dedicated Environmental Officer.
	C1012	PROJECT SPECIFIC CONDITIONS	The Employer will consider monitoring and reporting in terms of a sustainability rating tool and the Contractor will be required to engage through its appointed DEO with the ECO to provide all the relevant information.
SECTION D		STAKEHOLDER AND COMMUNITY LIAISON AND TARGETED LABOUR AND TARGETED ENTERPRISES UTILISATION AND DEVELOPMENT	
	D1002	DEFINITIONS AND APPLICABLE LEGISLATION	
		D1002.01 Definitions	
		(r) Target Area(s)	For Targeted Labour: Bela Bela and Modimolle-Mookgophong local municipalities.
		(w) Targeted Labour	Target Group for Targeted Labour: (a) black designated groups (As per latest PPPFA Regulations); (b) black people; (c) women; (d) people with disabilities
	D1003	TARGET GROUP PARTICIPATION	
		D1003.04 Contract Participation Goal (CPG)	
		CPG for Targeted Labour:	Minimum of 8% of the Final Contract Value by the end of the contract to Targeted Labour. Targeted Labour appointed for the Community Development work shall not contribute towards the CPG for Targeted Labour. The Final Contract Value is defined in clause D1003.04
		Targeted Labour minimum contributions by the following Target Groups:	
		(a) black designated groups; (i) Black people who are youth	30% of targeted labour value
		(ii) Black people who are persons with disabilities	0.3% of targeted labour value

		(b) Black women;	30% of targeted labour value
		CPG for Targeted Enterprise	<p>Minimum of 30 % of the Final Contract Value by the end of the contract to Targeted Enterprises.</p> <p>Targeted Enterprises appointed for the Community Development work shall not contribute towards the CPG for Targeted Enterprise.</p> <p>The Final Contract Value is defined in clause D1003.04.</p>
		Targeted Enterprise minimum contribution by the following Target Groups:	
		<i>(i) Targeted Enterprise with ≥51% ownership by Youth</i>	Minimum of 5% of the Final Contract Value
		<i>(ii) Targeted Enterprise with ≥51% ownership by Women</i>	Minimum of 5 % of the Final Contract Value
		<i>(iii) Targeted Enterprise with ≥51% ownership by Military veterans</i>	Minimum of 1 % of the Final Contract Value
		<i>(iv) Targeted Enterprise with ≥51% ownership by Disabled persons (Differently abled)</i>	Minimum of 0.5 % of the Final Contract Value
		<i>(v) Targeted Enterprise with CIDB 1 or 2 grading</i>	Minimum of 1% of the Final Contract Value
		<i>(vi) Targeted Enterprise with CIDB 3 or 4 grading</i>	Minimum of 1% of the Final Contract Value
	D1007	TENDER PROCESS FOR TARGETED ENTERPRISES	
		D1007.02 Procedures for Targeted Enterprises Subcontracting	
		(b) Tender process	
		<i>(ii) Conduct a tender briefing and tender training session</i>	<p>The Regional Transformation Officer's contact details are: Name: Tshegare Moletsane Cell phone: 062 707 3863 E-mail: MoletsaneT@nra.co.za</p>

	D1008	WORK SUITABLE FOR EXECUTION BY TARGETED ENTERPRISES	<ul style="list-style-type: none"> (a) Erection and maintenance of the Contractor's camp site (b) Clearing and grubbing. (c) Removal of trees. (d) Provision of traffic control facilities. (e) Management of traffic control facilities and traffic safety as part of the accommodation of traffic. (f) Construction and clearing of drains. (g) Installation of prefabricated culverts including inlet and outlet structures. (h) Concrete channelling and concrete linings for open drains. (i) Construction of concrete paving, kerbs and channels. (j) Construction of small concrete and other structures. (k) Construction of concrete walkways. (l) Pitching, stonework and protection against erosion. (m) Construction of gabions. (n) Erection of guardrails. (o) Landscaping. (p) Fencing. (q) Road signs. (r) Road markings. (s) Finishing the road and road reserve. (t) Site Security Services. (u) Haulage of materials (v) Supply of plant. (w) Supply of fuel. (x) Transport of labourers to site. (y) Specialised subcontract work such as: <ul style="list-style-type: none"> (i) Laying of asphalt using asphalt pavers. (ii) Structural concrete such as culvert and bridges. (iii) Batch plant erection and operations. (iv) Earthworks, layerworks construction.
SECTION E		REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS	
	E1018	PROJECT SPECIFIC CONSTRUCTION REQUIREMENTS	The baseline risk assessment is included as an appendix to Part C4.

SECTION C: ENVIRONMENTAL MANAGEMENT PLAN

SECTION C: ENVIRONMENTAL MANAGEMENT PLAN

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C1001 SCOPE

The South African National Roads Agency SOC Limited (SANRAL) recognises environmental management as a key component of road infrastructure development and as part of its Environmental Sustainability Framework has developed this Environmental Management Plan (EMP) as a tool for continual improvement in environmental performance.

This EMP prescribes the methods by which proper environmental controls are to be implemented by the Contractor for construction and maintenance projects. The duration over which the Contractor's controls shall be in place cover the construction period of the project as well as the limited time after contract completion defined by the Conditions of Contract for Construction for Building and Engineering Works Designed by SANRAL published by the Federation Internationale des Ingenieurs-Conseils (FIDIC) as the Defects Notification Period (maintenance period).

The provisions of this EMP are binding on the Contractor during the life of the contract. They are to be read in conjunction with all the documents that comprise the suite of documents for this contract, particularly the conditions of any environmental authorisation and associated site-specific Environmental Management Programme (EMPr). In the event that any conflict occurs between the terms of the EMP and the project specifications or environmental authorisation, the terms herein shall be subordinate.

The EMP is a dynamic document subject to similar influences and changes as are brought by variations to the provisions of the project specification. Any changes to the EMP and/or environmental authorisation cannot occur without being submitted to SANRAL who will manage the process of amending the EMP.

The EMP identifies the following:

- Relevant parties and their responsibilities;
- Construction activities that will impact on the environment;
- Specifications with which the Contractor shall comply in order to protect the environment from the identified impacts; and
- Actions that shall be taken in the event of non-compliance.

C1002 DEFINITIONS

Alien Vegetation: undesirable plant growth which includes but is not limited to all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA), 1983 and the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) Other vegetation deemed to be alien are those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.

Construction Activity: any action taken by the Contractor, his sub-contractors, suppliers or personnel during the construction process as defined in the contract **documents**.

Environment: the surroundings within which the contract exists and comprises land, water, atmosphere, micro-organisms, plant and animal life (including humans) in any part or combination thereof as well as any physical, **chemical**, aesthetic or cultural inter-relationship among and between them.

Environmental Aspect: any **component** of a contractor's construction activity that is likely to interact with the environment.

Environmental authorisation: a written statement from a Competent Authority, with the general and specific conditions and the EMPr **recording** its approval of an application for a planned undertaking that triggers listed activities in the Environmental Impact Assessment (EIA) regulations of the National Environmental Management Act (NEMA).

Environmental Impact: any change to the environment, whether desirable or undesirable, that will result from the effect of a **construction** activity. An impact may be the direct or indirect consequence of a construction activity.

Environmental Impact Assessment (EIA): a systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes Basic Assessment and Scoping and Environmental Impact Reporting.

Environmental Management Plan: An Environmental Management Plan (EMP) is an environmental management tool used to ensure that **adverse** impacts of the construction and operation and decommissioning of a project are prevented and/or minimised, and that the positive benefits are enhanced.

It is intended that this standard EMP be **the** base document for the development of the draft of each site-specific EMP that is to accompany each application to the relevant competent authority.

Environmental Management Programme (EMPr): A project-specific Environmental Management Plan approved by a competent authority through an environmental **impact** assessment process.

Road Reserve: a corridor of land, defined by co-ordinates and/or proclamation, within which the road, including access intersections or interchanges, is situated. A road reserve may, or may not, be bounded by a fence.

Site; the site is defined in the FIDIC Conditions of Contract and in the scope of works. It is bound by the limits of construction as shown in the drawings or the title of the project and extends to also include the following:

- Areas outside the construction zones where accommodation of traffic is placed;
- All borrowpits defined in the applications approved by the Department of Mineral Resources (DMR);
- All haul roads constructed by the Contractor for purposes of access;
- Any non-adjacent sites specified in the contract documentation;
- The Contractor's and his subcontractors' camp sites;

For the purposes of this EMP, the site includes areas outside of, but adjacent to, the road reserve that may be affected by construction activities;

Spoil material: is material that is unsuitable for construction of the road pavement and for which no other useful purpose can be found in additional works on the project (e.g. for the provision of protection berms). Such material requires spoiling at convenient areas to be identified by the Engineer and/or Contractor within the Site. Spoil material does not require removal to a designated landfill site unless it contains identifiable hazardous contaminants.

C1003 LEGAL REQUIREMENTS

(a) General

Construction shall be according to the best industry practices, as identified in the project documents. This EMP, which forms an integral part of the contract documents, informs the Contractor as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The Contractor should note that obligations imposed by the EMP are legally binding in terms of this contract. In the event that any rights and obligations contained in this EMP contradict those specified in the standard or project specifications then the latter shall prevail.

(b) Statutory and other applicable legislation

The Contractor is deemed to have made himself conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

Major environmental legislation, as amended from time to time, includes but is not limited to the following:

(i) Conservation of Agricultural Resources Act (Act No. 43 of 1983)

This act provides for control over the utilisation of the natural agricultural resources of South Africa in order to promote the conservation of soil, water sources and vegetation, as well as combating weeds and invader plants.

(ii) The Constitution (Act 6 of 1996)

The Constitution states that everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected through reasonable legislative and other measures to prevent pollution and ecological degradation; promote conservation and ensure ecologically sustainable development and use of natural resources.

(iii) Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)

This act makes provision for equitable access to, and sustainable development of, minerals and petroleum resources.

(iv) National Environmental Management Act (NEMA), (Act No. 107 of 1998)

This act supports the Bill of Rights within the Constitution and highlights principles of sustainable development including preservation of ecosystems and biological diversity and avoidance, minimisation and remediation of pollution and environmental degradation. It also sets the stage for the EIA Regulations.

(v) National Environmental Management: Air Quality Act (Act No. 39 of 2004)

This act provides reasonable measures for the prevention of pollution and ecological degradation; and provides for specific air quality measures; for national norms and standards regulating air quality monitoring, management and control by all spheres of government.

(vi) National Environmental Management: Biodiversity Act (Act No. 10 of 2004)

This act makes provisions to accomplish the objectives of the United Nations' Convention on Biological Diversity. SANRAL may be required to apply for permits to conduct certain listed activities which, together with the listed threatened or protected species, may be identified by the Minister.

Section 73 (3) of this act empowers a competent authority to direct a person to take steps to remedy any harm to biodiversity resulting from the actions of that person or as a result of occurrence of listed invasive species occurring on land on which that person is the owner. Thus SANRAL may be directed to remedy harm caused by listed invasive species.

(vii) National Environmental Management: Protected Areas Act (Act No. 57 of 2003)

This act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and seascapes.

(viii) National Environmental Management: Waste Act (Act No. 59 of 2008)

This act aims to regulate waste management practices through provision of national norms and standards, specific waste measures, licensing and control of waste activities, remediation of contaminated land as well as providing for compliance and law enforcement.

- (ix) National Forests Act (Act No. 84 of 1998)

This act makes provision for promoting the sustainable management and development of forests, and for the protection of certain forests and trees for environmental, economic, educational, recreational, cultural, health and spiritual purposes.

- (x) National Heritage Resources Act (Act No. 25 of 1999)

This act provides for an integrated and interactive system for identification, assessment and management of South Africa's heritage resources, and empowers civil society to nurture and conserve their heritage resources.

- (xi) National Water Act (Act No. 36 of 1998)

This act makes provision for the protection of surface water and groundwater and their sustainable management for the prevention and remediation of the effects of pollution, as well as for the management of emergency situations.

- (xii) The South African National Roads Agency Limited and National Roads Act (Act No. 7 of 1998)

This Act makes provision for a National Roads Agency for the Republic to manage and control the Republic's national roads system and take charge, amongst others, of the development, maintenance and rehabilitation of national roads within the framework of government policy.

C1004 ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS

Copies of this EMP shall be kept at the site office and must be distributed to all senior contract personnel who shall familiarise themselves with its contents.

Implementation of this EMP requires the involvement of several stakeholders, each fulfilling a different but vital role as outlined herein, to ensure sound environmental management during the construction phase of a project.

(a) SANRAL

SANRAL and anyone acting on SANRAL's behalf is accountable for the potential environmental impacts of any activities that are undertaken and is responsible for managing these impacts.

(b) The Engineer

The Engineer has been appointed by, and acts for, SANRAL as its on-site implementing agent and carries the responsibility to ensure that the Contractor undertakes its construction activities in such a way that SANRAL's environmental responsibilities are not compromised.

The Engineer will, within seven days of receiving a contractor's request for approval of a nominated Designated Environmental Officer (DEO), approve, reject or call for more information on the nomination. The Engineer will be responsible for issuing instructions to the DEO where environmental considerations call for action to be taken.

If in the opinion of the Engineer the DEO is not fulfilling his/her duties in terms of this EMP, the Engineer may, after discussion and agreement with SANRAL, exercise his powers under FIDIC general conditions of contract and instruct replacement of the DEO in writing and with stated reasons.

(c) The Contractor

The Contractor is responsible for project delivery in accordance with the prescribed specifications, among which this EMP shall be included.

The Contractor shall receive and implement any instruction issued by the Engineer relating to compliance with the EMP including the removal of personnel or equipment.

Compliance with the provisions contained herein or any condition imposed by the environmental approvals shall become the responsibility of the Contractor through an approved Designated Environmental Officer (DEO). The Contractor shall nominate a person from among his site personnel to fulfil this function and submit to the Engineer for his approval the *curriculum vitae* of the proposed DEO. This request for approval shall be given, in writing, at least fourteen days before the commencement of any construction activity clearly setting out reasons for the nomination, and with sufficient detail to enable the Engineer to make a decision.

(d) The Designated/Dedicated Environmental Officer (DEO)

Once a nominated representative of the Contractor has been approved, he/she shall become the DEO and shall be the responsible person for ensuring that the provisions of this EMP are complied with during the life of the contract. The DEO shall submit regular written reports to the Engineer but not less frequently than once a month.

The DEO may undertake other construction duties unless Section B: Specification Data, prescribes this position as 'Full-time' or 'dedicated' as opposed to the standard position being 'designated'. However, the DEO's environmental duties shall hold primacy over other contractual duties and the Engineer has the authority to instruct the Contractor to reduce the DEO's other duties or to replace the DEO if, in the Engineer's opinion, he/she is not fulfilling his/her duties in terms of the requirements of this EMP. Such instruction will be in writing clearly setting out the reasons why a replacement is required.

As a minimum the DEO shall have an accredited National Qualifications Framework (NQF) level 6 qualification in environmental or natural sciences or equivalent and a minimum of 2 years' experience in a similar role in construction or other environmental regulatory field.

In addition to the compliance duties relating to EMP the DEO shall also provide full cooperation whenever the Contractor is subjected to environmental audits.

(e) Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is an independent environmental specialist appointed by SANRAL or the Engineer to objectively and regularly monitor the Contractor's compliance with the conditions of the authorisations issued for the project and the approved EMP (that is this EMP augmented with specifics of the project). These are external audits and the regularity is determined by the environmental authorisations.

C1005 TRAINING

(a) Qualifications

The (DEO) shall have the minimum qualifications as prescribed above and must be conversant with all legislation pertaining to the environment applicable to the contract. He/she must be appropriately trained in environmental management and possess the skills necessary to impart environmental management skills to all personnel involved in the contract.

The Contractor shall ensure that adequate environmental training takes place. All employees and subcontractor's employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees.

(b) Content

Apart from induction environmental training should, as a minimum, include the course content below and no induction or course should be given until the Engineer has been afforded the opportunity to appraise it and provide comment.

- (i) The importance of conformance with all environmental policies and the consequences of departure from standard operating procedures;
- (ii) Environmental impacts, actual or potential, caused by work activities, prevention measures to avoid them and mitigation measures when they occur;
- (iii) Work force roles and responsibilities in achieving conformance with the environmental policy and procedures, including emergency preparedness and response requirements;
- (iv) The environmental benefits of improved personnel performance and
- (v) Consequences of non- compliance.

(c) Induction

In the case of permanent staff, the Contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the Contractor shall inform the Engineer when and how he intends concluding his environmental training obligations.

C1006 ACTIVITIES/ASPECTS CAUSING IMPACTS

Typical environmental aspects and impacts associated with road construction are listed in Table 1: *Aspects and Impacts Associated with Road Construction*. Actual impacts will differ from project to project and, therefore, so may the mitigation measures employed. The most common aspects and impacts are addressed separately, and typical avoidance and/or mitigation measures described. The list and descriptions are not by any means exhaustive and they shall be used for guideline purposes only.

Table 1: Aspects and Impacts Associated with Road Construction

Aspect	Potential Impact
Waste generation/storage	Water pollution; nuisance; visual impact
Water use and stormwater discharge	Change in flow regime and/or reduction in downstream availability; soil erosion: water pollution
Vehicle use and maintenance	Air pollution; noise
Chemical/fuel storage	Water/air/soil pollution; health impacts; accidents e.g. spills, fire
Site clearing; earthworks; layer-works; seal works	Change in landform; impact on heritage resources; noise; soil erosion; air pollution
River bridges; installing drainage structures	Water pollution; impact on river flows; noise
Land acquisition	Loss of land &/or livelihood; change in land use;
Acquisition of building material from borrow pits	Change in landform and use

(a) General approach

The role of the DEO cannot be underestimated and once approved he/she shall be on the site at all times, and before the Contractor begins each construction activity, he/she shall give to the Engineer a written statement setting out the following:

- (i) The type of construction activity about to be started.
- (ii) Locality where the activity will take place.
- (iii) Identification of the environmental aspects and impacts that might result from the activity.
- (iv) The methodology of impact prevention for each activity or aspect.
- (v) The methodology of impact containment for each activity or aspect.
- (vi) Identification of the emergency/disaster potential for each activity (if any) and the reaction procedures necessary to mitigate impact severity.
- (vii) Treatment and continued maintenance of impacted environment.

The Contractor shall programme his work in such a way that each cause and effect of a construction activity is also identified and the activity planned so as to prevent any impact from happening and shall demonstrate that he is capable of carrying out any repair and reinstatement of the damaged environment. These requirements shall be concurrent with the time constraints to produce method statements for each construction activity in compliance with the provisions of these project specifications.

The Contractor shall provide such information in advance of any or all construction activities provided that new submissions shall be given to the Engineer whenever there is a change or variation to the original.

The Engineer may provide comment on the methodology and procedures proposed by the DEO, but he shall not be responsible for the Contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the Contractor shall demonstrate at inception and at least once during the contract that the approved measures and procedures function properly.

(b) Spillages

Streams, rivers and dams shall be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous products. In the event of a spillage, the Contractor shall be liable to arrange for professional service providers to clear the affected area.

Responsibility for spill containment and treatment (whether hazardous or not) lies with the Contractor. The individual causing a spill, or who discovers a spill, must report the incident to his/her DEO or to the Engineer. The DEO will assess the situation in consultation with the Engineer and act as required. In all cases, the immediate response shall be to contain the spill. The exact treatment of polluted soil/water shall be determined by the Contractor in consultation with the DEO and the Engineer. Areas cleared of hazardous waste shall be re-vegetated according to the Engineer's instructions.

Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice will be sought for appropriate treatment and remedial procedures to be followed. The requirement for such input shall be agreed with the Engineer. The costs of containment and rehabilitation shall be for the Contractor's account, including the costs of specialist input as well as the sampling and testing of the water quality upstream and downstream of the spill. Water quality sampling and testing, and further treatment shall continue until upstream and downstream results correspond with each other.

(c) Water use and control

The Contractor's use of water shall take into consideration that it is a scarce commodity and shall be optimised. Authorisation shall be obtained from the

Department of Water and Sanitation (DWS) before water is drawn from streams or new boreholes developed.

The Contractor shall also ensure that any stream deviations or diversions are undertaken in such a manner that the impact on the environment is minimised. Method statements shall be submitted to the Engineer for comment, detailing how the work will be undertaken, what risks are foreseen and what measures will be employed to minimise such risks. Notwithstanding any comments by the Engineer, work on stream deviations or diversions shall be undertaken in accordance with GN 509 in GG 40229 of 26 August 2016 - General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 Of 1998) for Water Uses as defined in sections 21(c) and (i).

The quality, quantity and flow direction of any surface water runoff shall be established prior to disturbing any area for construction purposes. Cognisance shall be taken of these aspects and incorporated into the planning of all construction activities. Before a site is developed or expanded, it shall be established how this development or expansion will affect the drainage pattern. Recognised water users/receivers shall not be adversely affected by the expansion or re-development. No water source shall be polluted in any way due to proposed changes.

Streams, rivers, pans, wetlands, dams, and their catchments shall be protected from erosion and flooding by dredging, daylighting, removal of debris and vegetation, etc. These shall also be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous products.

The Contractor shall submit to the Engineer his proposals for prevention, containment and rehabilitation measures against environmental damage of the identified water and drainage systems that occur on the site. Consideration shall be given to the placement of sedimentation ponds or barriers where the soils are of a dispersive nature or where toxic fluids are used in the construction process. The sedimentation ponds must be large enough to contain runoff so that they function properly under heavy rain conditions up to 1:5 year severity.

The Contractor shall submit to the Engineer the results of the baseline water quality test taken above and below the site of the proposed activity; and thereafter monthly testing results or at the frequency as may be specified by the Water Use Licence/General Authorisation where applicable. No taking-over can be authorised until the water quality is shown to be at pre-construction levels or better.

(d) Vegetation management

The Contractor shall be responsible for the management of vegetation by protection of indigenous vegetation, especially identified protected species, and the prevention of alien vegetation germinating in areas disturbed by road construction activities within and outside the road reserve. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for or from road construction has been stored temporarily. This responsibility shall continue for the duration of the defects notification period. The project specification may instruct the removal of CARA and/or NEMBA-listed category 1 and 2 alien species and planting of specified indigenous species.

(e) Dust control

Dust caused by construction activities shall be controlled by appropriate means and applied at sufficient frequency so as not to cause nuisance to adjacent habitation or affect farming activities or natural vegetation. Vegetation cover should also be kept for as long as possible to reduce the area of exposed surfaces. Dust emissions from batching and screening plants shall be subject to the relevant legislation and shall be the subject of inspection by the relevant authorities.

(f) Noise control

The Contractor shall endeavour to keep noise generating activities to a minimum. Noises that could cause a major disturbance, for instance blasting and crushing activities, should only be carried out during the hours prescribed by the conditions of contract (i.e. normal hours). Should such noise generating activities have to occur at any time outside normal hours the people in the vicinity of the noise-generating activity shall be warned about the noise well in advance and the activities kept to a minimum. Relevant legislation shall also be taken into consideration, and any practical mitigation measures adopted. No noise generating activity outside of normal hours, regardless of its proximity to residences, can take place without application to the Engineer for approval. The application shall be accompanied by the noise containment measures proposed.

(g) Energy consumption

The Contractor shall take into consideration the impacts of high energy consumption, both from a cost and emissions point of view. Energy use shall be minimised, and where possible, alternative energy sources such as solar utilised.

Furthermore, the Contractor shall measure and keep records of the consumption of carbon units his chosen method of construction produces in the execution of his programme. In conjunction with the Engineer who will provide complete cooperation, a month by month output shall be compiled and efforts made to see how these outputs can be curtailed and reduced.

C1007 ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES

The Contractor shall undertake “good housekeeping” practices during construction as stated in the COTO Standard Specifications for Roads and Bridges and the FIDIC conditions of contract. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment within which the site is situated.

The construction activities addressed below shall become part of the Contractor's obligations regarding his programme of work and incorporated into the required method statements for workmanship and quality control.

(a) Site establishment

(i) Site Plan

The site refers to an area with defined limits on which the project is located. The Contractor shall establish his construction camps, offices, workshops, staff accommodation and testing facilities on the site in a manner that does not adversely affect the environment. However, before any site establishment can begin, the Contractor shall submit to the ECO for his comments and to the Engineer for his approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the Contractor proposes to put in place.

The plans shall detail the locality as well as the layout of the waste management facilities for litter, kitchen refuse, sewage and workshop-derived effluents. The site offices should not be sited in close proximity to steep areas, as this will increase soil erosion. Preferred locations would be flat areas along the route. If the route traverses water courses, streams and rivers, it is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles are located as far away as possible from any water course. No camp establishment, including satellite camps, can be placed within 150 metres of an identified watercourse unless the Contractor has applied to DWS and

received authorisation to do so. Regardless of the chosen site, the Contractor's intended mitigation measures shall be indicated on the plan. The site plan shall have been submitted and approved before establishment commences. Detailed, electronic colour photographs shall be taken of the proposed site before any clearing may commence. These records are to be kept by the ECO and the Engineer for consultation during rehabilitation of the site in order that rehabilitation is, as a minimum, done to a standard similar to pre-construction activities.

(ii) Vegetation

The Contractor has a responsibility to inform his staff of the need to be vigilant against any practice that will have a harmful effect on vegetation.

The natural vegetation encountered on the site is to be conserved and left as intact as possible. Vegetation planted at the site shall be indigenous and in accordance with instructions issued by the Engineer. Only trees and shrubs directly affected by the works, and such others as may be indicated by the Engineer in writing, may be felled or cleared. In wooded areas where natural vegetation has been cleared out of necessity, the same species of indigenous trees as were occurring shall be re-established. Protected trees may not be removed without a permit from the Department of Forestry, Fisheries and Environment.

Contravention of a notice of listed protected tree species under the National Forests Act, 1998 is regarded as a first category offence that may result in a fine or imprisonment for a period up to three years, or to both a fine and imprisonment. The DEO must be conversant with the latest gazette of declared protected trees.

Rehabilitation shall be undertaken using only indigenous tree, shrub and grass species. Special attention shall be given to any search and rescue operation identified during the environmental assessment process, and any removal to an on-site nursery for continuous nurturing and protection and later replanting.

Any proclaimed weed or alien species that propagates during the contract period shall be cleared by hand before seeding.

Fires shall only be allowed in facilities or equipment specially constructed for this purpose. The need for a firebreak shall be determined in consultation with the Engineer and the relevant authorities, and if required a firebreak shall be cleared and maintained around the perimeter of the camp and office sites.

(iii) Water management

Water for human consumption shall be available at the site offices and at other convenient locations on site.

All effluent water from the camp/office sites shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water sources (streams, rivers, pans, dams etc). Only domestic type wastewater shall be allowed to enter this system.

(iv) Heating and cooking fuel

The Contractor shall provide adequate facilities for his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The Contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

(b) Sewage management

Particular reference in the site establishment plan shall be given to the treatment of sewage generated at the site offices, site laboratory and staff accommodation and at all localities on the site where there will be a concentration of labour. Sanitary arrangements should be to the satisfaction of the Engineer, the local authorities and legal requirements.

Safe and effective sewage treatment will require one of the following sewage handling methods: septic tanks and soak-aways, dry-composting toilets such as “enviro loos”, or the use of chemical toilets which are supplied and maintained by a specialist service provider. The type of sewage management will depend on the geology of the area selected, the duration of the contract and proximity (availability) of providers of chemical toilets. The waste material generated from these facilities shall be serviced on a regular basis. The positioning of the chemical toilets shall be done in consultation with the Engineer. Should a soak-away system be used, it shall not be closer than 800 metres from any natural water course or water retention system and shall be approved by the Engineer in consultation with the ECO.

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on the works. Use of the veld for this purpose shall not, under any circumstances, be allowed.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. The toilets shall also be placed outside areas susceptible to flooding. The Contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such latrines in a clean, orderly and sanitary condition to the satisfaction of the Engineer.

(c) Waste management

The Contractor’s intended methods for waste management shall be outlined and implemented at the outset of the contract and shall be to the satisfaction of the Engineer. A waste inventory shall be drawn up of all waste streams that will possibly be generated by the site/project and an integrated approach shall be taken to its management. Records shall be kept of all waste disposed. Opportunities for avoiding, reducing, reusing and recycling of materials should be identified upfront, as should constraints for their implementation. All personnel shall be instructed to dispose of all waste in the proper manner.

(i) Solid waste

Solid waste shall be stored in an appointed area in covered, tip-proof metal drums or similar container for collection and disposal. Disposal of solid waste shall be at a licensed landfill site or at a site approved by the relevant authority in the event that an existing operating landfill site is not within reasonable distance from the project area. No waste shall be burned or buried at or near the project area.

(ii) Litter

No littering by construction workers shall be allowed and particular emphasis on litter control measures shall apply at stop/go facilities.

During the construction period, the various contractors’ facilities shall be maintained in a neat and tidy condition and the site shall be kept free of litter. At all places of work the Contractor shall provide litter collection facilities for later safe disposal at approved sites.

(iii) Hazardous waste

Hazardous waste such as oils shall be disposed of at an approved landfill site and proof of such disposal kept by the Contractor. Special care shall be taken to avoid spillage of bitumen products such as binders or pre-coating fluid to

avoid water-soluble phenols from entering the ground or contaminating surface water.

Under no circumstances shall the spoiling of bituminous products on the site, over embankments, in borrow pits or any burying, be allowed. Unused or rejected bituminous products shall be returned to the supplier's production plant. Any spillage of bituminous products shall be attended to immediately and affected areas shall be promptly reinstated to the satisfaction of the Engineer.

(iv) Construction and demolition waste

The opportunity for recycling and reuse of construction and demolition waste as fill for road embankments, land reclamation and drainage control must first be explored and take priority before the option of declaring these materials a 'waste'.

The Contractor is encouraged to actively engage with authorities and landowners adjacent to the site and identify where such materials can be usefully deployed to repair existing environmentally damaged areas such as erosion dongas.

(d) Control at the workshop

The Contractor's management and maintenance of his plant and machinery will be monitored according to the criteria given below:

(i) Hazardous Material Storage

Petrochemicals, oils and identified hazardous substances shall only be stored under controlled conditions. All hazardous materials such as bitumen binders shall be stored in a secured, appointed area that is suitably fenced, bunded and has restricted entry. Storage of bituminous products shall only take place using suitable containers to the approval of the ECO and the Engineer.

The Contractor shall provide proof to the Engineer that relevant authorisation to store such substances has been obtained from the relevant authority. In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure. Before containment or storage facilities can be erected the Contractor shall furnish the Engineer with details of the preventative measures he proposes to install in order to mitigate pollution of the surrounding environment from leaks or spillage. The preferred method shall be a concrete floor that is bunded. Any deviation from the method will require proof from the relevant authority that the alternative method proposed is acceptable to that authority. The proposals shall also indicate the emergency procedures in the event of misuse or spillage that will negatively affect an individual or the environment.

(ii) Fuel and gas storage

The Contractor shall take cognisance of the limits set by legislation for the storage of fuels and acquire the necessary authorisation for storage capacity beyond these. An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas to accommodate any leakage spillage or overflow of these substances. The area inside the bund wall shall be lined with an impervious lining to prevent infiltration of the fuel into the soil. Any leakage, spillage or overflow of fuel shall be attended to without delay.

Gas welding cylinders and LPG cylinders shall be stored chained in a secure, well-ventilated area exterior to any building wall.

(iv) Oil and lubricant waste

Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank and sent back to the supplier. Water and oil should be separated in an oil trap. Oils collected in this manner, shall be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials. Oil collected by a mobile servicing unit shall be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by a specialist oil recycling company.

Drip trays shall be used to collect any lubricants or fuel spilled where any vehicle and machinery are repaired or refuelled. The lubricants and fuel collected shall be handled as specified above.

All used filter materials shall be stored in a secure bin for disposal off site. Any contaminated soil shall be removed and replaced. Soils contaminated by oils and lubricants shall be collected and disposed of at a facility designated by the local authority to accept contaminated materials.

(e) Clearing the site

In all areas where the Contractor intends to or is required to clear the natural vegetation and soil, either within the road reserve, or at designated or instructed areas outside the road reserve, a plan of action shall first be submitted to the Engineer for his approval. Working areas shall be clearly defined and demarcated on site to minimise the construction footprint. 'No-go- areas' and other sensitive areas shall also be clearly demarcated on site, and staff must be made aware of them.

The plan of action shall contain a photographic record and chainage/land reference of the areas to be disturbed. This shall be submitted to the Engineer for his records before any disturbance/stockpiling may occur. The record shall be comprehensive and clear, allowing for easy identification during inspections.

(f) Soil management

(i) Topsoil

Topsoil shall be removed from all areas where physical disturbance of the surface will occur and shall be stored and adequately protected. The contract will provide for the stripping and stockpiling of topsoil from the site for later re-use. Topsoil is the natural soil covering, including all the vegetation and organic matter. Depth may vary at each site. The areas to be cleared of topsoil shall include all storage areas. All topsoil stockpiles and windrows shall be maintained throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil shall be removed by hand. Soils contaminated by hazardous substances shall be disposed of at an approved waste disposal site. The topsoil stockpiles shall be stored, shaped and sited in such a way that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water.

The Contractor shall ensure that no topsoil is lost due to erosion – either by wind or water. Areas to be top-soiled and grassed shall be done so systematically to allow for quick cover and reduction in the chance of heavy topsoil losses due to unusual weather patterns. The Contractor's programme shall clearly show the proposed rate of progress of the application of topsoil and grassing. The Contractor shall be held responsible for the replacement, at his own cost, for any unnecessary loss of topsoil due to his failure to work according to the progress plan approved by the Engineer. The Contractor's responsibility shall also extend to the clearing of drainage or water systems within and beyond the boundaries of the road reserve that may have been affected by such negligence.

(ii) Subsoil

The subsoil is the layer of soil immediately beneath the topsoil. It shall be removed, to a depth instructed by the Engineer, and if not used for road building it shall be stored and maintained separately from the topsoil so that neither stockpile is contaminated by the other. This soil shall be used for rehabilitation purposes by first spreading it over the excavated slopes without interfering with or contaminating the stockpiled topsoil.

Whilst in stockpile it shall be maintained free from erosion and weed infestation in the same way as for topsoil stockpile maintenance.

(g) Earthworks and layerworks

This section includes all construction activities that involve the mining of all materials, and their subsequent placement, stockpile, spoil, treatment or batching, for use in the permanent works, or temporary works in the case of deviations. Before any stripping prior to the commencement of construction, the Contractor shall have complied with the requirements of of this EMP. In addition, the Contractor shall take cognisance of the requirements set out below.

(i) Quarries and borrow pits

The Contractor's attention is drawn to the requirement of the Department of Mineral Resources, that before entry into any quarry or borrow pit, an Environmental Authorisation for the establishment, operation and closure of a quarry or borrow pit shall have been approved by the Department where applicable. It is the responsibility of the Contractor to ensure that he is in possession of the authorisation prior to entry into the quarry or borrow pit. The conditions imposed by the relevant authorisation are legally binding on the Contractor and may be more extensive and explicit than the requirements of this specification. In the event of any conflict occurring between the requirements of the specific authorisation and this EMP the former shall apply.

(ii) Excavation, hauling and placement

The Contractor shall provide the ECO and the Engineer with detailed plans of his intended construction processes prior to starting any cut or fill or layer. The plans shall detail measures by which the impacts of pollution (noise, dust, litter, fuel, oil and sewage), erosion, vegetation destruction and deformation of landscape will be prevented, contained and rehabilitated. Particular attention shall also be given to the impact that such activities will have on the adjacent built environment. The Contractor shall demonstrate his "good housekeeping", particularly with respect to closure at the end of every day so that the site is left in a safe condition.

(iii) Spoil sites

The Contractor shall be responsible for the safe siting, operation, maintenance and closure of any spoil site he uses during the contract period, including the defects notification period. This shall include existing spoil sites that are being re-entered. Before spoil sites may be used proposals for their locality, intended method of operation, maintenance and rehabilitation shall be given to the ECO for his/her comments and to the Engineer for his approval. The location of these spoil sites shall have signed approval from the affected landowner before submission to the ECO and the Engineer. No spoil site shall be located within 50m of any watercourse. A photographic record shall be kept of all spoil sites for monitoring purposes. This includes before the site is used and after re-vegetation.

The use of approved spoil sites for the disposal of any waste shall be prohibited.

Spoil sites will be shaped to fit the natural topography. Depending on availability, these sites shall receive a minimum of 75mm topsoil and be grassed with the recommended seed mixture. Appropriate grassing measures to minimise soil erosion shall be undertaken by the Contractor. This may include both strip and full sodding. The Contractor may motivate to the Engineer for other acceptable stabilising methods. The Engineer may only approve a completed spoil site at the end of the defects notification period upon receipt from the Contractor of a landowner's clearance notice.

(iv) Stockpiles

The Contractor shall plan his activities so that materials excavated from borrow pits and cuttings, in so far as possible, can be transported direct to and placed at the point where it is to be used. However, should temporary stockpiling become necessary, the areas for the stockpiling of excavated and imported material shall be indicated and demarcated on the site plan submitted in writing to the Engineer for his approval. The Contractor's proposed measures for prevention of environmental damage, containment and subsequent rehabilitation shall also be submitted.

The areas chosen shall have no naturally occurring indigenous trees and shrubs present that may be damaged during operations. Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of the stockpiles the Contractor shall at all times ensure that they are positioned and sloped to create the least visual impact, constructed and maintained so as to avoid erosion of the material and contamination of surrounding environment and kept free from all alien/undesirable vegetation.

After the stockpiled material has been removed, the site shall be re-instated to its original condition. No foreign material generated/deposited during construction shall remain on site. Areas affected by stockpiling shall be landscaped, top soiled, grassed and maintained at the Contractor's cost until clearance from the Engineer and the landowner is received.

Material milled from the existing road surface that is temporarily stockpiled in areas approved by the Engineer within the road reserve, shall be subject to the same condition as other stockpiled materials. Excess materials from windrows, in situ milling or any leftover material from road construction activities may not be swept off the road and left unless specifically instructed to do so in the contract documentation or under instruction from the Engineer.

The ECO shall comment on and the Engineer shall approve the areas for stockpiling and disposal of construction rubble before any operation commences and shall approve their closure only when they have been satisfactorily rehabilitated.

(v) Blasting activities

Wherever blasting activity is required on the site (including quarries and/or borrow pits) the Contractor shall rigorously adhere to the relevant statutes and regulations that control the use of explosives.

(h) On site plant

(i) Crusher, screening plants and concrete batching plants

Crushing plants and concrete batching plants, whether sited inside or outside of defined quarry or borrow pit areas, shall be subject to the requirements of the applicable industrial legislation that governs gas and dust emissions into the atmosphere. Such sites will be the subject of regular inspections by the relative authorities during the life of the project. In addition, the selection, entry onto, operation, maintenance, closure and rehabilitation of such sites shall be the same as for those under section C1007(g)(i) of this EMP, with the exception that the Contractor shall provide additional measures to prevent,

contain and rehabilitate against environmental damage from toxic/hazardous substances. In this regard the Contractor shall provide plans that take into account such additional measures as concrete floors, bunded storage facilities, linings to drainage channels and settlement dams. Ultimate approval of these measures shall be from the relevant authority, as shall approval of closure. The Engineer will assist the Contractor in his applications to the relevant authority.

Screening activities shall be undertaken so that dust and noise is minimised. This can be done by carefully choosing the site for the activity, and by using slightly damp material.

Effluent from concrete batch plants and crusher plants shall be reused where possible or treated in a suitable designated sedimentation dam to the legally required standards to prevent surface and groundwater pollution. The designs of such a facility should be submitted to the Engineer for approval.

(ii) Asphalt Plant

Asphalt plants shall be subject to the applicable legislation that governs establishment and operation of batching plants. The Contractor shall be responsible to obtain the necessary permit from the relevant authority.

Operation of the plant shall conform to the same requirements as for a crushing plant or concrete batching plant under C1007 h) i) above.

C1008 AREAS OF SPECIFIC IMPORTANCE

Any area, as determined and identified within the project documents as sensitive or of special interest within the site shall be treated according to the express instructions contained in these specifications or the specific environmental authorisation as well as the approved EMP. The Contractor may offer alternative solutions to the Engineer in writing should he consider that construction will be affected in any way by the hindrance of the designated sensitive area or feature. However, the overriding principle is that such defined areas requiring protection should not be changed. Every effort to identify such areas within the site will have been made prior to the project going out to tender. The discovery of other sites with archaeological or historical interest that have not been identified shall receive ad hoc treatment.

(a) Archaeological sites

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the Engineer of such discovery. The South African Heritage Resource Agency (SAHRA) is to be contacted, and a SAHRA-registered archaeological consultant may undertake the necessary work involved in confirming the find and advising on how it should be preserved or removed. Work may only resume once clearance is given in writing by the archaeologist. (Read with FIDIC condition of contract clause 4.24).

If a grave or midden is uncovered on site, then all work in the immediate vicinity of the graves/middens shall be stopped and the Engineer informed of the discovery. The South African Heritage Resource Agency and the South African Police Services (SAPS) should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The undertaker will, together with SAHRA, be responsible for attempts to contact family of the deceased and for the place where the exhumed remains can be re-interred.

C1009 REHABILITATION

The Contractor shall be responsible for the re-establishment of grass within the road reserve boundaries for all areas disturbed during construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for, or from, construction has to be stored temporarily, and designated or instructed areas outside the road reserve. It also includes the area where site offices were erected which may require rehabilitation at the end of the contract. All construction material, including concrete slabs and barbecue (braai) areas shall be removed from the site on completion of the contract unless written approval from the relevant landowner demonstrates it is to be left in place.

Responsibility for re-establishment of vegetation shall extend until expiry of the defects notification period. However, SANRAL reserves the right to continue holding retention monies (or not releasing guarantees in lieu of retention) depending upon the state of cover at the end of the defects notification period. Such extension may continue until closure of the relevant quarry or borrow pit has been secured,

Rehabilitation of affected areas should be undertaken as early as possible when the relevant activities are done in order to reduce further environmental damage. All re-vegetation should be undertaken using indigenous vegetation. The standard of rehabilitation should be to the satisfaction of the Engineer and the relevant authorities. The Department of Minerals Resources will only issue closure certificates for borrow pits and quarries when they are satisfied with the rehabilitation undertaken. It should also be noted that in some cases there is a requirement for a final environmental audit covering the extent of the project.

C1010 RECORD KEEPING

The Engineer and the DEO will continuously monitor the Contractor's adherence to the approved impact prevention procedures and the DEO shall submit regular written reports to the ECO and to the Engineer, at least once a month. The DEO will report the environmental compliance performance of the project at regular site meetings. The Engineer shall issue to the Contractor a notice of non-compliance whenever transgressions are observed. The DEO shall document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the Engineer in the monthly report.

Copies of all authorisations shall be kept on site and made available for inspection by visiting officials from SANRAL, relevant authorities or internal/external auditors.

C1011 COMPLIANCE AND PENALTIES

The Contractor shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. This record shall be submitted with the monthly reports and an oral report given at the monthly site meetings.

Any non-compliance/omissions with the procedures in this EMP, environmental authorisations and the approved EMPr constitute a breach of the Conditions of Contract. Regulatory financial penalties imposed on SANRAL shall be passed onto the defaulting parties.

SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL R.101-080-2019/1
FOR THE IMPROVEMENT OF NATIONAL ROAD R101 SECTION 8 FROM BELA BELA (KM 0.0) TO
MODIMOLLE (KM 26.8)

**SECTION D: STAKEHOLDER AND COMMUNITY LIAISON, AND TARGETED LABOUR AND
TARGETED ENTERPRISES UTILISATION AND DEVELOPMENT**

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D1001 SCOPE

Section D of the Specifications describes the structured engagement with project Stakeholders and affected Communities to the project. It also guides the selection and the enhanced utilisation and development of Targeted Labour and Targeted Enterprises.

D1001.01 Principles for Project Liaison, Sub-contracting, and Labour Sourcing in SANRAL Projects (Fourteen Point Plan)

The scope of the work described in this Section D of the Specifications shall be based on the Employer's 14 principles for project liaison, sub-contracting and labour sourcing in all SANRAL projects, which are stipulated below:

1. *SANRAL will establish a Project Liaison Committee (PLC) for every project to create a platform for project communication with the aim to facilitate successful, works execution, sub-contracting, procurement, participation with MOU partners, supply of material, services and goods and employment facilitation.*
2. *SANRAL will chair PLCs and provide secretarial support through the Consulting Engineer or its Agent. Representation on the PLC will comprise: SANRAL; the Contractor; the Consulting Engineer or SANRAL's Agent; business representatives; traditional authority representatives; provincial and municipal government representatives (not politicians); community representatives; and any other critical local stakeholder that may be deemed necessary by SANRAL. While serving on the PLC, PLC members must declare any conflict of interest and recuse themselves if requested by the PLC Chairperson.*
3. *The selection of a Project Liaison Officer (PLO) who will be employed by the Consulting Engineer, must be acknowledged, and supported by the PLC.*
4. *The definition of a target area (sometimes referred to as a local area or traffic area) will be determined by SANRAL in consultation with the PLC.*
5. *The setup of database for contractors, sub-contractors, consultants, and suppliers will be conducted with the input and support of the PLC. The final database will be disseminated to the PLC. The entities on the database must be assisted by the Consulting Engineer and the Contractor to be compliant with the relevant legislation required to conduct work for a SANRAL project.*
6. *The setup of databases for local labour in the target area will be done with the input and support of the PLC. The final list will be disseminated to the PLC. Entities on the database must be registered on the National Treasury Central Supplier Database (CSD). A system of labour selection from the database must be agreed at the PLC.*
7. *The databases for sub-contracting will be handed over to the Contractor for open tender processes. The labour database will be disseminated to the PLC and handed over to the Contractor to use for recruitment of local labour.*
8. *Tender processes for sub-contracting must be conducted by Contractor using government principles (e.g. public opening of received bids, announcement of bidders and prices). Winning bidders shall be tabled by the Contractor in the PLC meeting for information purposes.*
9. *Appeals to the tender process must be escalated to SANRAL for an independent review which will be facilitated by the Transformation Unit.*
10. *Capability assessments of sub-contractors and suppliers will be done with the input and support of the PLC, prior to the sub-contract tender stage commencing, to identify any deficiencies in skills and experience. For labour, skills assessments will be done at recruitment stage.*
11. *Sub-contractor development support and training must be coordinated and conducted prior to the sub-contract tender stage commencing, with the input and support of the PLC.*
12. *The PLC may identify works areas that are deliverable by local service providers, and areas where capabilities are not available locally. All works areas where capabilities are not available locally will be imported and local service providers will be given an opportunity to learn.*
13. *The PLC and Consulting Engineer must ensure that formal contracting arrangements between the main contractor and the sub-contractor are in place in all projects.*
14. *Communication will be streamlined through the PLC and used to manage expectations of local business and communities.*

These principles must be applied to facilitate better project level liaison with project Stakeholders and affected Communities. In addition, these principles serve to ensure communication and transparency in the execution of the Works and to facilitate inclusivity in the allocation of projects to benefit black business and local communities.

D1002 DEFINITIONS AND APPLICABLE LEGISLATION

The definitions and legislation listed below informs the requirements of this Section D of the Specifications for Stakeholder and Community Liaison, Targeted Labour employment and Targeted Enterprise sub-contracting.

D1002.01 Definitions

Unless inconsistent with the context, in these specifications, the following words, terms or expressions shall have the meanings hereby assigned to them:

(a) Business Coaching

Business coaching establishes an atmosphere of mutual trust, respect, responsibility and accountability to motivate the emerging business owner and his team. To that end, the business coach must conduct an ethical and competent practice, based on appropriate professional experience and business knowledge.

(b) Community¹

South African Citizens, as defined in terms of the South African Citizenship Act, 1995 (Act 88 of 1995), who permanently reside within the Target and Project Area(s) of the project.

(c) Contract Participation

A process by which the Employer implements Government's objectives by setting targets to enhance Targeted Labour and Targeted Enterprises' utilisation and development, which the Contractor shall achieve as a minimum.

(d) Contract Participation Goal (CPG)²

- (i) In the case of Targeted Enterprises, including manufacturers and suppliers, the amount equal to the value of goods, services and works for which the principal Contractor contracts to engage Targeted Enterprises in the performance of the Contract, expressed as a percentage of the tender value excluding escalation, contingency and value added tax associated with the targeting strategy that is identified in the Specification Data; or
- (ii) In the case of Targeted Labour:
 - a. the sum of the wages and allowances, for which the principal Contractor, Sub-contractor or Targeted Enterprises contract to engage Targeted Labour in the performance of the Contract, expressed as a percentage of the contract amount associated with the targeting strategy that is identified in the Specification Data; or
 - b. the amount equal to the person days worked for which the principal Contractor, Sub-contractors or Targeted Enterprises contract to engage Targeted Labour expressed as a percentage of the total person days worked associated with the targeting strategy that is identified in the Specification Data.

¹ CIDB Standard for Contract Participation Goals for Targeting Enterprises and Labour through Construction Work Contracts, 31 October 2017, as adapted from SANS 10845, Suite for Construction Procurement, 2015.

² Adapted from the CIDB Standard for Contract Participation Goals for Targeting Enterprises and Labour through Construction Work Contracts, 31 October 2017, as adapted from SANS 10845-5:2015 and SANS 10845-8:20SANS 10845, Suite for Construction Procurement, 2015.

(e) Contract Participation Goal Plan (CPG Plan)

The plan which outlines how the Contractor intends to achieve the various CPG targets as stated in the Contract Data and includes the detail of the Targeted Enterprise work programme, as well as the contents and value of the work packages. See Appendix 8 for the CPG Plan template.

(f) Contract Participation Performance (CPP)

The measure of the Contractor's progress in achieving the CPG.

(g) Contract Skills Development Goals (CSDG)³

The number of hours or head count of skills development opportunities that a Contractor contracts to provide in relation to work directly related to the contract or order up to:

- (i) completion in the case of a professional service contract;
- (ii) the end of the service period in the case of a service contract; and
- (iii) practical completion in the case of an engineering and construction works contract.

(h) Designated Group⁴

Unless otherwise permissible in terms of procurement regulations or the PPPFA, "Designated Group" means:

- (i) black designated groups;
- (ii) black people;
- (iii) women; or
- (iv) people with disabilities;

(i) Domestic Sub-contractors

A Domestic Sub-contractor is one in whose selection and appointment the Employer traditionally plays no part in other than simply giving consent when that is required under the terms of the main contract. The appointment of the sub-contractor is treated as something entirely for the benefit of Main Contractor and is a purely "domestic matter".

(j) Final Contract Value

Final Contract Value as defined under Section D1003.04 - Contract Participation Goal (CPG) of the Specifications, also means Contract Price as defined in FIDIC, sub-clause 1.1.4.2, (excluding CPA, adjustments for reduced payments, Rise and Fall adjustments, penalties, and VAT)

(k) Guidance

Guidance is anticipating where one might go wrong, or where one is doing a task in a complicated, inefficient or ineffective way, and giving help, advice and direction as to how to achieve a better result. Guidance is mostly given by a person in the direct reporting line but can be given by anyone. Guidance is not imparting skills but suggesting ways to improve performance.

(l) Labour

Persons:

- (i) who are employed by the Contractor or a Sub-contractor in the performance of the Contract; and
- (ii) whose monthly earnings are derived from hours worked for a fixed hourly rate which is adjusted from time to time by legislation (as a statutory minimum) and the Contractor's or Sub-contractor's employment policies;

³ CIDB Standard for Developing Skills through Infrastructure Contracts, July 2020 (or latest version).

⁴ Preferential Procurement Regulations, 2017, Government Gazette N. 40553, 20 January 2017.

(iii) but who are not Targeted Labour as stated in the Specification Data.

The personnel employed by the suppliers of goods and material are not defined as "Labour" for the purposes of this Contract.

(m) Mentoring

Mentoring is a professional relationship in which an experienced businessperson assists another by giving advice and imparting their knowledge in developing special skills and knowledge that will enhance the less experienced businessperson's professional and personal growth. The objective is to equip the emerging business owner and his team to improve their decision-making skills, being focussed and make positive progress quickly.

(n) Mobilisation Period

The period between the Commencement Date and the date of Access to Site), which period (duration) is stated in the Contract Data. This part of Section D of the Specifications describes the requirements of the Mobilisation Period.

(o) Project Area

The area through which the road under construction traverse or which is adjacent to and/or in proximity to project operations.

Based on market research and/or requisite resources availability, Project Areas other than defined above may be identified where preference would be given to Targeted Enterprises for sub-contracting opportunities.

(p) Project Liaison Committee (PLC)⁵

The Committee that represents the Employer, Engineer, Contractor, project Stakeholders and the Communities affected by the project. It is important to note that:

- (i) elected and/or nominated political office bearers shall not be members of the PLC, and
- (ii) the Engineer and Contractor becomes members of the PLC on their appointment and participate in the Committee within the scope of their respective roles and responsibilities.

(q) Project Liaison Officer (PLO)⁶

The person who acts as the liaison officer for the project. The PLO facilitates the selection of Targeted Labour to be employed by the Contractor and attends to the day-to-day project, Stakeholder, and Community matters that impact on the parties to the PLC.

(r) Stakeholders⁷

Any Stakeholder listed in the Employer's Communication Policy who is affected by the Employer's operations in the Project Area(s) and/or who has an interest or concern in the project, either as a decision maker, participant or affected party and may include, amongst others, the following entities:

- (i) Relevant Provincial departments;
- (ii) Relevant Municipal departments;
- (iii) Traditional authorities;
- (iv) Community interest groups;
- (v) Organised youth representation;
- (vi) Organised women representation;

⁵ CIDB Standard for Minimum Requirements for Engaging Contractors and Sub-Contractors on construction Works Contracts, 31 October 2017.

⁶ CIDB Standard for Minimum Requirements for Engaging Contractors and Sub-Contractors on construction Works Contracts, 31 October 2017; CLO definition.

⁷ Derived from SANRAL communication Policy, March 2018.

- (vii) Organised disabled people representation;
- (viii) Other structured community groups such as religion, education, farming, etc.
- (ix) Local transport industry forums, e.g. Bus and taxi;
- (x) Business sector forums;
- (xi) Road user forums;
- (xii) Environmental interest groups;
- (xiii) Road safety interest groups;
- (xiv) Any other recognised relevant and representative structure.

(s) Sub-contractor

An entity appointed by the Contractor to execute a portion of the Works as defined in the Conditions of Contract under FIDIC subclause 1.1.2.8. This includes both Domestic Sub-contractors and Targeted Enterprises.

(t) Target Area

The geographic area defined in the Specification Data for Targeted Labour and which typically are:

- (i) one or more Provinces;
- (ii) one or more Metropolitan or District Municipalities;
- (iii) one or more Local Municipalities;
- (iv) one or more Wards that are predominantly located within the Project Area;
- (v) one or more of the areas listed in the definition of Designated Groups.

(u) Targeted Enterprise⁸

A Targeted Enterprise is an entity to which the Contractor sub-contracts a percentage of the contract value as a condition of contract and which is:

- (i) an EME or QSE which is at least 51% owned by black people; or
- (ii) an EME or QSE which is at least 51% owned by black people who are youth; or
- (iii) an EME or QSE which is at least 51% owned by black people who are women; or
- (iv) an EME or QSE which is at least 51% owned by black people with disabilities; or
- (v) an EME or QSE which is at least 51% owned by black people who are military veterans; or
- (vi) an EME or QSE which is 51% owned by black people living in rural or underdeveloped areas or townships; or
- (vii) a cooperative which is at least 51% owned by black people.

In addition, Targeted Enterprises must be:

- a. CIDB registered where applicable;
- b. registered with National Treasury's Central Supplier Database;
- c. tax compliant prior to award of the sub-contract; and
- d. COIDA compliant prior to award of the sub-contract where applicable.

Targeted Enterprises are also Sub-contractors as defined in the Conditions of Contract under FIDIC subclause 1.1.2.8.

(v) Targeted Enterprise Construction Manager (TE Construction Manager)

The full-time dedicated staff member or sub-service provider appointed by the Contractor to develop, implement and monitor the training, development and support of Targeted Labour and Targeted Enterprises. The Targeted Enterprise Construction Manager also mentors, guides and coaches the Targeted Enterprises.

⁸ Preferential Procurement Regulations, 2017 Pertaining to the Preferential; Procurement Framework Act, Act no 5 of 2000.

(w) Targeted Enterprise Monitor

The Targeted Enterprise Monitor is an independent service provider, or individual, appointed by the Employer's Transformation Unit, to audit the Contractor and his TE Construction Manager's activities with respect to their obligations to Targeted Enterprises.

(x) Targeted Enterprise Procurement Coordinator (TE Procurement Coordinator)

The staff member or sub-service provider appointed by the Contractor to facilitate the procurement of Targeted Enterprise sub-contractors.

(y) Target Group

It is a group of entities and/or persons selected from the Designated Group as defined in the Preferential Procurement Policy Framework Act Regulations, 2017, and may include both Targeted Enterprises and Targeted Labour.

(z) Targeted Labour⁹

Persons:

- (i) who are unemployed; and
- (ii) who are then employed by the Contractor or a Sub-contractor (including Targeted Enterprises) in the performance of this Contract; and
- (iii) whose monthly earnings are derived from hours worked for a fixed hourly rate which is adjusted from time to time by legislation (as a statutory minimum) and the Contractor's or Sub-contractor's or Targeted Enterprise's employment policies; and
- (iv) permanently reside in the Target Area(s) or who are recognized as being residents of the Target Area(s) based on identification and association with, and recognition by, the residents of the Target Area(s); and
- (v) who are stated as being Targeted Labour in the Specification Data.

The personnel employed by the suppliers of goods and material are not defined as "Targeted Labour" for the purposes of this Contract.

(aa) Trainee Targeted Enterprise

A Targeted Enterprise as defined in this Section D of the Specifications but which is selected and sub-contracted as a Trainee in terms of the Community Development Project associated with this Contract.

(bb) Training

Training refers to the process of teaching a Trainee, usually in a classroom or simulated work environment situation where principles, theory, knowledge and skills are taught, and demonstrations are given. Assignments are set to ensure that the Trainee can apply what has been taught. Training is done by a specialist in the subject, and who is qualified and accredited to train. The objective is to improve the competency of the Trainee.

(cc) Training and Skills Development Programme

The programme which outlines how the Contractor intends to achieve the CSDG targets, as per Section D1010 of the Specifications and in line with the CIDB Standard for Developing Skills through Infrastructure Contracts (refer to latest version on cidb.org.za), by applying the various training methods described in Section D1010 of the Specifications.

⁹ SANS 10845-7:2015, definition 2.12

D1002.02 Applicable Legislation, Regulations and Standards

The following Acts, as amended from time to time, are predominant amongst those which apply to the Construction Industry and are listed here for reference purposes only:

- (a) The Constitution of South Africa;
- (b) Public Finance Management Act, 1999 (Act No. 1 of 1999);
- (c) Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000) and its latest applicable regulations;
- (d) Construction Industry Development Board Act, 2000 (Act No. 38 of 2000);
- (e) Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (f) The South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998);
- (g) The Skills Development Act, 1998 (Act No. 97 of 1998);
- (h) The Skills Development Levies Act, 1999 (Act no. 9 of 1999);
- (i) The amended Construction Sector Codes published in Notice 931 of 2017 of Government Gazette No. 41287 on 1 December 2017 by the Department of Trade and Industry;
- (j) The National Small Enterprises Act, 1996 (Act 102 of 1996) as amended.

The following Standards and Practice Notes, as amended from time to time, are applicable in terms of Targeted Labour and Targeted Enterprises and are used fully or portions thereof in this Section D of the Specifications:

- (i) SANS 10845: 2015, Parts 5, 7 and 8; and
- (ii) CIDB Standard for Contract Participation Goals for Targeted Enterprises and Labour through Construction Works Contracts (refer to latest version on www.cidb.org.za).

D1003 TARGET GROUP PARTICIPATION

This part of Section D of the Specifications describes the Employer's requirements for the establishment of Target Group databases from which participants in the project will be selected for employment and sub-contracting.

It also describes the measurement of, and penalties or bonus to be applied, with respect to the CPG as defined in the Specification Data.

D1003.01 Objectives of Target Group Participation

Amongst others, the key objectives of Government are to extend economic opportunities and build entrepreneurial capacity in rural and underdeveloped areas and townships by:

- (a) optimising the utilisation of local resources in the Project Area;
- (b) developing these local resources in the execution of the project; and
- (c) maximising the amount of funds retained within the Project Area.

To give effect to these objectives the Contractor shall, over the full duration of the contract, from site establishment up to the completion of the works:

- (i) employ Targeted Labour from the Target Area(s) as stated in the Specification Data; and
- (ii) sub-contract Targeted Enterprises as stated in the Specification Data; and
- (iii) give preference to Targeted Enterprises which are from rural and underdeveloped areas and townships within the Project Area(s).

D1003.02 Targeted Labour Database

A system for the recruitment of Targeted Labour shall be agreed with the PLC prior to the commencement of labour recruitment. This system shall be fair and transparent.

Based on the system for recruitment, a Targeted Labour Database shall be compiled by the Contractor, with the assistance of the PLO, and the input and support of the PLC, for the Target Area(s) as stated in the Specification Data. If necessary, the assistance of the Department of Labour may be called upon to provide a labour database of labourers with the required skills and within the required designated groups and Target Area. Once the Database has been disseminated to the PLC, it shall be utilised to facilitate the selection

of Targeted Labour as per the resources and skills required by the Contractor during the different construction stages.

The Targeted Labour Database shall be updated as and when required to reflect new employment seekers in the labour market.

Only Labour recruited from the Targeted Labour Database will be measured for Contract Participation Performance (CPP).

D1003.03 Targeted Enterprise Database

The Contractor shall, with the assistance and inputs of the PLC, compile a Targeted Enterprise Database from which Targeted Enterprises shall be sub-contracted to construct portions of the work as described in this part of Section D of the Specifications.

(a) Market Analysis and Requisite Resources Availability Audit

The Contractor shall conduct a market analysis and requisite resources availability audit to determine the availability, expertise, abilities, and proficiency of Targeted Enterprises in the Project Area.

To inform the market analysis and requisite resources availability audit, the Contractor shall, as a minimum, use the National Treasury's Central Supplier Database (CSD) which can be obtained from the Employer's Supply Chain Management department via the Project Manager, as well as the CIDB contractor database (if applicable).

The market analysis and requisite resources availability audit, and all updates thereof for the duration of the Contract, shall be submitted to the Engineer and the Employer's Project Manager in a format acceptable to the Employer.

Following the market analysis and a requisite resources availability audit, the Contractor shall apply the CPG Target Group criteria in the Specification Data to compile a **preliminary** Targeted Enterprise Database (see D1003.03(c) below).

(b) Call for an Expression of Interest

In addition to the CSD and the CIDB database, the Contractor shall call for an expression of interest from Targeted Enterprises in the Project Area. The call for an expression of interest shall outline the anticipated eligibility, functionality, preference and compliance criteria, as well as the anticipated Works content.

(c) Preliminary Targeted Enterprise Database

Based on the information obtained from the CSD, CIDB and the call for an expression of interest, the Contractor shall compile a Preliminary Targeted Enterprise Database.

The purposes of the Preliminary Targeted Enterprise Database are:

- (i) for the Contractor to determine if the required resources and skills to execute the identified Targeted Enterprise work packages are available in the Project Area(s);
- (ii) for the PLC to verify that Targeted Enterprises on the Preliminary Targeted Enterprise Database are authentic in terms of the Specification Data and other Database criteria, and
- (iii) for the PLC to alert prospective Targeted Enterprises that are not on the Preliminary Database of the opportunity.

Based on the market analysis and requisite resources availability audit, and the information obtained from the call for an expression of interest, additional criteria for the Preliminary Targeted Enterprise Database may be tabled by the PLC to the Contractor to ensure Target Group participation as intended by the Employer.

(d) Final Targeted Enterprise Database

Once the Preliminary Targeted Enterprise Database has been disseminated to the PLC, the Contractor shall invite Targeted Enterprises to tender for the Targeted Enterprise work packages. The Preliminary Targeted Enterprise Database shall remain a “live database” until the day of tender closure when a print-out of the CSD, based on the Database criteria, shall become the **Final** Targeted Enterprise Database for the tender and shall be disseminated to the PLC.

Any Targeted Enterprise may respond to the invitation to tender, but preference shall be given to those Targeted Enterprises that satisfy the tender criteria.

The Targeted Enterprise Database shall be updated at every instance that a new sub-contract tender or group of similar sub-contract tenders are to be let for Targeted Enterprise work packages.

Targeted Enterprises within the Project Area shall be encouraged and assisted to register on the CSD and to become compliant with all other statutory requirements.

D1003.04 Contract Participation Goal (CPG)

The CPG is the monetary value of the participation targets set by the Employer for Targeted Labour and Targeted Enterprises expressed as a percentage of the Final Contract Value. The participation targets comprise of the following:

% Targeted Labour (TL_{Total%}) = the sum of the % Targeted Labour employed by the Contractor, Sub-contractors and Targeted Enterprises.

% Targeted Enterprises (TE_{Total%}) = the % Targeted Enterprises, including the % Targeted Labour employed by Targeted Enterprises.

While the individual participation targets, i.e. TL_{Total%} and TE_{Total%} must be met, the total CPG (CPG_{Total}) is not the sum thereof, but are calculated as follows:

CPG_{Total} = Final Contract Value x [TL_{Total%} + (TE_{Total%} - Targeted Labour employed by the Targeted Enterprises))

where

Final Contract Value is = the total value of the Contractor's final certified work measured at the date of issue of the Taking-Over Certificate. The Final Contract Value includes the value of scheduled work and extra work, but excludes any Contract Price Adjustment and adjustments for reduced payments, Rise and Fall, Retention Money, Penalties and VAT.

The Contractor shall strive to distribute and implement the participation targets and opportunities equally and continuously over the duration of the Contract. Where the Contractor deems such an equal and continuous distribution of the participation targets to be unachievable, he shall provide reasons and motivate it clearly in the preliminary CPG Plan submitted with the tender document.

Both the Targeted Labour and Targeted Enterprise participation targets may consist of sub-targets which are stipulated in the Specification Data, clause D1003. The Contractor is required to achieve these individual sub-targets. If the Contractor fails to achieve any one of the individual sub-targets and does not substantiate that such failure is due to quantitative underruns, the elimination by the Employer of items contracted to targeted enterprises, or any other reason beyond the Contractor's control which may be acceptable to the Employer, penalties shall apply as stated in Section D1003.05 of the Specifications, and as provided for in clause 8.7 of the FIDIC Conditions of Contract.

The value of the Provisional Sum scheduled under item D10.05 will not necessarily make up the full value of the work required to meet the minimum target set by the Employer for Targeted Enterprises. It is the Contractor's responsibility to assess the work required to meet the targets and, if necessary, to engage additional Targeted Enterprises to execute work on the Contract as well to ensure that the minimum targets are achieved.

D1003.05 Contract Participation Performance (CPP)

The CPP is the monetary value of the Contractor's actual progress towards achievement of the CPG calculated as follows:

$$\begin{aligned} \text{CPP} &= \text{CPG}_{\text{Actual}} \\ &= \text{total monetary value (excluding VAT) of Targeted Labour employed by the Contractor} + \text{total monetary value (excluding VAT) of Targeted Enterprises contribution, including Targeted Labour employed by the Targeted Enterprises.} \end{aligned}$$

The Contractor's CPP shall be monitored monthly to determine the extent to which it is striving to achieve the CPG. The basis of monitoring shall be a comparison of the actual expenditure on Targeted Labour and Targeted Enterprises with the planned expenditure for Targeted Labour and Targeted Enterprises as per the accepted CPG Plan. Monthly returns, in the format required by the Employer, shall be submitted by the Contractor with each interim Payment Certificate.

To assist in the measurement of the CPP the Contractor shall include the envisaged CPG programme in its initial contract programme which is to be submitted within 28 days after the Commencement Date. The CPG programme shall be updated in the accepted construction programme on acceptance of the CPG plan and with every subsequent revision.

As an incentive to encourage the Contractor to exceed the CPG, a bonus is offered, measured as follows:

(a) CPP Bonus

$$\text{The bonus} = 0.25 \times (\text{CPP} - \text{CPG}_{\text{Total}})$$

Any bonus due (or portion thereof) shall be calculated on the Final Contract Value. No bonus shall apply if either the Targeted Labour, Targeted Enterprises and/or any individual sub-targets for Target Groups are not reached.

(b) CPP Penalties

Conversely, failure to reach either the CPG or any individual Target Group targets shall render the Contractor liable for a penalty as prescribed in clause 8.7 of the FIDIC Conditions of Contract unless there are compelling reasons why the target or sub-targets could not be achieved as stipulated in Section D1003.04 of the Specifications. Penalties for Targeted Labour and for Targeted Enterprises shall be calculated as follows:

$$\text{Penalty Targeted Labour} = 0.5 \times ((\text{TL} - \text{TG}) + \text{Sum}(\text{TL}_n - \text{TG}_n) - 1.2 \times \text{L dp})$$

Where:

n	=	Each lowest order sub-group of Targeted Labour stipulated in the Specification Data.
TL	=	Monetary value of the Targeted Labour calculated at the percentage stipulated in the Specification Data applied to the Final Contract Value.
TG	=	Cumulative monetary value of Targeted Labour employed on the contract by the Contractor and all Sub-contractors.
L dp	=	Cumulative monetary value of black Disabled Persons employed on the Contract by the Contractor and all Sub-contractors.
$(\text{TL}_n - \text{TG}_n)$	=	The monetary values calculated unless if any calculated value is negative, then it shall be a zero value.

Penalty Targeted Enterprises = $0.5 \times ((TE - TGE) + \text{Sum}(TE_n - TGE_n) - 1.2 \times TE_{mv} - 1.2 \times TE_{dp})$

Where:

n	=	Each lowest order sub-group of Targeted Enterprise stipulated in the Contract Data.
TE	=	Monetary value (excluding VAT) of Targeted Enterprises calculated at the percentage stipulated in the Specification Data applied to the Final Contract Value
TGE	=	Cumulative monetary value (excluding VAT) by Targeted Enterprises sub-contracted to the contract by the Contractor and 50% of the cumulative monetary value (excluding VAT) by Targeted Enterprise suppliers of goods and/or services.
TE mv	=	Cumulative monetary value (excluding VAT) by Targeted Enterprises being majority owned by black Military Veterans, sub-contracted to the Contract by the Contractor.
TE dp	=	Cumulative monetary value (excluding VAT) by Targeted Enterprises being majority owned by black Disabled Persons, sub-contracted to the Contract by the Contractor.
$(TE_n - TGE_n)$	=	The monetary values calculated unless if any calculated value is negative, then it shall be a zero value.

The total Penalty value shall be the sum of the Targeted Labour and Targeted Enterprises Penalty values unless the total Penalty value is negative then it shall be a zero value.

Interim penalty valuations, based on the accepted CPG Plan, shall be calculated to interim Payment Certificate values (excluding VAT) to establish the anticipated outcome, and to plan corrective actions for non-adherence to the CPG Plan.

Interim penalty valuations shall not be applied to the interim certificate value, but the Contractor shall by notice be placed on terms to correct as prescribed in sub-clause 15.1 of the FIDIC Conditions of Contract. Failure to correct by completion of the Contract will lead to an Employer's Claim in terms of sub-clause 2.5 of the FIDIC Conditions of Contract.

Any Penalty payable shall be calculated on, and applied to, the Final Contract Value.

D1003.06 Accredited Registration

The CPP for Targeted Enterprises shall only be accepted if the respective Targeted Enterprises comply fully with the definition of a Targeted Enterprise, and documentary evidence to support the claim lodged with the Engineer before the work, goods or service may be considered as having been performed by a Targeted Enterprise. The responsibility for producing evidence of the respective documentation shall rest with the Contractor.

The Contractor shall assume responsibility for the compilation and maintenance of comprehensive records detailing each Targeted Enterprise's progress.

D1003.07 Contractor's Responsibility

In terms of the Conditions of Contract, all Targeted Labour recruitment and employment and Targeted Enterprises sub-contracting, as well as its associated risks, shall remain the sole responsibility of the Contractor.

The Employer's CPG requirements, and the compulsory utilisation of project specific Targeted Labour and Targeted Enterprises databases, shall not relieve the Contractor of its obligations under the Contract and shall not attract any liability to the Employer.

D1004 STAKEHOLDER AND COMMUNITY LIAISON AND SOCIAL FACILITATION

This part of Section D of the Specifications describes the Employer's requirements with respect to Stakeholder and Community liaison and social facilitation. It also describes the roles and responsibilities of the Project Liaison Committee (PLC) and the Project Liaison Officer (PLO).

D1004.01 Purpose of Stakeholder and Community Liaison

To give effect to the need for transparency and inclusion in the process of delivering services, the Contractor shall liaise with the project Stakeholders and affected Communities for the duration of the Contract's life cycle. This shall be achieved through structured engagement with the PLC which was established by the Employer for this purpose.

D1004.02 Contractor's Responsibilities in Stakeholder and Community Liaison

The Contractor shall have the following general responsibilities in the Stakeholder and Community liaison process:

- (a) Stakeholder and Community engagement shall be executed based on the Employer's social facilitation principles and processes described in this Section D of the Specifications.
- (b) The Contractor shall make use of the PLC as the official communication channel and utilise it to facilitate harmonious relationships, with project Stakeholders and affected Communities.
- (c) PLC members, to which the Contractor is a party, shall be held accountable to disseminate project information discussed at the PLC meetings to the entities that they represent.
- (d) As a party to the PLC, the Contractor shall delegate from among his site personnel a responsible person to participate in the PLC and its business.
- (e) The Contractor shall provide the PLC with any assistance and information that it requires to execute its duties, which amongst others, include training, providing a meeting venue on site, provide Target Group reports, etc.

It is important to note that in terms of the Conditions of Contract, all Targeted Labour recruitment and employment, and Targeted Enterprises' selection and sub-contracting, as well as its associated risks, shall remain the sole responsibility of the Contractor.

The Contractor shall take cognisance of the Employer's PLC and PLO Forms, attached as Appendix 10, which shall be provided to the Contractor by the Engineer. While the Employer holds its own staff accountable for the deliverables listed in the checklist, the Contractor and the Engineer shall assist the Employer in accomplishing the deliverables.

The Employer's establishment of the PLC, and the Engineer providing a PLO to the Contractor, shall not relieve the Contractor of its obligations under the Contract and shall not attract any liability to the Employer.

D1004.03 Project Liaison Committee (PLC)

The PLC is the official communication channel through which the Employer, Engineer, Contractor and project Stakeholders and affected Communities communicates on project matters. This platform is also used to communicate the impact that the project has or may have on project Stakeholders and the affected Communities. This part of Section D of the Specifications describes the general processes pertaining to the PLC, as well as its role and responsibilities.

(a) Establishment of the PLC

A PLC has either been established prior to commencement of the Contract or shall be established as soon as possible by the Employer. The PLC consists of the Employer, Engineer, Contractor and representatives of project Stakeholders and affected Communities.

To ensure that all relevant Stakeholders are represented in the PLC, the Employer did, or will, consult with the Executive Mayor's office, as well as with the LED Department of the Local Municipalities in the Project Area. Once, the PLC has been established, the Employer's further Stakeholder engagement activities shall not prevent the Contractor from continuing with construction.

Typical Stakeholder representation on the PLC may include:

- (i) A PLC member from the relevant RRM PLC.
- (ii) Local Municipality LED Office.
- (iii) Traditional leadership representation.
- (iv) Forums representing people with disabilities.
- (v) Forums representing women.
- (vi) Forums representing youth.
- (vii) Forums representing business sector.
- (viii) Forums representing transport sector.
- (ix) Any other Stakeholder forum/organisation recognised by the Employer and the Local Municipality's LED Office.

Every forum/organisation/constituency shall have one (1) representative on the PLC, which representation shall be confirmed by a duly signed nomination form.

It should be noted that the PLC is not a political platform. While Councillors may be invited to some PLC meetings, they may not be PLC members and hence, will not have voting rights when attending a PLC meeting.

(b) Seating Allowance for PLC Members

PLC membership is voluntary and PLC members shall not be remunerated for any time spent or work done associated with representing their constituency on the PLC.

Provision for the cost of liaison, social facilitation and PLC support has been made under pay-item D10.02(a). This pay-item provides for the Contractor's cost incurred in executing his responsibilities w.r.t. Stakeholder and Community liaison.

This pay-item may also be utilised to pay an allowance to PLC members for actual costs incurred in executing their PLC duties (other than time or work done related). The Contractor will determine and table to the PLC a realistic seating allowance which will be substantiated by an outline of the anticipated actual costs envisaged to be incurred by PLC members.

The seating allowance shall be increased annually based on the CPI figure contained in Table B2 of Statistical Release P0141 by StatsSA.

(c) Induction of the PLC

The Employer shall conduct an induction meeting with the PLC to acquaint PLC members with the following information:

- i) SANRAL's Horizon 2030 Strategy.
- ii) SANRAL's Fourteen Point Plan.
- iii) The role and responsibilities of PLC members.
- iv) SANRAL's Transformation Policy.
- v) How the Transformation Policy impacts on SMMEs.
- vi) Relevant details of the Contract, e.g.
 - a. Start and end dates
 - b. Important milestones
 - c. CPG targets
 - d. Envisaged Targeted Enterprise packages
 - e. Envisaged work for other SMMEs (non-CPG).

(d) Rules of Engagement for the PLC

In the execution of their duties, members of the PLC shall adhere to the undertakings listed below and the Contractor shall inform the Engineer of any transgression of these undertakings.

(i) General Matters and Membership

- a. A PLC member may not be a politically elected representative and political party representation will not be allowed in the PLC.
- b. Ward Councillors may interact with the project team through the Mayor's Office.
- c. If required, and in consultation with the Employer, a Political Steering Committee (PSC) may be established to address political matters. A PSC will only be established where the Project Area traverse over more than one municipal area.

(ii) Term of Office for the PLC

- a. The duration of PLC members' participating in the PLC (term of office) shall depend on the duration of the project.
- b. If the Employer finds the performance of a PLC member to be below expectation or their conduct to be unacceptable, the affected member will be discharged from their obligations and a new nomination process shall commence.

(iii) Targeted Enterprise and Targeted Labour

PLC members shall:

- a. ensure that they, or companies in which they hold equity, will not tender on the Contract for any work or sub-contract that may be issued. Should they tender, this will be treated as a conflict of interest and the tender proposal submitted will not be evaluated.
- b. not have private or business interests in any of the sub-contract tenders tabled to the PLC or considered in this Contract.
- c. shall recuse themselves from discussions that deal with a sub-contract tender if any other member is of the opinion that a member's participation in deliberations, which is rightly or wrongly construed as improper or irregular, may lead to the award of a sub-contract to a tenderer known to the member or to the member itself.
- d. recuse themselves from the operations of the PLC following a situation as described in paragraphs ii) above and shall cease to be a PLC member for this Contract.
- e. during the tender and tender evaluation processes, neither deliberately favoured nor prejudiced a person or tenderer, as intended, or contemplated in treasury Regulation 16, A8.3 (a), (b) & (c).
- f. ensure that no conflict of interest arises from members' involvement in the PLC and potential involvement in targeted labour recruitment and/or targeted enterprises procurement and/or any other supplier/sub-contractor/service provider procurement or involvement in the contract.

(iv) Confidentiality

- a. PLC members shall accept that all information, documentation, and decisions regarding any matter serving before the PLC are confidential and undertake not to communicate decisions or discussions of PLC meetings to external or internal parties unless so directed and approved by the Project Manager.
- b. Information for public dissemination shall be clearly indicated by the committee to ensure that sensitive information is only disseminated to the correct audience.

(v) Removal from Office

- a. PLC members who violate the provisions of these Rules of Engagement for PLCs will be removed from their role as a PLC member at the sole discretion of the Employer.
- b. The Employer reserves the right to recover any costs from PLC members whose actions can be regarded as detrimental to the Employer or to the execution of the project.
- c. The Employer also reserves the right to recommend criminal prosecution if the offence warrants such action.
- d. The Employer reserves the right to dissolve the entire PLC should it believe that such an action is in its best interest, or that of the project. The Employer will not be obliged to reconstitute the PLC if such a dissolution occurs.

(e) **Responsibilities and Duties of the PLC**

The PLC shall execute specific duties during the design and construction phases of the project.

Some of the PLC's duties during the design and construction stages overlap and hence, for completeness, a description of the PLC's duties in both project stages is provided here.

The PLC shall execute the following duties:

(i) Project Design Stage

- a. Meet as often as required to discuss and resolve the project's design stage matters which are of interest or concern to the parties to the PLC.
- b. Peruse the Project Liaison Committee duties outlined in this Section D of the Specifications and agree on the duties of, and procedures to be followed by, the PLC to fulfil its duties.
Note: The principles outlined in this section shall not be amended, but duties and procedures may be altered to be project specific and to improve the functionality of the PLC.
- c. Act in accordance with the agreed terms of reference for the PLC.
- d. Inform the Employer of any training that project Stakeholder and affected Community representatives of the PLC require to execute their duties.
- e. Assist the Engineer to source suitable candidates, based on the Employer's qualifying criteria, for the position of PLO.
- f. Observe and verify that the qualifying criteria and procedures applied by the Engineer to select and employ the PLO were executed in a fair and transparent manner and were within the prescripts of the relevant labour legislation and regulations.
- g. Assist the Engineer to identify the project's Target and Project Area(s), from which Targeted Labour and Targeted Enterprises could be employed and sub-contracted respectively.
- h. Assist the Engineer to identify the project's Target Groups for inclusion in the Tender Documents and provide input and support to the identified Target Groups.

(ii) Project Construction Stage

- a. Meet formally prior to the Employer's monthly site meeting, or as may be required, to discuss and resolve project matters, which are of interest or concern to the parties to the PLC.
- b. Assist the Contractor to establish the selection criteria and process to employ Targeted Labour.
- c. Assist the Contractor to identify the eligibility, functionality, preference and compliance criteria to select and sub-contract Targeted Enterprises.

- d. Provide input and support for the Databases compiled by the PLO and the Contractor from which Targeted Labour will be selected and employed and Targeted Enterprises will be sub-contracted respectively.
- e. Verify that the criteria and methodologies applied by the Contractor to select and employ Targeted Labour and sub-contract Targeted Enterprises are executed in a fair and transparent manner and are within Government legislation and regulations and the Employer's Policies.
- f. Verify that the conditions of employment and the conditions of sub-contracting, in the employment of Targeted Labour and sub-contracting of Targeted Enterprises are applied in a fair and transparent manner and according to the Employer's employment and sub-contracting requirements.
- g. Make recommendations to the Contractor on the training needs, eligibility criteria and selection criteria for the provision of training to Targeted Labour, Targeted Enterprises, Designated Groups, project Stakeholders and the affected Communities.
- h. Verify that training and skills development programmes, which the Contractor committed to, are implemented and executed as approved and intended.
- i. Inform the entities whom they represent of any project matters which the respective party to the PLC wishes to communicate with each other.
- j. Inform the entities whom they represent of any project matters that are impacting or may impact, either positively or negatively, on the respective parties to the PLC.
- k. Inform the Contractor of Stakeholder and/or Community requests and/or needs which could possibly be addressed within the project's Scope of Work.
- l. Inform the Employer, Engineer and Contractor of any road safety concerns within the Project Area(s) and advise them of possible mitigating measures and/or road safety programs that will be most suitable for acceptance by the affected Communities to promote road safety.
- m. Assist parties to the PLC to agree on a dispute resolution mechanism to resolve any disputes that may arise between the parties to the PLC.
- n. Assist parties to the PLC to liaise with their respective entities to resolve any disputes amongst the parties which may occur due to the project.

(f) PLC Meetings

(i) Frequency

- a. Meetings will be conducted monthly or as required by the Stakeholders or the project matters.

(ii) Notice of Meetings

- a. The notice of the PLC meeting shall be given at least seven (7) calendar days prior to the meeting date.
- b. Where meetings have been diarised over a period by the PLC, it shall be the duty of each PLC member to ensure his/her attendance on the set dates.
- c. Where a PLC member has missed any meeting, he/she bears the onus of establishing the date and venue of the next meeting.

(iii) Venue

- a. The venue for PLC meetings shall be the project site office or any other venue agreed to by the members of the PLC and approved by the Employer's Project Manager.
- b. During the COVID-19 lockdown, or any other lockdown as announced by government, the meetings shall be held on an online platform such as WhatsApp, MS Teams, Zoom or similar.

- (iv) Agenda
 - a. An agenda shall be made available or displayed to all participants at the commencement of such meetings or the minutes of the previous meeting will serve as the agenda of such meetings.
 - b. The agenda shall not be amended without prior approval from the Employer's Project Manager.
- (v) Chairperson
 - a. PLC meetings shall be chaired by the Employer which will typically be the Employer's Project Manager, or a SANRAL staff member, with decision-making delegation, or the Engineer. The Chairperson shall:
 - i. chair all meetings of the PLC,
 - ii. co-ordinate all the activities of PLC,
 - iii. ensure that members are fulfilling their tasks as assigned by the PLC,
 - iv. see to the execution of decisions taken by the PLC,
 - v. ensure the validity of members' claim for allowance,
 - vi. ensure compliance of all activities of the PLC with current rules, law and general SANRAL policy, and
 - vii. be a co-signatory to all official documents of the PLC.
- (vi) Secretariate
 - a. The Engineer's staff shall provide a secretarial service to take minutes of PLC meetings.
 - b. Secretarial support other than taking minutes at PLC meetings shall be provided by the PLO.
- (vii) Quorum
 - a. The quorum for PLC meetings shall be constituted by 50%+1 ratio excluding co-opted members.
- (viii) Apologies and Non-attendance
 - a. Apologies shall be in writing except in emergency where the member apologising cannot communicate the apology in writing.
 - b. Apologies may be sent through any media agreed to prior by the PLC for example through SMS or WhatsApp messaging or similar application.
 - c. The organization, represented by a member who fails to attend three (3) consecutive meetings without an apology, will be informed in writing and asked to nominate a replacement member.
- (ix) Language
 - a. The meetings will be conducted in English to enable all participants at the meeting to understand the discussions of the meeting.
 - b. However, care and consideration must be given to provide non-English speakers an opportunity to participate. Therefore, where desirable, any of the 11 official languages may be used to conduct the meeting. If another language other than English is used, the minutes of the meeting will need to be transcribed, translated, and recorded in English.
- (x) Other
 - a. The PMT shall provide a finger lunch for PLC members at PLC meetings.

D1004.04 Project Liaison Officer (PLO)

The PLO facilitates the selection and employment of Targeted Labour and coordinates communication between the members of the PLC to address the day to day project, Stakeholder, and Community matters that impact on the parties represented in the PLC.

(a) Appointment of the PLO

The Engineer appoints the PLO in accordance with the Employer's criteria for a PLO. The appointment of the PLO must be acknowledged and supported by the PLC.

Although the PLO provides social facilitation support to the Contractor, the PLO shall report to the Engineer or his delegated representative, e.g. the Resident Engineer.

(b) Duties of the PLO

The PLO shall execute specific duties during the design and construction phases of the project. These duties include the following:

- (i) Except for taking the minutes of PLC meetings, which is a duty of the Engineer, the PLO shall provide a secretariat function to the PLC which includes, amongst others, the following:
 - a. Schedule meetings;
 - b. Compile meeting agendas;
 - c. Compile document packages for meetings;
 - d. Distribute minutes of meetings;
 - e. Assist representatives of project Stakeholders and affected Community to formulate their communication to the PLC in writing;
 - f. Distribute written communication between the parties to the PLC;
 - g. Keep records of all PLC correspondence and documentation; and
 - h. Provide any other reasonable secretariat function required by the PLC.
- (ii) Attend all PLC meetings to report on the day to day project, Stakeholder and Community matters that impact on the parties to the PLC.
- (iii) Attend all monthly project site meetings to report on the day to day project, Stakeholder and Community matters that impact on the parties to the PLC.
- (iv) Attend any other meetings related to the project and in which any of the project Stakeholders, affected Communities, Targeted Labour and Targeted Enterprises are involved.
- (v) Maintain a full-time presence on site to monitor and address the day to day project, Stakeholder and Community matters that impact on the parties to the PLC.
- (vi) Maintain a full-time presence on site to assist the parties to the PLC in the day to day liaison with each other.
- (vii) Assist the Engineer and the Contractor to disseminate information to PLC members such as:
 - a. the basic Scope of the Works and how it will affect the Community;
 - b. the project programme and regular progress updates;
 - c. the anticipated employment and sub-contracting opportunities;
 - d. the project programme as it pertains to the employment of Targeted Labour and sub-contracting of Targeted Enterprises;
 - e. Occupational Health and Safety precautions; and
 - f. any other information relevant to project Stakeholders and the affected Communities.
- (viii) Be well acquainted with the contractual requirements as it pertains to Targeted Labour employment and training.
- (ix) Assist the PLC to establish and agree the criteria to follow when selecting and employing Targeted Labour.
- (x) Assist the Engineer and the Contractor in their resources and skills audits by providing a coordinating function between the Engineer, the Contractor, project Stakeholders, and the affected Communities.
- (xi) Ensure that the Contractor compiles the Targeted Labour databases based on the eligibility and selection criteria and that he updates it as and when required.
- (xii) Coordinate the selection and employment of Targeted Labour based on the agreed eligibility and selection criteria and based on the Contractor's labour and skills requirements.
- (xiii) Ensure that each Targeted Labourer enters an employment contract which adheres to current and relevant Labour legislation.
- (xiv) Ensure that each Targeted Labourer understands the conditions of his/her employment contract with an emphasis on the employment start date, end date and wages payable.

- (xv) Identify and inform the Contractor of any relevant training required by the Targeted Labour.
- (xvi) Attend all disciplinary proceedings to ensure that hearings are fair and conducted in accordance with the current and relevant Labour legislation.
- (xvii) Be proactive in identifying project Stakeholder and affected Communities' (including Targeted Labour and/or Targeted Enterprise Sub-contractor), requirements, disputes, unrest, strikes, etc. and bring it to the attention of the PLC.
- (xviii) Assist the parties to the PLC to resolve any disputes, which may occur due to the project.
- (xix) Other than the document records to be kept as mentioned above, keep record of all other documents and processes pertaining to the employment of Targeted Labour.
- (xx) Produce and submit a monthly report to the PLC on PLC and other meetings attended by the PLO, as well as on Targeted Labour employment, and project Stakeholder, affected Community and any other project matters that impact on the parties to the PLC.

D1005 MOBILISATION PERIOD

The Mobilisation Period is defined in Section D1002 of the Specifications. This Section describes the requirements of the Mobilisation Period.

D1005.01 Purpose of the Mobilisation Period

The Mobilisation Period was introduced as an aid to the Contractor to:

- (a) become acquainted with the Stakeholder and Community liaison requirements of the Contract as prescribed in this Section D of the Specifications;
- (b) allow for the Contractor's planning to obtain the CPG as required in the Specification Data;
- (c) allow for the Contractor's planning to obtain the Contract Skills Development Goals (CSDG) as required in Section D1010 of the Specifications,
- (d) follow the processes prescribed in this Section D of the Specifications to employ the initially required Targeted Labour and enter the first sub-contracts with Targeted Enterprises; and
- (e) provide the training required by Targeted Labour and Targeted Enterprises to commence with the construction of the Works.

Access to site for the Commencement of the Works shall thus only be issued once the following deliverables have also been submitted and/or completed by the Contractor:

- (i) Submission of the CPG Plan, followed by acceptance of the Engineer.
- (ii) Submission and the Training and Skills Development Programme, followed by acceptance of the Engineer.
- (iii) Appointment of the initial Targeted Enterprise sub-contractors.

D1005.02 Duties of the Contractor

During the Mobilisation Period, the Contractor shall execute the following duties:

(a) Compile a CPG Plan

The Contractor shall compile an acceptable CPG Plan, which sets out how he intends to achieve the various CPG targets as stated in the Specification Data. The Contractor shall distribute and implement the participation targets and Targeted Enterprise work opportunities equally and continuously over the duration of the Contract, i.e. from site establishment to completion of the Works. Where the Contractor deems such an equal and continuous distribution of the participation targets to be unachievable, he shall provide reasons and motivate it clearly in the CPG Plan.

The CPG Plan shall provide the detail of the Targeted Enterprise work programme, as well as the contents and value of the work packages. See Appendix 8 for the CPG Plan format.

The Targeted Enterprise work programme shall be in line with the Works Programme and once the CPG Plan has been accepted by the Engineer, it shall be captured in the Works Programme.

The Mobilisation Period shall only be concluded once the CPG Plan has been accepted by, and all the duties above have been executed to the satisfaction of, the Engineer after consultation with the Employer.

The Employer and the Engineer shall monitor progress and adherence to the CPG Plan in the same manner as they would monitor the Works Programme.

Should the Contractor require an extension of the Mobilisation Period due to a delay not within his control, Contractual Procedure shall be followed, and the Contractor shall submit his Claim for an extension of time through the relevant Contractual Clauses of the Conditions of Contract.

(b) Compile a Training and Skills Development Plan

The Contractor shall compile an acceptable Training and Skills Development Plan, which sets out how he intends to achieve the various CSDG targets as per the Section D1010 of the Specification and in line with the CIDB Standard for Developing Skills through Infrastructure Contracts (refer to latest version on www.cidb.org.za)..

The Training and Skills Development Plan shall provide the detail of the training methods selected for implementation as described in Section D1010 of the Specifications and shall include an execution programme for acceptance by the Engineer, which shall demonstrate its correlation with the Works Programme.

The Mobilisation Period shall only be concluded once the Training and Skills Development Plan has been accepted by the Engineer after consultation with the Employer.

The Employer and the Engineer shall monitor progress and adherence to the Training and Skills Development Plan in the same manner as they would monitor the Works Programme.

(c) Sub-contracting of Targeted Enterprises

During the Mobilisation Period the Contractor shall execute the following duties w.r.t. the sub-contracting of Targeted Enterprises:

- (i) Liaise with the Employer, Engineer and the PLC to structure and finalise the work packages to be sub-contracted to Targeted Enterprises.
- (ii) Liaise with the Employer, Engineer and PLC to determine the Targeted Enterprise Database criteria for the sub-contracting of Targeted Enterprises.
- (iii) Compile the Targeted Enterprise Database(s) for input and support by the PLC.
- (iv) Undertake a skills audit of the Targeted Enterprises which appear on the Targeted Enterprise Database(s).
- (v) Based on the skills audit, and in consultation with the PLC, identify the pre-tender training requirements of Targeted Enterprises.
- (vi) Provide an opportunity to Targeted Enterprises to receive the identified pre-tender training.
- (vii) Tender the initial work packages and sub-contract the first group of Targeted Enterprises for commencement of the Works.

(d) Employment of Targeted Labour

During the Mobilisation Period the Contractor shall execute the following duties w.r.t. the employment of Targeted Labour:

- (i) Liaise with the PLC and the PLO on the compiled Targeted Labour Database(s) for the employment of Targeted Labour.
- (ii) Undertake a skills audit of the Targeted Labour which appear on the Targeted Labour Database(s).
- (iii) Based on the skills audit, and in consultation with the PLC, identify the training requirements of Targeted Labour to enhance their employability.
- (iv) Provide an opportunity to eligible Targeted Labour to receive the identified training to enhance their employability.
- (v) Select and appoint the first group of Targeted Labour for commencement of the Works.

(e) Training Requirements

The Contractor will not be able to address all the training requirements identified for Targeted Labour and Targeted Enterprises during the Mobilisation Period and it is accepted that training will take place over the duration of the Contract.

The training provided to both Targeted Enterprises and Targeted Labour during the Mobilisation Period shall focus on the activities and/or skills required for the commencement of the Works and shall include the mandatory Occupational Health and Safety training.

D1006 THE ROLE OF THE ENGINEER

The role and responsibilities of the Engineer are clearly described in the Conditions of Contract. This section elaborates on the Engineer's duties with respect to Stakeholder and Community Liaison, Targeted Labour Employment and Targeted Enterprise sub-contracting.

Together with the Employer and the Contractor, the Engineer is also a party to the PLC and hence, is co-responsible for successful project Stakeholder and Community liaison.

In addition, the Engineer shall play a supporting role to the Contractor in the successful implementation of the Employer's Targeted Labour and Targeted Enterprise utilisation and development goals.

D1006.01 Duties During the Design Phase

During the design phase, the Engineer undertook a preliminary skills and resources audit of the Targeted Enterprises in the Project Area. The purpose of the audit was to:

- (a) obtain an understanding of the Community's skills, both academically and occupationally;
- (b) obtain an understanding of the resources within the Community, i.e. Targeted Enterprise availability and capabilities;
- (c) establish the CPG targets for Targeted Enterprises and Targeted Labour for inclusion of the Specification Data; and
- (d) identify tender and other relevant training to be offered to Targeted Enterprises and Targeted Labour to prepare them for tendering and to enhance their employability.

D1006.02 Duties During the Construction Phase

To implement the Employer's Targeted Labour and Targeted Enterprise goals, the Engineer shall provide support to the Contractor by executing the following duties:

(a) Targeted Enterprise Sub-contracting

- (i) Make recommendations to the Contractor in identifying and structuring the work packages to be sub-contracted to Targeted Enterprises and approve the scope and extent of the work packages.

- (ii) Verify that the Targeted Enterprise Database(s) has been updated prior to the letting of every new set of sub-contracts.
- (iii) Approve tender procedures, tender documents, tender submission requirements and adjudication processes for the sub-contracting of Targeted Enterprises.
- (iv) Review all tender adjudication reports and monitor that the criteria and procedures applied by the Contractor to sub-contract Targeted Enterprises are executed in a fair and transparent manner and are within the Employer's and Government's Supply Chain Management Policies.
- (v) Verify that sub-contract agreements and the conditions of sub-contracting with Targeted Enterprises are fair and transparent and within the prescripts of the Contract requirements.
- (vi) Monitor the management of Targeted Enterprise sub-contracts and ensure that conditions such as the application of penalties, the termination of contracts, etc. are applied in a fair and transparent manner and within the prescripts of the agreement.

(b) Targeted Labour Employment

- (i) Verify that the Labour Database(s) from which Targeted Labour will be employed is updated prior to every new Labour intake.
- (ii) Monitor that the criteria and procedures applied by the Contractor to employ Targeted Labour are executed in a fair and transparent manner and is within the Contract requirements.
- (iii) Monitor that the conditions of employment of Targeted Labour are applied in a fair and transparent manner and within the prescripts of the current and relevant Labour legislation.

(c) Target Group Training Requirements

- (i) Make recommendations to the Contractor in identifying the training requirements of Targeted Labour and Targeted Enterprises and approve the proposed training programmes.
- (ii) Monitor that training programmes and support programmes, which the Contractor committed to, are implemented and executed as intended.

D1007 TENDER PROCESS FOR TARGETED ENTERPRISES

While the Contractor may utilise service providers, sub-contractors and suppliers of its choice and selected via its own internal processes, for the sub-contracting of Targeted Enterprises based on the Employer's Contract Participation Goals, the Contractor shall follow the prescripts of this Section D of the Specifications.

D1007.01 Targeted Enterprise (TE) Procurement Coordinator

The Contractor shall appoint a TE Procurement Coordinator to facilitate the sub-contracting of work to Targeted Enterprises as defined in the Specification Data. For Contracts with a value of less than R 100 million the Contractor may appoint a TE Procurement Coordinator from its site staff. For Contracts with a value of more than R 100 million the Contractor shall employ or sub-contract a dedicated TE Procurement Coordinator, whose sole responsibility will be the management of Targeted Enterprise procurement and sub-contracting matters.

The TE Procurement Coordinator shall be knowledgeable of, and have experience in, the management of road construction and ancillary works, National Treasury supply chain management legislation and regulations, and stakeholder relations management.

With the input and support of the PLC, the TE Procurement Coordinator shall conduct the tender processes and procedures for Targeted Enterprise sub-contracting as prescribed in this Section D of the Specifications and shall adhere to the Employer's and Government's Supply Chain Management Policies and requirements.

D1007.02 Procedures for Targeted Enterprises Sub-contracting

The Contractor shall utilise the Employer's proforma tender and contract document for Targeted Enterprise sub-contracting. The proforma sub-contract document is attached as Appendix 11 and an electronic version will be provided to the Contractor on award.

The identification and application of the eligibility and functionality criteria, and conducting the tender processes and procedures for sub-contracting include, amongst others, the following tasks:

(a) Tender Preparation

(i) Compile preliminary list of sub-contracting work packages

Based on the Specification Data and the Scope of the Works, the Contractor shall compile a preliminary list of the work packages (scope of work and number of packages) that are anticipated to be sub-contracted to Targeted Enterprises.

The Contractor shall refer to the construction activities that have been identified as being suitable for construction by Targeted Enterprises as listed in Section D1009 of these Project Specifications, and to any other construction activities which are required to execute the Works in terms of this Contract, to determine how to unbundle or package subcontracts for Targeted Enterprises.

(ii) Conduct a market analysis and resources and skills audit

Based on the preliminary list of work packages, the Contractor shall conduct a market analysis and resources and skills audits to determine the availability of the required resources and skills in the Project Area to execute the anticipated Targeted Enterprise work packages. The Contractor shall consult the following databases as a minimum:

- a. Construction Industry Development Board (CIDB)'s contractor database (not applicable to suppliers and non-construction services).
- b. National Treasury's Central Supplier Database (CSD) to be obtained from the Employer's Supply Chain Management Department.

(iii) Call for an expression of interest

In addition to consulting the CIDB contractor database and National Treasury's CSD, the Contractor shall call for an expression of interest, which shall be published in newspapers and at locations as agreed by the PLC.

For each group of work packages, the call for an expression of interest shall outline:

- a. evaluation and selection criteria such as eligibility, preference and functionality.
- b. compliance requirements such as CSD and CIDB registration, tax clearance and COID.
- c. the anticipated scope of the works to be undertaken.

(iv) Establish a Targeted Enterprise Helpdesk

Other than informing the Contractor's market analysis and resources and skills audits, the purpose of the call for an expression of interest is to alert Targeted Enterprises of the subcontracting opportunities and inform them of the anticipated eligibility, preference and functionality criteria, as well as of the compliance requirements.

The Contractor shall enhance the readiness of Targeted Enterprises to participate in the subcontracting opportunities by establishing a helpdesk at a suitable and easily accessible location in the Project Area.

The Contractor shall provide guidance to Targeted Enterprises in getting their statutory requirements in order in anticipation of the subcontracting opportunities. The helpdesk shall assist with, or provide guidance in, registering with the CSD and the CIDB, obtaining tax clearance and COID compliance and any other relevant qualifying requirements.

(v) Compile Preliminary Targeted Enterprise Database

Based on the CPG targets listed in the Specification Data and the information obtained from the activities described in paragraphs ii) and iii) above, the Contractor shall compile a Preliminary Targeted Enterprise Database.

In compiling the preliminary Targeted Enterprise Database, the Contractor must bear in mind that the benchmark for an adequate number of tenderers to ensure a competitive tender process is ten (10) tenderers that are able to achieve the functionality threshold during the tender evaluation.

(vi) Identify Targeted Enterprises, Target Groups and Project Area(s)

Based on the CPG targets listed in the Specification Data and the Preliminary Targeted Enterprise Database, the Contractor shall identify the:

- a. Targeted Enterprises (CIDB grades and types); and
- b. Designated Groups (woman, youth, etc.) which are anticipated to benefit from the subcontracting opportunities; and
- c. Project Area(s) from which Targeted Enterprises will be given preference for subcontracting opportunities.

(vii) Compile a Contract Participation Goal (CPG) Plan

The Contractor shall utilise all the information gathered from the activities described in the paragraphs above to compile an acceptable CPG Plan. The plan shall contain:

- a. a list of work packages (scope of work and number of packages) to be subcontracted to Targeted Enterprises;
- b. procurement, award and execution dates for the work packages, distributed over the duration of the Works Contract (from site establishment to completion of the Works) to ensure continuous work opportunities;
- c. the preliminary Targeted Enterprise Database(s) for each work package;
- d. the Targeted Enterprises (CIDB grades and types) and Designated Groups (woman, youth, etc.) which are to benefit from the subcontracting opportunities;
- e. the Project Area(s) from which Targeted Enterprises will be given preference for subcontracting opportunities; and
- f. the tender evaluation and selection criteria for the respective work packages.

(viii) Acceptance of the CPG Plan

The Contractor shall submit the CPG Plan to the Engineer for acceptance after which it shall be tabled to the PLC for their information.

The Contractor shall ensure that the tender requirements and the outcome of different tendering scenarios are explained to the PLC, specifically with respect to the outcomes of evaluating:

- a. Eligibility criteria;
- b. Functionality structuring and scenarios;
- c. Price and Preference;
- d. Compliance requirements; and
- e. Negotiation processes (if applicable).

If required, the Contractor shall make amendments to the CPG Plan based on the Engineer's instructions.

(ix) Compile tender documents

The Contractor shall compile the tender documents for each Targeted Enterprise subcontract work package and shall utilise the Employer's proforma document for Targeted Enterprise sub-contracting (see Appendix 11).

In compiling the subcontract tender documents, the Contractor shall include in each tender document relevant Conditions of Tender and the FIDIC subcontract agreement. The Contractor shall compile each subcontract tender document in a manner that facilitates the achievement of all objectives and principles pertaining to the development of the Targeted Enterprises.

The draft subcontract tender documents shall be approved by the Engineer before letting the tender.

(b) Tender Process

(i) Advertise the subcontract packages

The Contractor shall advertise and invite tenders from Targeted Enterprises for the respective subcontract packages. Advertisements shall be placed in local newspapers, on community notice boards, on SANRAL's electronic supply development desk portal (<https://sanralesdd.co.za>), and any other place or medium as agreed with the PLC.

If the Employer have a pro-forma Tender Notice available, the Contractor shall use this document.

(ii) Conduct a tender briefing and tender training session

For each group of subcontract packages, the Contractor shall conduct a compulsory briefing session to explain the tender process, the evaluation and selection criteria and the scope of the works to the Targeted Enterprises.

An Attendance Register shall be completed by all attendees and Minutes shall be taken during the briefing session. The Minutes of the briefing session shall be distributed to all attendees as an Addendum to the Tender Documents.

The Contractor shall conduct a "how to complete a tender document" training session as a component of the tender briefing to interested Targeted Enterprises. The level of detail and hence the duration of the training session shall be informed by the findings of the resources and skills audit conducted during the Tender Preparation Phase.

The Contractor shall engage with the Employer's Regional Transformation Officer on the Employer's SMME Pre-tender Training and Development Programme and utilise this programme if it is available at the time in the Project Area. The Regional Transformation Officer's contact details shall be provided on award:

Notes of this training session shall be distributed to all attendees of the briefing session as an Addendum to the Tender Documents, irrespective if they have attended the training session or not.

A separate Attendance Register shall be completed for the training session for future reference.

(iii) Minimum tender submission documents

It shall be a condition of tender that Targeted Enterprises include in their tender submissions the following documentation (if applicable, based on the subcontract type e.g. construction, supply or services):

- a. Proof of the Tenderer's B-BBEE contributor level.
- b. Proof that the Tenderer is an EME or QSE entity.
- c. Proof that the Tenderer is registered on National Treasury's CSD.
- d. Proof of the Tenderer's locality (address registered with the CIPC).
- e. Proof that the Tenderer is registered with the CIDB in the required grading and class (not applicable to suppliers).
- f. Proof that the Tenderer is compliant with the COID Act.
- g. Proof that the Tenderer is tax compliant.

(iv) Tender closure and opening of tenders

Tenders for the subcontract packages shall close at a stipulated time and date. Tenders shall be submitted to the Contractor in the format and at the address prescribed by the Contractor in the subcontract Tender Data.

The tender opening shall be conducted by the Contractor who shall publicly announce and record the names of all bidders and their tender prices.

(v) Finalise Targeted Enterprise Database

The purposes of the preliminary Targeted Enterprise Database are described in paragraph (a)(v) of the Tender Preparation phase above of which one is to alert Targeted Enterprises to assess their readiness to participate in the project's subcontractor opportunities.

The period between the Contractor's call for an expression of interest and the date of closure of the relevant subcontract tender allows for prospective Tenderers to become compliant to the database criteria. The preliminary database is thus a "live" database until the date of tender closure.

On the date of tender closure, the Contractor shall request the Employer's Supply Chain Management Department to print out a list from National Treasury's CSD, of entities that adheres to the Targeted Enterprise Database criteria. This list shall become the Final Targeted Enterprise Database for relevant sub-contract tender and shall be disseminated to the PLCr.

(c) Tender Evaluation

The Contractor shall evaluate the tenders and it shall be a condition of tender that tenders will only be accepted from Targeted Enterprises that fully comply with the definition of a Targeted Enterprise as described in Section D1002 of the Specifications.

The Contractor shall evaluate the tenders based on (1) Eligibility, (2) Functionality, (3) Price and Preference, and (4) Compliance.

(i) Stage 1 – Eligibility

Tenderers shall be checked for their eligibility to tender for the advertised subcontract packages based on the following eligibility criteria:

- a. Proof that the Tenderer is registered with the CIDB (if applicable).
- b. Proof that the Tenderer is registered on National Treasury's CSD
- c. Proof that the Tenderer is registered with the CIPC.
- d. Proof that the Tenderer is a level 1 to 4 B-BBEE contributor;
- e. Proof that the Tenderer is an EME or a QSE.
- f. Proof that the Tenderer falls within one or more of the designated groups as per the Specification Data (if applicable).

Eligible Tenderers shall be further evaluated against the functionality criteria.

(ii) Stage 2 – Functionality

No Targeted Enterprise may be prohibited from responding to the invitation to tender, however, preference shall be given to those Targeted Enterprises that adheres to the tender criteria which, amongst others, shall be measured by means of a functionality evaluation.

To ensure Targeted Enterprise participation as it is intended by the Employer and as defined in the Specification Data, Functionality shall be scored based on the type of subcontract package, e.g. construction or the supply of goods or services and at least three (3) or more of the criteria listed below shall be applied.

The points allocated for the listed criteria shall be clearly demonstrated to tenderers as a matrix in the tender document. The functionality matrixes provided in the Employer's proforma document for Targeted Enterprise subcontracting (Appendix 11) shall be applied to evaluate the functionality of Tenderers.

Tenderers must score a minimum of 75% for functionality and Tenderers that do not obtain the threshold shall not be evaluated further.

a. Locality

For lower CIDB grade packages, the points allocated for Locality typically has a higher weighting in the total evaluation points but shall not be more than 65% of the total evaluation points.

Points scored shall be based on the Targeted Enterprise's registered address with the CIPC.

- i. If the Targeted Enterprise is more than twelve (12) months old and the company address:
 - (a) was changed with the CIPC in the twelve (12) months prior to the tender advertisement; or
 - (b) does not correlate with the company address recorded on the CSD,the Targeted Enterprise shall provide additional proof of its address in the twelve (12) months preceding the tender advertisement date and that the address is current by submitting the following:
 - (i) for urban areas:
 1. signed lease agreement confirming occupation in the preceding twelve (12) months; or
 2. mortgage statement confirming ownership in the preceding twelve (12) months; and
 3. a current utility bill (not older than three (3) months) confirming that occupation is current; or
 - (ii) for semi-urban and rural areas
 1. an affidavit from the relevant ward councillor or traditional authority, signed and stamped by a registered commissioner of oaths, which confirms that the business has been operating from the said address in the preceding twelve (12) months.
- ii. If Targeted Enterprise is less than twelve (12) months old and the company address:
 - a. was changed with the CIPC in the twelve (12) months prior to the tender advertisement; or
 - b. does not correlate with the company address recorded on the CSD,

the oldest registered address on either the CIPC or the CSD will be accepted as the Targeted Enterprise's address for the purpose of scoring locality points.

- iii. If the Targeted Enterprise intends to operate from a branch office for the purpose of the anticipated subcontract, the same additional proof that the company has been operating from the branch office in the twelve (12) months prior to the tender advertisement date must be provided as listed in the paragraphs above.
- iv. If the above additional proof of address cannot be provided, locality points shall be awarded based on the tenderer's address registered with the CIPC in the twelve months prior to the tender advertisement date.

b. Equipment

For lower CIDB grade packages, the points allocated for Equipment typically has a lower weighting in the total evaluation points.

The combined points allocated for Equipment and Experience shall not be more than 35% of the total evaluation points.

c. Experience

For lower CIDB grade packages, the points allocated for Experience typically has a lower weighting in the total evaluation points.

The combined points allocated for Equipment and Experience shall not be more than 35% of the total evaluation points.

d. CIDB grade and class

The points allocated for CIDB grade and class shall not be more than 35% of the total evaluation points.

CIDB grade and class shall not be used as an evaluation criterion for packages pertaining to the supply of material, goods and/or services.

e. Project Specific Designated Groups; e.g. woman, youth, etc.

In addition to the eligibility criteria for preferential procurement functionality points may also be allocated for the following Designated Groups:

- i. Tenderer is 51%+ owned by black people who are youth.
- ii. Tenderer is 51%+ owned by black people who are women.
- iii. Tenderer is 51%+ owned by black people with disabilities.
- iv. Tenderer is 51%+ owned by black people who are military veterans.

The points allocated for Designated Groups shall not be more than 15% of the total evaluation points.

One, two or three of the Designated Groups listed above may be selected to count towards the score for Designated Groups.

If any one of the Designated Groups listed above is already an eligibility criterion, it must not be included as a functionality criterion as well.

The inclusion of any of the Designated Groups listed above shall be based on the Contractor's Resources and Skills Audit.

Youth and veterans may not be selected together.

(iii) Stage 3 – Price and Preference

Tenderers that obtained the minimum threshold for functionality shall be further evaluated on their Price and Preference submissions, i.e.:

- a. Price = 80 / 90 %
- b. Preference = 20 / 10 %

The highest scoring tenderer for each subcontract package shall be checked for compliance.

The Contractor shall state in the tender advertisement and in the tender documents that only one subcontract package shall be awarded to an entity at any one time for this project, meaning that a Targeted Enterprise may be awarded a work package and on conclusion thereof may be awarded a subsequent work package, but more than one work package may not be awarded simultaneously for this project.

If a tenderer tendered for more than one subcontract package and scored the highest points in more than one package, the Contractor shall award to the tenderer the work package that has the most economic benefit to the Employer.

(iv) Stage 4 – Compliance Check

The highest scoring tenderer for each subcontract package shall be checked for compliance with respect to the following criteria:

- a. Proof that the Tenderer is compliant with the COID Act (excl. CIDB 1 and 2 subcontractors).
- b. Proof that the Tenderer is tax compliant.

If the highest scoring tenderer fails to meet any of the compliance criteria, he will be given seven (7) calendar days to become compliant.

If the highest scoring tenderer fails to submit the requested compliance information in the required timeframe, he shall be deemed non-compliant and the evaluator shall check the second highest tenderer for compliance. This process is repeated until a compliant tenderer has been identified.

(d) Appoint successful Targeted Enterprises

(i) Table the Tender Report to the PLC

The Contractor shall present the Tender Report for each sub-contract package to the Employer and the Engineer and thereafter table it to the PLC prior to award of the sub-contract.

(ii) Negotiating tender sum and/or rates with Targeted Enterprises

a. Rates

If the Contractor choose to include work for which he has tendered rates in the subcontract package and the tenderer who scored the highest points tendered higher rates than that of the Contractor, the Contractor may negotiate rates and the final sum with the tenderer.

If the Contractor fails to negotiate a reasonable tender sum or rates with the tenderer, he may:

- i. approach the second highest points scoring, compliant tenderer for negotiation. This process may be repeated up to the third highest points scoring compliant tenderer, where after the package shall be retendered. The Contractor shall be limited to negotiate down to 25% above his own rates (this process must

be clearly explained prior to negotiation, when the tender report is tabled to the PLC); or

- ii. accept the highest points scoring tenderer's higher rates and total sum and remunerate the sub-contractor at the sub-contractor's tendered rates from the Lump Sum which the Contractor has tendered for the fluctuation between the Contractor's rates and that of the Targeted Enterprise sub-contractors.

b. Provisional Sum

If the Employer has provided a Provisional Sum for the work items in the subcontract package, the Contractor shall report on the feasibility of the highest point scoring compliant tenderer's tender rates and tender sum to the Employer and the Engineer.

- i. If the highest points scoring compliant tenderer's rates and tender sum are deemed market related by the Engineer, the Contractor shall obtain the Employer's approval to utilise the Provisional Sum provided for the work items.
- ii. If the highest points scoring compliant tenderer's rates and tender sum are deemed not market related and the Employer does not approve the utilisation of the relevant Provisional Sum, the Contractor may negotiate with the tenderer for market related rates and tender sum.
- iii. If the Contractor fails to negotiate market related rates and a tender sum with the tenderer, he may:
 - (a) approach the next highest point scoring, compliant tenderer for negotiation. This process may be repeated up to the third highest points scoring compliant tenderer, where after the package shall be retendered; or
 - (b) accept the highest points scoring tenderer's rates and total sum and remunerate the sub-contractor from the Lump Sum which the Contractor has tendered for the fluctuation between the Contractor's rates and that of the Targeted Enterprise sub-contractors. The Contractor shall not pay rates or tender sums that is more than 15% higher than what are deemed market related by the Engineer.

(iii) Low tender sums submitted by Targeted Enterprises

The Contractor shall report to the Employer and the Engineer on the feasibility of tendered rates, sums or provisional sums of tenderers who tendered exceptionally low. Exceptionally low rates, sums or provisional sums are those that are more than ten percent (10%) less than what the Contractor tendered or, in the case of a Provisional Sum, what is deemed market related by the Engineer.

- a. If the tendered rates, sums or provisional sums of those tenderers who tendered exceptionally low are deemed by the Engineer to still be feasible, the Contractor may continue to include these tenders in his tender evaluation.
- b. If the tendered rates, sums or provisional sums of those tenderers who tendered exceptionally low are deemed by the Engineer to not be feasible, the Contractor may disqualify these tenders from his tender evaluation.

The Employer strongly discourages the appointment of Targeted Enterprises that did not tender feasible rates, sums or provisional sums. If all prices submitted are deemed exceptionally low by the Engineer, the subcontract package shall be retendered.

The consequences of exceptionally low prices must be clearly outlined in the Tender Report and clearly explained to the PLC prior to award or retendering of the subcontract packages.

(iv) Payment to the Contractor

- a. The Employer shall not remunerate the Contractor, other than what have been provided for in the payment items, for accepting higher tender sums tendered by Targeted Enterprises.
- b. If the Contractor accepts tender sums that are higher than what have been provided for in the Contractor's tendered rates or the Employer's provisional and/or prime cost sums, the costs shall be paid by the Contractor from the Lump Sum which he tendered for the fluctuation between the Contractor's rates and that of the Targeted Enterprise sub-contractors.

(v) Entering the Subcontract Agreement

The Contractor's TE Procurement Coordinator shall assist successful Targeted Enterprises to enter into a subcontract agreement with the Contractor as described in this Specifications.

D1008 GENERAL RESPONSIBILITIES OF THE CONTRACTOR TOWARDS TARGETED ENTERPRISES

The Contractor shall have the responsibilities described in this Section, D1008 of the Specifications, towards all Targeted Enterprises subcontracted in terms of the CPG as stated in the Specification Data.

(a) The Employer's Independent Targeted Enterprise Monitor

The Employer shall, through its Transformation Unit, appoint an independent Targeted Enterprise Monitor, who shall audit the Contractor with respect to his obligations to Targeted Enterprises and who shall report his findings to the Employer's Project Manager, the Engineer, and the Regional Transformation Officer (RTO) monthly.

(b) Failure to Comply with Responsibilities Towards Targeted Enterprises

If the Contractor, in the opinion of the Employer's Project Manager or the Engineer, fails to comply with its responsibilities towards Targeted Enterprises, the Engineer shall issue a written warning to the Contractor, stating all the areas of non-compliance. The Contractor's time to correct shall be stated in the letter and shall be in accordance with the relevant specifications for the aspects of non-compliance.

A copy of the letter of warning shall be forwarded to the Employer's Project Manager and the Targeted Enterprise Monitor shall monitor that corrective action is taken by the Contractor.

Failure by the Contractor to comply with a deadline, will be sufficient grounds for the Employer to apply a penalty or institute a claim in accordance with the relevant Conditions of Contract.

D1008.01 Targeted Enterprise (TE) Construction Manager

The Contractor shall appoint a dedicated TE Construction Manager whose sole responsibility shall be to assist the Contractor with the execution of his responsibilities towards Targeted Enterprises and Target Groups as prescribed in this Section D of the Specifications, with an emphasis on D1008 and D1010.

The TE Construction Manager may be appointed from the Contractor's existing staff or may be employed or sub-contracted for the purpose of this Contract. Irrespective of the contractual relationship between the TE Construction Manager and the Contractor, the TE Construction Manager shall not perform any other duties than that of a dedicated TE Construction Manager on a full-time basis for this Contract.

(a) TE Construction Manager's Obligations

Amongst others, the TE Construction Manager shall facilitate the training, mentoring, development and support of Targeted Enterprises as per the Contractor's approved Training and Skills Development Programme (see Section D1010 of the Specifications).

The TE Construction Manager shall submit monthly TE Progress Reports in the Employer's reporting format. The report shall be submitted to the Employer's Project Manager and Regional Transformation Officer, the Engineer and the Contractor, at least one week prior to the monthly site progress meeting.

This report shall include, amongst others:

- i) Details of TEs trained, e.g., number, hours, value, modules, credits obtained, etc.
- ii) Details of TEs sub-contracted, e.g., number, packages, values, etc.
- iii) Details of TEs performance on the work packages, and skills gaps to be addressed, etc.
- iv) Details of TEs growth and sustainability, e.g., CIDB grading upgrades, business success, etc.
- v) Details of disputes and the associated interventions and/or resolutions.

(b) TE Construction Manager's Qualifications and Experience

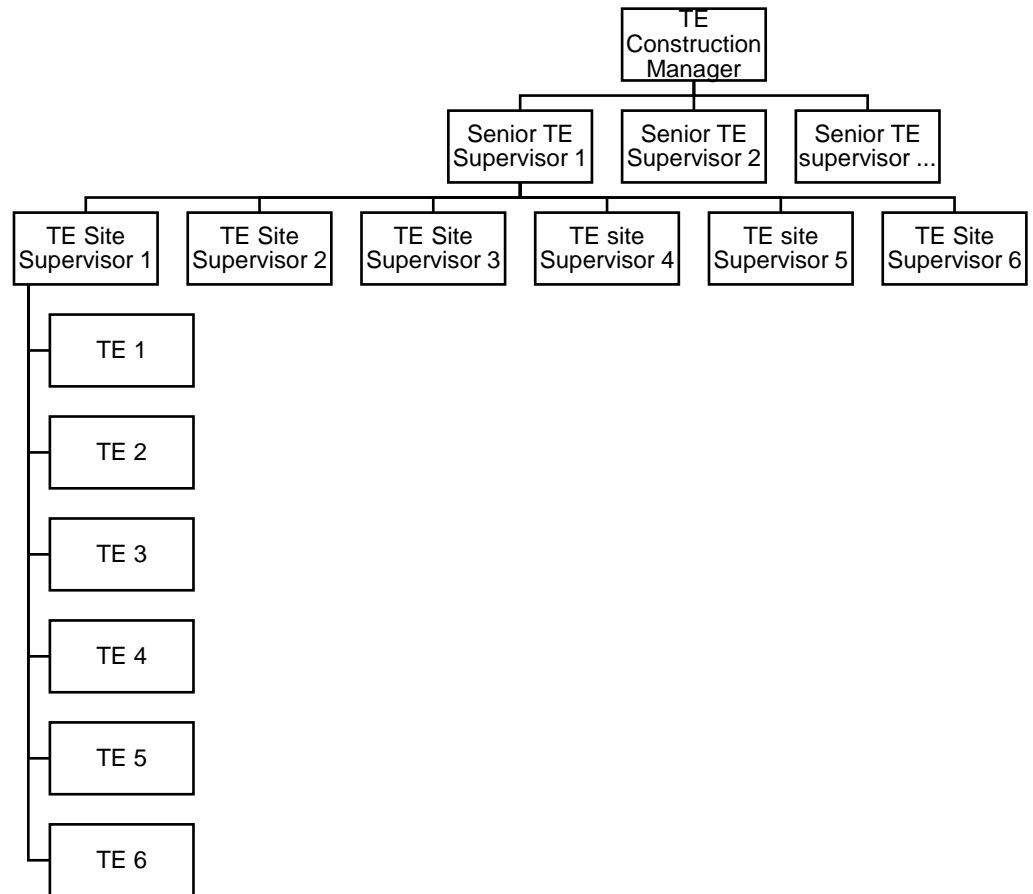
The TE Construction Manager shall have, as a minimum, a National Diploma: Management of Civil Engineering Construction Processes (NQF Level 5) or an equivalent qualification.

He shall have at least 5 years' experience as a Site Agent, managing construction processes in the fields of roads maintenance, new roads construction, roads rehabilitation, roads structures, etc. In addition, he shall have ample knowledge of, and experience in, the requirements of training and mentoring in the road construction environment.

(c) TE Construction Manager's Team

The TE Construction Manager shall have on his team one (1) TE Site Supervisor for every six (6) Targeted Enterprises which are in their respective construction phases and one (1) Senior TE Supervisor for every six (6) TE Site Supervisors.

The qualifications and/or experience of TE Site Supervisors and Senior TE Supervisors shall be relevant and of a suitable level to enable them to supervise the level of Targeted Enterprise and the specific works under construction. Below is an indicative organogram of the TE Construction Manager and his team.



D1008.02 General Obligations

The Contractor shall, with the assistance of the TE Construction Manager, comply with the following general obligations:

- (a) Assist the Targeted Enterprises in instituting a quality assurance system;
- (b) Provide adequate training, coaching, guidance, mentoring and any other identified and approved assistance to Targeted Enterprises and their employees;
- (c) Provide support and any other identified and approved assistance to ensure that the Targeted Enterprises meet their obligations and commitments with respect to their sub-contracts,
- (d) Assist Targeted Enterprises to monitor and manage the schedules, costs, and cash flows of their sub-contracts.
- (e) Endeavour to avoid sub-contract disputes and if disputes do arise, facilitate a process to find an amicable solution.
- (f)
- (g) Ensure that the CPG objectives are achieved.

D1008.03 Sub-contract Agreements

The Contractor shall conclude subcontract agreements with each subcontracted Targeted Enterprise and shall utilise the be the Employer's proforma document for Targeted Enterprise sub-contracting (see Appendix 11), which is based on the 2011 FIDIC Conditions of Sub-contract for Construction and shall be in accordance with the provisions of amended sub-clause 4.4 of the Conditions of Contract and shall be consistent with the terms and conditions of this Contract.

(a) Special Conditions of Contract

The following Special Conditions of Contract forms part of the subcontract agreement:

- (i) The Targeted Enterprise's entitlement to receive the training contemplated in this Contract (Part C1, C1.2.1, Part B, clause 6.8);

- (ii) The Targeted Enterprise's obligation to participate and co-operate in the training provided for in this Contract (Part C1, C1.2.1, Part B, clause 6.5);
- (iii) The allowable sources from which Labour may be drawn in terms of the Contract (Part C1, C1.2.1, Part B, clause 6.8);
- (iv) The terms and conditions relating to the recruitment, employment and remuneration of Labour engaged on the Contract (Part C1, C1.2.1, Part B, clause 6.5);
- (v) The training to be provided to the Targeted Enterprise's workforce (Part C1, C1.2.1, Part B, clause 6.8);
- (vi) The terms and conditions related to payment of the Targeted Enterprise (Part C1, C1.2.1, Part B, clauses 14.6 to 14.8 and 15.3);
- (vii) Sanctions in the event of failure by the Targeted Enterprise to comply with the terms and conditions of the subcontract agreement (Part C1, C1.2.1, Part B, clauses 14.6 and 20.4 to 20.7);
- (viii) Dispute avoidance and resolution procedures (Part C1, C1.2.1, Part B, clauses 20.4 to 20.7).

Further Special Conditions of Contract required by the Contractor shall only be included into the subcontract agreement once approved by the Employer and the Engineer.

(b) Monitoring of Sub-contract Agreements

The proforma subcontract agreement for each group of work packages shall be tabled to the Employer's Independent Targeted Enterprise Monitor for his review and confirmation that sub-contract agreements are in terms of the Employer's requirements and policies.

In addition, the PLC may request proof that subcontract agreements were entered into with the subcontracted Targeted Enterprises. The PLC may also request insight into the Conditions of Subcontract and Subcontract Data.

To protect Targeted Enterprises' competitive advantage and/or tender strategy, only the subcontract agreement shall be available to the PLC for perusal and not the pricing structure and/or Schedule of Quantities.

A copy of each subcontract agreement shall be filed with the Engineer after confirming that it is in accordance with the provisions of this Contract.

D1008.04 Payment of Targeted Enterprises

Targeted Enterprises shall be paid the rates and/or provisional sums which they have tendered, or which have been negotiated as described in this Section D of the Specifications.

(a) Payment of Provisional and General Obligations

Provision shall be made in the subcontract agreement for the Targeted Enterprise's preliminary and general obligations (P&Gs), which shall be calculated as a minimum of 15% of the value of the scheduled subcontract work items.

Where the Contractor's subcontract work is not paid from a Provisional Sum, the P&Gs of the Targeted Enterprise shall be paid from the Lump Sum tendered by the Contractor for the P&Gs of Targeted Enterprises.

P&Gs shall be paid to Targeted Enterprises as per Section C1.3.1 of the COTO specification payment items, i.e.:

- (i) C1.3.1.1 paid in 3 instalments of 50%, 35% and 15%;
- (ii) C1.3.1.2 paid as a percentage of the total value progressively per certificate;
- (iii) C1.3.1.3 paid monthly for the sub-contractor's contract duration.

(b) Monitoring of Payment of Targeted Enterprises

The Employer's independent Targeted Enterprise Monitor shall audit the Contractor's Payment of Targeted Enterprises to ensure timeous and correct payment in terms of the Employer's requirements and Policies and shall report his findings to the Employer's Project Manager on a regular basis.

D1008.05 Quality of Work and Performance of Targeted Enterprises

(a) Ensuring Quality of Work and Performance

The purpose of the Employer's CPG is to, amongst others, enhance the utilisation and development of Targeted Enterprises. Thus, while the Contractor remains responsible for the quality of work and performance of Targeted Enterprises, he may not neglect the developmental requirements in the sub-contracting of Targeted Enterprises.

It is thus emphasised that the Contractor's TE Construction Manager shall closely monitor and supervise all Targeted Enterprises and shall train, coach, guide, mentor and assist each Targeted Enterprise in all aspects of management, execution and completion of its subcontract. This shall typically include assistance with planning of the Works, sourcing and ordering of materials, labour relations, monthly measurements and invoicing procedures. The extent and level of such training, coaching, guidance, mentoring, and assistance to be provided by the Contractor shall be commensurate with the level of subcontract applicable and shall be directed at enabling the Targeted Enterprise to achieve the successful execution and completion of its subcontract.

(b) Failure by the Targeted Enterprise to Comply

If the Targeted Enterprise, in the opinion of the Engineer, fails to comply with any of the criteria listed below, the Engineer shall issue a written warning to the Contractor stating all the areas of non-compliance. A copy of the letter of warning shall be forwarded to the Employer's Project Manager and the Employer's independent Targeted Enterprise Monitor. The criteria are as follows:

- (i) Deliver acceptable standard of work as set out in the specifications;
- (ii) Progress in accordance with the time constraints in the subcontract agreement;
- (iii) Punctual and full payment of the workforce and suppliers;
- (iv) Site safety;
- (v) Accommodation of traffic.

(c) Assist the Targeted Enterprise to Make Good

The Contractor shall in terms of the sub-contract agreement (Part C, clause 3.1.12) give reasonable warning to the Targeted Enterprise when any contravention of the terms and conditions of the subcontract agreement has occurred or appears likely to occur.

The Contractor shall, together with the Targeted Enterprise, identify the causes that led to failure to comply and jointly develop a plan to rectify, which plan shall be submitted to the Employer's Project Manager and the Engineer for information purposes.

Based on the plan to rectify, the Contractor shall give the Targeted Enterprise reasonable opportunity to make good any such contravention, or to avoid such contravention, and shall render all reasonable assistance to the Targeted Enterprise in this regard.

(d) Monitoring Execution of the Plan to Make Good

The Employer's independent Targeted Enterprise Monitor shall review plans to rectify and monitor the execution thereof to ensure that Targeted Enterprises are given a fair opportunity to rectify within a developmental environment. He shall report his findings to the Employer's Project Manager monthly.

D1008.06 Dispute Avoidance and Resolution Procedures

When any disputes arise, the Contractor shall within seven (7) calendar days inform the Employer's Project Manager, the Employer's Targeted Enterprise Monitor, and the Engineer, in writing, of the details of the dispute.

(a) Facilitate Dispute Avoidance

Prior to taking any action, the Contractor shall commence with a facilitation process by arranging a formal meeting with the Targeted Enterprise with the aim to find an amicable solution to the dispute. The meeting shall be attended by the Employer's Project Manager, the Employer's Targeted Enterprise Monitor, and the Engineer to ensure a fair and transparent process in reaching a settlement.

If the parties are unable to find an amicable solution, the Contractor shall explain fully to the Targeted Enterprise the provisions in the sub-contract agreement to address disputes. If action is necessary, it shall be discussed with the Employer's Project Manager and the Engineer prior to any action being taken.

(b) Support to Targeted Enterprise during Dispute Resolution Process

While the Employer's Project Manager and the Engineer will observe the dispute resolution process to ensure fairness and transparency, the Targeted Enterprise may request consultation and assistance from the Targeted Enterprise Monitor. The Targeted Enterprise Monitor will assist the Targeted Enterprise with the interpretation of the Conditions of Sub-contract and will guide the Targeted Enterprise during the dispute resolution process.

(c) Issuing a Letter of Warning to Targeted Enterprise

The Contractor shall issue a letter of warning to the Targeted Enterprise, whom shall have 21 calendar days from the date of receipt of the letter of warning by the Contractor to address and rectify the issues raised by the Engineer, except for issues pertaining to Site Safety and Accommodation of Traffic, for which the reaction time shall be in accordance with the relevant specifications for those aspects of the Works, but which shall not be longer than 24 hours.

(d) Failure by the Targeted Enterprise to Comply

Failure by the Targeted Enterprise to comply with a deadline, will be sufficient grounds for the Contractor to apply a penalty or terminate the subcontract agreement provided that the Employer and the Engineer are satisfied that the Contractor has made every effort to correct the performance of the Targeted Enterprise.

The Targeted Enterprise may dispute any ruling given or deemed to be given by the Contractor or the Engineer, within 21 calendar days after receipt thereof by submitting a written Dispute Notice to the Contractor, in terms of the relevant Conditions of Sub-contract.

On request by the Targeted Enterprise, the Targeted Enterprise Monitor will assist the Targeted Enterprise with the interpretation of the Conditions of Sub-contract and will guide the Targeted Enterprise during the dispute resolution process.

D1009 WORK SUITABLE FOR EXECUTION BY TARGETED ENTERPRISES

To assist the Contractor in achieving his CPG, the following work items have been identified as being suitable for execution by Targeted Enterprises:

- (a) Erection and maintenance of the Contractor's camp site
- (b) Clearing and grubbing.
- (c) Removal of trees.
- (d) Provision of traffic control facilities.
- (e) Management of traffic control facilities and traffic safety as part of the accommodation of traffic.
- (f) Construction and clearing of drains.
- (g) Installation of prefabricated culverts including inlet and outlet structures.
- (h) Concrete channelling and concrete linings for open drains.
- (i) Construction of concrete paving, kerbs and channels.
- (j) Construction of small concrete and other structures.
- (k) Construction of concrete walkways.
- (l) Pitching, stonework and protection against erosion.
- (m) Construction of gabions.
- (n) Patching and repairing edge breaks.
- (o) Erection of guardrails.
- (p) Landscaping.
- (q) Fencing.
- (r) Road signs.
- (s) Road markings.
- (t) Finishing the road and road reserve.
- (u) Site Security Services.
- (v) Haulage of materials
- (w) Supply of plant.
- (x) Supply of fuel.
- (y) Specialised subcontract work such as:
 - (i) Construction of concrete pavements.
 - (ii) Laying of asphalt using asphalt pavers.
 - (iii) Structural concrete such as culvert and bridges.
 - (iv) Crushing of materials.
 - (v) Precast manufacture.
 - (vi) Batch plant erection and operations.
 - (vii) Earthworks, layerworks construction.
 - (viii) Structural steel fabrication, erection.

From the above work items, the following have been identified as suitable for execution by CIDB CE1 and CE2 Targeted Enterprises:

- (a) Concrete sidewalks.
- (b) Side drains.
- (c) Clearing and grubbing.
- (d) Construction and clearing of drains.
- (e) Any other work identified by the Employer to be executed in the Target Area.

The work to be carried out by Targeted Enterprises is not limited to the work listed above and the Contractor may need to engage Targeted Enterprises on other aspects of the Works to achieve the CPG.

A Provisional Sum for the work by CIDB 1 and 2 Targeted Enterprise sub-contractors is allowed under pay item D10.05.

D1010 TRAINING, COACHING, GUIDANCE, MENTORING AND ASSISTANCE

The Contractor shall with the input and support of the PLC develop a Training and Skills Development Programme which shall be managed by the Contractor's TE Construction Manager.

D1010.01 Purpose of the Training and Skills Development Programme(s)

Skills development forms an integral part of the Employer's Transformation and Community Development Policies and hence, it is important to the Employer that Targeted Labour and Targeted Enterprises be equipped with skills that can be used to gain meaningful future employment and secure subcontracting opportunities.

It is, therefore, a requirement of this Contract that the Contractor provide adequate training, coaching, guidance, mentoring and assistance to the Targeted Labour and Targeted Enterprises to ensure skills development within the Construction Industry.

D1010.02 Skills Audit and Analysis

To develop the Training and Skills Development Programme(s), the Contractor shall conduct a skills audit and analysis of Labour on the Targeted Labour database and the Targeted Labour of sub-contracted Targeted Enterprises to determine their levels of education, existing qualifications, and skills sets. The outcome of the skills audit and analysis shall be used to develop a Training and Skills Development Programme(s) that will benefit both the employee and the Construction Industry at large.

Included in the skills audit and analysis shall be a separate section, analysing the education, qualifications and skills sets of the Targeted Enterprise's owners and their supervisors sub-contracted by the Contractor to develop a Training and Skills Development Programme that will develop and improve the ability of small business owners and their supervisory staff to better manage their enterprises.

D1010.03 Developing the Training and Skills Development Programme

The Employer shall be involved in the decision making and quality control pertaining to the development and implementation of the Training and Skills Development Programme facilitated through this Contract.

The Employer has no service agreement or memorandum of understanding with any education and training quality assurance body and, therefore, does not function as the "Employer" as defined under any three-party-agreement between the Trainee, the Training Provider and the Employer.

However, the Employer requires similar outcomes to that of formal learnership programmes and the Contractor shall structure a Training and Skills Development Programme in a manner that permits continued access to further learning and qualifications within a defined programme.

The complete Training and Skills Development Programme shall be developed during the Mobilisation Period, accepted by the Engineer after consultation with the Employer and tabled to the PLC for their information before any training commence.

D1010.04 The Training Service Provider

While the Contractor's TE Construction Manager will manage the Training, Development and Support Programme and mentor Targeted Enterprise subcontractors from a practical point of view, the Contractor shall subcontract a Training Service Provider to implement the theoretical training components of the Programme by applying the Employer's Supply Chain Management Policy for second tier procurement.

(a) Accreditation of the Training Service Provider

The Training Service Provider entity shall be accredited, and have in its employ Practitioners, Assessors and Moderators who are registered, with the Construction Education Training Authority (CETA). Proof of accreditation and registration shall be current, valid and list the NQF levels and Unit Standards for which the entity and its staff are accredited.

(b) Qualifications and Experience of the Training Service Provider

The training and competency levels required of the Training Service Provider and his staff are outlined in the table below:

TABLE D1010/1: QUALIFICATIONS FOR TRAINING STAFF

Designation	Title and Unit Standard No.	NQF Level	Credit
Practitioner	Train the trainer; No 7384	4	16
Assessor	Conduct outcome base assessment; No 115753	5	15
Moderator	Conduct moderation of outcome-based assessment; No 115759	6	10

In addition to the above qualifications, and in keeping with current CETA practical experience requirements for registration as a Practitioner, NQF Level 4 Unit Standards shall only be presented by Practitioners with NQF Level 5 (one level up) credentials.

The Employer further requires that Assessors and Moderators shall have at least 5 years' experience as a Site Agent, managing construction processes in the fields of roads maintenance, new roads construction, roads rehabilitation and structures.

Elective Unit Standards are typically more vocational orientated and may require specialist input. It is thus not a requirement that individual Practitioners and Assessors shall have all the necessary skills for all the different categories of Unit Standards. The Training Service Provider may and shall therefore, when necessary, appoint Practitioners and Assessors on an ad hoc basis with the levels of experience which are required for the Unit Standards to be presented.

D1010.05 Training and Skills Development Programme: General Requirements

The Training and Skills Development Programme shall consist of Learnerships that include multiple, but related Unit Standards which are (1) relevant to the Works to be constructed, (2) aimed at achieving the skills development objectives of the Programme, and (3) lead towards a formal qualification in the Construction Industry.

Learnerships shall include both the theoretical and practical components of each Unit Standard and shall be in accordance with the various laws and regulations contained in the South African Qualification Authority (SAQA) statutes.

(a) Training Programme: Requirements and Considerations

The Skills Audit and Analysis shall inform the Contractor of every employee's Recognised Prior Learning (RPL) skills and competencies, which shall be taken into consideration in the development of the Training and Skills Development Programme so that the RPL skills and competencies, together with the Training Programme Unit Standards offerings, will lead to a full Learnership outcome and hence a formal qualification.

It is recognised that the Training and Skills Development Programme may consist of several Unit Standards but totalling insufficient credits for a full Learnership qualification. Nevertheless, the competencies and credits achieved in the Programme shall contribute to a full Learnership by a later acquisition of the outstanding Unit Standards required for the full Learnership.

The Training and Skills Development Programme shall be structured in a manner to prioritise those Unit Standards that will equip Trainees with the minimum skills and competencies required to become economically involved in the execution of the Works as soon as possible.

The Training Service Provider shall apply the SAQA Learnership criteria of which the basic elements are listed below to demonstrate the Employer's requirements:

- (i) Minimum credits for qualification;
- (ii) Fundamental Unit Standards and credit values;
- (iii) Core Unit Standards and credit values;
- (iv) Elective Units Standards and credit values;
- (v) Assumption that NQF Level 3 literacy, numeracy, and computer competencies exist;
- (vi) RPL processes;
- (vii) Exit level outcomes.

The above criteria are not exhaustive, and the Training Service Provider shall apply the systems and processes required by the relevant SAQA and other related legislation pertinent to training. The Training Service Provider shall regularly consult the SAQA website (www.saqa.org.za) to ensure that the most current Unit Standards are presented. In the event of any conflict, the legislated requirements shall apply.

While structuring the Learnership offerings, the Training Service Provider shall distinguish between the levels of learning required. The bulk of the training shall focus on NQF Levels 4 and 3. NQF Level 5 training is not anticipated but may be suitable for qualifying staff of established small contractors. The qualification titles for the respective NQF Levels are:

- a. NQF Level 3 National Certificate: Construction Roadworks.
- b. NQF Level 4 National Certificate: Supervision of Construction Processes
- c. NQF Level 4 National Certificate: Business Management
- d. NQF Level 5 National Diploma: Management of Civil Engineering Construction Processes

It may be necessary to include additional Core Unit Standards, e.g. "Tendering" or "Entrepreneurship" as an additional Unit Standard for NQF Level 4, to achieve the Contract's development objectives. The identification of any additional Unit Standards shall be discussed with the Engineer and shall not be implemented without prior approval.

Before qualifying, Trainees will be expected to demonstrate competence in a practical situation that integrates the assessment of all specific outcomes, for all Unit Standards in the Learnership Programme.

All training shall take place within normal working hours, or as agreed with the trainees.

(b) Selection of Trainees

To complete a Learnership successfully requires minimum literacy and numeracy competencies as defined by SAQA. The Training Service Provider shall utilise the skills audit and analysis and conduct additional skills analysis to benchmark the literacy and numeracy levels of Targeted Labour and Targeted Enterprises and their employees. This information shall guide the Training Service Provider in formulating the Trainee selection methodology(ies) and process(es). The Training Service Provider shall make provision for:

- (i) baseline assessments, e.g. conducting RPL enquiries and tests; and
- (ii) a skills gap programme consisting of Fundamental Unit Standards, to facilitate the selection process.

Trainees identified as having already acquired some tertiary training, particularly in the field of Civil Engineering, may be suitable for a specialised Trainee programme or a higher NQF Level programme. The Training and Skills Development Programme shall, therefore, make provision for Trainees with a variety of competency levels and shall make provision for different levels of training.

It should be noted that where this Section D of the Specifications refers to the selection and training of Trainees, any person, employed by any national, provincial

or local authority, being it full time or part time, is expressly excluded from being considered for this training.

(c) Learning Material

Learning material is required for each Unit Standard. This learning material is the equivalent of prescribed textbooks for other qualifications. Each Trainee shall receive a copy of the learning material to learn the contents and to use it as a reference source after obtaining the qualification.

The SAQA Unit Standard curriculums define the contents of the learning material. The learning material shall not only comply with the SAQA and CETA guidelines but shall be technically and practically aligned to road construction and/or road maintenance. Any input from a subject matter expert required to ensure the appropriateness of learning material contents shall be included in the Training Service Provider's costs.

The requirements to be addressed in learning material as outlined by the SAQA Unit Standard curriculums are, amongst others, the following:

- (i) purpose of the Unit Standard;
- (ii) specific outcomes (typically 4 per Unit Standard);
- (iii) assessment criteria (typically 4 per specific outcome);
- (iv) range as is defined for each specific outcome;
- (v) critical cross-field outcomes for the Unit Standard;
- (vi) Unit Standard essential embedded knowledge.

(d) Student Experiential Training or Learnerships or Internships

The Employer may deploy students to the construction site to obtain experiential training. The Contractor shall provide experiential training to these students in accordance with the relevant academic institution's requirements, which is typically a university, a university of technology, or a TVET.

The Contractor shall also provide students with all the tools (including appropriate information technology hardware and software) and site office space necessary to carry out engineering work as if they were the Contractor's own permanent staff.

Reporting on training progress of each student shall be compiled according to the formats and intervals set by the relevant academic institution.

(e) Keeping of Records

The Training Service Provider shall keep comprehensive records of the training provided to each Trainee and shall ensure that Trainees' successful completion of successive Unit Standards are entered onto the national SAQA database. After the successful completion of generic skills courses, each Trainee shall be issued with a certificate indicating the course contents as proof of attendance and completion. The Contractor shall keep a register of certificates issued. Whenever required, the Contractor shall provide copies of such records to the Engineer.

(f) Skills Development Requirements

(i) Contract Skills Development Goals (CSDG)

This section establishes a minimum CSDG which is to be achieved in the performance of a Contract (*as per the CIDB Standard for Developing Skills through Infrastructure Contracts August 2013*) in relation to the provision of different types of workplace opportunities linked to work associated with a Contract which culminates in or leads to:

- a. a part- or full occupational qualification registered on the National Qualification Framework;
- b. a trade qualification leading to a listed trade (GG No. 35625, 31 August 2012);

- c. a national diploma registered on the National Qualification Framework; and
- d. registration in a professional category by one of the professional bodies listed in Table 1 of the Standard.

The Contractor shall achieve or exceed the CSDG in the performance of the Contract. The Contractor may, if need be, devolve their obligations onto Subcontractors.

The CSDG shall not be less than the contract amount multiplied by 0.25 percent (%) for Civil Engineering work (CE). For this reason, the Contractor shall insert the CSDG amount in form C2.3 Summary of Pricing Schedule.

(ii) Achieving Contract Skills Development Goal (CSDG)

The Contractor shall achieve the CSDG by providing employment opportunities to Trainees requiring structured workplace learning using one or a combination of any of the following methods in relation to work directly related to the Contract:

Method 1: Structured workplace learning opportunities for Trainees (LoL) towards the attainment of a part or a full occupational qualification.

This training method shall apply to Targeted Enterprises and Targeted Labour.

Method 2: Structured workplace learning opportunities for apprentices or other artisan Trainees (LoA) towards the attainment of a trade qualification leading to a listed trade (GG No. 35625, 31 August 2012) subject to at least 60% of the artisan Trainees being holders of public FET college qualifications.

This training method shall apply to Targeted Enterprises and Targeted Labour.

Method 3: Work integrated learning opportunities for University of Technology or Comprehensive University students (LoUS) completing their national diplomas.

This training method shall apply to P1 and P2 Trainees, or Trainees with a 240 credits qualification. Both the permanently employed and temporary employed Trainees shall be considered under this training method.

Method 4: Structured workplace learning opportunities for candidates (LoC) toward registration in a professional category by a statutory council listed in Table 1 of the Standards.

This training method shall apply to Candidates with 480 credits qualification. Both the permanently employed and temporary employed Trainees shall be considered under this training method.

No single method shall contribute more than 75 percent of the CSDG. Permanently employed Trainees may not account for more than 33 percent (%) of the CSDG, and not more than one method may be applied to any individual concurrently in the calculation of the CSDG.

(iii) CSDG Credits

The CSDG shall be calculated by multiplying the number of people employed by the Contractor and placed for continuous training opportunities in a three-

month period by the notional values contained in Table 3 of the Standard, or as revised in a Gazette notice.

The Contractor may source beneficiaries of the CSDG from a Skills Development Agency (SDA) recognised by the CIDB.

All beneficiaries shall be registered with a construction Skills Development Agency (SDA) recognised by the CIDB.

(iv) Denial of Credits

Credits towards the CSDG shall be denied should the Contractor not fulfil all the requirements listed in clause 3.4 (a) to (f) of the Standards.

(v) Compliance with Requirements

The Contractor shall comply with the requirement as set out in clause 4 of the Standards.

(vi) Records

The Contractor shall submit all the documentation required in terms of clause 4 of the Standards, in a timely manner and according to a prescribed format where applicable.

The Engineer shall certify the value of the credits counted towards the CSDG, if any, whenever a claim for payment is issued to the Employer and shall notify the Contractor of this amount.

The Contractor shall, upon termination of the opportunities provided to satisfy the CSDG, certify the quantum and nature of the opportunity and submit the certificate, counter-certified by the relevant individual, to the Engineer for record-keeping purposes.

(vii) Sanctions

Failure to achieve the CSDG shall render the Contractor liable for a penalty as prescribed in clause 8.7 of the FIDIC Conditions of Contract. Penalties shall be as follows:

a. $\text{Penalty} = 0.5 \times \{[\text{LoAs} + \text{LoLs} + \text{LoUSs} + \text{LoCs}]\}$

Where:

LoLs = Monetary Value of the shortfall for structured workplace learning opportunities for Trainees towards the attainment of a part or a full occupational qualification;

LoAs = Monetary Value of the shortfall for structured workplace learning opportunities for apprentices or other artisan Trainees towards the attainment of a trade qualification leading to a listed trade (GG No. 35625, 31 August 2012) subject to at least 60% of the artisan Trainees being holders of public FET college qualifications;

LoUSs = Monetary Value of the shortfall for work integrated learning opportunities for University of Technology or Comprehensive University students completing their national diplomas (LoUS);

LoCs = Monetary Value of the shortfall for structured workplace learning opportunities for candidates towards registration in a professional category by a statutory council listed in Table 1 of the Standards (LoC), and

b. Delay the issuing of the Performance Certificate until all the required records described in clause 5 of the Standards are received.

(g) Generic Skills Training

Generic skills shall be taught where the need has been identified and approved by the Employer and the Engineer.

The Contractor shall make representation to the Employer and the Engineer, who shall approve candidates that should attend such courses as they deem appropriate. Those selected shall receive formal generic skills training in a programmed and progressive manner. The PLC may also identify a need for generic skills training.

Typical training programmes could comprise some or all of the following modules:

- (i) Basic hygiene and HIV/AIDS awareness;
- (ii) Road safety;
- (iii) Basic management of the environment;
- (iv) Tourism awareness and opportunities;
- (v) Managing personal finance;
- (vi) Adult Basic Education and Training (ABET);
- (vii) Community based training programmes (e.g. knitting, computer skills, plant/machine operator, etc.).

All generic skills training shall be accredited by the relevant Sector Education and Training Authority (SETA) and shall be provided with accredited entities and/or individuals.

(h) Community Training

Community training shall be taught where the need has been identified. Affected Communities may submit their training needs to the PLC for the Contractor's consideration and inclusion into the Training and Skills Development Programme.

While considering the training needs of affected Communities, the Engineer shall inform the PLC of the Contract's training limitations, as well as of the training that could be undertaken through the Contract. Trainees from the Community shall be identified through the Community structures, and with the input and support of the PLC. Trainees selected from the Community shall receive formal skills training in a programmed and progressive manner in compliance with subclause D1010.04. Priority shall be given to training that will equip Community members with skills that will enhance their employability.

All community skills training shall be accredited by the relevant Sector Education and Training Authority (SETA) and shall be provided with accredited entities and/or individuals.

(i) Training Facilities

The Contractor shall be responsible for providing everything necessary to offer the various training workshops and modules including:

- (i) a suitable venue with sufficient furniture, lighting and power,
- (ii) all necessary stationery consumables and study material,
- (iii) transport for attendees.

D1011 LABOUR ENHANCED CONSTRUCTION

The Contractor's attention is drawn to the fact that it is an objective of the Contract to maximise the labour content of certain operations or portions thereof. In this regard, where the specified work allows for a choice between mechanical or labour-enhanced means, the former should generally be kept to the practical minimum.

Before commencing with any labour enhanced operations the Contractor shall discuss his intentions with the Engineer and shall submit to the Engineer on a monthly basis, daily labour returns indicating the numbers of temporary personnel employed on the Works and the activities on which they were engaged.

It should be noted that activities that are conventionally done by labour methods, e.g. gabions, shall not qualify under this Section D of the Specifications.

D1012 COMMUNITY DEVELOPMENT

D1012.01 Corporate Social Investment (CSI)

The Contractor shall demonstrate its willingness to actively participate in the social development initiatives for local Communities affected by the Contract. To this end, the Contractor shall provide details of CSI initiatives it will actively pursue under Form D9: Corporate Social Investment.

D1012.02 Community Development Component

A separate community development project has been registered and does not form part of this tender.

Community Development (CD) components to the Contract are primarily training and skills development programmes to benefit an identified Community and Trainee Targeted Enterprises selected from this Community.

The owners and supervisors of Trainee Targeted Enterprises receive SAQA accredited training towards an accredited qualification which consists of theoretical and practical components.

The theoretical training is conducted by the Contractor's Training Service Provider while the practical training, which is the construction of the CD Works, is undertaken by the Trainee Targeted Enterprises under the mentorship and supervision of the Contractor's dedicated TE Construction Manager.

(a) CD Project(s)' Service Provider(s)

CD Projects identified for implementation in association with this Contract will be let for tender by the Employer as **separate Contracts**.

The name(s) and contact details of the Service Provider(s) appointed for the implementation of the CD Project(s) will be provided to the Contractor on award of the Contract or as soon as the Service Provider(s) has/have been appointed.

The Contractor shall collaborate and cooperate with the CD Project(s)' Service Provider(s) and take cognisance of the CD Project(s)' programme in compiling the programme of the Works Contract.

(b) CD Project(s) Associated with this Contract

The Employer identified a CD Project associated with this Contract with the CD project number and description being SANRAL C.xxx-xxx-20xx/1 for xxx xxx xxx (*insert CD project number and description*).

The CD Project commenced/is envisaged to commence (*select relevant wording*) on xx Xxx 20xx (*insert date*) and has an estimated duration of xx (*insert no.*) months.

The CD Project Works entail the following: (*insert a detailed description of the CD Project Works below*):

- (i) xxx
- (ii) xxx
- (iii) xxx

The Employer will identify a CD Project associated with this Contract and will inform the Contractor of the CD project number and description as soon as it has been registered, together with all other relevant detail.

D1013 MEASUREMENT AND PAYMENT

Item		Unit
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D10.01 Target Group Participation

(a) Contract Participation Performance bonus Prime Cost (PC) Sum

The prime cost sum for item D10.01(a) shall cover any CPP bonus due as specified in clause D1003.05. The prime cost sum shall be expended in accordance with clause 13.5 of the FIDIC Conditions of Contract.

Note:

No separate payment shall be made for any costs incurred by the Contractor, whether direct or indirect, for his efforts in accomplishing the specified requirements, and which are not recoverable from the pay-items allowed. Such costs shall be deemed to have been included in the rate offered under pay sub-item C1.3.1.3 Contractor's Establishment on Site and General Obligations: Time Related Obligations.

Item		Unit
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D10.02 Stakeholder and Community Liaison and Social Facilitation

(a) Cost of liaison, social facilitation and PLC support Prime Cost (PC) Sum

(b) Handling cost and profit in respect of sub-item D10.02(a) Percentage (%)

The prime cost sum for item D10.02(a) shall cover the direct costs incurred by attending members of the PLC. The rate of compensation shall be fair and agreed by the Engineer in accordance with clause 13.5 of the FIDIC Conditions of Contract. The tendered percentage for sub-item D10.02(b) shall include full compensation for all handling costs and profit of the Contractor associated with sub-item D10.02(a).

The liaison with, and assistance provided by the Contractor to the PLC to perform its duties shall not be paid from the prime cost sum. The Contractor's costs to liaise with the PLC and render such assistance shall be deemed to have been included in its rate offered for pay sub-item C1.3.1.3 Contractor's Establishment on Site and General Obligations: Time Related Obligations.

Item		Unit
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D10.03 Tender Process for Targeted Enterprises

(a) Contractor's charge for the management and execution of the Targeted Enterprise procurement process:

(i) Procurement process for the totality of all tenders concluded for the appointment of Targeted Enterprise subcontractors of CIDB 1 and 2 contractor grading..... Number (No)

(ii) Procurement process for the totality of all tenders concluded for the appointment of Targeted Enterprise subcontractors of CIDB 3 and 4 contractor grading..... Number (No)

- (iii) Procurement process for the totality of all tenders concluded for the appointment of Targeted Enterprise subcontractors of CIDB 5 and higher contractor grading.....Number (No)
- (iv) Procurement process for the totality of all tenders concluded for the appointment of Targeted Enterprise suppliersNumber (No)
- (b) Targeted Enterprise Procurement Coordinator.....Month

The unit of measurement for sub-item D10.03(a) shall be the number of individual subcontract agreements concluded with Targeted Enterprise sub-contractors and suppliers in accordance with the procurement process described in this Section D of the Specifications.

The tendered monthly rate for sub-item D10.03(b) shall include full compensation for the provision of the relevant personnel on a full-time basis to carry out the requirements in terms of sub-item D10.03(a) and the full contents of this Section D of the Specifications.

Each tendered rate shall be in full compensation for the management and execution of the Targeted Enterprise procurement process in the relevant CIDB contractor grading designation scheduled, including for the appointment of a TE Procurement Coordinator (if required), the pre-tender training of eligible Targeted Enterprises, the compilation, printing, binding and issue of the tender documents for each tender, for the advertising of each tender, for the provision of the venue and the conducting of each compulsory briefing session for tenderers, for the conducting of each tender opening process, for the adjudication of the tenders received for each tender, for the preparation of each tender adjudication report and the review thereof in conjunction with the Employer, Engineer and the PLC, for the award of each tender and for the conclusion of the subcontract agreement with each successful Targeted Enterprise tenderer, and any other relevant requirement described in this Section D of the Specifications.

Item	Unit
D10.04 Responsibilities of the Contractor towards Targeted Enterprises	
(a) Contractor's establishment, management, management support, assistance, coaching, guidance, mentoring and supervision of Targeted Enterprises	Month
(b) Targeted Enterprise Construction Manager.....	Person Month
(c) Targeted Enterprise Site Supervisors	Person Month

The tendered monthly rate for sub-item D10.04(a) shall include full compensation for the registration of all the subcontract agreements and the management of all the Targeted Enterprise subcontracts, including for the provision of the necessary management, support, coaching, guidance, mentoring and supervision of the Targeted Enterprise subcontractors.

The tendered monthly rate for sub-items D10.04(b) and (c) shall include full compensation for the provision of the relevant personnel on a full-time basis to carry out the requirements in terms of sub-item D10.04(a) and the full contents of this Section D of the Specifications.

Item	Unit
D10.05 Construction Works by Targeted Enterprises	
(a) Payments associated with the construction works executed by Targeted Enterprise sub-contractors of CIDB 1 and 2 contractor grading designation appointed in terms of Section D of the Specifications	Provisional (Prov) Sum

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- (b) Handling costs and profit in respect of payment associated with sub-item D10.05(a).....Percentage (%)
- (c) Fluctuation between the main contractor's rates and that of the Targeted Enterprise sub-contractorsProvisional Sum (Prov)
- (d) Preliminary and General Obligations of Targeted Enterprise sub-contractors appointed in terms of Section D of the Specifications Lump Sum (LS)

Expenditure under sub-items D10.05(a) shall be in accordance with clause 13.5 of the FIDIC Conditions of Contract.

The Provisional Sum for sub-item D10.05(a) is provided to cover the cost of the construction works , including preliminary and general obligations carried out by the Targeted Enterprise subcontractors of CIDB 1 and 2 contractor grading designation as certified by the Engineer, in separate payments for each Targeted Enterprise in accordance with Section D of the Specifications. Expenditure under sub-item D10.05(a) shall be limited to the Provisional Sum amount stated in the Pricing Schedule. Construction works by Targeted Enterprise sub-contractors of CIDB 1 and 2 contractor grading designation exceeding the Provisional Sum amount shall be measured for payment from the applicable work items in the Contractor's pricing schedule.

The tendered percentage for sub-item D10.05(b) is the percentage of the amount spent under sub-item D10.05(a) and shall include full compensation for the Contractor's handling costs, profit or any other costs associated with the work conducted by the Targeted Enterprise sub-contractors, which are not provided for in other pay items.

The Provisional Sum tendered under item D10.05(c) is for fluctuation of the Targeted Enterprise sub-contractor rates more than the contractor's tendered rates, for work not paid under items D10.05(a). Payment of the Lump Sum shall be on a prorata basis to provide compensation for the fluctuation between the tendered rates of the Main Contractor and that of the Targeted Enterprise sub-contractors until the Provisional Sum is depleted. Any costs incurred due to fluctuation in tendered rates more than the Provisional Sum under item D10.05(c) will be for the Contractor's account. Item D10.05(c) is applicable where the Target Enterprise sub-contractor's tender amount is higher than the Main Contractor's tender amount. The Provisional Sum will cover the fluctuation for all the tendered rates of the sub-contractors.

The Lump Sum tendered under item D10.05(d) is for the Preliminary and General Obligations of Targeted Enterprise sub-contractors (excluding CIDB 1 and 2 contractor grading designation paid from the Provisional Sum). Payment of the Lump Sum shall be on a prorata basis to provide compensation for the P&Gs of Targeted Enterprise sub-contractors until the Lump Sum is depleted. Any costs incurred for the P&Gs of Targeted Enterprise sub-contractors more than that tendered for under item D10.05(d) will be for the Contractor's account.

Item	Unit
D10.06 Training, coaching, guidance, mentoring and assistance	
(a) Training Costs	
(i) Accredited NQF training.....	Provisional (Prov) Sum
(ii) Accredited generic skills training	Provisional (Prov) Sum
(iii) Community skills training	Provisional (Prov) Sum
(iv) Handling cost and profit in respect of sub-items D10.06(a)(i), (ii) and (iii)	Percentage (%)

- (b) Student experiential training
- (i) Student stipends Prime Cost (PC) Sum
- (ii) Provision of experiential training Person Month
- (c) Other costs during training Provisional (Prov) Sum
- (d) Training venue Lump Sum (LS)

The Provisional Sums under sub-items D10.06(a) shall be paid in accordance with the provisions of sub-clause 13.5 of the FIDIC Conditions of Contract. The Provisional Sums shall include all charges for the provision and delivery of the service including an accredited Training Service Provider (if required), learning material and any other requirement as described in Section D1010 of the Specifications.

The rate tendered under sub-item D10.06(a)(iv) shall be deemed to cover all costs required to organise accredited trainers to provide training and shall include the Contractor's handling cost, profit, record keeping, reporting and all other costs associated with sub-items D10.06(a)(i), (ii), and (iii).

The prime cost sum under sub-item D10.06(b)(i) shall be paid in accordance with the provisions of sub-clause 13.5 of the FIDIC Conditions of Contract. The prime cost sum shall cover the monthly stipend as prescribed by the Employer to be paid to students receiving experiential training.

The unit of measurement for sub-item D10.06(b)(ii) shall be the person-month, with pro-rata payments made for partial months for training provided based on 23 workdays per month.

The rate tendered under sub-item D10.06(b)(ii) shall include full compensation for the Contractor to provide training to the students provided by the Employer inclusive of all costs to communicate with the Employer and any other body or organisation in respect of work assigned to the students. The rate tendered shall include telephone calls and charges, stationery and information technology hardware, software, connection or licence costs and lost production, profits and all other incidentals as well as all administrative and overhead costs.

The Provisional Sum under pay item D10.06(c) shall be paid in accordance with the provisions of sub-clause 13.5 of the FIDIC Conditions of Contract. The Provisional Sum shall cover the Contractor's costs for payment of wages of employed trainees attending training courses during working hours, for the provision of meals to trainees, for provision of transport and for all other incidentals required for the trainees and approved by the Engineer. No mark-up is payable to the Contractor under this item.

The unit of measurement for pay item D10.06(d), shall be the Lump Sum. The sum tendered shall include full compensation for the provision of the training venue, for all necessary lighting, power, furniture, stationery, consumables and study material and all other costs necessary to maintain the venue for the duration of the contract. Payment of the Lump Sum shall be made in two instalments as follows:

- (a) The first instalment, 75% of the Lump Sum, shall be paid after the Contractor has met all his obligations regarding the provision of the training venue as specified.
- (b) The second and final instalment, 25% of the Lump Sum, shall be paid after the provision of all the accredited training as specified in the document.

No payment, nor pro-rata payment, shall be made for trainees that, once selected, do not attend or only partially complete structured training courses. The Contractor's own staff may attend the courses provided. However, such attendants from the Contractor's staff shall not be considered for measurement and payment purposes unless they also qualify as Targeted Labour.

SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL R.101-080-2019/1

FOR THE IMPROVEMENT OF NATIONAL ROAD R101 SECTION 8 FROM BELA BELA (KM 0.0) TO
MODIMOLLE (KM 26.8)

**SECTION E: REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND
REGULATIONS**

Note to tenderer:

Wherever reference is made in this section of the Scope of Works to contractor this is the equivalent of the *principal contractor* in the Occupational Health and Safety Act and Regulations. Similarly, reference to subcontractors is equivalent to *other contractors*.

SECTION E: REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS

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E1001 SCOPE

The Occupational Health and Safety Act, Act 85 of 1993 (OHS Act) and its Regulations together with SANS Codes set out minimum standards with regards to Occupational Health and Safety. The South African National Roads Agency SOC Limited (SANRAL), has developed this Occupational Health and Safety Specifications with these minimum standards in mind and in certain aspects the requirements of SANRAL exceeds the minimum legal requirements to follow best practices and to ensure a healthy and safe workplace for all.

SANRAL in no way assumes The Principal Contractors legal liabilities and responsibilities. The Principal Contractor is and remains accountable for the quality and execution of his health and safety program for his employees. This Health and Safety Specification reflects minimum legal and SANRAL requirements and should not be construed as all encompassing.

It is realized that The Principal Contractor have its own Health and Safety Management system and safe work practices. The intention of this Health and Safety Specification is not to change The Principal Contractors Health and Safety management system, but for The Principal Contractor to use its current Health and Safety management system to draw up a project specific Health and Safety plan according to these specifications as well as to legally comply with the any applicable Regulations under the OHS Act and incorporated Standards.

It is the responsibility of the Principal Contractor and other Contractors to make themselves conversant and comply with the requirements and conditions contained in the various legislation pertaining to their profession and scope of works at all times.

This specification is not exhaustive of all duties imposed by the OHS Act and its Regulations, governing the duties and obligations, of a Designer, Principal Contractor and Contractor performing duties in terms of an agreement with the client (SANRAL). These duties are fully described in the OHS Act and its Regulations and it is the duty of every Designer, Principal Contractor and Contractor to acquaint themselves therewith before commencing work.

This specification is compiled to ensure that the Principal Contractor and any other Contractors working for SANRAL directly or through a Principal Contractor, are aware of the Occupational Health and Safety requirements when working on a SANRAL contract, as well as to make them aware of their legal liabilities and responsibilities as per the Occupational Health & Safety Act, Act 85 of 1993, and its Regulations.

Words used herein in the singular shall be deemed to include the plural and male shall include female and vice versa unless the context otherwise requires.

E1002 DEFINITIONS AND ABBREVIATIONS

Assessment – An opinion or a judgment about someone or something that has been thought about very carefully.

At-risk behavior – Conduct that unnecessarily increases the likelihood of an injury or incident.

Audit – A systematic and documented review of the effectiveness of implementation of processes, programs and procedures, based on general process criteria.

Baseline risk assessment: This is the initial assessment of risk in a workplace. It is a broad assessment and includes all activities taking place on site but does not include risk control measures or safeguards.

Client – Any organization or person for whom construction work is performed. For the purpose of this document, the client is the South African National Roads Agency SOC Limited, also identified in the contract document as the Employer.

Competence – A combination of attributes such as knowledge, training, experience and qualifications to assure successful performance.

Competent Person – Means a person who has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable,

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qualifications, specific to that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualification Framework Act, 2000 (Act No. 67 of 2000), those qualifications and that training must be regarded as the required qualifications and training; and is familiar with the Act and with the applicable regulations made under the Act.

Consequence – Outcome or impact of an event.

Continual Improvement – A recurring process of enhancing performance to achieve consistent improvements in overall performance.

Contractor – An employer as defined in section 1 of the OHS Act, who performs construction work and includes Principal Contractors and Sub-Contractors.

Construction Work – any work in connection with:

- The construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure; or
- The construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving of earth, clearing of land, the making of excavation, piling, or any similar civil engineering structure or type of work.

Corrective Action – An action taken to eliminate the cause of a detected non-conformity or other undesirable situation.

Construction Regulations (CR) – Construction Regulations, GNR. 84 of 2014

Critical equipment – A piece of equipment or a structure whose failure to perform to design specification, has the potential to result in a major accident event.

Design – in relation to any structure, includes drawings, calculations, design details and specifications.

Designer –

- (a) competent person who:
 - Prepares a design;
 - Checks and approves a design;
 - Arranges for a person at work under his or her control to prepare a design, including an employee of that person where he or she is the employer; or
 - Designs temporary work, including its components;
- (b) an architect or engineer contributing to, or having overall responsibility for a design;
- (c) a building services engineer designing details for fixed plant;
- (d) a surveyor specifying articles or drawing up specifications;
- (e) a contractor carrying out design work as part of a design and building project; or
- (f) an interior designer, shop fitter or landscape architect.

DMR – Driven Machinery Regulations, GNR. 295 of 26 February 1988

Documents – Structured units of recorded information and its supporting medium (paper or electronic). Most records are documents, but not all documents are records. A document becomes a record when it is part of a business transaction, is kept as evidence of that transaction and is managed within a record-keeping system.

EIR – Electrical Installation Regulations, GNR. 242 of 6 March 2009

Emergency – An abnormal occurrence that pose a threat to the safety or health of employees, customers, or local communities, or which can cause damage to assets or the environment.

Employee – An individual who is employed by or works for an Employer and who receives or is entitled to receive any remuneration or who works under the direction or supervision of an employer or any other person.

Employer – Any person who employs or provides work for any person and remunerates that person or expressly or tacitly undertakes to remunerates him but excludes a labour broker as defined in section 1(1) of the Labour Relations Act, 1956 (Act No. 28 of 1956).

The South African National Roads Agency SOC Limited, also identified in the contract document as the Employer.

EMR – Electrical Machinery Regulations, GNR. 250 of 25 March 2011

Environment – The surroundings or conditions in which a person, animal or plant lives or operates, including air, water, land, natural resources and habitats.

Epidemic Disease - An *epidemic* disease is one affecting many persons at the same time and spreading from person to person in a locality where the disease is not permanently prevalent. The World Health Organization (WHO) further specifies *epidemic* as occurring at the level of a region or community.

Excavation work – The making of any man-made cavity, trench, pit or depression formed by cutting, digging or scooping

GAR – General Administrative Regulations, GNR. 929 of 25 June 2003

GMR – General Machinery Regulations, GNR. 1521 of 5 August 1988

GSR – General Safety Regulations, GNR. 1031 of 30 May 1986

Harm – A significant and or long-lasting adverse effect on people, the environment or the community.

Hazard – A source, situation or act with a potential for harm in terms of human injury or ill health.

Health and Safety File – Means a file, or other record in permanent form, containing the information in writing as required by the Construction Regulations, GNR. 84 of 7 February 2014, Section 7(1)(b).

Health and Safety Plan – Means a project specific documented plan in accordance with the client's health and safety specifications, as required by the Construction Regulations, GNR. 84 of 7 February 2014, Section 7(1)(a).

Health and Safety Specification – Means a project specific document prepared by the client pertaining to all health and safety requirements related to construction work, as required by the Construction Regulations, GNR. 84 of 7 February 2014, Section 5(1)(b).

HSE – Health, Safety and Environment. Commonly used in the format HSE.

Incident – Work-related events (including accidents which give rise to injury, ill health, fatality or emergencies) that have resulted in, or has the potential to result in adverse consequences to people, the environment, property, reputation or a combination of these.

Likelihood – A description of probability or frequency, in relation to the chance that something will occur.

Lost Time Injury (LTI) – When a person is injured during the execution of his/her duties and as a result of the injury is unable to perform his/her regular duties for one full shift or more on the day following the day on which the injury has incurred, whether a scheduled work day or not(weekend).

Management System – Management processes and documentation that collectively provide a systematic framework for ensuring that tasks are performed safely, correctly, consistently and effectively to achieve a specified outcome and to drive continual improvement in performance.

Mandatory – An agent, contractor or sub-contractor for work, but without derogating from his status in his own right as an employer or a user.

MSDS – Material Safety Data Sheet

Near Hit / Near Miss – Any occurrence or situation which had the potential for adverse consequences to people, the environment, property, reputation or a combination of these.

Non-conformance – Any deviation from work standards, practices, procedures, regulations that could either directly or indirectly lead to injury or illness, property damage, damage to the environment or a combination of these.

OHS Act – Occupational Health & Safety Act, 85 of 1993

Pandemic Disease - a *pandemic* disease is an *epidemic* disease that has spread over a large area, that is, it is prevalent throughout an entire country, continent, or the whole world.

Policy – Statement by an organization of its intentions and principles in relation to its overall performance which provides a framework for action and for the setting of its objectives and targets.

PPE – Personal Protective Equipment

Preventive Action – An action implemented to eliminate the cause of a potential non-conformity or other undesirable potential situation.

Principal Contractor – An employer appointed by the client to perform construction work and who is in overall control and management of a part of or the whole construction site.

Procedure – A specific documented way to carry out an activity or a process.

Records – Recorded information, in any form that is kept as evidence. Records include monitoring results, evidence of training, audits, inspections and calibration reports.

Risk Assessment – A process of evaluating the risk(s) arising from hazards taking into account the adequacy of any existing controls and deciding whether or not the risk(s) is acceptable.

Risk Management – The ongoing treatment of risks through the application of management policies, processes, procedures and risk control measures.

Risk – A combination of the likelihood of an occurrence of a hazardous event or exposure and the severity of injury or ill health that can be caused by the event or exposure.

Root Cause – The cause of the incident that, when rectified, will prevent the recurrence of not just incidents with those exact circumstances, but others with similar causes.

SACPCMP – South African Council for Project and Construction Management Professions

SANRAL - South African National Roads Agency SOC Limited

Supplier – A person or company that supplies material or equipment to a contractor on a construction site but does not physically carry out construction work on the construction site.

The Act – The Occupational Health and Safety Act No. 85 of 1993

The Site – The area where work is carried out for SANRAL as defined on the front page of this document.

WAH – Acronym for Working at Heights.

E1003 HEALTH AND SAFETY POLICY

Contractors are expected to have their own written Health and Safety Policy. The policy should declare their attitude and approach to the health, safety and welfare of their employees and others. The policy should include a description of the company and

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provision must be made to review the policy annually and the CEO or Managing Director must sign and date the policy to indicate his commitment to ensuring the health and safety of his employees, as per Section 7 of the OHS Act.

E1004 ROLES AND RESPONSIBILITIES

Every Contractor is considered to be an employer in his own right and shall comply with all legal requirements pertaining to an employer, which include the responsibility to provide as far as reasonably practicable a safe and healthy working environment for his employees, as per Section 8 of the OHS Act.

In conjunction with Section 8 of the OHS Act, all employees on the project are responsible for their own health and safety as well as the safety of persons who may be affected by their acts, as per Section 14 of the OHS Act. It is the responsibility of each employee to ensure that he acts in a safe manner before and during work is carried out.

The Principal Contractor shall ensure that where required by the OHS Act and Regulations, competent employees are appointed in writing. These appointments must be project/contract specific and specific to the tasks that will be performed. Every appointment must display the duties of the person appointed and training certificates from a registered training provider must be attached to such appointment (where applicable). A list of possible appointments can be found in clause E1010 below.

E1005 HSE TRAINING AND COMPETENCE

Where appropriate qualifications and training are registered in terms of the provisions of the National Qualifications Framework Act, 2000 (Act No. 67 of 2000), those qualifications and training must be regarded as the required qualifications and training and employees must have attended courses of the aforementioned nature to be considered competent in the task.

All employees that forms part of the construction work must be trained and competent. Employees formally appointed to perform a certain duty must be in possession of a training certificate (where applicable), received from a registered training provider. All employees must as a minimum have received site specific safety induction training and must receive daily safe task instruction training (DSTI) before any work commences and thereafter on a daily basis.

(a) Training Needs

There shall be a system in place to determine the training requirements of each individual, based on the tasks that the employee will perform as well as to ensure the health and safety of fellow employees and the public. Special attention should be given to employees who are new hires, new to the task or have combined responsibilities.

(b) Basic Safe Work Training (Induction Training)

Every contractor shall ensure that his employees are inducted into his own company Health and Safety System as well as basic safe work training (HSE Induction Training). The Principal Contractor shall ensure that his, all his Contractor's employees and visitors are inducted on the specific site safety procedures.

A Daily Safe Task Instruction (DSTI) must be conducted on site with all employees involved in the project. The DSTI must be carried out each day before work commences and proof thereof must be available on site. Each work crew may conduct their own specific DSTI to discuss the hazards, risks and control measures associated with their task for the day.

Where two or more contractors or work crews work in the same area, they should have a combined DSTI to ensure they know of the additional hazards the other

contractor or work crew will introduce to their operations and what precautions to put in place.

The Principal Contractor shall have evidence that employees have been trained on the relevant procedures prior to and during the project duration. The evidence will be in a form of attendance register.

(c) Formal Training

All qualifications for which there are SAQA registered training courses, must be regarded as the minimum required qualifications and training. To be deemed “competent” an employee must have received training at a registered training provider, the training course must be registered and if there is an assessment, the employee must have been found competent after the assessment. A person cannot be deemed competent after awareness training only.

The Principal Contractor shall ensure that his employees, as well as the employees of any contractors that may be used, have received appropriate training for the type of work that will be performed, e.g. First Aid, Flag Man, Mobile Plant Operator, Working at Heights, Risk Assessment training etc.

(d) Records

Record of all training shall be kept by the employer and shall be readily available. Records shall make provision for refresher training where applicable. Where an employee is legally appointed with certain duties and responsibilities a copy of the training certificate must be attached to the appointment.

E1006 APPLICATION FOR CONSTRUCTION WORK PERMIT

Construction Regulation, 2014 Section 3 requires that the client apply for a construction work permit at least 30 days before construction work is started, if the intended construction work will:

- exceed 365 days AND will involve more than 3 600 person days of construction work; or
- if the tender value limit is a CIDB grade 7, 8 or 9.

If approved, the provincial director will issue a construction work permit in writing to perform construction work within 30 days of receiving the application and assign a site-specific number for the construction site. It is the intention of SANRAL to apply for a construction work permit as soon as The Principal Contractor is appointed and his Health and Safety Plan is received, in order to minimize construction delays.

The site-specific construction work permit number must be displayed at the main entrance to the site and a copy of the construction work permit must be kept in the principal contractor's health and safety file for inspection purposes.

E1007 DUTIES

Various duties are imposed on the client, designer, principal contractor and other contractors by the Construction Regulation, 2014, Sections 5, 6 & 7. SANRAL will comply and carry out the required duties as contemplated in Section 5 of the Construction Regulations, 2014 and it is expected from the designer and every contractor to make themselves conversant with the requirements and duties imposed on them and to ensure that they comply with the requirements of section 6 & 7 at all times.

E1008 MANAGEMENT AND SUPERVISION

The Principal Contractor shall ensure that the project is managed safely, and legal compliance is ensured at all times.

A full-time competent person must be appointed as a Construction Manager to manage all construction work, including health and safety compliance. The construction manager may not be appointed to manage more than one single construction site. An Alternate Construction Manager must be appointed, to carry out the duties in the absence of the Construction Manager.

The construction manager must appoint construction supervisors responsible for construction activities and ensuring occupation health and safety on the construction site.

The Principal Contractor must appoint a full-time construction health and safety officer, who is registered with the SACPCMP, to assist in the control of health and safety aspects on site.

E1009 RISK MANAGEMENT

The Principal Contractor must follow a formal risk-based approach to ensure hazard control measures are implemented to an acceptable reasonable practical level. The Principal Contractor and his employees shall be responsible to ensure all hazards pertaining to his scope of activity are proactively identified, the risks assessed and appropriately eliminated or minimized and managed on an ongoing basis. Risk assessments shall also identify possible and potential environmental, health and hygiene issues pertaining to each hazard with potential exposures and limits.

(a) Risk Assessment

(i) Hazard Identification and Risk Assessment (Construction Regulation 9)

The Principal Contractor shall, before the commencement of any construction work or work associated with the aforesaid construction work and during such work, conduct a risk assessment by a competent person, appointed in writing and the risk assessment so produced shall form part of the OH&S plan and be implemented and maintained as contemplated in Construction Regulation 9(1). Competence is a factor of training, knowledge, experience and/or appropriate qualifications.

The risk assessment shall include, as far as is reasonably practicable, at least:

- The task or task step
- the identification hazards to which persons may be exposed to during the task or task step;
- The analysis and evaluation of the risks associated to the hazards identified, inclusive of a residual risk rating methodology. The method to be used is not prescribed;
- a documented plan of safe work procedures, to mitigate, reduce or control those residual risks that have been identified as unacceptably high, by means of the rating system;
- a monitoring plan;
- a review plan, inclusive of dates to be adhered to; and
- Ergonomic related risks are to be analysed, evaluated and addressed as part of the process.

Based on the risk assessments, The Principal Contractor shall develop a set of site-specific OH&S rules that shall be applied to regulate the OH&S aspects of the construction. The risk assessments, together with the site-specific OH&S rules shall be submitted to the Employer before construction on site commences. SANRAL has conducted a Baseline Risk Assessment as per clause E1009 (b) below, which must be used by The Principal Contractor to develop task specific risk assessments before work commences. This does not mean that all possible Risk Assessments must be attended to before work commences, but that all relevant Risk Assessments receive the necessary attention as the contract progresses, and this is the responsibility of The Principal Contractor.

All variations to the scope of work shall similarly be subjected to a risk assessment process.

(ii) Risk Assessment Monitoring

The Principal Contractor shall ensure that a monitoring plan for all risk assessments are in place. Risk assessments must be monitored to ensure effectiveness and employee understanding. The monitoring of risk assessments shall be formal, and records thereof shall be available for audit purposes.

(iii) Review of Risk Assessment

The Principal Contractor shall review the hazard identification, risk assessments and standard safe working procedures:

- prior to any work activity commencement,
- where changes are affected to the design and construction that result in a change to the risk profile,
- when an incident has occurred, or
- at least quarterly.

The Principal Contractor shall provide the Employer, sub-contractors and all other concerned parties with copies of any changes, alterations or amendments as contemplated above.

Activities carried out without conducting a risk assessment or found to be non-compliant with the risk assessment, will be stopped until such time a risk assessment is compiled, and work is carried out according to the risk assessment.

Risk assessments must be fully communicated to all relevant personnel and must be considered when establishing training, awareness and competency requirements. Records of risk assessment communications must be kept for inspection purposes.

(b) Baseline Risk Assessment

SANRAL prepared a Baseline Risk Assessment from which the Health and Safety Specifications for this project was prepared. The Baseline Risk Assessment highlights all work for which The Principal Contractor must prepare safe work procedures and or work method statements. It must be noted that the Baseline Risk Assessment is not exhaustive and Principal Contractors are required to identify risks and come up with control measures, this must be identified by Principal Contractor when preparing the Issue Based Risk Assessments.

The Baseline Risk Assessment for this Project can be found in clause E1018.

(c) Continuous Risk Assessment

The Principal Contractor shall continuously assess the risks of the activities that are carried out. Risk assessments must be in writing, site specific and must be reviewed continuously as per E1009 a(iii) to ensure it is current and it address all the relevant hazards and risks associated with the specific activity at the specific site.

The Risk assessment must be discussed with the whole work crew before the activity starts and the work crew must acknowledge in writing having discussed the risk assessment and that they understand it. This acknowledgement must be on site and must be available to the client for audit purposes.

E1010 LEGAL COMPLIANCE AND DOCUMENT CONTROL

The Principal Contractor is required to implement systems and procedures to ensure legal compliance through:

- Identification of all relevant HSE legislation, standards and codes applicable to its operations.
- Have available copies of all relevant HSE legislation, standards and codes for reference purposes.
- Update systems and procedures with changed/updated legislation, standards and codes.
- Communicate to all employees any changes that may affect their accountabilities and conformance
- Incorporate any legal requirements into their HSE management system
- Monitor and review their HSE management system for effectiveness.

The Principal Contractor shall, as a minimum, comply with:

- The Occupational Health and Safety Act and Regulations (Act 85 of 1993), an up-to-date copy of which shall be available on site at all times.
- The Compensation for Occupational Injuries and Diseases Act (Act 130 of 1993), an up-to-date copy of which shall be available on site at all times.
- Where work is being carried out on a quarry/borrow pit/"mine", The Principal Contractor shall comply with the Mines Health and Safety Act and Regulations (Act 29 of 1960) and any other OH&S requirements that the mine may specify. An up-to-date copy of the Mines Health and Safety Act and Regulations shall be available on site at all times.

Wherever in the Construction Regulations or this specification there is reference to other regulations (e.g. Construction Regulation 24: Electrical Installations and Machinery on Construction Sites) The Principal Contractor shall be conversant with and shall comply with these regulations.

All legal appointments of The Principal Contractor regarding the Health and Safety of his employees who are to work on the project are addressed and governed by the OHS Act and applicable Regulations. Legal appointments must be in place and must reflect in the project safety file before work commences.

(a) Overall Supervision and Responsibility for OH&S

SANRAL will appoint the Principal Contractor in terms of Construction Regulation 5(1)(k). A Mandatory agreement as per Section 37.2 of the OHS Act, shall be signed between SANRAL and the Principal Contractor.

It is a requirement that the Principal Contractor, when he appoints other contractors in terms of Construction Regulations 7(1)(c), 7(1)(d), 7(1)(f) and 7(3) includes in his agreement with such Contractors the following:

- OH&S Act (85 of 1993), Section 37(2) agreement: "Agreement with Mandatory".
- OH&S Act (85 of 1993), Section 16(2) appointee(s) as detailed in his/her/their respective appointment forms. (Where applicable).

The signed Mandatory agreements shall be placed in the project file for reference and for audit trail purposes.

(b) Specific Supervision Responsibilities for OH&S

The Principal Contractor shall appoint designated competent employees and/or other competent persons as required by the OHS Act and Regulations, as well as this specification. Appointments shall be in writing and the responsibilities clearly stated together with the period for which the appointment is made. This information shall be communicated to and agreed with the appointees. Where applicable, the training certificate must be attached to the appointment. Notice of appointments shall be submitted to the Employer. All changes shall also be communicated to the Employer.

Below is a list of possible appointments for the project, which is not an all-inclusive list, but for reference purposes only:

Appointment	Legal Reference
Assistant to CEO	OHS Act 16(2)
Health and Safety Representative	OHS Act 17(1)
Nominated Health and Safety Committee Member	OHS Act 19(3)
Contractor (Sub-contractor)	CR 7(1)(c)(v)
Construction Manager	CR 8(1)
Alternate Construction Manager	CR 8(1)
Assistant Construction Manager	CR 8(2)
Health and Safety Officer	CR 8(5)
Construction Supervisor	CR 8(7)
Assistant Construction Supervisor	CR 8(8)
Risk Assessor	CR 9(1)
Fall Protection Plan Developer	CR 10(1)(a)
Structure Inspector	CR 11(2)(a)
Temporary Works Designer	CR 12(1)
Temporary Works Supervisor	CR 12(2)
Excavation Supervisor	CR 13(1)(a)
Demolition Supervisor	CR 14(1)
Competent Person in the use of Explosives	CR 14(11)
Scaffold Supervisor	CR 16(1)
Suspended Platform Supervisor	CR 17(1)
Rope Access Supervisor	CR 18(1)(a)
Material Hoist Inspector	CR 19(8)(a)
Bulk Mixing Plant Supervisor	CR 20(1)
Explosive actuated fastening device Inspector	CR 21(2)(b)
Explosive actuated fastening device cartridge Controller	CR 21(2)(g)(i)
Construction Vehicle & Mobile Plant Operator Authorised	CR 23(1)(d)(i)
Temporary Electrical Installation Controller	CR 24(c)
Stacking and Storage Supervisor	CR 28(a)
Fire Equipment Inspector	CR 29(h)
Incident investigator	GAR 9(2)
Lifting tackle inspector	DMR 18(10)(e)
Ladder inspector	GSR 13(a)
Certified Explosives Manager	ER 12(1)
First Aider GSR	GSR 3(4)
Lifting machine Operator	DMR 18(11)

In addition to the above, the Employer requires that a Traffic Safety Officer be appointed.

It is a requirement that The Principal Contractor shall provide the Employer with an organogram of all sub-contractors that he/she has appointed or intends to appoint and keep this list updated and prominently displayed on site.

(c) Designation of OH&S Representatives (Section 17 of the OH&S Act)

Where the Principal Contractor employs more than 20 persons (including the employees of sub-contractors) he has to appoint 1 (one) OH&S representative for every 50 employees or part thereof. This is a minimum (legal) requirement. The Principal Contractor may at his own discretion appoint more OH&S representatives according to site specific requirements. General Administrative Regulation 6 requires

that the appointment or election of the OH&S representatives be conducted in consultation with employee representatives or employees (Section 17 of the Act and General Administrative Regulation 6 & 7). OH&S representatives shall be designated in writing and the designation shall include the area of responsibility of the person and term of the designation. OH&S representatives must be experienced, permanently employed by The Principal Contractor or his sub-contractors, trained and able to move freely within their designated area of responsibility.

(d) Duties and Functions of the OH&S Representatives (Section 18 of the OH&S Act)

The Principal Contractor shall ensure that the designated OH&S representatives perform their functions in respect of the workplace or section of the workplace for which they have been appointed. These functions include to conduct continuous monitoring and monthly inspections of their respective areas of responsibility, focusing on unsafe acts and unsafe conditions and report thereon to The Principal Contractor and OH&S Committee. OH&S representatives shall participate in accident or incident investigations. OH&S representatives shall attend all OH&S committee meetings. The complete list of functions can be found in Section 18 of the OHS Act.

(e) Appointment of OH&S Committee (Sections 19 and 20 of the OH&S Act)

The Principal Contractor shall establish an OH&S committee, which shall meet at least once a month, where two or more Health and Safety Representatives have been appointed. OH&S representatives must be appointed as OH&S committee members. The number of members nominated by management may not exceed the number of OH&S representatives on the committee and must be appointed in writing.

E1011 OPERATIONAL INTEGRITY

The operational integrity of plant, equipment, structures and protective systems must be monitored and assured on an ongoing basis throughout the project cycle. Hazards must be identified, risks assessed and as far as reasonably practicable, eliminated or the risks treated to as low as reasonably practicable (ALARP).

(a) Construction Plant & Equipment

The Principal Contractor shall maintain all items of plant and equipment necessary to perform the work in a safe condition.

SANRAL reserves the right to inspect items of plant and equipment brought to site and used on site by The Principal Contractor. Should it be found that any item is inadequate, faulty, unsafe or in any other way unsuitable for the safe and satisfactory execution of the work for which it is intended, The Principal Contractor will be advised of such observation/inspection, and The Principal Contractor shall be required to repair, make safe or remove such item from operation and replace it with a safe and adequate substitute.

The Principal Contractor shall ensure that all plant, equipment, and power tools that are brought onto and used on site are:

- Appropriate for the type of work to be performed
- Placed on a register and inspected by a competent person and/or the authorized operator before use, daily or monthly dependent on Legislation.
- Record inspection findings on a register that must be kept on site.
- The inspection register shall reflect the serial number of the plant, equipment or power tool.
- Maintained and used in accordance with the manufacturers' recommendations
- Have adequate machine guarding fitted to all exposed rotating or moving parts, as reasonably practicable, that have the potential to cause harm

- All electrical power supply units are protected with operational earth leakage devices.
- Any defective, damaged or sub-standard equipment must be marked as unsafe for use and removed from operation as soon as possible

(b) Standards and Registers

As standard project procedures, The Principal Contractor is expected to:

- Set up an initial set of registers as per the requirements of the OHS Act and Regulations.
- Complete the registers for each piece of plant, tool and equipment brought on and used on site
- Maintain a complete, continuous and comprehensive inspection and service history in these registers or checklists
- Ensure daily, weekly, monthly inspections are done and recorded for all plant, tools & equipment by a competent person and/or authorized operator as required by the OHS Act and Regulations.
- Have the inspection and maintenance records available for audit purposes.

E1012 OCCUPATIONAL HEALTH AND HYGIENE

(a) Medical Fitness for Duty

All contractor employees shall undergo medical examinations and be certified fit for duty by an Occupational Health Practitioner before they are allowed to work on site.

The medical certificate must be in the form of Annexure 3 of the Construction Regulations and stipulate the possible exposures the employee might be exposed to during the execution of the project.

It is recommended and in the best interest of The Principal Contractor to implement pre-employment, periodic, as well as exit medical surveillance, especially with regards to Section 8 of the Noise Induced Hearing Loss Regulation.

(b) First Aid

According to GSR 3(4), where more than 10 employees are employed at a workplace/worksites, The Principal Contractor shall ensure that there is at least one trained first aider for every group of 50 employees at the workplace/site. First Aid boxes must be provided where more than 5 employees are employed and must be readily available and accessible for the treatment of injured persons at the workplace.

To ensure immediate treatment of an injured person, it is recommended that all work crews have at least one trained first aider, with a fully stocked first aid box, irrespective of the number of people in the work crew. This is especially important when contractors work at great distances from the nearest emergency facility or town. These persons shall be appointed in writing as the first aiders with their certificates attached as proof of competency.

The minimum contents of the first aid box shall be as per the supplied list in the General Safety Regulations.

All treatments done must be recorded on a register and kept with the first aid box. A trained and appointed first aider must be responsible for the first aid box and its content. Used content must be replenished as soon as possible.

In order to ensure prompt response at the emergency facility it is recommended that the W.CI 2 forms be partially completed with the Employers' details.

(c) Hygiene Facilities

The Principal Contractor and his contractors shall ensure compliance to Section 30 of the Construction Regulations with regards to facilities on the construction site as well as where accommodation is provided to employees on remote sites. The Principal Contractor shall ensure that the facilities are kept clean at all times, either through a service provider or self-employed persons. The Principal Contractor shall provide employees with at least one sanitary facility for each sex and for every 30 workers, changing facilities for each sex and sheltered eating areas.

(d) Health related Epidemics and Pandemics

The contractor shall, as far as reasonably practicable describe in his health and safety plan how health related epidemics and pandemics will be dealt with. The Employer is aware that this section in the health and safety plan will not speak to specifics, but generic procedures. The Contractor must ensure that the requirements stipulated in the Hazardous Biological Agents (HBA) Regulation are addressed in his health and safety plan, training and information given to staff and procedures implemented on site to prevent health risks on site.

Once the nature and scale of the epidemic or pandemic is known, the Contractor must update his health and safety plan with the relevant information and send the updated plan to the relevant appointed OHS Agent for approval. Once approved, the Contractor must implement the updated health and safety plan and maintain the updated plan on site.

E1013 WASTE MANAGEMENT

The Principal Contractor shall comply with all applicable and relevant Waste management legislation, as well as municipal bylaws applicable to waste management.

The Principal Contractor shall remove all waste generated at the construction site as soon as possible after generation to ensure good housekeeping at all times. The Principal Contractor shall have a waste management plan which must be implemented on the construction site and which will have the objective to ensure that waste is managed according to the Waste Management Hierarchy:

- Reduce what you can. If you cannot reduce then,
- Re-use what you can. If you cannot re-use then,
- Recycle what you can. What you cannot recycle,
- Convert into energy sources. If it cannot be converted to an energy source,
- Dispose of in a landfill – this is only to be done as a last resort and disposed without endangering human health and without using processes or methods which could harm the environment.

E1014 HAZARDOUS SUBSTANCE MANAGEMENT

The Principal Contractor shall ensure that hazardous substances brought onto site are easily identifiable and stored according to the requirements of the General Safety Regulations, GNR. 1031 of 1986, Section 4.

Where flammable liquids are being used or stored, this must be done in a manner which would not cause a fire or explosion hazard.

The Principal Contractor shall have Material Safety Data Sheets (MSDS) readily available for flammable, hazardous and toxic chemical substances and materials brought onto site and shall ensure that his employees are trained in these MSDS's.

Flammable, hazardous or toxic chemical substances may not be stored in empty food or drink containers. Empty flammable, hazardous and toxic containers must be disposed of in a safe manner, which will prevent further use of such a container.

A survey of the construction site must be done during site establishment, to locate any asbestos. Should asbestos be located, the conditions of the Asbestos Regulations, GNR. 155 of 2002 must be followed and complied with.

E1015 CONTRACTORS

(a) Consultations, Communications and Liaison

OH&S liaison between the Employer, The Principal Contractor, The Contractors, the designer and other concerned parties will be through the OH&S committee. In addition to the above, communication may be directly to the Employer or his appointed agent, verbally or in writing, as and when the need arises.

Consultation with the workforce on OH&S matters will be through their construction managers and supervisors, OH&S representatives and the OH&S committee. The Principal Contractor shall be responsible for the dissemination of all relevant OH&S information to The Contractors e.g. design changes agreed with the Employer and the designer, instructions by the Employer and/or his/her agent, exchange of information between subcontractors, the reporting of hazardous/dangerous conditions/situations etc. The Principal Contractors' most senior manager on site shall be required to attend all OH&S meetings.

(b) Operational Procedures

Each construction activity shall be assessed by The Principal Contractor so as to identify operational procedures that will mitigate against the occurrence of an incident during the execution of each activity. This specification requires The Principal Contractor:

- to be conversant with all relevant Regulations;
- to comply with their provisions;
- to include them in his OH&S plan where relevant

(c) Checking, Reporting and Corrective Actions

(i) Monthly Audit by Employer (Construction Regulation 5(1)(o))

The Employer will conduct monthly health and safety and document verification audits in compliance with Construction Regulation 5(1)(o) in order to ensure that The Principal Contractor has implemented and is maintaining the agreed and approved OH&S plan.

The Principal Contractor will be provided with a copy of the Health and Safety audit report within seven days after the audit. The Employer or his representative may stop any Principal Contractor from executing a construction activity which poses a threat to the health and safety of persons which is not in accordance with the client's health and safety specification and the Principal contractor's health and safety plan for the specific site.

(ii) Other Audits and Inspections by the Employer

The Employer reserves the right to conduct other ad hoc audits and inspections as deemed necessary. This will include site safety walks.

(iii) Principal Contractor's Audits and Inspections

The Principal Contractor must conduct his own regular internal audits to verify compliance with his own OH&S management system, as well as with this specification.

The Principal Contractor shall furthermore ensure that each contractor's health & safety plan is being implemented and maintained. The Principal Contractor will ensure that periodic health and safety audits and document verification are conducted at intervals mutually agreed upon between the Principal Contractor and any contractor, but at least once every 30 days.

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(iv) Inspections by OH&S Representatives and other Appointees

OH&S representatives shall conduct monthly inspections of their areas of responsibility and report thereon to their foreman or supervisor, as well as the OH&S Committee, whilst other appointees shall conduct inspections and report thereon as specified in their appointments e.g. vehicle, plant and machinery drivers, operators and users must conduct daily inspections before start-up.

(v) Recording and Review of Inspection Results

All the results of the abovementioned inspections shall be in writing, reviewed at OH&S committee meetings, endorsed by the chairman of the meeting and placed on the OH&S File.

(d) Project Health and Safety Management Plan

As per Section 5(1) (l) and Section 7(1) (a) of the Construction Regulations of 2014, The Principal Contractor shall develop, implement and administer a Health and Safety Management Plan. The plan shall be in writing and shall be negotiated between The Principal Contractor and SANRAL or designated OHS Agent and must be approved by SANRAL or the designated OHS Agent prior to the commencement of work on site. The plan shall demonstrate management's commitment to ensure employee health and safety as their primary objective during the contract. The H&S plan shall be site and project specific and must address all aspects of the project H&S specification.

(e) Project Health and Safety File

The Principal Contractor shall compile a project specific Health and Safety File that consist of all the relevant project specific documentation. The Health and Safety file may consist of multiple files, which when combined should contain all the required documentation.

It is recommended that the project specific Health and Safety file contain at least the following:

- Scope and summary of the project as well as any scope changes.
- Notification of Construction Work to DoL / Copy of Work Permit
- Proof of COID registration (Letter of Good Standing)
- Contractor Health and Safety Policy statement signed by management
- Appointment of Principal Contractor
- Mandatory Agreement – OH&S Act 37.2 (Between Employer and Principal Contractor)
- Client Health and Safety specification
- Latest copy of the OHS Act and Regulations
- Company Organogram depicting Health and Safety Responsibilities, including sub-contractors
- Employee list including copy of IDs and medicals
- Project specific Health and Safety Management Plan agreed with the Employer – See E1015(d) above
- Relevant OH&S Legal appointments which includes duties and responsibilities as well as competencies (training certificate)
- Copies of minutes of meetings – OH&S committee and other relevant OH&S meeting minutes
- Site specific Fall Protection Plan (if applicable)
- Risk Assessments
- Contractor Induction material
- Waste management Plan
- Emergency preparedness (first aid, firefighting, emergency plan, etc.)
- Emergency Contact Telephone numbers
- List of hazardous chemical substances used on site
- Material Safety Data Sheets of hazardous chemicals on site

- List of plant & equipment to be used on site
- Inspection Checklists/Registers of plant & equipment and emergency equipment
- List of Sub-contractors including type of work
- Sub-contractor 37.2 Mandatary Agreements
- Sub-contractor appointments which shall include the type of work The Principal Contractor is appointed for.

(f) Contracting Philosophy

Any site-specific hazards and safety management expectations will be made known to the Principal Contractor prior to the work commencing on site. This will be done through the OH&S Specification for the project. SANRAL as the Employer/Client may specify requirements that are stricter than Legislative requirements in this OH&S Specification. Legal OHS requirements contained in the OHS Act and Regulations, SANS Codes and the project OH&S Specifications are the minimum requirements the Principal Contractor must apply during this contract with regards to Occupational Health and Safety. The Principal Contractor shall implement the minimum OH&S requirements and ensure conformance to these at all times.

(g) Workers Compensation Registration

The Principal Contractor shall ensure that his employees are covered for any occupational injuries and illnesses in terms of the Occupational Injuries and Diseases Act 130 of 1993, which cover shall remain in place and up to date for the duration of the project.

The Principal Contractor shall ensure that his sub-contractor employees are covered for any occupational injuries and illnesses in terms of the Occupational Injuries and Diseases Act 130 of 1993, which cover shall remain in place and up to date for the duration of the project.

(h) HSE Non-Compliance

It is a legal duty of the client according to the Construction Regulation 5(1)(q) that a Principal Contractor is stopped from executing any activity which poses a threat to the health and safety of persons. Depending on the seriousness of the non-compliance only the specific activity may be stopped until the non-compliance is rectified or the whole operation may be stopped.

It is also the duty of every employee to take reasonable care of his own health and safety and of other persons who may be affected by his acts as per OHS Act, Section 14(a). Keeping this in mind, it is required of The Principal Contractor to ensure his employees has the right to remove themselves from any unsafe situation or work activity, without any negative consequence to them until such time as The Principal Contractor has made the unsafe situation or activity as safe as practicable possible.

(i) Indemnity by Contractor

The Principal Contractor shall indemnify the Employer against and from all damages, losses and expenses (including legal fees and expenses) resulting from:

- (i) the loss of output and delay caused by the slowing down or partial or total stoppage of work caused by:
 - all or any of The Principal Contractor's workforce as a result of a dispute between all or any of the Principal Contractor's workforce and The Principal Contractor; or
 - all or any of the Principal Contractor's suppliers' difficulty or impossibility to deliver goods or materials needed to perform the Works;
- (ii) Any unlawful, riotous or disorderly conduct by or amongst the Principal Contractor's personnel."

(j) The Principal Contractor Conduct

Guidelines to the most important rules that shall be implemented and maintained by the Principal Contractor:

- Complete compliance to the OH&S Act 85 of 1993 and Regulations,
- Hazard identification and Risk Assessments for all activities,
- Daily communication of DSTI's before work commences, even if it is a repetitive task,
- Safe access and egress to and from work areas,
- Compulsory use of lifelines, Safety Harnesses and Fall Arrestors (Lanyards to be attached at all times), when working in elevated positions,
- Scaffold shall comply with Legal and SANS standards at all times,
- Good housekeeping and stacking practices,
- Safe lifting, rigging and slinging practices,
- Complying to Legal standards for lifting machinery & equipment,
- No lifting in wind conditions exceeding 30km/h (This is a guide and is dependent on risk assessments),
- Securing of tools, equipment and material at heights,
- Wearing of appropriate personal protective equipment as identified in the risk assessment.

Supervisors in charge are responsible for ensuring that the employees are aware of the hazards/risks involved in the work they will be doing/are doing and shall ensure the safety rules are obeyed.

No person shall act in a manner that endangers or is likely to endanger, the safety of any other person, or cause harm to any other person.

An employee who observes any dangerous situation, shall as soon as possible inform the person who is responsible for that section of the site.

Any employee who becomes aware of any person disregarding any safety rules, shall remind that person of the rules. If he persists in disregarding the rules, the matter must be reported to his supervisor.

No person shall damage, alter, remove, render ineffective or interfere with anything that has been provided for the protection of the site, or for the health and safety of persons.

No person shall interfere with or use firefighting equipment without authority and training.

No person in a state of intoxication or condition that render him incapable of controlling himself shall enter or be allowed to enter the site.

No alcohol or illegal drugs shall be taken onto the site.

All safety and warning signs shall be obeyed.

Always be alert of construction vehicles as well as traffic. Never turn your back to oncoming traffic, always have a line of sight.

(k) Principal Contractor and Contractor Management

The Principal Contractor shall establish, maintain and ensure that all his contractors establish and maintain OH&S standards and systems as necessary and to comply with the Legal requirements as well as these OH&S specifications.

The Principal Contractor shall be solely responsible for carrying out work on the project, having the highest regard for the health and safety of his employees and people in the vicinity of his work area.

(I) Public Health and Safety

The Principal Contractor shall, as far as is reasonably practicable, be responsible for ensuring that non-employees affected by the construction work are made aware of the dangers likely to arise from said construction work as well as the precautionary measures to be observed to avoid or minimise those dangers.

This includes:

- Non- employees entering the site for whatever reason
- The surrounding community
- Passers-by to the site.

E1016 DESIGNING FOR HEALTH, SAFETY AND THE ENVIRONMENT

Designing for safety is a process aimed at minimizing injury, death, property damage or destruction and harm to the environment, by utilizing an approach to identify and eliminate or control hazardous conditions and material during the design process. The Principal Contractor is responsible for appointing the temporary works Designer and shall ensure that the temporary works Designer implement a process and designs the temporary works in such a way that ensure the safety of employees during the erection, use and dismantling of the temporary works. The temporary work designer shall comply with the duties of the Temporary Work Designer as per the Construction Regulations, 2014 Section 6(2).

The Principal Contractor must communicate the anticipated risks and hazards resulting from the design to his employees and establish safe work procedures for the temporary works.

E1017 INCIDENT MANAGEMENT

The Principal Contractor shall ensure that a culture exists within his company that promotes the recognition, response, reporting and investigation of incidents, including near misses (near hits). The Principal Contractor must implement a procedure for reporting and investigating accidents, incidents and near misses. The Principal Contractor should have a clear objective and target to obtain zero injuries for the duration of the project and such an objective must be communicated to all employees.

Appropriate corrective actions must be implemented, and the applicable learnings must be shared within The Principal Contractors business to prevent a recurrence of the incident or to prevent the near miss from becoming an incident in future.

(a) Incidents and Accidents

The Principal Contractor and his contractors shall coordinate their investigation of all accidents/incidents where employees and non-employees were injured to the extent that he had to be referred for medical treatment by a doctor, hospital or clinic. The results of the investigation shall be entered into an accident/incident register, which must be updated with each accident/incident.

The Principal Contractor shall notify the relevant SANRAL Project Manager and or SANRAL OHS Specialist of any incident/accident within the Principal Contractors or his Contractors area of responsibility in writing as soon as possible.

Although the accident/incident is reported to the client, the Principal Contractor has a responsibility and is required by law to report any Section 24 accidents and incidents to the Department of Labour. Any road traffic accident must be reported to the relevant authorities.

It is essential that the Principal Contractor demonstrate that corrective and preventative action has been taken to prevent a similar incident in future and that it is communicated to all the Principal Contractors affected staff. A copy of the investigation, corrective and preventative action taken as well as the attendance register of the employees who attended the discussion of the incident and the action

implemented to prevent a similar incident, must be forwarded to the SANRAL Project Manager and or the SANRAL OHS Specialist.

Investigations must be completed for:

- Near Miss Incidents (To prevent it from becoming an incident)
- First Aid case Incidents
- Medical treatment case Incidents
- Fatalities

(b) Incident Reporting

The Principal Contractor shall provide the Employer with copies of all statutory reports required in terms of the Act within 7 days of the incident occurring. In addition, The Principal Contractor shall update monthly the Disabling Injury Frequency Ratio (DIFR) and display this information on a signboard at the site office.

The Principal Contractor is responsible for collecting, recording, calculating and reporting his and his sub-contractors Health & Safety statistics to the SANRAL OHS Specialist.

The statistics should contain at least the following for all employees of all contractors working on the project:

- Total Number of workers
- Total Number of hours worked (on the SANRAL project)
- Total Number of Near Miss Incidents
- Total Number of First Aid case Incidents
- Total Number of Medical Treatment case Incidents (Excluding Section 24 type incidents)
- Total Number of Section 24 type Incidents
- Preventative actions taken on incidents that have occurred
- Communication to employees and contractors of incidents and preventative actions.

E1018 PROJECT SPECIFIC CONSTRUCTION REQUIREMENTS

The clause contains specific requirements for Contract SANRAL R.101-080-2019/1: For the Improvement of National Road R101 Section 8 from Bela Bela (km 0.0) to Modimolle (km 26.8), which must be adhered to in addition to minimum legislative requirements.

(a) Baseline Risk Assessment

The following is a list of activities, hazards and risks identified which forms the Baseline Risk Assessment for the project prepared by the Client in terms of Construction Regulation 5(1) (a):

Risks associated for identified activities and hazards:

<u>Activity</u>	<u>Associated Hazards</u>	<u>Associated Risks</u>	Risk Rating <div>High</div> <div>Medium</div> <div>Low</div>
Site establishment	Extreme temperatures; Pesticides, herbicides, dust. Snakes, bees, spiders, vermin (rats & mice); Portable electrical equipment; Electrical hand tools; Lifting equipment; Aggrieved members of the public.	Heat exhaustion; Dehydration; Poisoning; Fatality / Serious health effect; Silicosis; Electrical shock; Personal Injuries; Falling objects; Strikes / riots	M
Security	Aggrieved members of the public; Uncontrolled people	Protest Riots Theft	M
Loading / Unloading of materials / plant & equipment from trucks	Lifting equipment; Inexperience operators; Inexperienced workers;	Material / plant falling from height; Operator losing control; Employees under/close to suspended loads.	M
Transportation of personnel / materials	Overloaded vehicles; Transportation of workers in vehicles not designed to transport people; Transporting vehicle defective / not roadworthy	Operator losing control of vehicle; Vehicle overturning; Vehicle accidents; Fatality; Serious injuries	H
Erection of temporary site offices / Laboratory	Extreme temperatures; Pesticides, herbicides, dust, cement; Snakes, bees, spiders, vermin (rats & mice); Portable electrical equipment; Electrical hand tools; Lifting equipment; Temporary works; Aggrieved members of the public.	Heat exhaustion; Poisoning; Fatality / Serious health effect; Silicosis; Electrical shock; Personal Injuries; Falling objects; Strikes / riots	M
Working with and handling of hazardous / flammable / toxic materials	Hazardous, flammable and toxic substances	Chemical burns; Fire; Serious injuries; Fatalities	M
Disposal of waste materials	Hazardous waste	Environmental pollution Re-use of containers can have serious health effect on people or fatal.	H

<u>Activity</u>	<u>Associated Hazards</u>	<u>Associated Risks</u>	<u>Risk Rating</u> <div>High</div> <div>Medium</div> <div>Low</div>
Traffic accommodation / calming	Public vehicles; Extreme temperatures Stop & Go	Employees run over by public vehicles – serious injuries / fatalities Heat exhaustion Public not adhering to stop & go signals / try to bypass stop & go – fatality / serious injuries / vehicle accidents.	H
Working in elevated positions - Working at heights, on slopes, next to excavations, on trucks.	Defective / Inadequate equipment; Improper use or non-use of fall protection equipment; Environmental conditions – rain / strong wind, lighting; Live electrical power lines; Suspension trauma.	Inadequate protection of employees against falls; Electrical Shock; Electrical arching; Slippery work surfaces; Fatality / serious injuries;	H
Stockpiling	Material falling from stockpile	Serious personal injuries; Material damage	M
Operations involving Noise	Noise	Noise induced hearing loss	M
Operations involving Vibration	Vibration	Damage to joints, muscles, circulation and sensory nerves.	M
Working above / near water environments	Working at heights Water environment	Drowning	M
Working near existing services – overhead/underground power cables; telecommunication cables	Electricity	Electrical Shock; Electrical arching; Fire; Burns Fatality Serious injury	H
Working with portable electrical equipment – grinders, circular saws, generators	Electricity Electrical tools Portable electrical equipment	Electrical shock Cuts Personal injuries	M
Lifting / Lowering operations	Elevated objects Lifting machines Improper rigging Electrical cables	Lifting machine / crane overturning; Falling objects Dropped loads Strong winds	H

<u>Activity</u>	<u>Associated Hazards</u>	<u>Associated Risks</u>	Risk Rating <div>High</div> <div>Medium</div> <div>Low</div>
		Loads striking personnel, vehicles or equipment. People working underneath High voltage power lines may arch onto crane boom.	
Driving and operation of construction vehicles and mobile plant	Distracted drivers; Recklessness; Impaired driving; Poor visibility; Poor road conditions; Unsecured loads; Uncontrolled vehicle entry; Equipment failure; Public vehicles; Uneven ground surfaces	Fatalities; Serious injuries; Crashes; Vehicles, plant and equipment damage; Workers not seen by operators; Workers working too close to mobile plant and vehicles; Construction vehicles & mobile plant not road worthy / defective; Roll over of construction vehicles / plant.	H
Excavation work	Unstable ground Underground electrical cables; Underground pipelines; Excavation equipment, construction vehicles & plant.	Cave-ins; People falling into excavation; Workers buried in excavation due to cave-ins; Construction vehicles / plant falling into excavation; Fatalities; Serious injuries	H
Use of explosives	Explosives; Flying debris	Fatality; Serious Injuries	M
Gabion work	Manual handling Slopes Slippery Rocks	Personal injuries Trips, Slips & Falls	M
Work adjacent or in proximity of railway lines	Trains	Working too close to railway track can cause train draft to suck workers under trains. People falling onto or in front of trains while working above railway track.	H
Work adjacent or near traffic	Public vehicles	Workers not attentive to approaching vehicles.	H

<u>Activity</u>	<u>Associated Hazards</u>	<u>Associated Risks</u>	Risk Rating <div>High</div> <div>Medium</div> <div>Low</div>
		Drivers not slowing down to indicated speed limit. Drivers losing control of their vehicles.	
Temporary works – Form work & support work	Temporary works	Falls from height; Collapse of temporary work overloading	H
Demolition work	Demolition equipment Flying debris Explosives;	Fatality; Serious Injuries; Damage to equipment; Damage to public assets	H
Work adjacent to public property	Construction plant and equipment; Excavation activities; Demolition activities;	Injury to public persons; Damage to public property and assets;	H
Protection of public H&S	Unprotected temporary works; Stockpiles; Incomplete structures.	Public persons accessing construction area, stockpiles and incomplete structures. Fatality / Serious injury to public persons	H
Welfare facilities – drinking water; eating facilities; sanitary facilities	Water not suitable for human consumption; Shortage of water; Hazardous substances; Environmental impact.	Serious health effects; Dehydration Environmental pollution	M
Working in the environment	Bees Snakes Spiders Lighting Strong winds Heavy rain Hot/cold conditions	Poisoning; Fatality / Serious health effect; Electrical shock / burns; Personal Injuries; Slips; Drowning; Heat exhaustion; Dehydration;	M
	Hazardous biological agents	Serious health effects; Fatality; Pandemic; Epidemic	H

(b) Daily Site Attendance Register

The Principal Contractor shall keep a daily site register so as to be able to identify the entire Contractors personnel on site in case of an emergency or evacuation situation. The attendance register must include permanent as well as temporary workers working on the site.

All contractors shall report to security/reception upon arrival at site. The Principal Contractor will only grant first time access to work on the site if all required

documentation has been provided by the contractor and has been approved by the Principal Contractor.

All site visitors, suppliers and any new contractors shall report to security/reception upon arrival at site. All visitors need to sign an attendance register when visiting the site. Visitors include all persons which are not permanently working on the site but excludes temporary site workers. Visitors must undergo site induction training before they are allowed on site to make them aware of the site dangers.

(c) Emergency Numbers / Emergency Evacuation

A list with emergency numbers must be readily available to first aiders and supervisors. Emergency numbers must be site specific and must display the nearest emergency facilities.

The Principal Contractor shall identify and formulate emergency procedures in the event an incident does occur. The emergency procedures thus identified shall also be included in The Principal Contractor's OH&S plan and communicated as part of induction training. It is the responsibility of the first aid worker, together with the construction supervisor, to make an assessment regarding the severity of injuries and which actions are appropriate. For example: transfer to a medical facility by ambulance or helicopter.

The Principal Contractor must implement an emergency evacuation procedure on site to ensure that in case of an emergency, all staff will leave their place of work when the emergency siren is sound and proceed to the designated emergency assembly point. The emergency assembly point at the site office must display the sign "Emergency Assembly Point".

An evacuation route diagram must be displayed and visible at strategic points in the site office buildings and on notice boards.

All staff working on site must be given awareness training on the emergency evacuation procedure and evacuation drills must be exercised to ensure all staff know the correct procedure to follow in case of an emergency.

(d) Site Security

Certain areas where work must be carried out, is recognized unsafe areas and certain other areas may from time to time become unsafe, due to 3rd party actions. The Principal Contractor must, as far as reasonably possible, anticipate unsafe areas and must ensure that his site staff is safe from 3rd party actions, which include but is not limited to:

- Unrests,
- Violent Demonstrations,
- Theft,
- Injury to staff due to 3rd party actions.

The Principal Contractor must, when work is to be carried out in the above-mentioned areas, make provision for security services to accompany site staff during the execution of their work, as The Principal Contractor is responsible for the Health, Safety and Security of his own staff. The provision for security services must form part of The Principal Contractors tender.

(e) Personal Protective Equipment

Comply with General Safety Regulations, Section 2

The Principal Contractor shall identify the hazards in the workplace and follow the hierarchy of controls to prevent incidents. Where possible, hazards must be eliminated or, where impracticable, mitigate the hazards through implementing control measures. Where mitigated hazards still pose a risk to the health and safety of workers, take steps to protect workers and make it possible for them to work safely

and without risk to their health under the hazardous conditions, by wearing personal protective equipment and clothing.

Personal protective equipment (PPE) should, however, be the last resort and there should always first be an attempt to apply engineering and other solutions to mitigate hazardous situations before the wearing of PPE is considered. The hierarchy of hazard control must be followed before the option of personal protective equipment is considered. The following hierarchy of controls must be followed:

- Elimination
- Passive Controls
 - Substitution – Using a cherry picker or man-lift instead of a ladder.
 - Engineering Controls – Installing barrier railings; Installing stairs instead of using vertical ladders.
- Active Controls
 - Administrative policies and procedures
 - Personal protective equipment

Where it is not possible to create an absolutely safe and healthy workplace, the Principal Contractor shall inform employees regarding this and issue, free of charge, suitable equipment to protect them from any hazards being present and that allows them to work safely and without risk to health in the hazardous environment.

It is a further requirement that the Principal Contractor maintain the said equipment, that he instructs and trains the employees in the use of the equipment and ensures that the prescribed equipment is used by the employee/s.

Employees do not have the right to refuse to use/wear the equipment prescribed by the Employer and, if it is impossible for an employee to use or wear prescribed protective equipment through health or any other reason, the employee cannot be allowed to continue working under the hazardous condition/s for which the equipment was prescribed but an alternative solution has to be found that may include relocating the employee.

The Principal Contractor shall include in his OH&S plan the PPE he intends issuing to his employees for use during construction and the sanctions he intends to apply in cases of non-conformance by his employees. Conformance to the wearing of PPE shall be discussed at the DSTI and Toolbox Talk meetings.

The Principal Contractor shall ensure that all his personnel, excluding those who are permanently office bound, are equipped with reflective safety jackets and that these are worn at all times when working on site. Any person found not wearing a reflective jacket on site must be removed from the site until such time as he is in possession of and wearing a reflective jacket. Reflective safety jackets shall be kept in good condition and any jackets that are ineffective must immediately be replaced by The Principal Contractor.

(f) Site Supervision

Comply with Construction Regulation, Section 8.

The Principal Contractor shall appoint a competent Construction Manager who shall be responsible for the construction activities and for ensuring occupational health and safety compliance on the construction site.

(g) Working in Elevated Positions

Comply with Construction Regulation, Section 10

The Principal Contractor shall ensure that a fall protection plan, developed by a competent person who is designated as the Fall Protection Plan Developer, is available on site and understood by all employees who will be working in elevated positions.

All employees working in elevated positions shall protect themselves from falls by wearing a full body harness and the lanyard shall be attached as far as possible

above the head of the worker to a life-line or other approved and anchor point indicated in the fall protection plan.

In addition to obvious elevated work activities, work activities which include:

- Working on the edge of an excavation where there is a risk of falling into the excavation; or
- Work on the edge of a vertical drop where there is a risk of falling;

shall be considered work in elevated positions and Section 10 of the Construction Regulations must be adhered to at all times. The hierarchy of controls must be implemented when such activities are carried out. As a minimum the employee must wear PPE as identified in the risk assessment, which shall include a full body harness.

(h) Structures

Comply with Construction Regulations, Section 11.

The Principal Contractor shall ensure that all practicable measures are taken to prevent the uncontrolled collapse of new or existing structures or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying out of construction work. No structure may be loaded in a manner which would render it unsafe.

When a structure is of temporary nature, all conditions as required by the Construction Regulations Section 12 - Temporary Works, must also be complied with.

(i) Excavations

Comply with Construction Regulations, Section 13

The Principal Contractor shall ensure that all excavations are carried out under the supervision of a competent person who has been appointed in writing as Excavation Supervisor.

The Principal Contractor must evaluate the stability of the ground before excavation work begins as well as during excavation work.

Excavations must be barricaded to prevent unauthorized access.

Material removed from excavations, as well as heavy machinery and construction vehicles, must not be closer than 1 meter to the edge of the excavation, to prevent additional loads on the excavation edge, which could cause cave-ins, to prevent construction vehicles from falling into the excavation and to prevent the accumulation of carbon monoxide gas inside the excavation.

The principal contractor and its contractors must cause every excavation which is accessible to the public or which is adjacent to the public roads or thoroughfares, or whereby the safety of persons may be endangered, to be –

- Adequately protected by a barrier or fence and as close to the excavation as is practicable; and
- Provided with warning illuminants or any other boundary indicators that are clearly visible at night or when visibility is poor.

People working in the excavation must be adequately protected from cave-ins, by means of protection systems such as trench boxed and shielding and must have a safe means of access into the excavation and egress from the excavation.

(j) Scaffolding

Comply with Construction Regulations, Section 16, General Safety Regulations, Section 6 and SANS 10085 – The Design, erection, use and inspection of access scaffolding

The Principal Contractor shall appoint a competent person in writing as scaffolding Supervisor. Scaffolding Inspectors and Scaffolding Erectors must be trained and found competent to carry out scaffolding work. It is important to note that only competent scaffold erectors are allowed to build the scaffolding. The scaffold inspector is not allowed to build the scaffold with the scaffold erector team.

Scaffolding shall be erected according to SANS 10085 and shall be tagged "Unsafe for use" while it is being build and "Safe for Use" after inspection indicated that the scaffold is safe to use. The inspection of the scaffold shall be in writing and proof thereof shall be available for any user of the scaffold as well as for audit purposes.

Scaffold left erected while The Principal Contractor is not in attendance, must be tagged with a "Not Safe for Use" tag and all reasonably practicable measures must be taken to prevent unauthorised access to the scaffold.

Scaffold must be inspected by the competent scaffold inspector on completion of the scaffold build, weekly thereafter or following severe weather conditions.

Hazards such as overhead power lines must be identified before the scaffold is build and must be reflected in the risk assessment.

When using mobile scaffold, employees and materials must be removed from scaffold before moving the mobile scaffold. Hazards such as overhead power lines must be identified before moving mobile scaffold and must reflect in the risk assessment.

(k) Suspended Platforms

Comply with Construction Regulation, Section 17, SANS 10295-2 - Suspended access equipment Part 2: Temporary suspended platforms (TSPs)

All suspended platform work must be carried out under the supervision of a competent appointed Suspended Platform Supervisor. Suspended platform erectors, operators and inspectors must be competent.

The Principal Contractor must be in possession of a certificate of design for the use of the suspended platform system.

(l) Cranes

Comply with Construction Regulation, Section 22, Driven Machinery Regulation, Section 18.

Crane operators must be trained and found competent to operate the particular type of lifting machine and have a valid operator's card. The crane operator must be in possession of a valid medical certificate of fitness, issued by an occupational health practitioner.

The wind factor should always be taken into consideration when operating cranes and a wind speed device must be fitted so that it provides the operator with an audible warning when the speed exceeds the safe lifting speed. Upon noticing that the wind speed is equal or more than the specified speed limit, the operator should stop immediately.

(m) Construction Vehicles & Mobile Equipment

Comply with Construction Regulation, Section 23, National Road Traffic Act, 1996

Construction vehicle operators must have received training to operate the class of construction vehicle or mobile equipment and must be in possession of an operator's card as proof of competency. Construction vehicle operators must be authorised in writing and have a medical certificate of fitness issued by an occupational health practitioner to operate the construction vehicle and/or mobile equipment.

All construction vehicles operating on a public road, must be roadworthy, licenced and when operated on a public road, comply with the National Road traffic Act.

(n) Electrical Equipment

Comply with Construction Regulations, Section 24.

The Principal Contractor shall take adequate steps to ascertain the presence of and guard against danger to workers from electrical cables or apparatus which is under, over or on the site.

The exact location of underground electric power cables must be determined before any excavators are used for excavation purposes.

The location of overhead electrical cables must be assessed when working with cranes and lifting equipment. Injury may be possible from touching the electrical cables with the crane boom, or from arching when the crane boom comes too close to the electrical cable.

All temporary electrical installations must be inspected at least once a week by a competent person and the records of the inspections must be recorded in a register which must be kept on site.

Electrical machinery and extension cords must be in a serviceable condition and must be inspected on a daily basis before use on a construction site by the authorised operator and the inspection checklist must be kept on the construction site.

Comply with Electrical Installation Regulations.

All electrical installations shall be inspected and approved by an accredited electrical inspector and a valid Certificate of Compliance must be issued for the installation.

All electrical installations carried out on site (permanent and temporary) must be in accordance and comply with the Electrical Installation Regulations.

All power supplies and generating units must be fitted with a functional earth leakage device.

(o) Temporary Storage of Flammable Liquids

Comply with Construction Regulation, Section 25 and General Safety Regulations, Section 4

The Principal Contractor must ensure storage areas of flammable liquids are well ventilated and "No Smoking" signs are placed at the entrances and ventilation ducts of the storage areas. Firefighting equipment must be available in suitable positions around the storage areas.

The Principal Contractor must ensure that good housekeeping is practiced in and around the flammable storage areas.

(p) Water Environments

Comply with Construction Regulation, Section 26.

The Principal Contractor must ensure that a lifejacket forms part of the employees PPE and is worn when the employee is exposed to the risk of drowning, by falling into water.

The risk assessment must make provision for the rescuing of persons in danger of drowning and for preventing employees from falling into the water.

When working next to a river, the Principal Contractor shall put a system in place to monitor the river water level in order to evacuate employee in case of a flood.

When working over water environments, Section 10 of the Construction Regulations – Fall Protection will also apply.

(q) Housekeeping

Comply with Construction Regulation, Section 27, Environmental Regulations for Workplaces, Section 6(3).

The Principal Contractor shall ensure that suitable and acceptable housekeeping is continuously implemented and maintained on the construction site. Off-cuts and waste must be removed as soon as practicable.

(r) Stacking & Storage of Material, Plant & Equipment

Comply with Construction Regulations, Section 28 and General Safety Regulations, Section 8.

The Principal Contractor shall appoint a competent person in writing with the duty of supervising all stacking and storage operations on site.

Stacking shall only take place in areas specifically demarcated for this purpose. Circular items must be secured with wedges or chocks.

Items removed from a stack shall only take place from the topmost layer of the stack.

Stacks shall not obstruct any fire extinguishing equipment, first aid equipment, electrical switchgear (DB Boxes) and ventilation or lighting installations.

Unstable stacks must be broken down immediately.

(s) Fire Precautions

Comply with Construction Regulation, Section 29.

The Principal Contractor must provide his own firefighting equipment that is within the service date and safe for use. Firefighting equipment must be on a register and inspected by a competent person who has been appointed in writing.

Suitable and sufficient fire extinguishing equipment must be placed at strategic locations and a sufficient number of firefighters must be available, which must be trained in the use of it.

(t) Intoxicating Liquor and Drugs

Comply with General Safety Regulations, Section 2A.

The principal Contractor must compile a Substance Abuse Policy, which must be communicated to all employees. This policy should form part of the induction material for employees as well as visitors.

The Substance Abuse Policy should set the limit for intoxication to zero in order to complement a vision of zero tolerance.

Any person found to be intoxicated, or consuming intoxicating liquor or illegal drugs, shall not be allowed onto the premises and/or must be removed from the premises.

The Principal Contractor has the right to test any person entering the premises for intoxicating liquor or illegal drugs and may refuse entrance on the basis of the outcome of the test.

The Principal Contractor shall ensure that employees taking prescription medicine informs the Principal Contractor of such and shall ensure that the side effect of such medicine does not constitute a hazard to the employee himself or people working with, or in close proximity to the employee.

(u) Confined Space Work & Tunnelling

Comply with Construction Regulation, Section 15 and General Safety Regulations, Section 5.

The Principal Contractor shall ensure that only authorized persons enter confined spaces.

An entrance log must be kept to ensure people are not left inside the confined space. Adequate air monitoring must be carried out before entering the confined space. When air monitoring indicated the oxygen to be less than 20% by volume, the confined space must be purged and ventilated to obtain a safe atmosphere or self-contained breathing apparatus must be used.

(v) Site Services

The Principal Contractor shall provide and maintain on the site adequate facilities for employees to use, which must be serviced and kept sanitary and hygienic at all. The following site services should be taken not of:

(i) Drinking Water

The Principal Contractor must ensure that an adequate supply of potable drinking water is available for all persons engaged in managing and working on the construction site and, if necessary, similar facilities elsewhere for such personnel off the site. Employees working in hot conditions must consume enough water per hour to prevent dehydration.

Where water is unsafe for human consumption, it must be so indicated by means of adequate signage.

(ii) Accommodation

The Principal Contractor shall comply with the requirements of Construction Regulation 30 with regards to employee's accommodation. Reasonable and suitable living accommodation must be provided to employees who are far removed from their homes.

(iii) Sanitary Facilities

The Principal Contractor shall comply with the requirements of Construction Regulation 30 with regards to employee's sanitary facilities. Sanitary facilities must be positioned in close proximity of the work area. Sanitary facilities must be serviced regularly and kept in a clean and hygienic condition.

(w) Traffic Accommodation

The Principal Contractor must develop a clear Traffic Management Plan, which must be approved by the Engineer. Traffic must be organized and controlled in accordance to the Traffic Management Plan and any work area must have adequate signage, signaling or other control arrangements to guard against the dangers relating to the movement of vehicles. Where reasonably practicable, solid barriers must be placed between workers and traffic passing by.

When the Principal Contractor is executing night work, permission should be obtained from the Engineer. The Principal Contractor must put in place visible or reflective signs that can be seen by motorist at a distance. If a stop and go method is used flag persons must be properly trained on how to control the traffic.

SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL R.101-080-2019/1
FOR THE IMPROVEMENT OF NATIONAL ROAD R101 SECTION 8 FROM BELA BELA (KM 0.0) TO
MODIMOLLE (KM 26.8)

**SECTION F:PROJECT SPECIFICATION AMENDMENTS TO THE STANDARD SPECIFICATIONS
FOR ELECTRICAL AND LIGHTING**

SECTION F: ELECTRICAL AND LIGHTING

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1. REGULATIONS AND STANDARDS

1.1 REGULATIONS AND STANDARDS

The material supplied, construction, installation and testing shall be in accordance with the following Acts and regulations:

- (a) The latest issue of SANS 10142-1: "Code of Practice for the Wiring of Premises-Part 1: Low Voltage Installations",
- (b) The latest issue of SANS 10142-2: "Medium Voltage installations above 1kV a.c. not exceeding 22kV a.c. and up to and including 3000kW installed capacity",
- (c) The latest issue of SANS 475: 2005: "Code of Practice for Streetlight Luminaires",
- (d) The latest issue of SANS /IEC 10098-1: "Lighting of public thoroughfares",
- (e) The latest issue of SANS /IEC 10098-2: "Lighting of certain specific areas of streets and highways",
- (f) SANS 97: Electrical cables with impregnated paper insulation
- (g) SANS 1507: Electrical cables and flexible cords with poly-vinyl chloride (PVC) insulation
- (h) SANS 10198: The choice, handling and installation of electrical power cables with a rating not exceeding 33 kV
- (i) SANS 1339: Electrical cables with insulation of cross-linked polyethylene (XLPE) Insulated Electric Cables
- (j) SANS 10225: The design and construction of lighting masts
- (k) SANS 121/ISO 1461: Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods
- (l) The Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended,
- (m) The Local Government Ordinance 1939 (Ordinance 17 of 1939) as amended and the municipal by-laws and any special requirements of the local supply authority,
- (n) The Fire Brigade Services Act 1993, Act 99 of 1987 as amended,
- (o) The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as amended,
- (p) The Post Office Act 1958 (Act 44 of 1958) as amended,
- (q) The Electricity Act 1984 (Act 41 of 1984) as amended,
- (r) The Regulations of the local Gas Board where applicable.
- (s) Relative Municipal Authority specifications

It shall be assumed that the Contractor is conversant with the above-mentioned requirements. Should any requirement, by-law or regulation, which contradicts the requirements of this Document, apply or become applicable during erection of the Installation, such requirement, by-law or regulation shall overrule this Document and the Contractor shall immediately inform the Engineer of such a contradiction. Under no circumstances shall the Contractor carry out any variations to the installation in terms of such contradictions without obtaining the written permission to do so from the Engineer.

No claims for extras in respect of failure by the Contractor to comply with any of the above regulations will be considered. Where conflict exists between any of the above regulations and the specifications, the said conflict shall be referred to the Engineer in writing for his ruling in writing.

1.2 NOTICES AND FEES

The successful Tenderer for this Contract shall, immediately after he has been officially notified that his tender has been accepted, and at any time thereafter as may be necessary, notify all the relevant authorities, pay fees including inspection and re inspection fees and take any other steps which may be required or prescribed to execute the installation as specified.

Copies of such correspondence with the relevant authorities shall be forwarded to the Engineer who shall at all times be kept informed. Submission of copies to the Engineer to keep him informed does not relieve the Services Contractor of his responsibilities in terms of the contract. The contractor shall give all notices required by and pay all necessary fees, including any inspection fees, which may be due.

1.3 QUALITY OF MATERIALS

Only materials of highest quality shall be used and all materials shall be subject to the approval of the Employer. The Employer's specifications for various materials to be used on this Contract are attached to and form part of this specification.

Wherever applicable, the material shall comply with the relevant South African National Standards and Specifications, or to IEC Standards Specifications where no SANS Specifications exist.

Materials wherever possible, must be of South African manufacture.

The Contractor shall submit samples of all materials or equipment before installation to the Employer for their approval upon request.

The material shall be approved, installed and commissioned in accordance with these Specifications and Codes and to the satisfaction of the Employer.

1.4 WORKMANSHIP AND STAFF

An accredited person shall exercise general control over all electrical installation work being carried out.

The workmanship shall be of the highest grade and to the satisfaction of the Employer.

All inferior work shall, on indication by the Employer's inspecting officers, be immediately removed and rectified by and at the expense of the contractor.

1.5 CERTIFICATE OF COMPLIANCE

On completion of the service, certificates of compliance shall be issued to the Employer in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

1.6 MAINTENANCE OF INSTALLATIONS

With effect from the date of the Taking-Over Certificate the contractor shall commence with maintenance of the installation as specified in paragraph 2.13

If during the maintenance period the installation is not in working order for any reason for which the contractor is responsible, or if the installation develops defects, the contractor shall immediately, upon being notified thereof, take steps to remedy the defects and make any necessary adjustments.

Should failures however be so frequent as to become troublesome, or should the installation otherwise prove unsatisfactory during the Defects Liability Period the contractor shall, if called upon by the Engineer or the Employer, at his own expense replace the whole of the installation or such parts thereof as the Engineer or the Employer may deem necessary, with apparatus specified by the Engineer or the Employer.

SECTION F2: SCOPE OF WORK AND TECHNICAL SPECIFICATIONS

This section defines the Scope of Work and Technical Specifications for the electrical and lighting works.

The requirements in this section of the specification are supplementary to the Quality Specification and take precedence over the requirements in the Quality Specification of this specification but shall be read in conjunction with the rest of the document.

2.1 PURPOSE AND OVERVIEW OF DOCUMENT

This section of the document provides a brief summary of the scope of the work and is not a complete record. Quantities and volume of work shall be read or obtained from the drawings, pricing schedules and the rest of the specification. The Technical Specifications specify the standard of workmanship and quality of material for the installation, the scope of which is specified in the Scope of Works, on the Drawings and listed in the Pricing Schedules.

Upon receiving a set of documents, Tenderers shall make sure that all pages are included, in the correct numerical order as per the CONTENTS and that all the drawings are attached as per the SCHEDULE OF DRAWINGS. Should this not be the case it should immediately be brought to the attention of the Engineer for rectification.

2.2 SCOPE OF WORK

Lighting of the National Route R101 Section 8 in Bela Bela (km 0.0 to km km 5.5) and Modimolle (km 24 to km26.8) in accordance with SANS /IEC 10098:

No.	Section	Lighting Parameters
(a)	R101-8	Category A1 with median and greater than 600 vehicles per hour per lane

This contract covers includes the following key components:

- (a) Masts and poles: Design, supply and installation
- (b) Luminaires: Installation and commissioning
- (c) Electrical works: Supply, installation and commissioning
- (d) Power Connections: Payment to and co-ordination with local supply authority for provision of supply
- (e) Security and monitoring system for cabling, kiosks, and poles. This include access control management into kiosks and transformers.

This contract covers the supply, delivery to site, testing, commissioning and handing over in proper working order of the complete lighting installation as specified in the Project Specification and in all the constituent parts of this set of documents.

This contract covers the installation (including aiming) of the luminaires as well as testing, commissioning and handing over.

In addition, full maintenance of the installation shall be provided during the 12-month defects liability period.

The specifications are based on a design with energy efficient, high performance LED street lighting luminaires, that can be controlled and dimmed via the LMS.

2.2.1 Masts and Poles

The project consists of the supply and installation of the following masts, poles and luminaires along Road R101-8

- (a) 18m anti-vandal masts with double spigot configuration for installation of up to 2 x high performance LED street lighting luminaires, median mounted along sections of the R101 through Bela Bela

- (b) 13,5m anti-vandal lighting poles with single spigot configuration for installation of up to 1 x high performance LED street lighting luminaires, verge mounted along sections of the R101 through Modimolle
- (c) LED streetlighting luminaires will be supplied as detailed in paragraphs 2.2.3 and 2.11

2.2.2 Electrical Works

The electrical work shall include the following:

- (a) Application to and co-ordination with the local supply authority for the installation of Medium Voltage supply points (1x anti-vandal/vandal proof minisub) in accordance to the correspondence with and standards of the local supply authority and the electrical design drawings.
- (b) Supply, install, test and commission 380/410V 3 phase low voltage anti-vandal distribution kiosks with associated control and protective equipment.
- (c) Supply, install, test and commission security cages around the low voltage distribution kiosks in accordance to the drawings and SANRAL Specifications.
- (d) Supply, install, test and commission low voltage reticulation consisting of 35 mm² & 50 mm² 4 core Aluminium PVC SWA/ECC FRPVC 600/1000V cable with integral earth continuity conductor in ducts and/or trench, including trenching and concrete encasement
- (e) Install, test and commission the lighting scheme consisting of 18 m mid-hinge masts and 12 m mounting height lighting poles and luminaires. The termination panels within the masts and poles shall accommodate 35 mm² & 50 mm² 4 core AL PVC SWA/ECC FRPVC 600/1000V cable terminations and earth.
- (f) Trenching associated with electrical works.
- (g) The electrical low voltage cable, where direct buried, the cable shall be installed and encased in 20MPa concrete (minimum 300 mm wide x 150 mm thick concrete bedding + 150 mm thick concrete cover) so that the top of the finished concrete encasement is 1 000 mm minimum below final ground level.
- (h) Testing and cleaning of all service sleeves shall be done before services are to be drawn through the sleeves after the Engineers approval.
- (i) Earthing and lightning protection, including earthing of the light masts and poles.
- (j) Relocation of existing services where necessary including 11kV cables, LV cables and lighting poles.
- (k) Supply, install, test and commission a security monitoring system for transformers, cabling, kiosks, poles, manholes and sleeves at crossings.
- (l) Commissioning, aiming of luminaires and testing of system to the satisfaction of the Engineer shall form part of this contract.
- (m) Service tools and accessories.
- (n) As-built drawings, documentation and training.

2.2.3 Installation and Testing of Luminaires and Lighting Management System (LMS)

The work to be done by the Electrical Subcontractor shall include:

- (a) Supply, installation, aiming, switching-on and testing of luminaires
- (b) Commissioning and testing of Lighting Management System
- (c) Supply, install, commission and test a lighting management including but not limited to:
 - i. Central Control System which includes computer hardware and software
 - ii. Communications networks including data costs
 - iii. Segment controllers (if required for the LMS)
 - iv. Luminaire controllers (pre-fitted to luminaires)

2.2.4 Civil Works and Traffic Accommodation

The civil works associated with the installation of masts, poles and cables shall be done by the Main Contractor. This includes:

- (a) Mast footings including anchor bolts
- (b) Sleeves
- (c) Manholes
- (d) Directional drilling of sleeves
- (e) Guardrails

(f) Traffic Accommodation

2.3 GENERAL REQUIREMENTS PROVISIONS AND OBLIGATIONS

2.3.1 General Requirements and Provisions

The general requirements and provisions are defined in COTO Chapter 1 Clause 1.2.

Specifically, the electrical subcontractor shall note the provisions of COTO Clause 1.2.7.1 with respect to drawing up their Programme of Work. The Electrical Subcontractor shall co-ordinate his programme with the Main Contractor.

2.3.2 Contractor's Establishment on Site and General Obligations

The general obligations of the Main Subcontractor and Subcontractors are defined in COTO Chapter 1 Clause 1.3.

The measurement and payment items for the general obligations of the electrical subcontractor are set out in Section F4 below.

2.3.3 Dayworks

The provisions and requirements in respect of Dayworks are specified in COTO Chapter 1 Clause A1.2.3.11.

The measurement and payment items for the general obligations of the electrical subcontractor are set out in Section F4 below.

2.4 CABLES

2.4.1 Cable Lengths

All scheduled cable lengths are for tendering purposes only. The Contractor shall be responsible for the measurement for the actual lengths required before ordering.

The length of all cables will be re-measured after installation. The Contractor will be paid for the actual lengths measured on site.

The contractor shall make allowances for snaking, joints, ends, terminations and wastage in the unit rate tendered. The Contractor must take the height of the mast/pole cable access hatch into account when ordering cable.

2.4.2 Trenching and Burial of cables

For typical trenching detail refer to drawing 33532.00-305 series.

Trenching shall be programmed in advance and the approved program shall not be departed from except with the consent of the Engineer.

Where trenching for cabling is required, the cable shall be installed and encased in 20 MPa concrete (minimum 300 mm wide x 150 mm thick concrete bedding + 150 mm thick concrete cover) so that the top of the finished concrete encasement is 1 000 mm minimum below final ground level.

Where fibre optic mini-duct is to be installed with the electrical cables, another bedding of 100 mm shall be installed on top of the mini-duct. Note the installation of danger tape on the drawing detail.

The contractor shall provide security on site from the time the cable is laid until the concrete has hardened to sufficient strength to prevent cable theft, and for at least 48 hours after the cable has been laid.

When laying cables in trenches excavated in soft or hard rock or containing sharp stones, rocks or other matter likely to injure the cables, the following precautions shall be taken:

- (a) Before laying the cables all injurious items shall be removed from the bottom of the trench.
- (b) The floor of the trench shall be evenly covered with a layer of sifted backfill, or sandy loam to a level which is 150 mm above the highest unevenness of the trench.

The backfill used for this purpose shall have passed through a screen having a 6,0 mm square mesh.

The thermal resistivity of the bedding soil shall be less than 1.2 K m/W.

The laying of cables shall not be commenced until the trenches have been inspected and approved.

The cable shall be removed from the drum in such a way that no twisting, tension or mechanical damage is caused (i.e. rolled off the drum) and must be adequately supported at short intervals during the whole operation.

After the cables have been laid in the trench on 150 mm concrete bedding and inspected and approved by the Engineer they shall be covered with an additional 150 mm layer of concrete backfill.

Backfilling shall then be continued with proper grading of material to ensure settling without voids, and the material is to be compacted after the addition of every 150 mm layer. Soilcrete (5%) or concrete shall be used for backfilling where specified by the Engineer. The surface is to be made good to approval, and in the case of roadway crossings the excavations shall be consolidated to original stability.

Should the specified backfill not be available at any particular section of the trench, the Contractor shall transport from elsewhere.

Where cables are cut and are not intended to be made off within 24 hours the ends are to be sealed without delay.

Where more than one horizontal layer of cable is laid, the level of the upper layers of cable shall be gauged from the level of the finished bottom of the trench and marked on the side of the trench at frequent intervals before the installation of the lower layers, to ensure that the correct vertical spacing is maintained.

The contractor shall, before commencing with any excavation work, satisfy himself as to the location of any buried cables, water pipes, buried earthing conductors or other underground service which might be damaged during excavation. Any damage inflicted on other services by the Contractor shall be immediately reported to the engineer and shall be made good by the Contractor or by others at the Contractor's expense.

The contractor shall take all the necessary precautions and provide the necessary barriers, warning signs and/or lights to ensure that the public and/or employees on site are not endangered.

The contractor shall ensure that the excavations will not endanger existing structures, roads, railways, other site constructions or other property.

Trenches shall connect the points shown on the drawings in a straight line. The Engineer beforehand shall approve any deviations due to obstructions or existing services.

The excavated material shall be placed adjacent to each trench in such a manner as to prevent nuisance, interference or damage to adjacent drains, gateways, trenches, water furrows, other works, properties or traffic. Where this is not possible the excavated materials shall be removed from site and returned for back filling on completion of cable laying.

All surplus ground, rocks and spoil generally shall either be removed to a selected area of the site or shall be spread evenly across the surface of the site, whichever is directed by the Engineer, and the cost of same shall be included in the prices for laying and installing the cables.

Trenches across roads, access ways or footpaths shall not be left open. If cables cannot be laid immediately the contractor shall install temporary “bridges” or cover plates of sufficient strength to accommodate the traffic concerned.

Where two MV cables are run in the same trench they shall be separated by at least 200 mm. Where two lighting cables are laid in the same trench, they shall be separated by at least 25 mm. Where a lighting cable is laid in the same trench as a MV cable they shall be separated by at least 300 mm and the MV cable shall be closest to the road reserve boundary.

Cable laying shall be planned so that as far as possible cables do not cross each other. Where crossing is unavoidable, a vertical separation of not less than 150 mm shall be provided for cables of the same voltage and of 300 mm for cables of differing voltage.

2.4.3 Cables in median ducts and sleeves across bridge structures

Cables in the median barrier shall be installed in the ducts provided.

One duct is provided which links every mast base. A second duct is provided which passes from manhole to manhole only. Note the reticulation concept below.

Where cables are installed onto a bridge or another structure, through sleeves in the structure, the entry and exits shall be encased in concrete for a length of 2m at either end of the bridge.

2.4.4 Cable Routing

The Electrical Subcontractor shall peg out the cable routes after which the Engineer or his representative shall be called to approve the routing.

2.4.5 Electrical Cables

Low voltage distribution and lighting cables shall be 4-core stranded aluminium polyvinyl chloride (PVC) insulated PVC bedded galvanised steel wired armoured (SWA) PVC sheathed 600V/1000V cables with ECC earth conductor, manufactured to SANS 1507.

All cables shall be 3-core stranded aluminium and steel wired armoured.

2.4.6 Cable Joints

Cable jointing and termination shall be carried out by a qualified cable jointer using only approved standard methods for the particular type of cable. Proof of his training and experience may be required.

Joints in all cables shall only be made at full drum length intervals unless otherwise approved by the Engineer. In low voltage lighting installations, no joints will be allowed between poles unless with the prior approval of the Engineer.

All strands of steel wire armouring shall be through jointed.

Cable joints for low voltage cables shall be done by means of suitable ferrules which shall be properly sweated onto the conductors or crimped using a hexagonal die.

The ends of cables that are cut shall immediately be sealed by means of plumbed lead end caps should there be a delay before jointing is to take place.

The sealing of cable ends by means of rubber or bituminised tapes shall not be allowed. Heat shrink caps manufactured by Raychem may be used provided the seal is correctly applied. Where cable ends were open for 24 hours or more, the cable ends shall be tested for moisture.

Joints may be subject to inspection. Any joint found to be inferior shall be remade at the expense of the contractor.

2.4.7 Cable connections and terminations

Cable connections shall be made by means of crimped or sweated lugs, firmly bolted, one plain and one lock washer being placed under the nut, so that the plain washer is against the lug and there shall be no washer between the lug and the terminal. A plain washer is also required under the bolt head. Only approved tools shall be used for either crimped or sweated lugs. Crimped lugs shall be fitted using manual tools up to 70 mm² and hydraulic tools from this size upwards. Where a single point hydraulic crimping tool is used, the lug shall be crimped in three places. Where a hexagonal die is used, this shall extend the full length of the lug.

The bolting down of all lugs of aluminium terminations shall be done with conductive grease to prevent corrosion. The terminations shall be brushed with a wire brush prior to the application of the conductive grease.

Cable connections shall be made using brass bolts, nuts and washers, together with a star lock washer on all minisubs.

Where cable connections are required to the MV and LV terminals of transformers, these shall be made off as follows:

- (a) Red phase to terminal A
- (b) White phase to terminal B
- (c) Blue phase to terminal C

All connections are to be colour coded.

XLPE cable terminations are to be made in full compliance with the recommendations of the Supplier of the termination system.

Where an XLPE cable is terminated onto an item of equipment with a cable box as in the case of switchgear, and outdoor type taped termination complete with silicone tape shall be used. The cable box must be effectively sealed against moisture but shall not be compound filled. A standard compression type gland shall be used where the cable enters the cable box. The gland plate shall be effectively earthed to the equipment earth bar.

2.4.8 Labelling and Marking of Cables

All cables shall be labelled with 3,0 mm high letters punched onto aluminium tape attached to the cable with aluminium wire. The label shall state the cable size, number of cores, source and destination. For lighting masts and poles the source shall indicate the pole number from which the cable originates and the destination the pole number which the cables feeds.

Concrete or other approved cable markers shall be installed at road crossings, at changes of direction, at cable joints and on straight runs at intervals not exceeding 50 m and as specified.

Exact positions of cable markers shall be confirmed on site. The cable markers shall be installed in the centre of the cable trench.

Each cable beneath a cable marker is to be individually labelled and in addition the labels shall be taped over with a bright coloured PVC tape (e.g. red) to protect the labels from damage.

On lighting distribution cables the source end need shall labelled at the minisub or control kiosk. The label shall indicate the circuit identity.

2.4.9 Handling of Cables

The storage, transport, handling and laying of cables must conform to approved and acceptable practice and must meet the requirements of SANS 10198 as amended. Cables which are cut and left open for a period of time before being coupled must be sealed in the prescribed manner. When such cable ends are flooded by water they must be subjected to the tests prescribed by the Engineer.

The contractor shall have adequate suitable equipment and labour available to prevent damage to cables.

Care shall be taken when handling drums of cable. Cable drums shall not be dropped or allowed to roll unchecked. The drums shall, under no circumstances, be rolled in any direction other than that indicated by arrows thereon.

When running cable off a drum, it shall be properly/securely mounted and rotate without difficulty. The spindle supporting it shall be straight and horizontal. The inner end of the cable shall be released before running any cable off the drum.

No cable shall be bent to a radius of less than that specified in the Wiring Code (SANS 10142) and in accordance with the manufacturer's recommendation.

Care shall be taken to ensure that each length of cable is run off the drum sequentially so that a crossed core situation does not arise at joints.

If a cable becomes damaged or the sheath or end cap punctured, this fact shall be brought to the attention of the Engineer immediately. He shall then decide on further action. The Engineer shall also be notified immediately should there be any suspicion of moisture having entered an XLPE cable.

Before the cable is installed, the cable trenches must be carefully inspected and any objects, which may damage the cable during or after installation, must be removed.

2.4.10 Cable Testing

Low voltage power cables shall, after glanding off, be subjected to the test voltages appearing in appendix D of SANS 150 for a period of 15 minutes.

All site tests results shall be recorded in a form approved by and acceptable to the Engineer and test results shall be submitted on a daily basis to the Engineer's site representative who shall then call for tests to be repeated at random if he so wishes to check the values recorded.

2.4.11 Schedule of Cables

CIRCUIT NUMBER	FROM	TO FIRST POLE / MAST	TO LAST POLE / MAST	TOTAL RUN LENGTH m	CABLE TYPE	CABLE SIZE (mm ²)	EARTH CONDUCT OR SIZE (mm ²)
SL1/1	SLK 1	L1-1	L1-19	1 250 m	PVC PVC SWA/ECC Al 4c	25 mm ²	ECC
SL1/1	SLK 2	L1-1	L1-15	950 m	PVC PVC SWA/ECC Al 4c	25 mm ²	ECC
SL2/1	SLK 2	L2-1	L2-15	950 m	PVC PVC SWA/ECC Al 4c	25 mm ²	ECC
SL1/1	SLK 3	L1-1	L1-15	1 000 m	PVC PVC SWA/ECC Al 4c	25 mm ²	ECC
SL2/1	SLK 3	L2-1	L2-13	900 m	PVC PVC SWA/ECC Al 4c	25 mm ²	ECC
SL1/1	SLK 4	L1-1	L1-19	960 m	PVC PVC SWA/ECC Al 4c	25 mm ²	ECC
SL2/1	SLK 4	L2-1	L2-31	1 500 m	PVC PVC SWA/ECC Al 4c	25 mm ²	ECC

NOTE: ALL CABLE ROUTES SHALL BE DETERMINED ON SITE WITH THE ENGINEER AND THEN MEASURED BEFORE ANY CABLES ARE ORDERED.

The schedule of cables may not be used for ordering purposes. The cable lengths given in the schedules are only allowed for tender purposes. The contractor shall do all measuring on site himself in respect of lengths of cable, earth wires and trenches as may be required. The contractor must take the height of the mast/pole cable access hatch into account when ordering cable. Payments will only be made for the lengths of cable actually installed and at the tendered tariffs. Tenderers shall allow for snaking, joints, terminations and wastage in the unit rate tendered.

2.4.12 Cable Sleeves at Roadway Crossings

Where cables pass under roadways, they shall be laid in 110 mm diameter PVC sleeves provided or in pipes at a depth not less than 1 100 mm below the surface. Where sleeves for cables are required e.g. at road crossings, or over or under other services or for another reason at least 3 x 110 mm ribbed PVC sleeves shall be installed. The sleeves shall be heavy duty class 34 U-PVC sleeving with a wall thickness of not less than 1,5 mm thick and a smooth finish inside, and shall carry the SABS certification mark in respect of specification SANS IEC 61386-24-2005.

The ends of all sleeves shall be sealed with a non-hardening watertight compound after the installation of cables. All sleeves intended for future use shall likewise be sealed.

The sleeves shown on the drawings have been measured under section C2.2.1

2.5 SUPPLY AUTHORITY APPLICATION FOR CONNECTION

Provisional Sums have been included in the Pricing Schedules for the provision of supply to and installation of the kiosks.

The Electrical Subcontractor shall be responsible for the submission and payment of applications to supply authority for these new connections.

2.6 ELECTRICAL KIOSKS (LOW VOLTAGE)

All electrical distribution kiosks shall be of the vandal proof/anti-vandal type and shall be enclosed in an anti-vandal cage with electronic security.

The provisional number of kiosks to be supplied and installed is indicated in the Pricing Schedules.

The kiosks shall be installed alongside the minisubs. Each kiosk shall be equipped with a main incoming circuit breaker for the LV feeder from the minisub and distribution circuit breakers for each of the lighting circuits. Details of equipment to be installed is provided in the kiosk Schematic Diagrams.

The security alarm system for the anti-vandal minisub/kiosk security enclosure shall be installed in the kiosk.

The contractor shall supply workshop drawings for the anti-vandal electrical kiosks within 45 days of the award of the sub-contract. Manufacturing of the electrical kiosks shall commence only on approval of the workshop drawings by the Engineer.

2.6.1 Standards and materials

Equipment shall be in accordance with the applicable SANS Specifications and Codes and with this Specification.

Selection of materials, finishes, equipment, etc. shall also be based on the conditions and environment where the boards and equipment are to be installed, e.g. corrosive, hot, wet, damp, and dusty.

2.6.2 Construction

The kiosks shall be designed and constructed to accommodate the equipment shown on the schematic diagrams plus 25%.

Sufficient space shall be left inside panels for incoming and outgoing cable connections and for interconnections and control wiring, taking into account the sizes and quantities of cables and wires involved.

The kiosks shall be equipped with white powder coated, galvanised steel mounting plates, and removable galvanised steel gland plates.

Doors shall be suitably braced to ensure stiffness and shall have a smooth, flat finish. Door hinges shall be heavy duty and shall be concealed to prevent access to the hinges from outside the panel.

Doors shall not have any handles or locking mechanisms visible to the outside. The plate metal shall be a minimum of 4,5 mm thick.

The terminals for the incoming feeder cables shall be sized to accommodate cables up to 120 mm². The terminals for the distribution cables shall be sized to accommodate cables up to 70 mm².

2.6.3 Protection against dust/water ingress and condensation

The kiosks shall be manufactured and tested to Ingress Protection rating IP55.

No holes other than those required for cable entry shall be allowed. Should extra holes be required for temporary installations, these holes shall be suitably blocked off on the removal of these temporary installations.

The doors shall be ingress protected by means of a minimum of 10 mm thick non-perishable gasket, resistant to deterioration from heat, chemicals and moisture and capable of being compressed to half its original thickness.

In order to protect the kiosk equipment against the condensation from humidity, each kiosk shall be equipped with a suitably sized panel heater (minimum 60W) controlled by an electronic hygrostat (adjustable range 40 - 90% relative humidity) and thermostat (adjustable range 0 – 60°C).

The panel heater shall typically switch on when the panel temperature is less than 20°C or the humidity greater than 70%)

2.6.4 Painting and protection

The kiosks shall be finished with an epoxy/polyester baked powder coating process to SANS 1274: 2013.

The colour of the electrical kiosks shall be Moss Green. The contractor shall submit a sample for approval prior to manufacture.

The interior mounting plates shall be finished with quality white epoxy/polyester baked powder coating.

All metal parts shall be decreased, rinsed, pickled, rinsed, phosphate, neutralised and then thoroughly dried before powder coating.

All board finishes shall be made good to the satisfaction of the Engineer before final handover.

2.6.5 Labelling

All components and circuits shall be labelled.

All safety warning notices shall be in English.

All kiosks shall be labelled in the sequence shown on the drawings and as specified or approved. The Contractor shall obtain final information and approval before labelling is manufactured.

Black letters on white background shall be used for all normal labels and red letters on white or yellow background for danger notices. All labels used shall be engraved Traffolite.

External number labels shall be black letters on yellow background and shall be installed facing the road in the direction of travel.

The main isolating switch or switches shall be clearly labelled in accordance with the regulations.

Size and origin of supply cables and bus bars shall be clearly labelled on all boards.

All grouped single, double and three pole circuit breakers on distribution boards shall be properly labelled, indicating the number of the circuit controlled.

All equipment situated inside the board, e.g. Contactors, relays, fused, timers and time switches shall be clearly marked, indicating function, circuit controlled and fuse rating.

The main designation label shall be fitted at the top centre of the board and shall be in English. Individual labels are to be fitted to each compartment door and corresponding fixed portion of rear panel (if accessible).

All circuit labels shall be the same size for boards or similar equipment supplied under this Contract.

These labels shall be white/black/white composition engraved Traffolite labels secured by self-tapping screws or channelling.

Letter size: Main label – 20 mm, other labels – 6,0 mm.

The following labels shall be installed in English:

- NOTICE/LABEL warning to switch off in case of accidental contact, etc.
- NOTICES in all places as required by the Occupational Health and Safety Act of procedures prescribed in case of fire and/or electric shock.
- NOTICES on doors together with warning sign prohibiting unauthorised entry.

Labels on power cables shall be attached with approved type plastic adjustable grip clips.

The labels for power cables shall be provided with holes for the clips to pass through for fastening. Each power cable label shall be fastened with at least two clips.

A legend card, covered by removable 2,0 mm thick transparent acrylic plastic ('PERSPEX') or equivalent panel, shall be installed on the inside of the door of the kiosks and circuits shall be designated on this card.

2.6.6 Bus bars

Bus bars and connections shall be in accordance with SANS 1195.

Spacing of busbars shall be calculated in accordance with SANS 1195, but shall not be less than 50 mm.

Bus bars shall be mounted on substantial porcelain or other approved insulators and spaced that they will prevent busbar distortion under maximum short circuit conditions.

Busbars shall be pre-drilled and plated for connection to the maximum number of circuit breakers.

The busbars shall be shrouded to protect them from inadvertent contact from above and in front. The shroud shall be removable and shall be labelled "Danger Live Busbars".

All terminations onto bus bars and interconnections shall be bolted with cadmium plated high tensile bolts, washers, spring washers and nuts.

All connections from transformer to busbars and busbars to equipment are to be made with colour coded PVC insulated copper conductors terminated with crimped lugs. The connections to the transformer bushings shall be puttied and taped.

Bare conductors shall be so spaced that with all clamps, lugs and lead offs in position, the spacing between any conductor and earth shall not be less than 40 mm.

Connections to the bus bars shall be made by means of the correct clamps or lugs with soldered connections or with connections crimped with the correct equipment.

Bus bars shall each be identified by means of 100 mm long painted (or other approved) phase colouring bands spaced not more than 300 mm apart.

The following colours shall be used:

NUMBER OF PHASES	PHASE COLOUR	NEUTRAL COLOUR	EARTH COLOUR	SPECIAL PURPOSE COLOUR
1	Red	Black	Green/Yellow	Orange
2	Red and White	Black	Green/Yellow	Orange
3	Red, White Blue	Black	Green/Yellow	Orange
4 & more	Any base colour except Green, Yellow and Orange with serial numbers (numerals or words)	Numbered as for the phase colour	Green/Yellow	-

Where bus bars are mounted horizontally the longer dimension shall be in the vertical plane. The bus bars shall be designed to withstand the mechanical and thermal stresses of any possible short circuit that could occur at that point in the system.

Rating of bus bars shall not exceed 1,55 A/ mm² for copper and 1,0 A /mm² for aluminium. Neutral bus bars shall have the same cross section as phase bars.

Where small leads are connected directly onto the bus bars, such as voltmeters, fuses, etc., they shall be provided with a 20 ampere fuse mounted at the bus bar and a 2 ampere fuse at the piece of equipment.

Bus bar chambers and droppers shall be segregated from each other and shall be completely screened from any other compartment by removable bolted covers. Furthermore, the bus bar supports shall divide the bus bar chamber into discrete sections.

All bus bar contact surfaces shall be tinned.

All bracing and other insulating material shall be non-hygroscopic.

Dropper from the bus bars to the terminals of fuses or isolators must be of adequate section for the maximum rating of the isolator irrespective of the circuit rating. Colour coding will be as for main bus bars. All droppers shall be fully insulated.

2.6.7 Wiring

All internal wiring to the kiosks shall be carried out with wiring with PVC insulation to SANS 1507-2 having a minimum of 3 strands per conductor, and colour coded in accordance with the table below:

Colour of Wire	Circuit Particulars
Red, White and Blue	Phase connections in current and voltage transformers circuits and in all three phase circuits.
Green/Yellow b-colour	Insulated earth wires
Black	Neutral connections
Grey	Control connections
White	Connections in DC alarm circuits

All internal wiring to and from contactors shall be sized according to the contactor manufacturer's recommendation for the duty selected.

Wires shall not be joined between terminals points and no terminal shall have more than two wires connected to it unless they are lugged connections. Crimp lugs or ferrules shall be used on all conductors exceeding 10 mm². All terminals shall be either bolted or screwed. All terminals for wires smaller than 16 mm² shall have pressure plates.

Connections to bus bars or earth bars shall be made with tinned copper cable lugs soldered or crimped to the ends of the conductors and bolted to bus bars by means of cadmium plated high tensile steel bolts and nuts provided with spring washers.

Wiring shall be neatly installed, grouped and strapped together using plastic buckle clips or hard plastic "loom formers". Wiring shall not be run at random but shall follow board construction features as far as is possible. Only wires of the same phase shall be grouped or bunched together.

No excessive bunching of wiring, which will impair the current carrying capacity, will be accepted. All wiring is to be kept free and away from any exposed terminals or other un-insulated current carrying parts.

Connections to terminals shall suit the connectors used, but in all cases terminal clamp screws shall not bear directly on the conductor.

2.6.8 Earthing

The kiosks shall be fitted with a 6.3 x 50 x 200 mm Cu earth bar, predrilled with holes of 6,0 mm diameter.

The door and mounting plate of each electrical kiosk shall be bonded to the enclosure by flat Cu straps at a minimum of 2 points.

2.6.9 Terminals

Terminal assemblies shall consist of a metal mounting rail onto which terminal modules are fixed.

For cables up to and including 10 mm², clamp type terminals may be provided, but the type where the clamp screws bear directly on the conductor will not be accepted.

For exceeding 10 mm², terminal modules suitable for crimping lugs or ferrules shall be used.

Terminal modules shall have rigid insulating barriers between poles to provide an adequate creepage path for use at 440V between adjacent poles for 380V applications.

The terminals of the modules shall be large enough to accommodate the cable sizes specified. All terminals shall be clearly marked in accordance with the working drawings and wiring diagrams and as approved.

2.6.10 Surge Arresters

Surge arresters shall be provided for each phase and neutral in all kiosks.

Surge arresters shall conform to EN/IEC 61643-11 (Type 2/ Class 2) with the following minimum specifications:

Nominal discharge current	30kA
Voltage protection level	2 kV
Response time	<=25 nsec

2.6.11 Moulded Case Circuit Breakers (MCCB's)

All moulded case circuit breakers shall comply with SANS/IEC/EC 60947-2. All MCCB's shall be of flush mounting type with inverse current time delay overload characteristics and instantaneous short circuit characteristics on each phase.

Rupturing capacity shall be adequate relative to maximum transformer fault levels but not less than Class 6kA, 415V.

All main circuit breakers shall be connected to the busbars with solid copper connections of adequate section to resist short circuit stresses that may be imposed by faults up to the maximum rupturing capacity of the breaker.

All MCCB's shall be of one make throughout the installation. The Engineer will not accept a mixture of circuit breakers from various Manufacturers to meet the various ratings and duties required.

MCCB's shall have hydraulic magnetic over current releases.

Mechanically coupled single pole circuit breakers used as double or triple pole circuit breakers are not acceptable unless overload releases are internally coupled.

Neutral bars associated with each bank of MCCB's shall be positioned below each bank and shall be wired in the same sequence as the MCCB's above.

2.7 EARTHING AND LIGHTNING PROTECTION

The entire installation shall be properly and effectively earthed and bonded as prescribed in the Wiring Code and as specified below.

2.7.1 Earthing of Electrical Kiosks

A 2.4 m x 16 mm Cu earth spike shall be installed at each EK and connected to the EK earth bar by a 25 mm² Cu earth conductor. The soil conditions at each site shall be tested and a Crow's foot earth shall be added to achieve an earth resistance reading of 1 Ohms. Additives shall be added to the soil to achieve the required reading.

The kiosk Crows' foot earth shall consist of 3 lengths 70 mm² stranded copper conductors of 7 m each, installed in such a way to form 120° angles between the conductors (Crow's foot). At the centre of the 120° angle all wires shall be Exo-welded together with a 70 mm² earth conductor to the main earth bar of the kiosk. All earth wires shall enter the kiosk via the normal cable opening of the kiosk.

2.7.2 Earthing of Lighting Masts and Poles

The primary requirement of lighting mast earthing is to ensure adequate lightning protection of the installation in accordance with SANS 62305.

Therefore, every effort shall be made to obtain an earth resistance value of lighting masts of 10 Ohms or less. Where ground conditions make this impossible without incurring unrealistic costs a maximum value of 30 Ohms will be accepted for the lighting mast earthing subject to the approval of the Engineer.

The earthing system shall be contained within the lighting foundations to prevent theft. The earthing of the masts shall as a minimum include four 1.5 m earth spikes (installed in the corners of the foundation excavation) plus a trench earth of at least three coils of 70 mm² copper earth conductor connecting the spikes.

One 70 mm² copper tails shall be provided for extending the mast earthing with a trench earth if required.

The entire mast earthing scheme shall be clamped to the reinforcing steel and holding down bolts of the foundation by means of U-bolts installed at least four places. The contractor shall co-ordinate the activities of civil and electrical/earthing contractors to ensure successful

installation of this earthing. Each earthing scheme shall be photographed by the contractor and inspected by the Engineer or his representative prior to pouring of concrete.

Immediately after installation and before energising the equipment the Contractor shall test the earth resistance of the earth system, using the respective earth bar or termination as the reference point. If the required value is not obtained the pigtails shall be used to install an additional trench earth with spikes. If additional earth spikes are installed it shall not be within 6m of any other spike. The contractor shall submit a report to the Engineer, in duplicate, confirming the first and second values measured.

If the procedure above does not achieve the required values, the Engineer is to be advised and will give further instructions for the improvement of the values obtained. Where more spikes are necessary to obtain the required value, these shall not be installed within 6 m of any other spike.

All lighting mast and poles shall be bonded together by means a bare copper earth potential equalisation conductor of 16 mm² minimum.

2.7.3 Earthing Material and Installation methods

2.7.3.1 Earth Spikes

Earth spikes shall comprise 16 mm sectional steel cored rods with a minimum of 0,25 mm pure copper coating molecularly bonded thereto. They shall comply with SANS 1063, and shall be of "Cadweld" or equivalent manufacture. The top of earth spikes and the interconnecting conductors shall be 1,0 m below finished ground level.

The connections to earth spikes shall be by means of at least two phosphor bronze mechanical clamps of an approved type for this duty, or a "Cadweld" joint. The clamps shall not be attached to the rod but shall be installed so that the bolt face is in contact with the rod. Brazing will not be accepted. The connection shall be wrapped with two layers of "Denzo" tape.

2.7.3.2 Earth Continuity Conductors

Earth conductors shall be tin-plated copper wire interwoven with steel complying with SANS 1411, Part 1 -1966. This product is generally known as anti-theft copper earthing conductor. The conductor sizes shall be such that they can carry the short circuit current likely to be imposed upon them but generally shall be half the area of the phase conductors with a maximum size of 70 mm².

Earth continuity conductors shall be connected to main earth bars.

A terminal lug shall be crimped onto the end of the main earth conductor for bolting to the main earth bar.

Earth connections shall be made so that in the event of any connections being removed the earth connection to the rest of the equipment will not be affected.

2.7.3.3 Bonding

All sections of panels to be bonded together.

The steel structure of the minisub shall be bonded to earth. The maximum resistance of any such point to the earthed end of the earthing lead shall not exceed 0.2 Ohm.

Where equipment is bolted together, as in the case of a MV or LV switchgear panel, there is to be a 32 mm x 4,0 mm copper earth strap extending the whole length of the equipment. All earth bars shall be run in once continuous length as far as possible, and shall not be bent or formed in any way that requires hammering or severe distortion. Any joints shall be lapped with at least two bolts with nuts and washers of suitable size. The lapped ends shall be pre-tinned. If multiple straps are used, they shall be bolted and fixed together at not more than 750 mm intervals. All connections shall be made using brass or stainless steel bolts, nuts and washers, together with a star lock washer, on minisubs.

2.7.3.4 Installation

The Cadweld method of jointing shall be used for all earth conductor T-offs and joints.

All earthing conductors shall be terminated with crimped lugs and fixed with cadmium plated mild steel or brass bolts. Where lugs are used for terminating stranded earth conductors, the lugs shall be crimped with an approved type of crimping tool. The lug stud size shall correspond to the fixing bolt and the lug shall be positioned that the full contact area of the lug is utilised.

Self-tapping screws are not an acceptable means of securing earth conductors.

The armouring on all cables coming into switchboards shall be bonded together and bonded onto the earth bar. The armouring of cables alone shall not be considered as an effective earth conductor.

The continuity of the earth conductors shall be tested and recorded. In no case shall the resistance from any point of the installation to the main mini-sub exceed 0.1 Ohms. In the event of this valued being exceeded this must be brought to the Engineer's attention.

2.7.4 Surge Arresters

The site location is an area of high lightning incidence. In addition to the earthing specified, additional protection of the luminaires and controllers shall be provided by means of surge arresters installed as follows:

- (a) Kiosks – refer paragraph 2.6.10
- (b) Masts and poles – see below

Surge arrestors shall be installed alongside the miniature circuit breaker at the base of every pole and mast.

Surge arresters shall conform to EN/IEC 61643-11 (Type 2/ Class 2) with the following minimum specifications:

Nominal discharge current	10kA
Voltage protection level	2 kV
Response time	<=25 nsec

2.7.5 Lighting Finials

Each 18m light mast shall be fitted with a M16 x 1.5 m lightning finial (air terminal) which is silver passivated zinc plated. The finial shall be bonded to the mast structure with a high conductivity bond.

2.8 MINISUB AND KIOSK SECURITY MEASURES

2.8.1 Security Enclosure

The security measures for the minisubs shall be designed and manufactured in accordance with this technical specification and drawing 33532.00-305 series.

The minisubs and kiosks shall be enclosed in a steel mesh cage security enclosure sized as follows:

- L 1.5 m x W 3m x H 2.3 for the kiosk

Where possible these sections may be back-to-back to form one structure. Each section shall have a separate gate W 1 m x H 2 m.

The roof shall be enclosed with the same material as the sides.

The enclosure shall be manufactured from vandal resistant anti-climb 358 welded security mesh fitted to a frame. The mesh and frame shall be of stainless steel and plastic coated to withstand coastal environments.

The uprights of the enclosure shall be cast into C25/30-20 MPa concrete foundation. The concrete base plinths of the mini-sub and kiosk shall be surrounded by concrete reinforced 150 mm thick flooring that shall extend 1 000 mm beyond the perimeter fencing, in order to prevent burrowing under the fencing and vegetation growth within the fencing.

All cage gates shall be equipped electronic locks, with bypass, which are connected and controlled by the SANRAL Electronic Control Management System (ECMS).

2.8.2 Electronic Security System

Each minisub and kiosk shall be fitted with an electronic security system with battery back-up of at least 48 hours.

The electronic security system shall comply with the following specifications:

The enclosure and cage shall be fitted with the following electronic security:

- (a) electronically activated locking mechanism per door,
- (b) door sensors,
- (c) vibration sensor on kiosk and cage.
- (d) an electronic back-up / override system

In addition, vibration sensors shall be installed on masts, poles and sleeves.

Tilt sensors shall be installed on masts and poles. The sensors on the masts and poles shall be combined tilt and vibration sensors.

Magnetic sensors shall be installed on manholes.

The electronic security system shall comply with the following specifications:

Tampering Detection Modules- End Devices

For the detection of tampering of electrical substations, mini-substations, outdoor transformers, LV kiosks, lighting structures, fences and gates using Radio Frequency technology.

Minimum Requirements:

- (a) Ingres Protection Rating- IP 66
- (b) Communications– Long Range Bi-directional RF (RX: 863-873MHz, TX: 864-873MHz)
- (c) Range – 2,0 km radius
- (d) End-to-End encryption- AES 128-bit
- (e) Rated Current - <1A
- (f) Operating Voltage-3-5V DC
- (g) Battery Type - LiFePo
- (h) Ambient Temperature Range- -10°C to +50°C
- (i) Relative Humidity - 40% to 90% RH
- (j) PCB Coating- Conformal Coating
- (k) PCB Surge Protection - Integrated

Magnetic Open/Close Sensors

(For Substations, Mini Substations, Outdoor Transformers, LV Kiosks, Enclosures, and Gates)
Minimum Requirements:

- (a) Sensor devices should be robust in construction for industrial use.
- (b) The sensor should have a reliable detection against tampering with high immunity against false alarms.

- (c) The sensors should have a multi-level, application specific sensitivity adjustment to ensure that the sensors can be easily fine-tuned to the environmental conditions in which it is installed.
- (d) All access doors of vandalized substations, mini-substations or enclosures shall be fitted with door sensors (magnetic or optical).
- (e) To be installed strategically for optimal functioning.

Vibration Sensors

(For LV Kiosks, Enclosures, Lighting Structures and Fences)

Minimum Requirements:

- (a) Vibrations are detected through a piezo element.
- (b) The sensitivity should be subject to three parameters i.e. vibration, time and frequency.
- (c) Sensor devices should be robust in construction for industrial use.
- (d) The sensor should have a reliable detection against tampering with high immunity against false alarms.
- (e) The sensors should have a multi-level, application specific sensitivity adjustment to ensure that the sensors can be easily fine-tuned to the environmental conditions in which it is installed.
- (f) To be installed strategically for optimal functioning.

Gateway Device

(For each project location with end devices)

Minimum Requirements:

- (a) Single Gateway to control up to 1000 devices in range of at least 2,0 km radius
- (b) Gateways are to be used in long range star network architectures
- (c) Ingress Protection Rating IP 66
- (d) Communications– Long Range Bi-directional RF (RX: 863-873MHz, TX: 864-873MHz)
- (e) Range – 2,0 km radius
- (f) End-to-End encryption- AES 128-bit
- (g) Ambient Temperature Range- -10°C to +50°C
- (h) Relative Humidity - 40% to 90% RH
- (i) PCB Coating- Conformal Coating
- (j) Internet Communication- Protocol IPv

Electronic Controller

(For the access control of all Substations, Mini Substations, Outdoor Transformers, LV Kiosks, and Enclosures fitted with electronically activated locksets)

- (a) The controller shall be a Bi-Directional Communication device
- (b) The main controller output should be the primary source for all required locking arrangement systems and sensor devices
- (c) The battery back-up power will be the secondary source for the controller when the primary source is not available
- (d) Controller and software shall be capable of sending and accepting instructions to perform remote switching from a control room or office by means of a smart device, desktop computer, lap top computer, or any other pc system available
- (e) The Controller and software shall be compatible with wireless technology (Internet of Things), Low Power, Long Range Radio Frequency (RF), Wi-Fi, and Bluetooth Communication Systems
- (f) The main controller should be the master controller and the override controller should only be utilised when the main controller fails, or no controller communication is present
- (g) Override controller should report via the same Master Control and Monitoring Software.
- (h) Electronics and software shall be capable only to open and close enclosures by means of approved methods such as remote keys, tag readers or via smart devices utilising password protected software

- (i) The override controller shall have its own unique serial number and displayed on the software program and can't be operated if the serial number is not allocated to a specific master controller
- (j) The controller must be adequately protected against lightning and power surges
- (k) Controllers should be RTC (Real-Time-Clock) compatible for date/time stamping of all events and alarms
- (l) The Main Controller shall be compatible with both solenoid and motor driven locking arrangement systems

Event/ Alarm Logging & Reporting:

- (a) The Controller with the software shall identify the authorized person opening and closing any enclosure and store the information on a database which will upload information to the client server via the gateway device
- (b) The controller and software shall store the record of the date and time when the enclosure was opened and closed on a data base.
- (c) A health / status check should be performed every 60 minutes automatically between the controller and software (Bi-directional Communication)
- (d) The controller shall be fitted with a visual and audible alarm and must make a sound when the enclosure is accessed in an authorised / unauthorised manner.
- (e) The preferred operation shall be from a Smart Device and Centralised Control Centre with Authentic Cloud Base Software
- (f) Any events/ alarms that occur in the field shall be automatically sent to the control and monitoring system
- (g) The event shall be identified and displayed together with the address of the enclosure (geographical area, street address, enclosure number, controller serial number)
- (h) The Controller and software shall constantly monitor the back-up battery voltage and condition and immediately report when the battery voltage drops below 11.6 V or is non-existing / removed
- (i) Communication Signal Strength should be monitored and a weak or no signal event should be recorded and reported immediately for the required attention
- (j) Mains power failure should report to the main server and only sends a SMS to the standby staff after 4 hours to accommodate load shedding conditions.
- (k) Mains power failure time period should be accurately as possible be recorded in regards when power was disconnected and when power was restored again
- (l) Three phase monitoring and any missing phase must be reported if required
- (m) Any abnormal operation of accessing the enclosure should be immediately reported by means of the controller and software to selected persons
- (n) Any abnormal vibration for example from a grinder, hammer or any other forces should be immediately reported by means of the controller and software to selected persons.
- (o) The controller and software shall report normal authorised access activities to a software database for record keeping.
- (p) The controller and software shall alert selected people when enclosure doors are open for longer than 4 hours at a time
- (q) The controller and software shall be capable to detect and store at least the last hundred (100) events of any enclosure before it is overwritten. An early alarm should warn specified pc stations if the event recording has reached 80% of its capacity for an operator to download and store the information on backup server/s
- (r) The system should be able to notify / alert selected people of any alarm events via sms and / or e-mails.

Battery Backup:

- (a) Battery backup power should be available for at least 48 hours and controllers should be fully functional for at least 20 operations during this 48-hour period
- (b) The backup power source shall be rated for at least 4 years operating life
- (c) The backup power shall be protected against incoming surges
- (d) The system should have an automatic change over facility between mains and battery operations without losing any operation of the controller and any of its sensors
- (e) The backup power source shall be protected against excessive discharges
- (f) On-board charger to be used to not overcharged batteries to prolong their useful lifespan
- (g) The charger must monitor the battery's voltage, temperature or time under charge to determine the optimum charge current and to terminate charging

- (h) Charger should fast-charge the battery up to about 85% of its maximum capacity in less than two hours, then switch to trickle charging, which charges the battery to its full capacity in less than 24 hours.

Power Requirements:

- (a) The power supply to the electronic controller shall be protected by a suitable circuit breaker against overload and short circuit conditions and to disconnect the supply to the controller when required
- (b) A clip-on neutral screw type terminal connection block shall be mounted next to the controller, a neutral conductor from the main neutral bus-bar shall be utilised to supply the neutral terminal connection block, the neutral supply shall be from the connection block and not directly from the bus-bar
- (c) A clip-on earth screw type terminal connection block shall be mounted next to the controller, an insulated earth conductor from the main earth bus-bar shall be utilised to supply the earth terminal connection block, the earth supply shall be from the connection block and not directly from the bus-bar
- (d) The circuit breaker, neutral and earth connection terminal blocks shall be mounted side to side to one another next to the controller on a Din Rail
- (e) The controller and control circuit equipment shall be clearly labelled / marked

Antenna:

- (a) As far as possible all antennas should be internal
- (b) Should be RoHS compliant
- (c) Antennas should be high gain omni-directional and should match the correct communication controller module and operating frequencies for the application
- (d) Antennas should be omni-directional i.e. no faraday cage must be formed
- (e) Where communication is inadequate with an internal fitted antenna, an external antenna should be fitted
- (f) External / Outdoor Antennas Should Conform to The Following:
 - A moulded (eg. resin type) robust, heavy duty vandal proof type
 - Weather resistant, IP67 rated.
 - Can only be removed with the means of tools
 - The housing should be a direct mount antenna package with excellent isolation (10dB+). The antenna should have its own ground-plane and must radiate on any mounting environment like metal or plastic without affecting performance
 - Should be fitted with a suitable waterproof seal not to allow water inside enclosure.

Data Usage:

- (a) Data usage should be kept to the minimal to reduce costs but not to compromise required performance
- (b) The controller required is for access control and asset management purposes, data usage is basically for an hourly health status check and when alarm or other events are triggered
- (c) Data usage of the RF Communication system is the Data between the Gateways and Server/because of the RF communication between end-device and Gateway it is important to determine the total Data usage between Gateways and Servers and relate to an average usage per controller.

Override Controller:

- (a) The override controller shall be powered from an external 12V DC supply as connection points are fitted on the outside of the enclosure for this purpose, controller should be protected against any other voltage input not rated for correct operation
- (b) The override controller should be connected that it operates all doors at the same time where electronically activated locking arrangements are fitted in metering and distribution enclosures, in the case of mini-sub, two override controllers should be installed, one on the LV side and one on the MV side to ensure different level of access are maintained and connected to the electronically activated locking arrangement doors

- (c) The override controller shall be protected against incoming surges any harmful overcurrent, short-circuit and earth fault conditions
- (d) The override controller shall be protected against incoming voltages greater than 12V DC and up to 415V AC
- (e) The override controller shall have its own unique serial number and displayed on the software program and can't be operated if this serial number is not allocated to a specific authorised user
- (f) The override controller should have a 12V DC (10A) output and the output wires should be directly connected to the electronically activated door locking arrangement
- (g) The override controller should be Bluetooth / Wi-Fi operated
- (h) The override controller must be operated by a Bluetooth Smart Device and only receive commands via the Master Access Control and Monitoring Software to ensure only authorised users are allowed to have access to the locking arrangement devices
- (i) The operation is via the Master Software and must still record all access events including the user details
- (j) Should be compatible with the latest Android operating system.

2.9 LIGHTING MASTS AND POLES

NOTE: All masts and poles shall be fitted with required electrical cabling and components as part of the tendered rate.

2.9.1 Lighting Masts, Cable Terminations and Labelling

This section covers the structural design, manufacture, transport to site and erection of street lighting mid-hinge masts (18 m) and poles (various lengths) for lighting.

The dimensions, functional, mechanical and electrical requirements of the masts and poles are specified in the paragraphs below.

The materials and manufacturing processes shall comply with the specifications in of COTO Chapter 13.

All masts and poles shall be fitted with the required electrical cabling and components prior to installation on site. Termination of electrical supply at poles shall be according to phase rotation Red, White, Blue and shall be done on suitable termination blocks. Termination of cables in all poles shall only be of the relevant phase and neutral. The other conductors shall be through connected and the contractor shall avoid cutting them as far as possible. Neutral shall be earthed at the pole and at the mini-substation.

A miniature circuit breaker shall be installed per mast or pole as follows:

- (a)** 18 m anti-vandal masts or 13,5 m pole: 10A single phase plus neutral

Each mast or pole shall be fitted with a surge arrester as specified in paragraph 2.8.5

Termination in poles may be up to 35 mm² and bridge terminals shall be supplied that can accommodate cable size up to 50 mm².

All masts and poles shall be numbered with labels with black letters on yellow background and a minimum letter size of 75 mm. The labels shall be installed facing the road in the direction of travel on poles and facing the road in both directions (i.e. 2 labels) on mid-hinge and high masts. The labels shall be oriented at 45 degrees towards approaching traffic at a height of 1.5 m from the base plate.

2.9.2 Mast and Pole Positions and Foundations

Provisional positions of all mast and pole positions are indicated on the setting out drawings issued with this tender.

The 18m anti-vandal mast foundations bases and bolts are included in the scope of the civil works and are measured under items Pricing Schedule – Schedule G items G 3.2, 13.1 and 13.11.

The bases and bolts for the 9.4m baseplate poles shall be integrated into the bridge parapets. These modifications to the bridge parapets are included in the scope of the civil works and are measured under items G 13.4.

Excavation and backfill for buried poles are measured under items in Chapter 2.4.

2.9.3 Galvanised Steel Poles 12m m-h

Galvanized steel poles shall be installed in the positions shown on the drawings and detailed in the schedule of co-ordinates.

Direct buried poles shall be located at least 3.7 m (12m m-h) or 4.5 m (18 m m-h) behind the yellow shoulder line. (Where these offsets cannot be achieved, guardrails shall be installed).

Parapet mounted poles shall be bolted onto the bases forming part of the modifications to the bridge parapets.

Poles shall be fitted with galvanised steel spigots or outreaches as tendered and approved by the Engineer.

Poles shall be fitted with luminaires as supplied by the Luminaire and LMS Contractor.

Fibre glass poles shall not be accepted.

The poles shall be designed and manufactured in accordance with this technical specification and Drawing No. TD-E-P-2000-1-V1 Anti-Vandal Pole 6-12 m.

In particular the anti-cutting and other vandal-proofing measures shall be included in the design and construction of the poles.

Access doors to poles shall be provided at 3 m above ground level and shall be fitted with vandal proof bolts.

The steel street lighting poles shall be designed to support two luminaires of unit mass of approximately 15 kg each.

The steel street lighting poles shall be manufactured of grade 300WA steel or equivalent, in accordance with SANS 657 with a minimum yield stress of 300 MPa and a minimum tensile strength of 450 MPA.

The steel street lighting poles shall be capable of withstanding a fluctuating wind load in accordance with the requirements of SANS 10225. The maximum horizontal deflection at the spigot end, when subjected to two thirds of the design loading, shall not exceed 0,025 of the developed length above ground. The maximum vertical deflection at the spigot end, when subjected to the mass of the luminaries shall not exceed 1,5 % of the total length of the pole. Tenders must be accompanied by full technical details including comprehensive strength calculations certified by a qualified professional structural engineer.

2.9.4 18m Anti-vandal Galvanised Steel Masts

18m anti-vandal masts shall be installed as shown on the drawings and detailed in the schedule of co-ordinates.

Masts shall meet the following specifications:

The mast shall be constructed to form a continuously tapered, totally enclosed, octagonal shaft.

The mast shall consist of a fixed lower part and a moving part hinged to the fixed part at approximately half the height of the mast. The moving part of the mast shall have the luminaire cross-arm mounted on it and shall be adequately counterbalanced. The contractor shall obtain the total weight of the luminaires and arrange with the mid-hinge mast manufacturer to install the correct counter-weight during manufacture of the mast.

The hinge shall be made from AISI grade 316 stainless steel.

The following design calculations shall be submitted with tenders.

- The mast in wind conditions
- The mast during lowering

Failure to submit this documentation may result in a tender being declared non-responsive.

The mast shall be hot dip galvanized and shall be manufactured from Grade 300WA steel or equivalent having a minimum tensile strength of 430 N/mm square with a **minimum wall thickness of 4,0 mm at any point in the mast structure**. The mast manufacturer shall be ISO 9001 certified. Tenderers shall submit proof of manufacturer's certification with their tenders. Failure to submit a copy of this certificate and design drawings of mast (when lowered) and hinge shall render the tender non-responsive. All the requested information shall be submitted. Partial submission may also render the tender non-responsive.

No welding on site shall be permitted.

The steel mid-hinge masts shall be capable of withstanding a fluctuating wind load in accordance with the requirements of SANS 10225. The maximum horizontal deflection at the spigot end, when subjected to two thirds of the design loading, shall not exceed 0,025 of the developed length above ground. The maximum vertical deflection at the spigot end, when subjected to the mass of the luminaries shall not exceed 2 % of the total length of the mast. Tenders must be accompanied by full technical details including comprehensive strength calculations certified by a qualified professional structural engineer.

The steel street lighting poles shall be designed to support four luminaires of unit mass of approximately 15 kg each.

The mast, when fully equipped with the luminaries, shall be designed to withstand a wind velocity appropriate to the site conditions. During raising and lowering and while in the horizontal position, the mast shall withstand the wind forces from any direction as well as its own weight and any inertial effects due to sudden stoppage.

The locking mechanism to secure the mast in the vertical position shall be vibration proof and vandal proof.

An access opening shall be provided in the base of the mast for access to an electrical distribution board. The opening shall only be accessible after the mast lid section has been hinged open. A safety chain or equivalent shall be provided which will ensure safe working conditions while work is conducted on the distribution board.

Access doors to masts shall be fitted with vandal proof bolts. The mast lid section shall be fitted with vandal proof locknuts, as approved by SANRAL.

The mast shall be lowered and raised with a lightweight, manually operated but robust portable winch which can be stored in the base compartment.

A spring-loaded gravity ratchet or equivalent shall ensure that when the operating handle is released during the raising and lowering operation, the moving part stops in whatever position it is in. The ratchet shall be fitted with a lever which must be depressed with a constant pressure during the whole operation of lowering the mast.

An equivalent mechanism may be used to lower the mast, as approved by SANRAL.

The necessary precautionary measures shall be taken to prevent damage to the trailing cable while lowering or raising the mast.

Masts shall be fitted with luminaires as supplied by the Luminaire and LMS Contractor. The luminaries shall be permanently connected to the supply cable, to facilitate testing when the mast is in the lowered position. No additional cable or connections are allowed.

Grouting for all masts shall be done after installation with non-shrink cementitious grout with a minimum compressive strength of 50 MPa at 28 days.

An electrical York box (IP 65) shall be included in the rate. It shall contain a circuit breaker mounting rail and a 10A double-pole circuit breaker (curve 3, 5kA, 230V). Waterproof glands shall be included to terminate a 16 mm² or 25 mm² 4-core cable in the York box.

The wiring to the luminaires shall be included in the rate as well as the glands needed to terminate these wires in the York box and luminaire. The York box shall be securely affixed to the pole and shall be fully accessible.

2.10 LUMINAIRES

2.10.1 Luminaire and LMS Contractor and Process for issue of Luminaires

The Electrical Subcontractor shall be responsible for collection of luminaires, installation, aiming, switching-on and testing of luminaires.

Once the luminaires are installed and switched on the Electrical Subcontractor shall test the luminaires.

2.10.2 Lighting Design Parameters for Luminaires

For the selection and procurement of the luminaires the following design parameters have been applied:

R101: Section 8 through Bela Bela

Freeway Category A1 with median and greater than 600 vehicles per hour per lane, based on SANS 10098:2007 Table 1:

Ln	Uo	UI	TI
1.5 cd/m ²	0.4	0.7	20 max

The lighting design solution for the R101 section 8 is based on mounting 18 m anti-vandal masts on concrete footings integrated into the median barrier (giving an effective mounting height of 18 m) at 70 m spacing.

R101: Section 8 through Modimolle:

Category A1 with median and less than or equal to 600 vehicles per hour per lane, based on SANS 10098:2007 Table 1:

Ln	Uo	UI	TI
1.5 cd/m ²	0.4	0.7	20 max

The lighting design solution for the R101 section 8 carriageway is based on mounting 13,5 m anti-vandal lighting poles buried in the ground integrated into the verge (giving an effective mounting height of 12 m) at 50 m spacing.

For this contract where the alignment is split into two carriageways lighting design solution is based on an edge opposite staggered arrangement using 18 m anti-vandal masts on concrete footings.

Where no median barrier is to be constructed, free-standing footings are to be used. These will be located in the grassed median or along the edges of the carriageway. Guardrails shall be installed where required to protect these masts.

Where the mounting height is reduced for overhead electrical lines or for the bridge parapets on the viaducts, the lighting design solution is based on an edge opposite arrangement per carriageway using 12m m-h poles (13,5 m direct buried poles).

2.11 LIGHTING MANAGEMENT SYSTEM (LMS)

2.11.1 Supply of LMS by Luminaire and LMS Contractor

The Luminaire and LMS Contractor, appointed via a separate tender process, shall supply, install, commission, test and maintain the lighting management system.

The Electrical Subcontractor shall assist the Luminaire and LMS Contractor with commissioning and testing of the LMS.

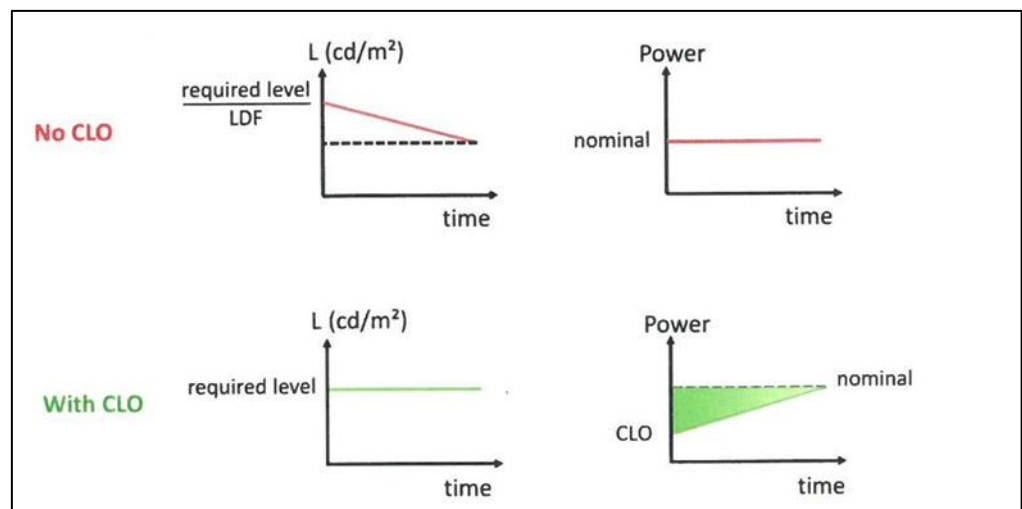
The Electrical Subcontractor shall be trained by the Luminaire and LMS Contractor in the operation and use of the LMS to support luminaire testing, maintenance and asset management activities.

The information in the following paragraphs is provided in order that the Electrical Subcontractor can understand the functionality and role of the LMS.

2.11.2 Objectives of LMS

The Lighting Management System (LMS) shall be implemented for the entire lighting scheme with the following objectives:

- (a) Reduction of lighting levels (i.e. reduction of lighting class) when less onerous conditions allow. Typically, the most common parameter used is traffic volume. The maximum vphpl after dark in KZN typically occurs during the pm peak (in winter). Late at night and early morning sees a rapid drop in traffic volumes and therefore the lighting level can be reduced by one class during off peak periods, typically between 10 pm and 3 am
- (b) Constant output control (CLO) where the driver current of the luminaire is initially reduced and then increased gradually over the lifetime of the luminaire to compensate for lumen degradation. This ensures constant lumen output over the lifetime of the luminaire. This concept is illustrated in the graphs below



- (c) Maintenance and Asset Management where the LMS shall provide the facility to effectively monitor lighting assets and manage the maintenance of these assets as the LMS constantly monitors the type, location and status of each luminaire.

2.11.3 LMS Architecture

The Lighting Management System shall be based on the following System Architecture:

- (a) Luminaire controllers which interface to the dimming controller of the luminaire
- (b) Segment controllers which are the interface between the level 1 and 2 communications described in c)
- (c) Communications networks:
 - Level 1: Central System - Segment Controllers e.g. Ethernet over fibre, wireless, cellular 3G or IoT

- Level 2: Segment Controllers – Luminaire Controllers e.g. wireless (mesh or ZigBee) or IoT
- (d) Central Control System which includes computer hardware and software.

In some systems the luminaire controllers may act as segment controllers, which does away with the need for separate segment controllers.

2.12 MAINTENANCE

The scope of work includes maintenance of the entire installation for a period of 12 months from the date of issue of the Taking-Over Certificate i.e. during the 12-month defects liability period.

The extent of the installation included in the maintenance is the kiosks, masts, poles, electrical cables and equipment, luminaires and complete lighting management system.

The scope of maintenance and repair shall include but not be limited to:

- (a) Responsive maintenance, performed to correct a system or component breakdown/fault
- (b) Preventive maintenance or routine maintenance, including setting up and implementation of procedures to service and inspect all components of the system systematically and according to a fixed schedule
- (c) Set up of complete maintenance plan. After initial setup the maintenance plan shall be continuously updated to reflect the most recent maintenance procedures and status
- (d) The maintenance procedures shall be based on manufacturers' guidelines and installers' maintenance experience.

Maintenance shall not interfere with traffic. Notifications and traffic accommodation plans shall be submitted to SANRAL prior to the commencement of any maintenance work.

The contractor shall make extensive use of the Lighting Management System to assist with maintenance e.g.

- (a) Respond to alarms/fault notifications
- (b) Identify replacement luminaires
- (c) Testing of installation and replaced luminaires

2.12.1 Spares Stock

The Contractor shall hold sufficient spares stock to cover all equipment replacement necessitated by responsive maintenance, preventative maintenance, accidents and vandalism/theft.

It shall be the responsibility of the Contractor to store the spares and insure the same. SANRAL shall have the right to audit the spares stock.

The Contractor shall procure and pay for the initial spares stock as part of the tendered maintenance rates. During the 12 month defects liability period replenishment of the spares stock shall be for the cost of the Contractor as part of the tendered maintenance rates. Where the Contractor can provide clear evidence of accident, theft or vandalism (e.g. CCTV footage) replenishment of the spares stock will be paid for under the contract at tendered rates plus escalation.

After the 12 month defects liability period has lapsed, replenishment of the spares stock shall be paid for under the contract at tendered rates plus escalation, with the exception of luminaires. Luminaires shall be replaced free of charge given two year guarantee requirement specified in paragraph 2.11.7.

At the end of the maintenance period the Contractor shall hand over the entire spares stock to SANRAL in good working order, at a price to be agreed, together with the asset register/database set up on the LMS.

SECTION F3: QUALITY ASSURANCE SPECIFICATION

3.1 GENERAL

This Quality Assurance specification defines the minimum requirements which must be met by the Contractor in respect of quality processes, procedures and records. This specification shall be read in conjunction with the Project Specification, which defines the extent of work required.

3.2 QUALITY ASSURANCE SYSTEM

The contractor shall prepare and submit a quality assurance system to SANRAL for approval. The quality assurance system shall include procedures for:

- (a) design and preparation of workshop drawings
- (b) installation
- (c) commissioning
- (d) acceptance testing
- (e) lighting level testing
- (f) documentation control

3.3 DRAWINGS AND DOCUMENTATION

3.3.1 Engineers Drawings

The Engineer's Drawings included with the tender documents are for tender purposes only. Construction drawings shall be issued prior to construction. The Engineer's drawings covering the various sections of the installation are listed in the SCHEDULE OF DRAWINGS.

All details, dimensions and instructions shown on the Engineer's drawings shall form part of this Specification. The drawings generally show the scope and extent of the proposed work and shall not be held as showing every minute detail of the work to be executed.

The position of power supply points, mini-substations, poles, masts, luminaires, cable and sleeve routes may be influenced by site conditions (landscape, etc.) and shall be established on site, prior to these items being installed.

If there is any discrepancy in or contradiction between drawings and specifications, it shall be referred to the Engineer in writing for a ruling.

Unless otherwise specified, three sets of paper prints of the Engineer's drawings will be issued to the Electrical Subcontractor for installation purposes.

Where work is incorrect due to failure by the Contractor to consult the working drawings, the cost of corrective or remedial work shall be for his own account.

3.3.2 Drawings to be submitted with the Tender

The following drawings and information shall be submitted with the tender:

- Details of masts and foundations of masts including dimension drawings and design calculations
- Drawings of all luminaires
- Drawing of tendered electrical kiosk
- Dimensioned drawing of security fencing enclosure
- Overview drawing of Lighting Management System
- Drawings indicating any special features.

Drawings and information required with the tender is to illustrate specific features such as layout or size of equipment offered.

These drawings are not regarded as workshop drawings. Workshop drawings shall be specifically and separately submitted as specified below.

3.3.3 Workshop Drawings

Within 28 days after the electrical sub-contract has been awarded the electrical sub-contractor shall submit two (2) copies of the following drawings to the Engineer for approval:

- (a) Poles: Design calculations and manufacturing drawings
- (b) Lighting masts: Design calculations and manufacturing drawings
- (c) Detailed dimension drawings including mounting detail of Luminaires
- (d) Kiosks.

In addition, samples of all luminaires and LMS components shall be submitted for approval.

The Engineer's approval of shop drawings or samples shall not relieve the Contractor of responsibility for any deviation from the requirements of this Contract unless the Contractor has informed the Engineer in writing of such deviations at the time of submission of shop drawings or samples and the Engineer has given written approval for the specific deviation, nor shall the Engineer's approval relieve the Contractor of responsibility for errors or omissions in the shop drawings or samples.

All equipment shall be fully dimensioned showing all fixing details, cable entry positions and other details and dimensions that may be required for construction of foundations.

Electrical and electronic drawings shall consist of detail circuit and wiring diagrams, overall schematic diagrams, and equipment layout and equipment details. The drawings shall also contain the voltage, power, current, resistance and other component values.

All mechanical drawings shall show equipment layouts and details and all static and dynamic loads where this is relevant to the design of foundations and base-plates.

3.3.4 As-built Drawings

On receipt of the Engineers Construction Drawings the Contractor shall retain one set at the site office for the purpose of mark up for as-built drawings. This set of drawings shall be marked up with all on-site details and changes as construction progresses.

If the Contractor cannot provide as built drawings for cable routes, then the Engineer will arrange re excavation to determine the positions of cables, joints, etc. All costs for the re-excavations to determine and record the positions of the cables will for the Contractor's cost.

As built drawings shall be submitted of all workshop drawings submitted by the Contractor during the contract period unless the Engineer has granted written exemption.

Submission and approval of submitted as-built drawings is a prerequisite to the issue of the Taking-Over Certificate.

3.3.5 Drawing Requirements and Standards

All drawings shall be prepared using AutoCAD and comply with the following standards:

- SANS Code of Practice 0111
- BS 308

All drawing TEXT shall be in English.

Drawing symbols used shall be clearly defined and consistently used. Symbols shall be standardised and generally used such as BS, DIN or IEC symbols. The Contractor's own concoction of symbols, where standardised symbols exist, will not be accepted.

3.4 INSPECTIONS, TESTS AND COMMISSIONING

3.4.1 General

SANRAL may call for the inspection or testing of all or any goods forming the subject of the Contract. SANRAL may be present or represented at any of the tests carried out at any stage during the manufacture or installation.

The Contractor shall be responsible for arranging all the tests as specified, at the appropriate times.

The Engineer reserves the right to attend or not to attend any of the inspections, tests or commissioning. Written reports and test results shall be submitted to the Engineer, whether the Engineer attends these or not.

The Contractor shall replace any portion of the installation, which does not meet with the requirements of the Wiring Code, relevant SANS standards or this Specification, or the local by laws as may be found by test or inspection. Such replacement shall be done at his own cost.

3.4.2 Tests and Inspections

The entire installation shall be tested after completion in accordance with the Wiring Code and any applicable by laws of local authorities.

Tests as stipulated in the "Occupational Health and Safety Act no. 85 of 1993, as amended, and in the "Code of Practice for the Wiring of Premises" SANS 10142 (as amended), shall be done. These test report forms must be filled in fully and correctly in ink, signed by the installation electrician and handed to the Engineer or its representative.

Tests shall be conducted on site after the whole installation is complete, unless written the Engineer to the contrary grants permission. The tests must include a full-load test for an adequate period to ensure the satisfactory working of the installation. If negative test results are obtained, faults must be rectified and tests again done.

All tests shall be carried out in conjunction with and to the satisfaction of the Supply Authority and in the presence of the Engineer or his representative. The contractor shall make all arrangements for testing and inspection, the costs thereof being included in the tendered rates.

The Contractor shall assist the Inspectors during any tests carried out by them and shall supply tools, instruments and consumables for testing purposes.

The Engineer/SANRAL reserves the right to be present at any tests and the Contractor shall inform SANRAL of all tests to enable them to be present if he so desires.

SANRAL may perform similar tests at any time and the Contractor shall render all assistance and shall provide all tools and instruments, which may be required for such tests.

The work specified in this document shall not be considered to have been completed until the installation inspectors of the responsible authorities have issued a clearance certificate for the electrical installation.

3.4.3 Acceptance Tests

After completion, either in a part or as a whole the complete installations shall be subject to acceptance tests by the Engineer.

The acceptance testing shall include the conducting of a Systems Acceptance Test (SAT) of the complete lighting installation in conjunction with the Lighting Management System.

The SAT is the final test to be completed and can only be initiated once all of the system elements have been installed and configured and all other tests have been successfully completed. The SAT looks at the entire system, and tests are completed to ensure that the overall functional requirements are met and that the system act as one integrated whole.

System reliability is a key requirement and random system behaviour shall prompt investigation by the Contractor with a written report as to the reason and proposed remedy to the random action(s).

The Contractor shall develop a System Acceptance Testing Plan (SATP), which shall be submitted to the Engineer for review and acceptance at least twenty one (21) days prior to commencement of System Acceptance Testing. The SATP shall include any tests necessary to document that the system is performing in compliance with the specified requirements. The test plan shall include a traceability matrix to show that all requirements of this specification will be tested. Full functionality, compliance and integration of all systems and components shall be demonstrated as a minimum.

The SATP shall include all equipment and services placed into service to demonstrate the performance of the system as a whole. Where necessary, full system functionality shall be tested based on real time operations and dimming schedules, for instance to demonstrate that the LMS has been configured correctly.

System Acceptance Testing shall be conducted over a minimum one month period, but may be staggered. During the system acceptance testing period, the Contractor shall measure and report system and subsystem performance, defects and failures, and report the same on a weekly basis.

The entire lighting system as specified in this contract, including all hardware, software, systems, sub-systems and interfaces shall be subject to SAT.

3.4.4 Test and Commissioning Instruments, Labour and Consumables

All labour, power, fuel, dummy loads and all instruments and appliances that may be required for the tests and commissioning shall be provided by the Contractor.

Test instruments used to demonstrate capacities and characteristics specified or offered shall be tested for accuracy by an approved laboratory or by the manufacturer and certificates showing degree of accuracy shall be furnished to the Engineer.

If gauges, thermometers, etc. which are to be left permanently installed are used for tests, they shall not be installed until just prior to the tests to avoid possible changes in calibration.

3.4.5 Test and Commissioning Certificates and Records

The Engineer reserves the right to attend or not to attend any of the inspections, tests or commissioning. Written reports and test results shall be submitted to the Engineer, whether the Engineer attends these or not.

- All certificates shall be in English
- All test and commissioning forms shall be completed in rough or final form during these operations
- All test certificates are to be countersigned by the Engineer as "witnessed" or "accepted" or "seen"
- Four copies of test and commissioning certificates shall be handed over to the Engineer
- Handover of the certificates and records is a prerequisite for handover of the installation.

With Final Acceptance the Electrical Subcontractor shall accept in writing the responsibility for the total installation as installed by him certifying the correctness of the installation in accordance with and on the Certificates of Compliance of Electrical Works. The contractor shall also be responsible to have the sections required to be completed by the Engineer and the Owner (SANRAL) completed by them as required.

3.5 CERTIFICATE OF COMPLIANCE BY AN ACCREDITED PERSON

On completion of the electrical installation the contractor shall complete all the Certificates of Compliance for the electrical Installation in the form of Annexure 1 as described in the Occupational Health and Safety Act no. 85 of 1993, as amended, and obtainable from the

Electrical Contracting Board of South Africa. This form must be handed to the Engineer or its representative.

3.6 LABELS AND NOTICES

The contractor shall arrange for the labelling of all equipment, instruments, meters, relays, cables, poles etc., as indicated below.

Where identical items of equipment can be removed from their housings, e.g. HV circuit breaker carriages, plug-in relays etc., both the fixed and withdrawal portion are to be labelled identically.

Prior to any equipment being labelled, the contractor shall request the Engineer to provide a complete labelling schedule for all items of equipment. Under no circumstances is equipment to be labelled in accordance with the tender drawings since any description thereon is for identification purposed during construction only and is unlikely to apply to the completed Works.

The following list indicates the general labelling requirements but does not limit the extent of labelling required, which shall encompass the full extent of the equipment supplied,

75 mm high lettering:

- Street lighting masts and poles

50 mm high lettering:

- Substation and mini sub designation
- Outdoor switch gear designation
- Transformer designation
- Distribution kiosk and fused feeder panel designation

20 mm high lettering:

- Main or sub-main board designation.
- Control panel designation
- Indoor switch gear designation

5,0 mm high lettering:

- Mini sub feeder breakers and isolators
- Distribution kiosk feeder breakers and isolators
- General distribution switchgear

This size shall be used to designate the conductor size and number of cores of each cable installed under this Contract. In addition, all feeder cables shall be labelled at both ends indicating from where/to cables are feeding.

All kiosks shall be provided with a label in both official languages reading "In case of leakage or accidental contact, put off main switch immediately".

All kiosks shall be provided with notices as required by the Machinery and Occupational Safety Act. All doors to such locations shall be fitted with the appropriate notices.

3.7 DEFECTS LIABILITY AND EQUIPMENT GUARANTEES

3.7.1 Defects Liability

The defects liability period is defined in FIDIC general Conditions of Contract Cl 11 and the duration of the defects notification period is stated in C1.2.2 Contract Data.

The defects notification period for this contract is 12 months.

Tenderers should take careful note of the contractor's obligations during the defects notification and liability period.

3.7.2 Equipment Guarantees

All equipment (unless otherwise specified elsewhere in this specification) shall be guaranteed against defects and failure for a period of at least 5 years from date of acceptance of the system i.e. issuing of the taking over certificate.

Failure of a luminaire includes failure of more than 5% the LEDs, loss of output more than 30%, and driver failure.

The contractor shall guarantee that the proposed systems and components will be supported for at least 5 years after installation and that spare parts will be available for at least 10 years.

SECTION F4: MEASUREMENT AND PAYMENT

C1.3 SUBCONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS

MEASUREMENT AND PAYMENT

Item	Unit
------	------

C1.3.1 The subcontractor's general obligations

Add the following payment subitem:

"C1.3.1.1 Fixed obligations (in terms of COTO Chapter 1 Cl 1.3). lump sum

The unit of measurement shall be a lump sum. This pay item represents full compensation for all the subcontractor's general obligations. This includes insurance of the electrical works and such insurance shall include insurance of the luminaires from time of collection from the luminaire supplier/contractor until the issue of the Taking-over-Certificate for the electrical works.

C2.1 GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES EXCAVATION AND BACKFILLING

MEASUREMENT AND PAYMENT

Item	Unit
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Add the following payment subitem:

C2.1.6 Trench excavation (in soft material):

C2.1.6.1 Trench excavation (in soft material):

- (a) Excavating soft material situated within the following depth ranges below the surface level:
 - (i) Trenches for electrical cable as shown in drawing up to 1,0 m deep cubic meter (m³)
 - (ii) Bases for Kiosks/Minisubs as shown in drawing up to 1,0 m deep cubic meter (m³)
 - (iii) Planting of poles in all material types
 - (1) For 13,5 m pole: 1,8 m depth cubic meter (m³)

C2.1.7 Extra over items C2.1.6, C2.1.8 and C2.1.16 for excavating in:

C2.1.7.1 Hard material irrespective of depth cubic meter (m³)

Backfilling

C2.1.11 Backfilling of trenches:

C2.1.11.2 Backfill compacted to 90% (100% for sand) of MDD or complying with the DCP requirements of Clause A2.1.8.2c (areas not subject to traffic loads) using material:

- (a) From the excavated trench material cubic meter (m³)

Add the following to pay item C2.1.11.2

- (f) Using imported selected material..... cubic meter (m³)

- (g) Extra over sub items 22.02(a) and (b) for soil cement backfilling (5% cement) cubic meter (m³)
- (h) Using concrete (class C16/20-20) 20 MPa backfilling cubic meter (m³)
- (i) Bedding using sieved material from excavations..... cubic meter (m³)
- (j) Minisubs/Kiosks cast in situ concrete (class C16/20-20) 20 MPa for minisubs/kiosks footings..... cubic meter (m³)
- (k) Backfilling of holes for planting of poles, using soil cement backfilling (5%) for 11.8 m pole..... cubic meter (m³)

The tendered rate for sub item C2.1.11.2 (f), (g), (h), (i), (j) & (k) shall also include full compensation for procuring, furnishing and placing of all material, including testing, loading, transporting and unloading of the selected material obtained from commercial sources or from an approved source."

MASTS AND POLES

COTO C13.9: STRUCTURAL STEELWORK FOR MINOR STRUCTURES

Item	Unit
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Add the following to pay items:

"C13.9.1.3 Structure: Streetlighting Poles and Masts: Design, Supply and Installation

- | | | |
|-------|--|--------------|
| (a) | 13,5 m lighting pole (12 m m-h) | number (No) |
| (b) | Single spigot for lighting pole | number (No) |
| (c) | 18 m anti-vandal lighting mast with double-twin spigot..... | number (No) |
| (d) | Attic stock | |
| (i) | Supply attic stock of 13,5m lighting pole | number (No) |
| (ii) | Supply attic stock of single spigot | number (No) |
| (iii) | Supply attic stock of 18m lighting mast with double spigot | number (No)" |

The unit of measurement shall be the number of steel poles/spigots, as specified and manufactured by the approved supplier, installed according to the approved design and specifications as stated in the standard and project specifications. The rate shall make provision for the design, drafting of drawings, shop details, supply of all the required materials, fabrication, all testing, process control, storage, loading, all transport required for storage and erection of the poles at the required locations, off-loading, erecting the pole to the required level of accuracy. It shall also include full compensation for all welding, nuts, bolts, washers, rivets, cutting, waste, and any temporary bracing necessary for transporting and erecting. It will also include all plant and equipment required for the successful erection of the pole.

The tendered rate shall also include full compensation for supplying and pouring the specified grout under and around the base plates of the steel masts, for procuring and supplying all the necessary labour, constructional plant, tools and materials, as well as waste, formwork for the grout, and finishing to obtain the required surface finish for the grout under and around the base plates. The tendered rate shall also include for all wiring in the mast and to the luminaires, including electrical York box, circuit breakers and glands to complete the operation of the mast shall be included in the rate.

The Contractor or his approved sub-contractor must ensure that the poles are erected in conditions that are favourable for the successful installation of the poles. Any additional cost due to erecting poles in conditions not favourable (i.e. Strong winds, wet conditions or bad visibility etc.) will not be compensated for additionally. The Engineer may stop any erection of poles should he feel that it is not safe at any time during the erection process. No additional payment will be made for this. It is the Contractor's responsibility to ensure that the installation of the poles is carried out in safe conditions.

C13.9.3 Corrosion protection

Item	Unit
------	------

Add the following to pay items:

"C13.9.3.2 Galvanising:

(c) Hot-dip galvanizing:

(i) 13,5 m lighting pole (12 m m-h) number (No)

(ii) Single spigot for lighting pole number (No)

(iii) Double spigot for lighting pole number (No)

(iv) 18 m mid-range lighting mast with double spigot number (No)

The unit of measurement shall be the number of steel poles/spigots/outreaches, galvanised to ISO 1461 including all transport."

NOTE: TRENCHING, BEDDING AND BACKFILL FOR ELECTRICAL CABLES MEASURED UNDER B2200 OF CIVIL WORKS

SEPARATE RATES SHALL BE PROVIDED FOR MATERIALS AND LABOUR

ELECTRICAL CABLES (Section F 2.4.5)

Item	Unit
1 3-Core XLPE MV 11kV Aluminium (Al) Underground Supply Cable..... meter (m) (a)-(b) Supply and installation of 11kV 3 Core Cross-linked Polyethylene (XLPE) stranded Al cables SWA/ECC laid in trench or drawn into ducts The unit of measure shall be the number of meters supplied, installed and tested (trenching, compacting and backfilling measured elsewhere). Measurement of cables laid in trenches shall be of the actual length of that part of a cable laid in the trench when the cable is finally installed. Allowances for snaking, joints, ends and wastage shall be incorporated in the unit rate.	
2 Copper 3-Core PVC PVC SWA PVC 600V/1000V Cable..... meter (m) (a)-(b) Supply and installation of PVC PVC SWA PVC 600V/1000V stranded Cu cables laid in trench or drawn into ducts The unit of measure shall be the number of meters supplied, installed and tested (trenching, compacting and backfilling measured elsewhere). Measurement of cables laid in trenches shall be of the actual length of that part of a cable laid in the trench when the cable is finally installed. Allowances for snaking, joints, ends and wastage shall be incorporated in the unit rate.	
3 Copper & Aluminium 4-Core PVC PVC SWA PVC 600V/1000V Cable..... meter (m) (a)-(e) Supply and installation of PVC PVC SWA/ECC FRPVC 600/1000V Cu & Al cables laid in trench or drawn into ducts The unit of measure shall be the number of meters supplied, installed and tested (trenching, compacting and backfilling measured elsewhere). Measurement of cables laid in trenches shall be of the actual length of that part of a cable laid in the trench when the cable is finally installed. Allowances for snaking, joints, ends and wastage shall be incorporated in the unit rate.	
4 Earth Cables meter (m) The unit of measure shall be the number of meters supplied, installed and tested (trenching, compacting and backfilling measured elsewhere). Measurement of cables laid in trenches shall be of the actual length of that part of a cable laid in the trench when the cable is finally installed. Allowances for snaking, joints, ends and wastage shall be incorporated in the unit rate.	

Item	Unit
5	Cable TerminationsNumber (No)

(a)-(b) Supply and installation of 11kV XLPE cable terminations at minisubs

The unit of measure shall be the number of 11kV terminations supplied and installed. The termination shall be rated for 11kV and be made from heat shrinkable material.

Item	Unit
6	Supply and Installation of PVC PVC SWA PVC 600V/1000V CableNumber (No)

(a)-(g) Terminations at minisubs/kiosks and lighting masts

The unit of measure shall be the number of 3- or 4-core terminations supplied and installed.

The termination shall be rated for 1000V and be made from heat shrinkable material.

Item	Unit
7	Cable Warning Tape and route markers

(a) Plastic Cable Warning Tape meter (m)

The unit of measure shall be the number of meters supplied and installed (Trenching measured elsewhere).

The warning tape shall be installed 300 mm above MV as well as LV cables.

(b) Cable route markersNumber (No)

The unit of measure shall be the cable markers supplied and installed.

Item	Unit
8	3-core 11kV XLPE Cable JointsNumber (No)

(a)-(b)

The unit of measure shall be the number of 11kV joints supplied and installed.

Item	Unit
	PVC PVC SWA PVC 600V/1000V Cable JointsNumber (No)

(c)-(k)

The unit of measure shall be the number of 3- or 4-core joints supplied and installed.

The joint shall be rated for 1000V.

Item	Unit
Bare Copper Earth Wire (BCEW) Cadweld joints.....	Number (No)
(l)-(s)	

The unit of measure shall be the number of Cadweld joints supplied and installed.

The termination shall include the Cadweld kit and material needed to complete the termination.

SUPPLY AUTHORITY APPLICATION FOR SUPPLY (Section F 2.5)

Item	Unit
9	APPLICATION FOR POWER AND CONNECTION FEES
(a)	Submission of application for electrical connection by supply authority Prime Cost (PC) sum
	The unit of measure shall be a Lump sum for the application for LV power supplies with the power Supply Authority of the area, as well as follow up and co-ordination with the supply authority until the connection has been made.
(b)	Provisional Sum for Connection Fees payable to supply authority Provisional (Prov) sum
	The unit of measure shall be a Lump sum for the payment of connection fees to supply authority.
(c)	Contractor's handling cost, profit and all other charges in respect of Subitem 9(b) Sum for Connection Fees payable to supply authorityPercentage (%)
	The unit of measure shall be a % mark-up on the payment of connection fees to Eskom in respect of handlings costs, profit and all other charges.

ELECTRICAL KIOSKS AND MINIATURE SUBSTATIONS (Section F 2.7)

Item	Unit
10	LV Electrical Distribution Kiosk. (Section F 2.7.5)..... Number (No)
(a) - (d)	
	The unit of measure shall be the number of distribution kiosks supplied, installed, tested and commissioned complete with all distribution board equipment.
	The rate shall include all associated costs involved in bringing the LV kiosk to full operational status.
	A concrete plinth suitable for the kiosk shall be included in the rate. (Security measures measured elsewhere)
Item	Unit
11	Mini-substation (11kV /410V/ 230V) Delta/Star (Section F 2.7.1 – 2.7.4)..... Number (No)
	The unit of measure shall be the number of mini-subs supplied, installed and commissioned.

The rate shall include all associated costs involved in bringing the mini-sub to full operational status.

A concrete plinth suitable for the mini-sub shall be included in the rate. (Security measures measured elsewhere)

Item	Unit
12	Miniature Circuit Breakers in Masts/Poles. (Section F 2.10.1) Number (No)

(a)-(b)

The unit of measure shall be the number of miniature circuit breakers supplied, installed and commissioned measures measured elsewhere)

Item	Unit
13	Earthing and Lighting Protection (Section F 2.8)

(a)	Earthing of Miniature Substation (Section F 2.8.1) Number (No)
-----	---

The unit of measure shall be the number of mini substation earthing systems supplied and installed to achieve at least an earth resistance smaller or equal to 1 Ohms. The rate shall include the earth system resistance tests done.

All the cable connections to the earth electrodes shall be CAD-welded.

(b)	Earthing of Electrical Distribution Kiosk (Section F 2.8.2) Number (No)
-----	--

The unit of measure shall be the number of electrical kiosk earthing systems supplied and installed to achieve at least an earth resistance smaller or equal to 1 Ohms. The rate shall include the earth system resistance tests done.

All the cable connections to the earth electrodes shall be Cad-welded.

(c)	Lightning protection of masts (Section F 2.8.3) Number (No)
-----	--

The unit of measure shall be the number of mast earthing systems supplied and installed to achieve at least an earth resistance smaller or equal to 10 ohms. The rate shall include the earth system resistance tests done.

All the cable connections to the earth electrodes shall be Cad-welded.

(d)	Lightning finials for masts and poles (Section F 2.8.6) Number (No)
-----	--

The unit of measure shall be the number of lightning finials supplied and installed.

(e)	Supply and installation of additional 2.4 m earth electrodes including Cadweld connections of earth conductors (Section F 2.8.4.1) Number (No)
-----	---

The unit of measure shall be the number of additional 2,4 m x 16 mm earth electrode terminations supplied and installed.

- (f) **Supply and installation of additional 1,6 m earth electrodes including Cadweld connections of earth conductors (Section F 2.8.4.1)** Number (No)

The unit of measure shall be the number of additional 1,6 m x 16 mm earth electrode terminations supplied and installed.

- (g) **70 mm² Bare Copper Earth Cable (Section F 2.8.4.2)** meter (m)

The unit of measure shall be the number of meters supplied, installed and tested (trenching, compacting and backfilling measured elsewhere).

Measurement of cables laid in trenches shall be of the actual length of that part of a cable laid in the trench when the cable is finally installed. Allowances for snaking, joints, ends and wastage shall be incorporated in the unit rate.

- (h) **Surge Arrestors in masts and poles (Section F 2.8.5)** Number (No)

The unit of measure shall be the number of surge arresters supplied and installed inside masts and poles

Item		Unit
-------------	--	-------------

14	Minisub and Kiosk Security Measures (Section F 2.9)	
-----------	--	--

- (a) **5,5 m x 3,0 m steel mesh enclosure (Section F 2.9.1)** Number (No)

The unit of measure shall be the number of 5.5 m x 3 m . steel mesh cage enclosures complete with steel gate, lock and razor wire. The rate shall include foundations as specified.

- (b) **3,0 m x 1,5 m steel mesh enclosure (Section F 2.9.1)** Number (No)

The unit of measure shall be the number of 3 m x 1.5 m. steel mesh fence enclosures complete with steel gate, lock and razor wire. The rate shall include foundations as specified.

- (c) **Electronic Security System Electronic Controller (Section F 2.9.2)** Number (No)

The unit of measure shall be the number of electronic security systems and electronic controllers (per minisub/kiosk site) including magnetic door switches, electronically activated locking mechanism per door, on kiosk and cage, electronic back-up / override system and event logging and reporting functionality The rate shall include testing and commissioning, and any SIM card plus SMS/data contract for 2 years.

- (d) **Vibration Sensors (Section F 2.9.2)** Number (No)

(i) – (iii)

The unit of measure shall be the number of vibration sensors installed in masts/poles, LV Distribution Kiosks and in underground sleeve (road crossings). The rate shall include testing and commissioning.

- (e) **Tilt Sensors (Section F 2.9.2)**..... Number (No)

The unit of measure shall be the number of tilt sensors installed in masts/poles. The rate shall include testing and commissioning.

(f) **Magnetic sensors (Section F 2.9.2)** Number (No)

The unit of measure shall be the number of magnetic sensors installed in manholes to detect opening of the manhole lid. The rate shall include testing and commissioning.

(g) **0,5 mm² 4 Pair Instrumentation Cable (Section F 2.9.2)** meter (m)

Measurement of cables laid in trenches shall be of the actual length of that part of a cable laid in the trench when the cable is finally installed. Allowances for snaking, joints, ends and wastage shall be incorporated in the unit rate.

(h) **0,5 mm² 4 Pair Instrumentation Cable terminations (Section F 2.9.2)** Number (No)

The unit of measure shall be the number of terminations supplied and installed. The termination shall include all the lugs and insulating material needed to complete the termination.

(i) **Sensor communication (RF or other) module (Section F 2.9.2)** Number (No)

The unit of measure shall be the number Sensor Communication (RF or other) modules of gateway terminations supplied and installed. The termination shall include all the lugs and insulating material needed to complete the termination.

(j) **Gateway Communication Device (Section F 2.9.2)** Number (No)

The unit of measure shall be the number of Gateway Communication Devices (installed in the LV kiosks and other strategic locations) to provide communication between the sensor communication modules and the electronic security system.

(k) **Battery Back-up System complete (Section F 2.9.2)** Number (No)

The unit of measure shall be the number battery back-up systems consisting of a battery charger, battery & inverter complete with all wiring required to successfully complete the installation inside the SANRAL LV Distribution Kiosk.

Item	Unit
-------------	-------------

15	Testing, Labelling and Documentation
-----------	---

(a) **Soil resistivity tests by specialist subcontractor (per test)** Number (No)

The unit of measure shall be the number of soil resistivity tests. Each test shall include a certificate and recommendation regarding the soil conditions.

(b) **MV Cable Tests as described (Section F 2.4.10)** Number (No)

The unit of measure shall be the number of MV cable tests. Each test shall include a certificate.

(c) **Testing and Commissioning of the complete Electrical Installation** Lump sum

The unit of measure shall be a Lump Sum for the testing and commissioning of the entire electrical installation. The rate shall include for all cable, equipment and system tests not measured elsewhere.

(d) Issuing of Certificate of Completion for the complete Electrical Installation Lump sum

The unit of measure shall be a Lump sum for the issuing of a CoC for the electrical installation.

(e) Labelling of masts/poles all electrical equipment (Section F 3.6) Lump sum

The unit of measure shall be a Lump sum for the labelling of all masts, poles, kiosks and electrical equipment. Payable on completion of all labelling to the satisfaction for the Engineer.

(f) Provision of as-built documentation Lump sum

The unit of measure shall be for the cost of providing four copies of complete 'as built' drawing on paper and electronically of all equipment, layouts, etc. A suitable CAD package shall be used for the drawings.

Exact positions of cables shall be clearly shown.

LUM		LUMINAIRES – INSTALLATION, TESTING AND COMMISSIONING (SECTION F 2.11)	
Item			Unit
1	Supply and installation of Streetlight Luminaires as specified in Part C3 Section F 2.11		
	(a)	Supply of LED luminaire, with bottom entry, individual photocell, 7-pin nema socket outlet complete with all accessories as per specifications minimum specifications: - 265 W/ 160 LED fitting with optical lense - 38 354 luminaire output flux (lm) - 4 000K colour rendering - IP 66 Rated	Number (No)
	(b)	Attic Stock: Supply attic stock of above	Number (No)
	The unit of measure shall be the number luminaires according to the manufacturer's requirements, irrespective of the number of luminaires per mast or pole (1, 2 or 4)		
	(c)	Luminaire installation on 13,5 m m-h poles (Section F 2.11)	Number (No)
	(d)	Luminaire installation on 18 m m-h mast (Section F 2.11)	Number (No)
	The unit of measure shall be the number of poles on which luminaires are installed according to the manufacturer's requirements, irrespective of the number of luminaires per mast or pole (1 or 2)		
Item			Unit
2	Testing, Commissioning and Switching on of Lighting Installation		
	(a)	Full testing, commissioning, setting of work, switching and handing over of the entire installation including all necessary test certificates	Lump sum
	The unit of measure shall be a Lump Sum for the full testing, commissioning, setting to work, switching on and handing over of the entire installation including all necessary test certificates.		
Item			Unit
3	Documentation as specified in Part C3 Section F 2.10.4 (e).....		
	The unit of measure shall be a Lump Sum for the provision of the specified documentation		
Item			Unit
4	Any other items as may be necessary to complete the installation		
	The unit of measure shall be a Lump Sum. Tenderers shall list and price any other items necessary to complete the installation and /or which have not been measured elsewhere.		

MAINT**MAINTENANCE OF LIGHTING INSTALLATION– (SECTIONS F 2.13)****NOTE: SEPARATE RATES SHALL BE PROVIDED FOR MATERIALS AND LABOUR**

Item	Unit
------	------

1	Maintenance (2.13) of lighting installation as specified in Part C3 Section F 2.13 for masts, poles, electrical cables, kiosks/equipment, luminaires and lighting management system
---	--

(a)	Maintenance during Defects Liability Period Provisional Sum (Prov Sum)
-----	---

The provisional sum allowed shall be expended at the discretion of the Engineer to cover the cost of maintenance work during the Defects Liability Period which may be required in respect of repairing damaged infrastructure.

Payment under this item shall be in accordance with the General Conditions of Contract applicable to Provisional Sums.

PART C4: PROJECT INFORMATION

PART C4: PROJECT INFORMATION

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Information Only

All data and descriptions contained in this section of the contract documents are given for information purposes only and cannot be interpreted as prescriptive or as an instruction despite the fact that the text may give the opposite perspective. If any conflict arises between the content of this section and other sections of the contract documents, the latter take precedence.

C4.1 DESCRIPTION OF THE WORKS

The description of the works shall inter alia contain the following particulars regarding the work to be constructed and maintained under the contract.

C4.1.1 Overview of the works

National Road R101 Section 8 is situated within two Local Municipalities (Bela Bela and Modimolle-Mookgophong), both of which fall under the Waterberg District Municipality in the Limpopo Province.

According to the pavement management system (PMS) information, the road was constructed in 1964 as National Road N1 joining Pretoria and Polokwane. The N1 was however realigned during 1995/1996 under a concession contract at which time this section was renumbered as R101.

The general objective of this project is to successfully and optimally complete improvement of the road section to achieve the following:

- Relieve traffic congestion to acceptable level of service by providing suitable cross sections.
- Improve road geometry (alignment) to provide better road safety;
- Provision of pedestrian facilities.
- Provide adequate pavement capacity for a 20-year design period.
- Widen/improve bridges and other drainage structures for hydraulic capacity and to accommodate the improved cross-section.

The project scope entails the following main components of work:

- Accommodation of traffic.
- Improving the cross-section in the urban sections a dual carriageway with two 3.7 m lanes with kerb and channel and 3.0 m sidewalks on both sides.
- Improving the cross-section in the rural section to include two 3.7 m wide lanes, 3.0 m surfaced shoulders and 0.5 m gravel shoulders;
- Construction of a new service road with 3.7 m lanes and 1.0 m gravel shoulders and 0.5 m gravel shoulder rounding.
- Construction of roundabouts in the Bela Bela urban section.
- Construction of pedestrian facilities.
- Construction of new pavement structure to accommodate future traffic loadings.
- Improvement of vertical and horizontal curves with three major road realignments at km 10.4, km 11.4 and km 15.2 respectively.
- Excavation and crushing of material for construction of road materials at three major hard rock cuttings at road realignments.
- Construction of a closed drainage system in the Bela Bela and Modimolle urban sections.
- Construction of new minor- and major culverts to suit the widened cross-section;
- Structural works are summarised below and described in more detail in *Section C4.1.3*:
 - Construction of two new bridge structures.
 - Construction of one cellular bridge.
 - Construction of three new major culverts.
 - Construction of retaining wall.
- Removal of existing streetlights and erection of new streetlights in Bela Bela and Modimolle urban sections.
- Replace existing fencing where required with stock-proof fencing.
- Remove all road signs and erect new road signs along the extent of the project.
- Erect new guardrails.

- Landscaping.
- Implementation of the access management plan.

C4.1.2 Roadworks

C4.1.2.1 General

Road R101-8 is a single carriageway road with three distinct cross sections. The existing cross-sections are as summarised in Table 4.1.

Table 4.1: Existing Cross-section along Road R101-8

Position	Cross-section description
Km 0.000 to km 0.100	4-lane undivided single carriageway
Km 0.100 to k 6.200	2-lane single carriageway with gravel shoulders
Km 6.200 to km 7.500	2-lane single carriageway with a climbing lane in the northbound direction
Km 7.500 to km 14.400	2-lane single carriageway with gravel shoulders
Km 14.400 to km 15.700	2-lane single carriageway with a climbing lane in the southbound direction
Km 15.700 to km 25.300	2-lane single carriageway with gravel shoulders
Km 25.300 to km 26.400	2-lane single carriageway with a passing lane in the southbound direction and turning lanes in the northbound
Km 26.400 to km 26.800	4-lane undivided single carriageway

The existing surfacing consist of asphalt surfacing along the section from km 0.0 to km 2.3 and similarly, for the section from km 25.1 to km 26.8. A 14 mm single seal is present along the section from km 2.3 to km 25.1.

Road R101-8 intersect with the following provincial and local roads summarised in Table 4.2.

Table 4.2: Intersection along Road R101-8

LOCATION (KM)	DESCRIPTION	
Km 0.000	Voortrekker Street (R516)	LHS
Km 0.100	Van der Merwe Street	LHS
Km 0.800	Mile Street	RHS
Km 3.200	Limpopo Road	RHS
Km 5.500	Klein Kariba	RHS/LHS
Km 8.360	Negester Retirement Village and Valley View	LHS/RHS
Km 10.000	Groot Nylsoog Access Road	LHS
Km 16.620	De Nyzyn Access Road	LHS
Km 24.380	Hans Campher Drive	LHS
Km 24.980	Steve Tswete Street	RHS
Km 25.240	Boshoff Street	LHS
Km 25.520	Elias Motsoaledi Steet	RHS
Km 25.780	Leyds Street/Odendaal Steet	LHS/RHS
Km 26.100	Kerk Street	LHS/RHS
Km 26.250	Gholf Street	RHS
Km 26.800	Nelson Mandela Drive (R33)	LHS/RHS

C4.1.2.2 Design Cross-section

C4.1.2.2.1 *Section from km 0.0 to km 6.0 and km 23.0 to km 26.05*

These sections will be improved to a 4-lane urban configuration with raised kerbed median and sidewalks as shown in Figure 4.1 and Figure 4.2. The guardrail and streetlights will be provided for pedestrian safety.

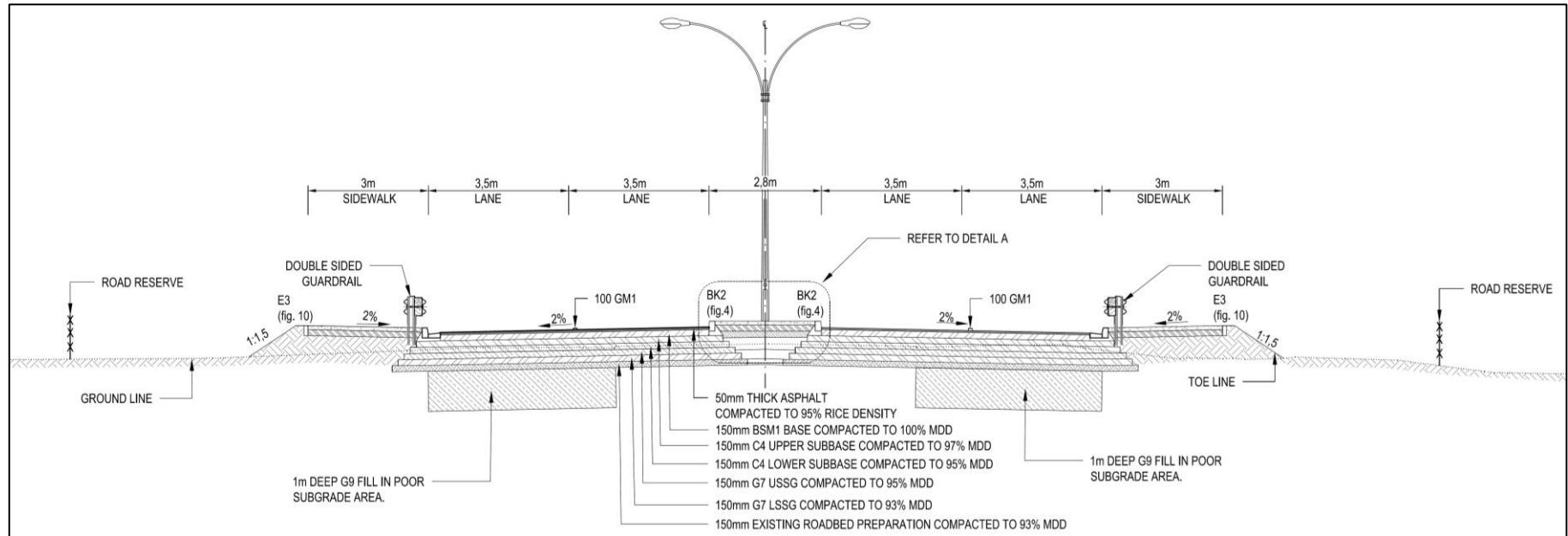


Figure 4.1: Typical Cross-section from km 0.0 to km 6.0

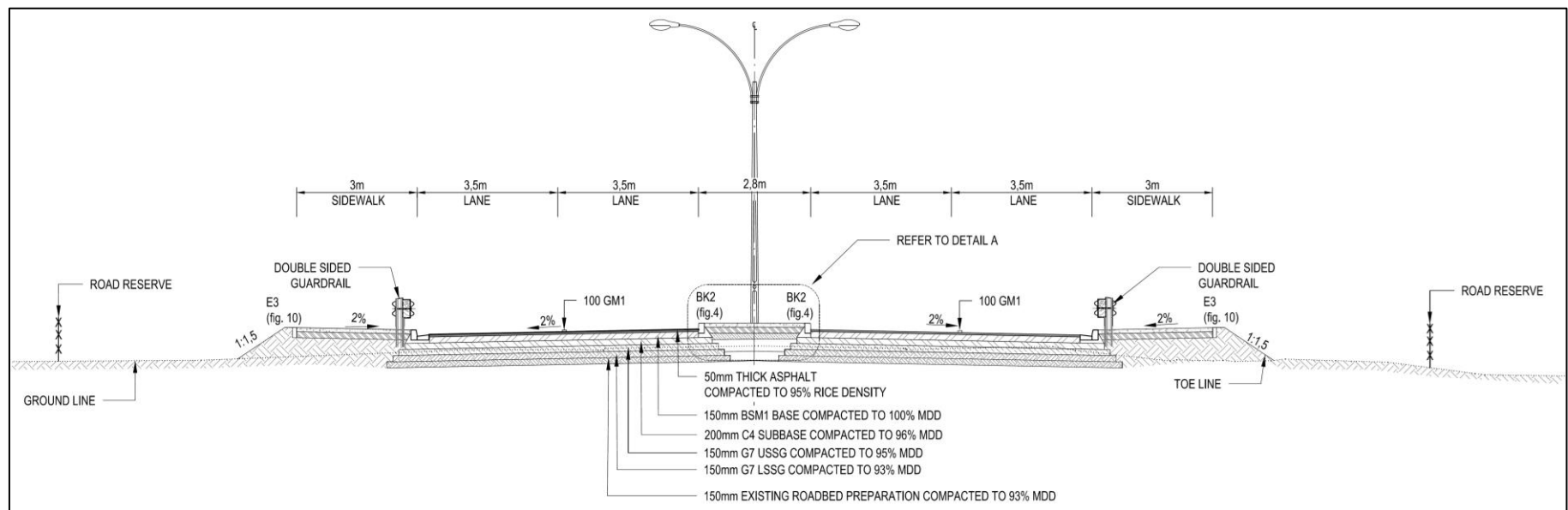


Figure 4.2: Typical Cross-section from km 26.05 to km 26.13

C4.1.2.2.2 Section from km 6 to km 7.9

This section will be improved to a 2-lane cross-section with 3 m surfaced shoulder on the right-hand side, climbing lane with 1 m surfaced shoulder on the left-hand side and both sides will have 0.5 m gravel shoulder rounding as indicated in Figure 4.3.

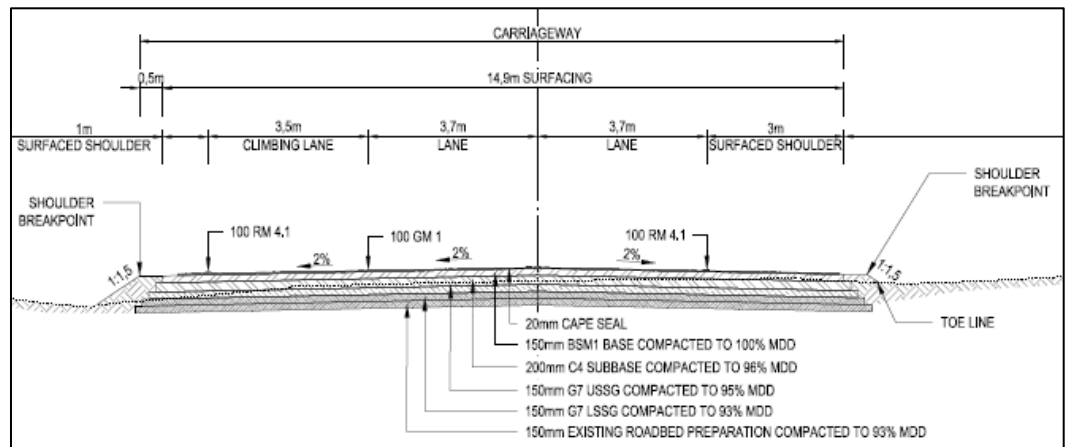


Figure 4.3: Typical Cross-section from km 6.0 to km 7.9

C4.1.2.2.2 Section from km 7.9 to km 14.2 and km 16.6 to km 23.0

These sections will receive a 2-lane cross-section with 3 m surfaced shoulders and a 0.5 m gravel shoulder rounding as shown in Figure 4.4. This will form the majority of the road with a total of approximately 12.7 km.

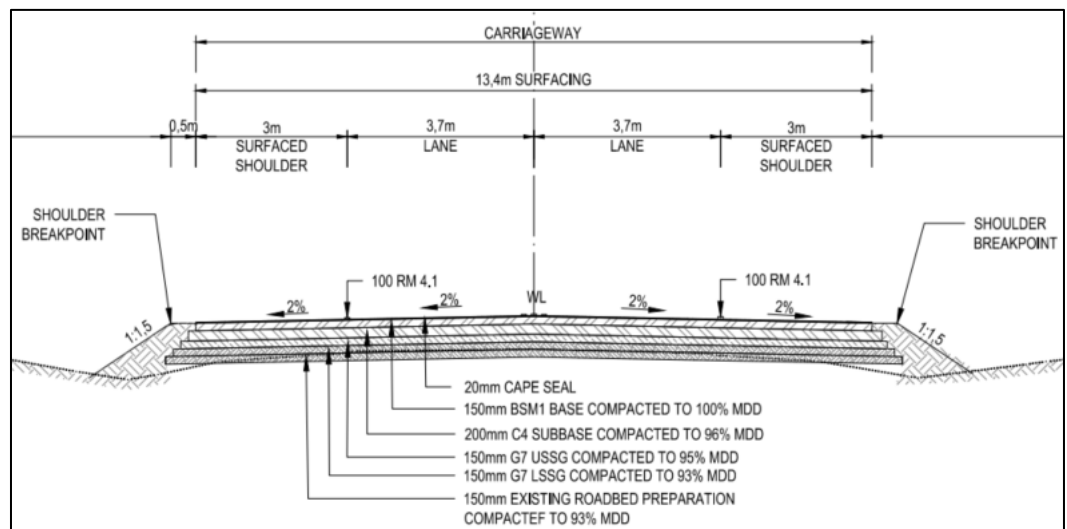


Figure 4.4: Typical Cross section from km 7.9 to km 14.2 and km 16.6 to km 23.0

C4.1.2.2.2 Section from km 26.05 to the end of the project

Due to the narrowing road reserve, these sections will receive a 1 m raised median and 3.4 m lanes. The section from km 26.05 to km 26.13 will have 3 m sidewalks and guardrail as shown in Figure 4.5, whereas the section from km 26.13 to the end of the project will receive 2.2 m parking bays and 2.2 m sidewalks as shown in Figure 4.6.

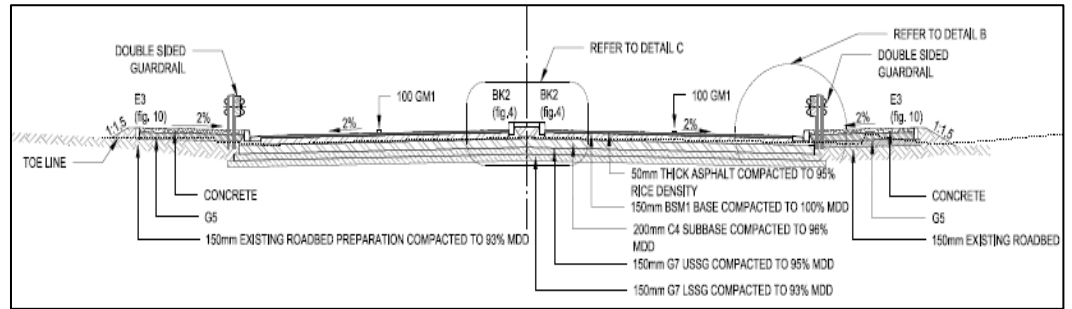


Figure 4.5: Typical Cross section from km 26.05 to km 26.13

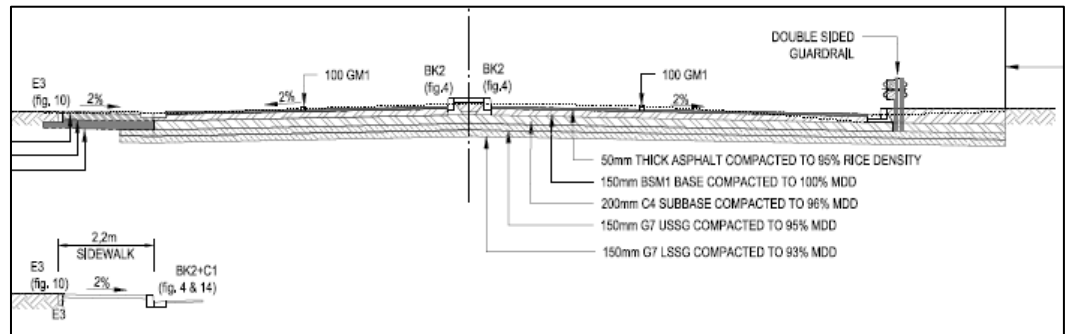


Figure 4.6: Typical Cross-section from km 26.13 to km 26.35

C4.1.2.3 **Drainage**

The urban sections in Bela Bela (km 0.00 to km 6.00) and Modimolle (km 23.05 to km 26.80) will receive raised kerbs and channels for stormwater management.

A pipe network consisting of a 900 mm and 600 mm pipes will be constructed along the median and the catchpits next to the sidewalks to collect the water along urban section. For further details refer to Drawing 33532.00-120 series.

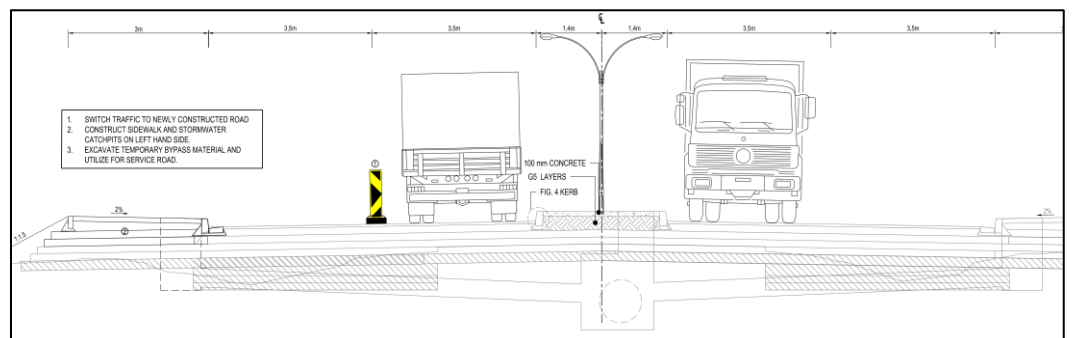


Figure 4.7: Typical stormwater reticulation along urban sections

Due to the realignment and widening of Road R101-8, the existing side drains will need to be demolished and reconstructed at appropriate positions. Side drains to be utilised will be Type F reinforced concrete drains with grid inlets where required with subsurface drains provided underneath the concrete drains.

All high fills over 3 m will receive a smaller concrete side drain (Type A of 800 mm or kerbs) with concrete inlets, chutes and energy breakers. Cut-off drains and earth berms will be provided at the top of all cuttings that exceed 3 m in height to ensure water is intercepted by the channel and reticulated to the discharge point.

C4.1.2.4 **Traffic accommodation**

The high volumes of traffic in the urban sections of Bela Bela and Modimolle require the construction of a temporary deviation to accommodate two-way traffic.

The remainder of the road will include widening on the one side of the road to accommodate two-way traffic, except at the two bridges, isolated intersections and three realignments sections.

A temporary deviation will be constructed at Bridge B447 with half width traffic required at Bridge B375 due to the existing topography.

Half width traffic will also be required at certain intersections for short durations to facilitate construction of the pavement whilst the existing road will be used to accommodate traffic at the three realignment sections.

The temporary deviation will also allow access to the properties adjacent to this project.

C4.1.2.5 **Services**

Applications for water and electrical wayleaves were submitted to both Bela Bela and Modimolle Local Municipalities. The Municipalities indicated that they do not have any as-built information available, however a site visit was conducted with the technical personnel to identify all known services within the road reserve.

Further to the above, the surveyor conducted a ground penetrating radar (GPR) survey in the urban sections (km 0.0 to km 5.0 and km 24.0 to km 26.8).

C4.1.2.5.1 *Electricity –Service Owner*

The identified electrical services along Road R101-8 are summarised in Table 4.3.

Table 4.3: Electrical services along R101 Section 8

LOCATION	SERVICE	SERVICE OWNER	DESCRIPTION	ACTION REQUIRED
km 0.1– km 0.7	Street lights Electrical cables	Bela Bela Local Municipality	Buried electrical cables along R101-8	To be removed and replaced with new street lights.
km 11.8	Overhead Eskom electrical supply	Eskom	Overhead electrical lines	More posts to be installed to accommodate new realignment cut.
km 25.8 – km 26.6	Electrical supply crossing R101 -8	Modimolle Local Municipality	Buried electrical cables along R101-8	None.

C4.1.2.5.2 *Water-Service Owner*

The identified water services along Road R101-8 are summarised in Table 4.4.

Table 4.4: Water services along R101 section 8

LOCATION	SERVICE	SERVICE OWNER	DESCRIPTION	ACTION REQUIRED
km 0.0	Sewer pipe system	Bela Bela Local Municipality	Buried sewer pipe crossing R101-8	The contractor to investigate if relocation is necessary.
km 0.6	Main water supply	Bela Bela Local Municipality	Buried water pipe crossing R101-8	The contractor to investigate if relocation is necessary.
km 25.0	Main water supply	Modimolle Local Municipality	Buried water pipe crossing R101-8	The contractor to investigate if relocation is necessary.

C4.1.2.5.3 *Optic Fibre - Service Owner*

The identified optic fibre services along Road R101-8 are summarised in Table 4.5.

Table 4.5: Optic fibre services along R101 section 8

LOCATION	SERVICE	SERVICE OWNER	DESCRIPTION	ACTION REQUIRED
Km 2.0 - km11.0	Fibre Optic	The service owner was hard to identify as the manholes are locked	Buried fibre service along R101-8 on the right-hand side.	None. Inform service provider when work commences.
Km 26.8	Fibre Optic	MTN	Buried fibre service along R33 on the right-hand side.	None. Inform service provider when work commences.

C4.1.2.6 **Earthworks and pavement layers**

(a) Cuts

The excavation of cuttings and widening of road prisms will require the Contractor to give sufficient notice to the Engineer to inspect the excavations due to variable geological as well as the surrounding in-situ material conditions. The inspection will be required for final approval to proceed with excavation and subsurface drainage systems as depicted on the drawings or as indicated by the Engineer.

Cuttings along proposed realignments were investigated by means of core drilling. Drilling was conducted to depths corresponding with new alignment levels to prove the engineering properties of the soil and/or rock for possible re-use of the material. The borehole profiles and core photographs are contained in Volume 6.

Material derived from cuttings will have to be utilised in a sustainable and sensitive manner and detailed planning will need to be included in the Management and Utilization plans.

Laboratory testing from the geotechnical investigation indicated that the material from the realignment cuttings is expected to be of G5-quality. This material will mainly be used for the construction of the upper pavement layers. A detailed description of the usage of and material properties are included in Volume 6.

(b) Roadbed

A combination of roadbed treatments will be used due to the variability of the subgrade conditions along the road. Inactive clay will be treated by either removing the material to a depth of 1 m below the roadbed and replacing it with G9 material or with lime modification of the in-situ material as directed by the Engineer.

Roadbed consisting of rock will be treated by ripping, drilling, or blasting. Once the roadbed preparation through the hard formation has been constructed the initial layer will consist of a drainage blanket layer covered in geotextiles ahead of construction of the next fill or pavement layer.

The drainage blanket shall conform to the requirements for a drainage blanket as specified in Table A4.1.5-13 of the draft standard of Chapter 4 of COTO (2020).

(c) Fills

The proposed design of the embankment is accepted to consist of normal fill quality compacted to a density of 93% MDD. The maximum height of the embankment is approximately 4420 mm at km 17,100. Side batters of 1(V): 1,5 (H) will be required.

Coarse fill material will be constructed at the temporary deviation at Bridge B447.

(d) Pavement layers

The pavement design consists of flexible pavement structures with detailed description of the pavement design described in section C4.1.3.

Pavement layers will be constructed in accordance with the project specification utilizing materials from existing pavement layers and material sourced from cuttings.

The material from the cuttings will be stockpiled, crushed to required fractions and blended during construction where required to meet the requirements of the pavement layer material.

C4.1.2.7 **Ancillary work**

(a) Guardrail and barriers

The current vertical alignment has fewer high fills and therefore only sections at bridges, major culverts, and sharp curves require guardrails. New guardrails will be introduced along all fill conditions (where fill > 3 m). Along the sidewalks in urban sections, double sided guardrails will be installed to improve pedestrian safety.

(b) Road signs

Due to the widening of Road R101-8 and the re-alignment, most existing road signs will be replaced or relocated. Speed limit signage, hazard plates, and general warning signage will be incorporated. A schedule of all signs (new and existing) required for the improvement Road R101-8 is included on drawing 33532.00-114-series.

(c) Road markings

New road marking will be required along Road R101-8 in line with the proposed improvements. Waterborne retroreflective road markings will be utilised towards the end of construction period and thermoplastic road markings towards the end of Defects Liability Period.

The road studs on the lane lines (WM2) and the yellow line (RM4.1) will be high density metal pin type (RSA-1). RM5 painted island markings will be utilised for the intersections with turning lanes and the change in cross-section such as rural to urban to direct traffic to the adjacent project's lane configuration. New road studs will be installed along centreline and yellow line.

(d) Fencing

Fencing along Road R101-8 is generally in good condition with limited damaged sections in the rural section. A new fence will be installed for the new road reserve boundary along the realignments. New fence will be erected where fence is damaged or missing especially in the urban sections.

Ten accesses will be relocated and 55 to be closed to concur to the access management plan (AMP) principles as indicated on drawings in Volume 4.

C4.1.2.8 **Streetlighting**

The streetlighting services should be designed and installed according to all relevant street lighting standards and regulations. Streetlighting will be included in the contract and consists for the following main components.

- (i) Poles: Design, supply and installation
- (ii) Luminaires: Design, supply, installation and commissioning
- (iii) Electrical works: Supply, installation and commissioning

- (iv) Power Connections: Payment to and co-ordination with local supply authority for provision of supply
- (v) Security and monitoring system for transformers, cabling, kiosks, and poles. This includes access control management into kiosks and transformers.

The streetlights will consist of 18 m anti-vandal/vandal proof direct buried poles with double spigot in Bela Bela and 13,5 m anti-vandal/vandal proof with single spigot in Modimolle.

The main components of the electrical works consist of the following:

- (i) Supply, install, test and commission 380/410V 3 phase low voltage anti-vandal distribution kiosks with associated control and protective equipment.
- (ii) Supply, install, test and commission low voltage reticulation consisting of 35 mm² & 50 mm² 4 core Aluminium PVC PVC SWA/ECC FRPVC 600/1000V cable including trenching and concrete encasement.
- (iii) Collection of luminaires from Luminaire Contractor's store, installation, aiming, switching-on and testing of luminaires.
- (iv) Assisting of Luminaire and LMS Contractor with commissioning and testing of Lighting Management System.

The requirements of the OHS Act and the following Regulations have been used as measure and reference:

- SANS 10098-1 (Edition 3.3) Public Lighting – Part 1: The Lighting of public thoroughfares
- SANS 10098-2 (Edition 2) Public Lighting – Part 2: The Lighting of certain specific areas of streets and highways
- Occupational Health and Safety Act, No. 85 of 1993, as amended
- SANS 10142-1: The wiring of premises

C4.1.2.9 **Demolition work**

Minor buildings and barns will have to be demolished to make way for the construction of the service road and deviations. These properties and buildings have been acquired by SANRAL through a land acquisition process.

Both river bridges, four major culverts and several other structures including side drains, manholes, etc. will be fully or partially demolished during the phased construction process.

C4.1.3 **Pavement design for all parts of the various roads**

C4.1.3.1 **Existing pavement structure**

The visual assessment showed an asphalt surfacing along the section from km 0.0 to km 2.3 and similarly for the section from km 25.1 to km 26.8. An asphalt surface and slurry at localised areas are present from km 2.30 to km 5.44. A 14 mm single seal is present along the remainder of the road (km 5.44 to km 25.1).

The materials investigation showed that the existing pavement material consist of base crushed material, thin macadam layer and gravel material with varying thickness.

C4.1.3.2 **Design Pavement structure**

Urban section (Bela Bela)

The urban section (km 0.0 to km 6.0) is in a more distressed condition with much higher traffic volumes as the remainder of the road section. The laboratory testing on the widened cross-section indicated that the subgrade consists of poor quality material with water recorded in some of the trial pits. To improve this section, the following pavement structure will be constructed:

- Cut and fill as required.
- 150 mm G9 lower selected layer.
- 150 mm G7 upper selected layer.

- 150 mm C4 lower subbase layer.
- 150 mm C4 upper subbase layer.
- 150 mm BSM1-foam base layer.
- 50 mm Sa-V14 (PG64V-16 (EMB) wearing course.

Rural section and Urban section (Modimolle)

The rural section from km 6.00 to km 23.00, urban section in Modimolle (km 23.0 to km 26.32), and the service road will receive the same pavement structure, but different surfacings as indicated below:

- Box cut and prepare the roadbed for widened cross-section.
- Mill out the existing base and subbase material to stockpile for later use to construct LSSG.
- 150 mm G9 lower selected layer.
- 150 mm G7 upper selected layer.
- 200 mm C4 subbase layer.
- Construct a 150 mm BSM 1-foam base layer.
- Construction of a 20 mm seal with two slurries in the rural section km 6.00 to km 23.00 and service road with an asphalt surfacing consisting of 50 mm Sa-V14 (PG64V-16 (EMB)) wearing course from km 23.00 to km 26.32 in Modimolle.

Temporary deviation

The temporary deviations pavement structure will consist of the following:

- Cut and fill as required.
- Roadbed preparation.
- 200 mm SSG layer only at localised areas with poor subgrade conditions.
- 150 mm C4 subbase.
- 150 mm G5A base.
- 10 mm seal and single slurry.

C4.1.4 Structural works

All existing structures or major culverts will be widened or replaced during construction. To accommodate the new road cross section and alignment. The structures to be demolished and replaced are listed in Table 4.6.

Table 4.6: List of major structures along the Road R101-8

KM	STRUCTURE NO.	STRUCTURE NAME	EXISTING STRUCTURE DESCRIPTION	NEW STRUCTURE DESCRIPTION
0.82	IDC3321 (New Nr. B0619)	Bela-Bela Stream 1	9-span reinforced concrete slab continuously supported on wall type culvert walls	5-Cell portal frame cellular culvert founded on a raft foundation
5.19	IDC3322 (New Nr. C9519)	Bela-Bela Stream 2	2-span reinforced concrete slab continuously supported on wall, and single precast pipe culvert	4-Cell portal frame cellular culvert founded on a raft foundation
16.80	No Nr. (New nr. W2099)	Modderloop River Retaining Wall on R101 at km 16.73 on LHS	Mass concrete retaining wall founded on spread footings	Reinforced concrete retaining wall founded onto spread footings
16.88	B375 (New Nr. B0593)	Modderloop-river	5-Span simply supported reinforced concrete flat slab deck supported on wall type abutments	4-Span continuous reinforced concrete flat slab deck supported on wall type abutments and

KM	STRUCTURE NO.	STRUCTURE NAME	EXISTING STRUCTURE DESCRIPTION	NEW STRUCTURE DESCRIPTION
			and piers onto spread footings	column type piers onto spread footings
17.60	B447 (New Nr. B0594)	Groot-Nyl river	4-Span simply supported reinforced concrete flat slab deck supported on wall type abutments piers onto spread footings	3-Span continuously reinforced concrete flat slab deck integrally supported on wall type abutments and piers onto auger piles
22.50	No Nr. (New nr. C9520)	Klein-Nyl river	2-span reinforced concrete slab continuously supported on wall type culvert walls	3-Cell portal frame cellular culvert founded on a raft foundation

(a) Bridges

A plan, long section and cross-section of the proposed new bridges are illustrated in the Figures below.

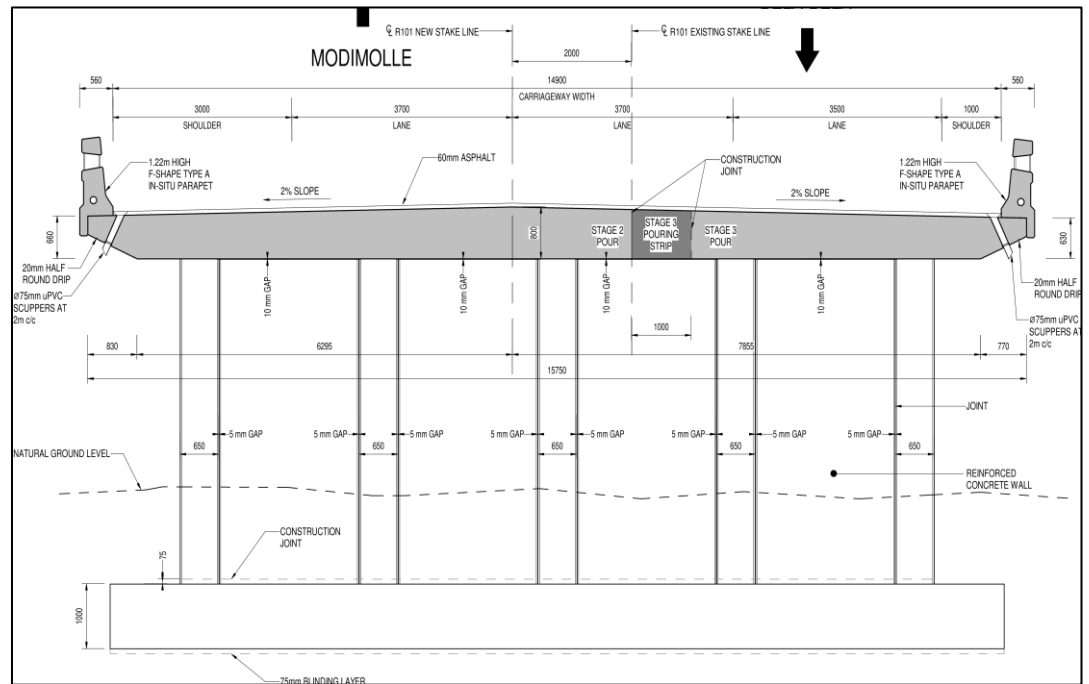


Figure 4.8: Cross section of new bridge B0593

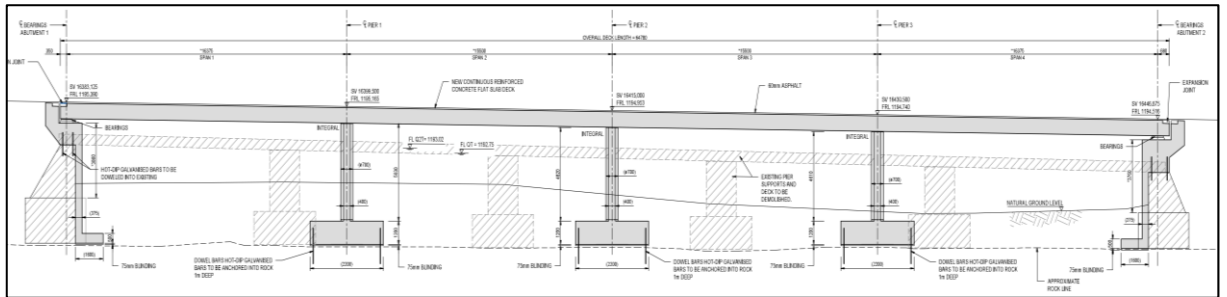


Figure 4.9: Long section of new bridge B0593

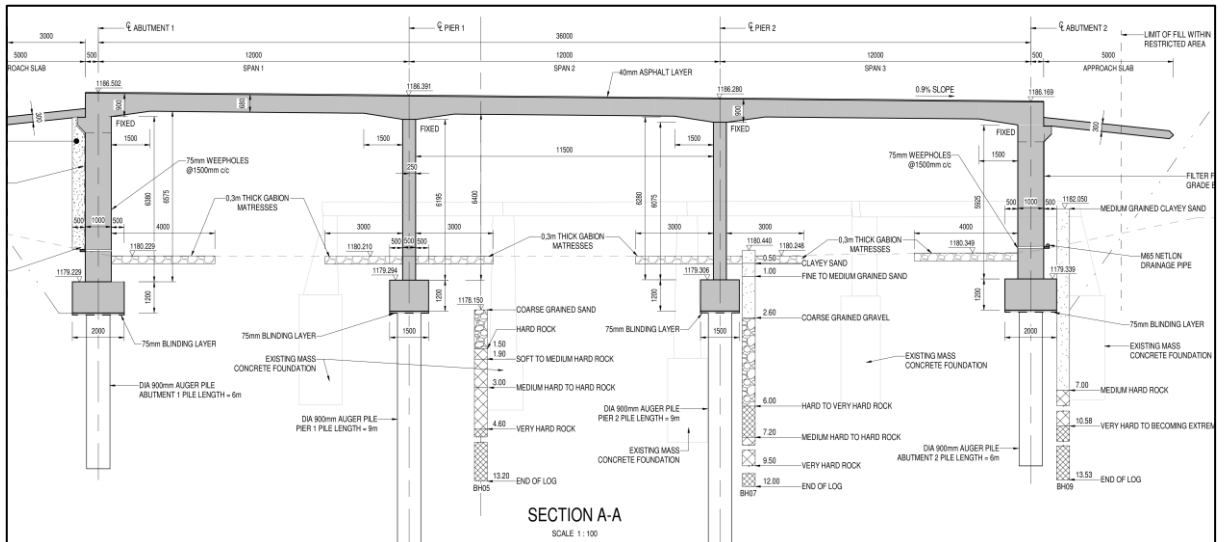


Figure 4.10: Long section of new bridge B0594

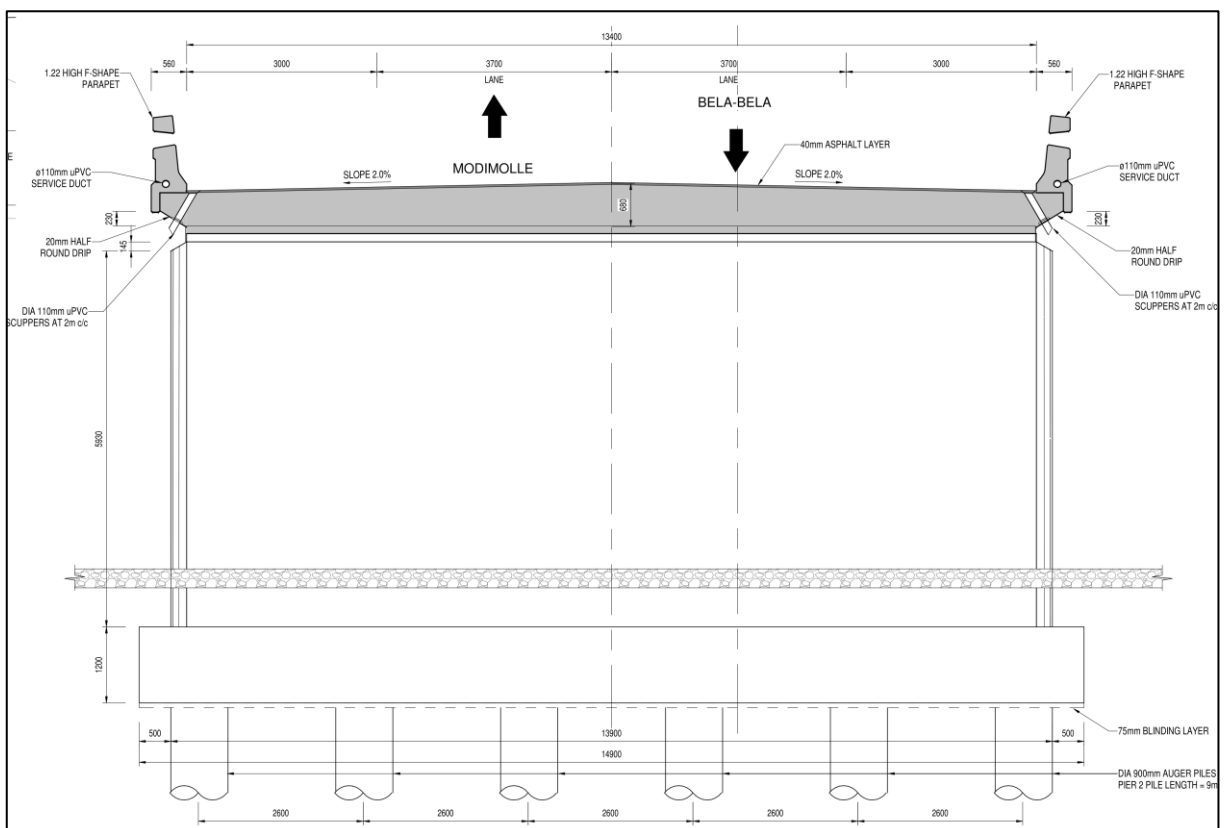


Figure 4.11: Cross section of new bridge B0594

(b) Other structures

As part of the replacement of Bridge B375 and realignment of the road, a new retaining wall (W2099) will be constructed on the right-hand side approaching the bridge.

C4.1.5 Construction sequence

The proposed construction methodologies are detailed in Section B: Specification Data Clause A1.2.3.4 and Volume 6. The traffic accommodation during construction of road works and bridges are included in drawing 33532.00-104-series and 33532.00-219-02-series, respectively.

C4.1.6 Maintenance Works

There is currently a Routine Road Maintenance (RRM) Contract in place along the route. The contact details of the parties involved in the RRM contract are as follows.

Route Manager:

Gregory Ngobeni (Dinoken Engineers (Pty) Ltd)
Cell: 082 878 0227
Email: gregory@dinokengineers.co.za

Contractor:

Takalani Khumeleni (Shonisani Rambau Construction)
Tell: 012 661 0814
Email: takalani@srconstruction.co.za

C4.2 DRAWINGS

The drawings that form part of the tender document are issued for tender purposes only.

The contractor will be supplied with one set of paper prints plus a CD containing all the construction documentation and drawings.

Only figured dimensions may be used and drawings may not be scaled unless so instructed by the engineer. The Engineer will supply all figured dimensions omitted from the drawings.

The levels given on bridge drawings are subject to confirmation on site, and the Contractor shall submit all levels to the engineer for confirmation before he commences any structural construction work. It is the contractor's responsibility to check all clearances given on the drawings and to inform the engineer of any discrepancies.

C4.3 CAMP ESTABLISHMENT, POWER SUPPLY AND OTHER SERVICES

The contractor is to make his own arrangements concerning the supply of electrical power and all other services. No direct payment will be made for the provision of electrical and other services. The cost thereof is deemed to be included in the rates and amounts tendered for the various items of work for which these services are required.

The contractor himself shall provide a suitable site for his camp and for accommodating his labourers.

C4.4 CONSTRUCTION IN CONFINED AREAS

It will be necessary for the contractor to work within confined areas. In certain places the width of the fill material and pavement layers may decrease to zero and the working space may be confined. The method of construction in these confined areas largely depends on the contractor's constructional plant.

Regardless, measurement and payment will be in accordance with the specified cross-sections and dimensions only, irrespective of the method used for achieving these cross-sections and dimensions. It is deemed that the rates tendered in the Pricing Schedule include full compensation for all special equipment and construction methods and for all

difficulties encountered when working in confined areas and narrow widths, and at or around obstructions. No extra payment will be made nor will any claim for additional payment be considered in such cases. (Refer to standard specification sub-clause C1.1.3.2(b)).

C4.5 MANAGEMENT OF THE ENVIRONMENT

The contractor will be responsible for construction according to an environmental management plan in terms of Section C1000 Scope of Works.

The contractor must take the utmost care to minimise the impact of his establishment and other construction activities on the environment and must adhere to the requirements as set out in Section C of the Scope of Works. Where the contractor fails to adhere to these requirements the specifications in Section C of the Scope of Works provide the methodology and cost liability of remedy.

C4.6 TRAFFIC

Traffic information from the three traffic counting stations recorded in 2015 and 2018 are displayed in the Table 4.7 and Table 4.8, respectively.

Table 4.7: Traffic data in 2015 along Road R101-8

Section Km-km	ADT (Veh/ Day)	ADTT (Veh/ Day)	Directional Split	% Heavy Vehicles
0.00 –2.22	6 576	599	51: 49	9.1%
2.22 –5.44	6 576	599	51: 49	9.1%
5.44 –24.83	4 307	228	52: 48	5.3%

Table 4.8: Traffic data in 2018 along Road R101-8

Location (km)	ADT (veh/day)	ADTT trucks/day	Directional split	Heavy vehicle %
3.025	7 488	1 054	49: 51	14.1%
6.700	4 788	402	49: 51	8.4%
23.400	4 431	398	49: 51	9.0%

Annual growth rates for Road R101-8 between 2015 and 2018 is summarised in Table 4.9.

Table 4.9: Traffic growth rates based on 2015 and 2018 counts

Segment (km – km)	ADT 2015	ADT 2018	ADT annual growth rate	ADTT 2015	ADTT 2018	ADTT annual growth rate
0.00 –5.44	6 576	7 488	3.02%	599	1054	7.01%
5.44 –26.80	4 307	4 788	2.60%	228	400	7.02%

C4.7 SMALL CONTRACTOR DEVELOPMENT, TRAINING AND COMMUNITY LIAISON

The South African National Roads Agency SOC Limited is committed to the implementation of Government's policies and in turn expects the same from its contractors. Accordingly, it is a requirement of this project that tenderers are familiar with the specifications that relate to the transformation of the construction industry through the following:

- (i) adherence to the policies of the Reconstruction and Development Programme and other similar Government initiatives,
- (ii) employment and/or creation of Targeted Enterprises,
- (iii) arrangement of generic skills, engineering skills and entrepreneurial skills training programmes for which provision has been made in the Pricing Schedule,
- (iv) construction using labour maximisation principles and,
- (v) active participation with community-based structures.

Tenderers should note that liaison with Community Stakeholders via active participation with the Project Liaison Committee, as well as employment of people from within the community, are essential parts of the project. A provisional sum to cover costs incurred by members of the community in the liaison process has also been included in the Pricing Schedule.

Section D of the Scope of Works covers the contractor's requirements in detail, as well as defining the targets that comprise the Contract Participation Goal (CPG).

C4.8 CLIMATE

The project area is characterised by warm, wet summers and cool, dry winters. Figure 4.12 shows the average minimum and maximum daily temperatures per month. This shows that during winter (June/July), average minimum temperatures drop to almost 0°C. Data also shows that temperatures below freezing point are not uncommon. A minimum (extreme) temperature of - 6°C was measured at this station.

During summer the average daily maximum temperature increases to $\pm 30^{\circ}\text{C}$ with these temperatures extending from October to March. Average minimum temperatures during the same period range from 14°C to 18°C.

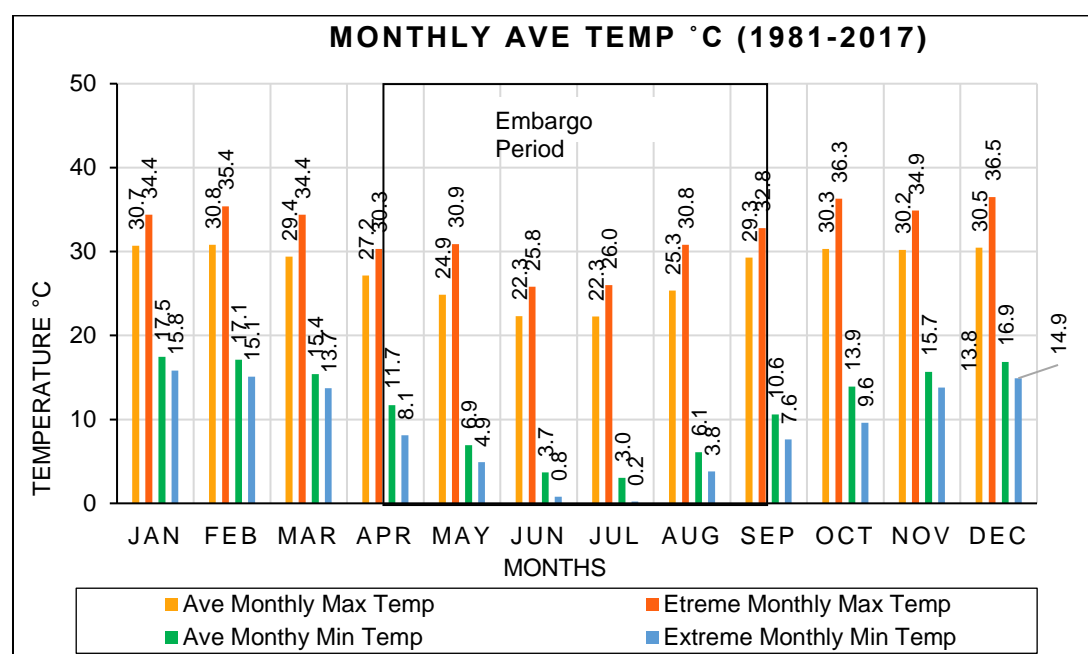


Figure 4.12: Average Monthly Temperature – Bela Bela station 0589594 1

According to the climate data the mean annual precipitation (MAP) for the area is 609 mm. Average monthly rainfall figures are presented in Figure 4.12. Also shown is the highest rainfall measured in a single day for the month.

The data shows that most of the rainfall occurs during the summer months from October to April. The average monthly rainfall during this period varies from 60 mm to 126 mm, the latter experienced in January. Winter rainfall is very limited with only ± 34 mm occurring from May to September.

Figure 4.13 also shows the number of days per month during which rainfall exceeding 10 mm was recorded.

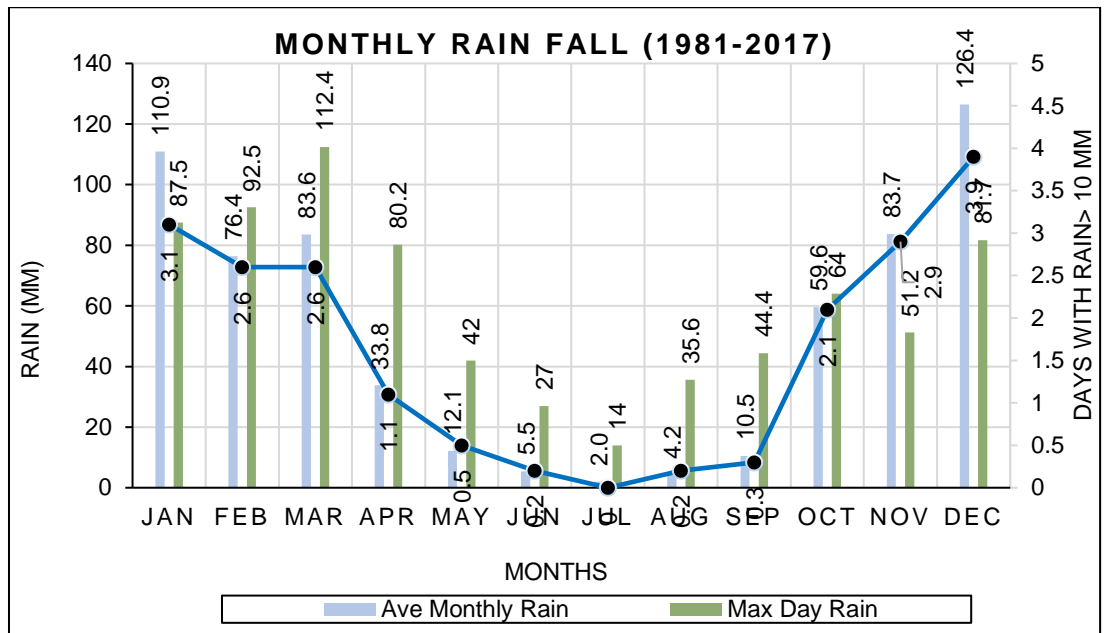


Figure 4.13: Average Monthly Rainfall – Bela Bela station 0589594 1

C4.9 REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS 2014

Refer to Section E of the Scope of Works for general requirements in terms of the OH&S requirements.

A project specific baseline risk assessment is included in Appendix 13.

C4.10 SAFETY PROCEDURES

Key local individuals, representatives and organisations must be identified and included in the Project Liaison Committee to ensure the rights of all affected communities are not infringed and benefits of the project are realised by local communities. The Contractor should make allowance for implementation and engagement with the community to successfully implement the security measures as part of Stakeholder Liaison.

C4.11 OTHER INFORMATION

The non-usable assets to be disposed by the Contractor is listed in the following disposal plan:

Table 4.10: Assets to be disposed by the Contractor

ASSET DESCRIPTION	ESTIMATED QUANTITY	DISPOSAL REQUIREMENT
Guardrail and posts	200 m	Contractor's choice or SANRAL RRM if instructed by the Engineer
Road signs	200 m ²	RRM
Fencing	3.0 km	Contractor's choice
Electrical cables and poles	0,72 km and 60 poles	Municipality

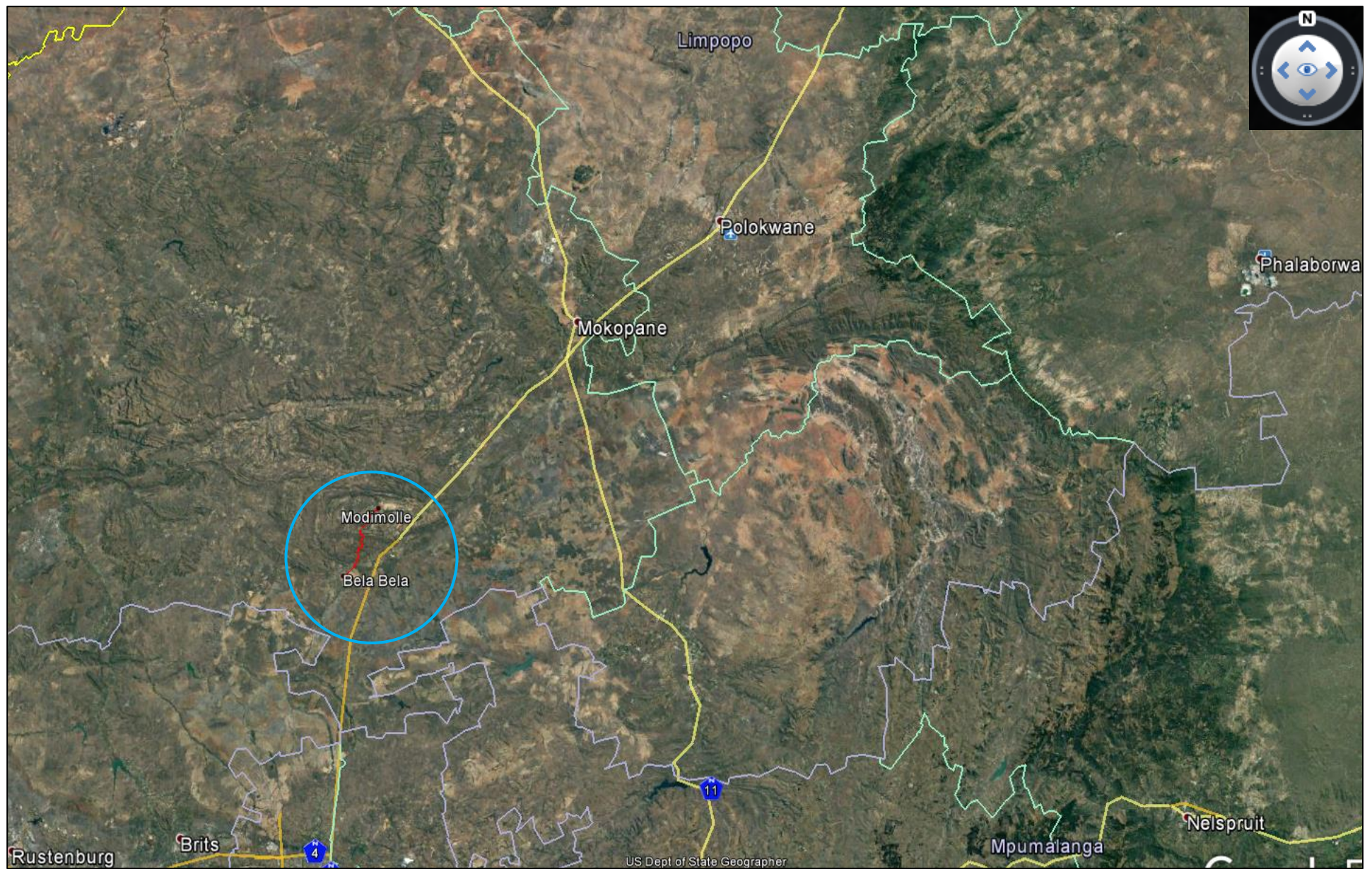
C4.12 AGREEMENT TO OCCUPY SANRAL'S PROPERTY

In the event that SANRAL-owned land will be made available for the use of the contractor for his construction camps, offices, stores, workshops and/or testing facilities, the use of such land will not be treated as a lease but will form part of the contract. In this regard the contractor shall complete the prescribed agreement and comply with all the conditions thereof as if it is part of the contract. The Employer's appointed service provider who administers and manages SANRAL owned land, will facilitate the process and the contractor shall liaise and co-operate with the service provider in this regard.

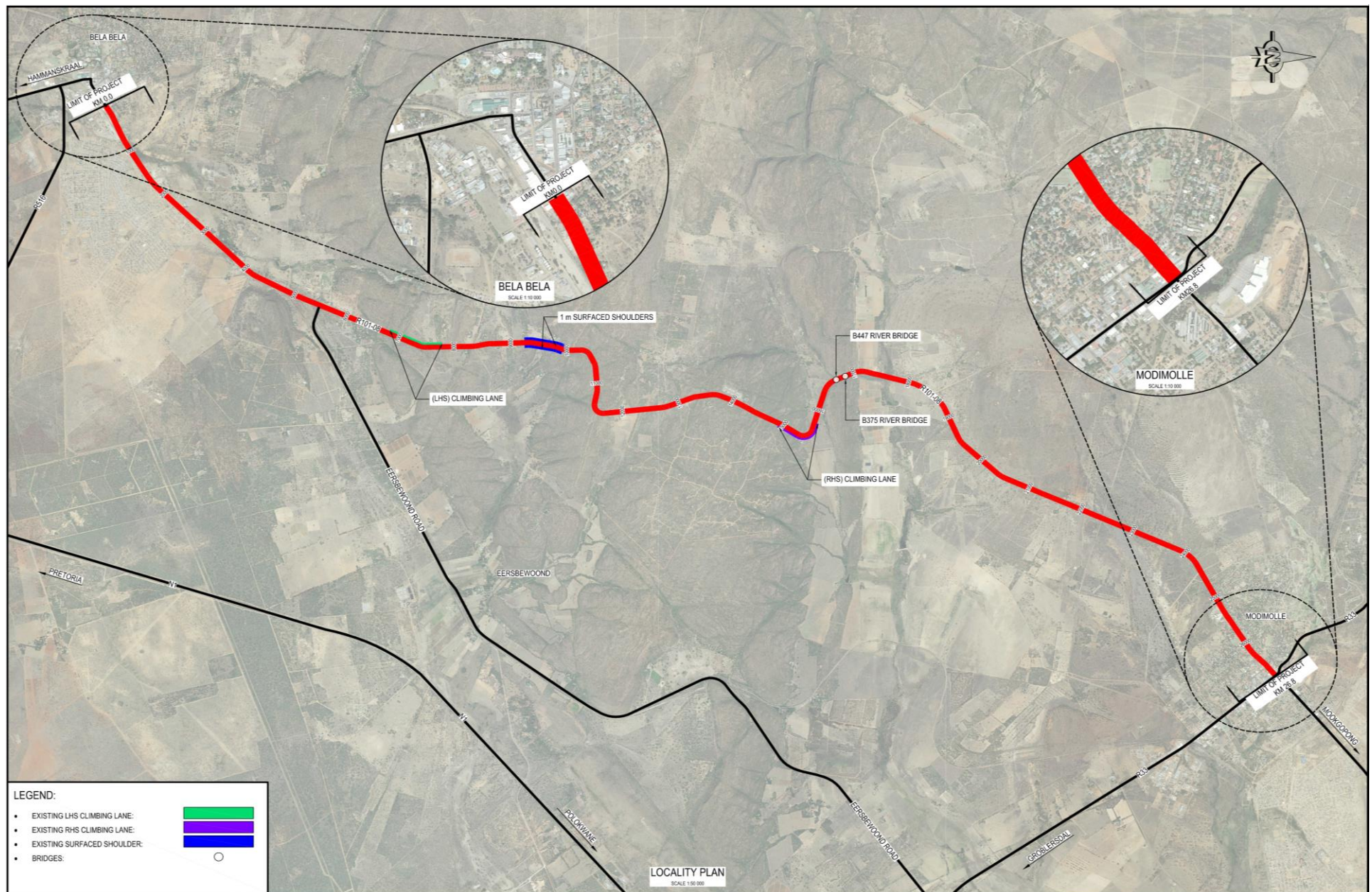
C4.13 APPENDICES

Appendix 1:	Locality Plan
Appendix 2:	Weather Data
Appendix 3:	Traffic Data
Appendix 4:	Roughness Data (Not applicable)
Appendix 5:	Agreement to Occupy SANRAL's Property
Appendix 6:	Dispute Adjudication Agreement
Appendix 7:	Imported content
Appendix 8:	CPG Plan
Appendix 9:	SANRAL Project Liaison Committee Guidelines
Appendix 10:	Checklist for PLC and PLO (Not applicable)
Appendix 11:	Proforma subcontract document
Appendix 12:	General requirements for Community Development Project.
Appendix 13:	Baseline Risk Assessment

APPENDIX 1: LOCALITY PLAN



Locality Plan – Location of Road R101 Section 8 (km 0.0 to km 26.8)



Layout Plan – Works and limits of Road R101 -8 (km 0.0 to km 26.8)

APPENDIX 2: WEATHER DATA

CLIMATE OF SOUTH AFRICA

CLIMATE STATISTICS - AS PER CLIENT'S REQUEST

1981 - 2017

Number:0589594 1

Name: WARMBAD - TOWOOMBA

 $\phi = 24^{\circ} 53' S$ $\lambda = 28^{\circ} 19' E$

HT:1143 m

Period: 1981-2017



TABLE 1 - AIR TEMPERATURE IN DEGREES CELSIUS

	AVERAGE OF DAILY				MAXIMUM (TX) P = 37 Years												MINIMUM (TN) P = 37 Years												
	MAX	MIN	MEAN	RANGE	HIGHEST (TXX)			AVERAGE NUMBER OF DAYS WITH TX						LOWEST (TXN)			HIGHEST (TNX)			AVERAGE NUMBER OF DAYS WITH TN						LOWEST (TNN)			
	TX	TN	(TX+TN)/2	TX - TN	MAX	YY/DD	MEAN	>=35	>=30	>=25	>=20	>=15	<10	MEAN	MIN	YY/DD	MAX	YY/DD	MEAN	>=20	<15	<10	<5	<0	<-5	MEAN	MIN	YY/DD	
J	30.7	17.5	24.1	13.2	43.7	16/07	35.6	2.9	19.1	29.4	30.8	31.0	0.0	23.5	15.8	08/10	23.9	16/07	20.5	1.9	3.1	0.1	0.0	0.0	0.0	13.6	8.3	01/02	J
F	30.8	17.1	24.0	13.7	41.4	16/16	35.1	3.6	16.9	26.4	27.7	27.9	0.0	24.1	17.2	81/08	27.4	16/15	20.5	1.8	3.7	0.1	0.0	0.0	0.0	13.1	8.4	07/12	F
M	29.4	15.4	22.4	14.0	38.6	10/12	34.2	1.8	14.2	27.7	30.6	30.9	0.0	22.1	15.4	08/17	20.9	07/23	19.1	0.4	12.7	0.4	0.0	0.0	0.0	10.9	6.7	03/26	M
A	27.2	11.7	19.5	15.5	35.0	98/06	31.7	0.0	6.0	22.3	28.6	29.4	0.0	20.2	15.0	10/24	18.5	88/07	16.2	0.0	26.3	7.7	0.9	0.0	0.0	6.2	0.9	08/22	A
M	24.8	6.9	15.9	17.9	35.0	12/05	29.5	0.0	1.3	15.2	28.6	30.4	0.0	18.4	13.0	17/13	15.5	85/02	12.4	0.0	30.5	26.3	7.9	0.6	0.0	1.5	-4.3	07/23	M
J	22.3	3.6	13.0	18.7	30.2	13/05	26.8	0.0	0.1	5.1	23.3	28.3	0.0	16.3	11.4	94/29	12.1	86/03	9.6	0.0	28.6	27.8	20.5	2.9	0.0	-1.1	-3.8	82/16	J
J	22.3	3.0	12.7	19.3	31.8	02/29	27.1	0.0	0.1	5.9	24.3	30.4	0.0	16.3	7.4	96/17	14.0	93/19	9.2	0.0	30.8	30.2	23.6	5.1	0.5	-1.9	-5.0	00/21	J
A	25.4	6.1	15.8	19.3	36.1	05/23	31.1	0.1	3.3	17.3	28.5	30.7	0.0	18.2	10.2	81/19	18.0	86/27	13.8	0.0	30.4	26.6	12.9	1.2	0.5	-0.2	-5.6	03/21	A
S	29.3	10.6	20.0	18.7	39.3	15/29	35.3	2.1	15.1	25.2	28.8	29.9	0.0	19.5	11.0	08/01	22.0	92/21	17.1	0.2	27.5	12.1	2.2	0.1	0.0	3.8	-1.4	06/01	S
O	30.3	13.9	22.1	16.4	41.4	11/24	36.4	4.5	18.1	27.4	30.2	30.9	0.0	20.9	12.8	81/24	25.5	16/31	19.3	0.4	19.3	3.4	0.1	0.0	0.0	8.1	4.2	81/05	O
N	30.1	15.7	22.9	14.4	42.2	15/11	36.4	3.8	16.8	25.7	28.6	29.4	0.0	20.9	14.9	88/18	25.0	05/04	20.3	1.1	11.4	0.6	0.0	0.0	0.0	10.5	5.7	02/07	N
D	30.5	16.9	23.7	13.6	42.1	15/07	35.4	3.0	17.5	28.4	30.1	30.3	0.0	22.7	17.9	88/08	24.8	03/15	20.1	1.6	5.0	0.1	0.0	0.0	0.0	12.9	8.0	95/01	D
YR	27.7	11.5	19.6	16.2	43.7	16/07	38.0	22	128	256	340	359	0	13.8	7.4	96/17	27.4	16/15	21.7	7	229	135	68	10	1	-2.7	-5.6	03/21	YR

TABLE 2 - PRECIPITATION (and FOG), DRY- AND WETBULB TEMPERATURES, RELATIVE HUMIDITY and CLOUD COVER

	PRECIPITATION (R mm) P = 37 Years														TEMPERATURE (°C)						REL HUM (%)					CLOUD (eighths)			
	MONTH	24 HOUR MAX		TOTAL PER MONTH / YEAR				AVERAGE NO. OF DAYS WITH R (mm) >=							MEAN on the hour			MEAN on the hour			MEAN on the hour			MEAN		MEAN on the hour			
	TOT	RXX	YY/DD	MAX	YEAR	MIN	YEAR	0.1			1	5	10	30	DRY BULB (P = 36 years)			WET BULB (P = 36year)			P= 33 Years					P= 37 Years			
							AVE	MAX	MIN					8	14	20	8	14	20	8	14	20	MAX	MIN	8	14	20		
J	116	88	06/23	298	2008	3	2001	10.5	17	2	8.8	5.2	3.3	1.0	22.8	28.8	23.5	18.8	20.3	18.8	70	47	66	97	23	4	5	4	J
F	84	93	89/23	213	1996	4	2007	8.1	15	1	6.5	3.6	2.5	0.6	22.3	29.1	23.1	18.5	20.1	18.4	71	45	65	96	24	3	5	4	F
M	84	112	09/14	240	1997	0	2007	8.7	16	0	7.2	4.2	2.5	0.6	20.4	27.8	21.0	17.3	19.2	17.2	74	45	68	97	23	3	4	3	M
A	35	80	10/01	188	2010	0	1991	4.9	12	0	3.6	2.0	1.2	0.1	17.2	25.9	17.5	14.3	16.9	14.0	74	41	68	96	21	2	4	2	A
M	14	42	96/18	74	1997	0	1982	1.5	5	0	1.1	0.6	0.5	0.1	13.0	23.9	13.7	10.1	14.1	9.8	70	33	61	95	17	1	2	1	M
J	5	27	07/05	33	2009	0	1982	1.2	6	0	0.9	0.3	0.2	0.0	9.1	21.5	11.0	6.6	12.1	7.1	72	31	58	96	14	1	2	1	J
J	2	14	96/16	22	1996	0	1981	0.7	5	0	0.6	0.1	0.0	0.0	8.6	21.4	11.2	5.8	11.6	6.6	68	29	51	96	13	1	1	1	J
A	5	36	02/27	49	2002	0	1982	0.6	4	0	0.4	0.2	0.1	0.0	12.9	24.5	14.8	8.6	13.1	8.6	58	25	42	93	12	1	2	1	A
S	11	44	02/27	71	1987	0	1982	1.8	8	0	1.3	0.7	0.3	0.1	18.2	28.3	19.5	12.1	15.3	11.8	51	25	40	90	9	2	2	1	S
O	60	64	12/06	133	1988	0	2005	7.8	16	0	6.3	3.4	2.1	0.3	20.8	29.0	21.6	15.2	17.2	14.8	58	32	51	96	11	3	4	3	O
N	85	51	86/28	188	1998	15	2002	10.4	18	3	8.5	4.9	3.0	0.5	22.1	28.6	22.3	16.9	18.4	16.5	62	40	59	96	16	4	5	3	N
D	131	82	08/08	291	1999	39	2001	12.3	21	4	10.0	6.4	4.1	1.0	22.6	28.5	22.8	18.3	19.8	18.2	68	47	66	97	22	4	5	4	D
YR	633	112	09/14	914	2000	285	2003	68	100	30	55	32	20	4	17.5	26.4	18.5	13.5	16.5	13.5	66	37	58	99	8	2	3	2	YR

Period = years covering the data for all the columns of both tables.

P = Average number of years covering the data in the columns concerned.

TX = Average maximum, TN = Average minimum air temperature

TXX = Highest maximum, MAX = highest in P years.

TXN = Lowest maximum, MIN = lowest in P years.

TNX = Highest minimum, MAX = highest in P years.

TNN = Lowest minimum, MIN = lowest in P years.

-- = MEAN = AVE = AVERAGE e.g.

08, 14, 20 = MEANS of observations which were made on these hours (SAST).

YY/DD = Year/Day of occurrence of the extreme in the previous column.

(Number of days (NOD) with TX >= 10) = (NOD in the month - NOD with TX < 10).

TH = Thunder, HA = Hail, SN = Snow, FOG = fog.

> signifies greater than, >= signifies greater than or equal to.

(Number of days (NOD) with TN < 20) = (NOD in the month - NOD with TN >= 20).

< signifies less than, <= signifies less than or equal to.

LEGEND

Average of the daily maximum temperatures (in °C) by month

*** indicates data is missing or is not yet available in the current month

--- indicates that data is unavailable or was not requested

= indicates that the average is unreliable due to missing daily values

Average Daily Maximum Temperature (C) Data for station [0589594 1] - WARMBAD TOWOOMBA

Measured at 08:00

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1981	29.4	27.1	27.0	27.0	22.6	20.9	21.6	21.6	26.1	24.3	25.3	31.8
1982	30.0	30.9	29.4	24.9	24.7	21.6	21.5	24.9	28.7	28.3	30.5	32.0
1983	32.1	32.6	29.5	27.9	24.6	21.9	21.8	22.6	29.9	28.4	29.9	28.7
1984	31.0	31.9	28.6	26.3	24.5	19.6	20.3	24.3	29.2	29.8	28.1	30.8
1985	30.3	29.1	28.9	27.2	23.7	21.8	21.6	25.1	27.0	30.6	30.8	29.2
1986	30.7	29.9	29.2	25.8	25.5	21.8	22.5	26.1	27.4	28.0	27.6	29.0
1987	29.8	31.8	28.9	29.1	26.7	20.6	21.0	23.5	24.9	28.1	29.3	29.2
1988	31.1	29.4	28.3	26.7	24.2	22.0	22.3	25.0	27.2	27.9	28.5	28.0
1989	29.4	27.2	28.2	23.7	23.8	21.2	21.4	26.3	28.0	29.1	28.3	29.1
1990	29.8	28.8	28.6	26.9	23.0	22.2	23.4	24.3	28.1	30.4	32.4	31.1
1991	30.0	29.2	26.5	26.0	24.4	21.2	22.1	25.1	28.8	30.7	29.9	29.1
1992	33.2	33.8	30.3	29.2	25.3	22.2	22.0	22.7	31.1	31.1	28.5	29.9
1993	31.1	28.8	27.8	27.1	26.3	21.8	22.4	24.0	30.0	28.5	27.4	30.3
1994	28.0	27.5	29.7	27.5	25.0	20.6	20.0	24.0	29.1	28.0	29.8	30.5
1995	30.9	31.6	28.5	26.2	22.2	20.6	22.4	25.0	29.5	30.9	29.8	28.2
1996	28.5	27.3	26.9	25.1	23.0	21.4	19.9	23.6	28.8	31.3	28.5	28.8
1997	29.5	30.1	25.8	24.4	21.7	21.6	21.1	25.2	27.0	27.9	29.5	30.4
1998	29.4	30.9	31.3	29.5	25.5	24.2	23.0	24.3	28.8	28.8	28.8	27.6
1999	28.7	30.7	29.8	28.3	24.8	22.4	21.8	25.2	27.2	29.8	31.3	29.1
2000	26.4	25.8	27.0	24.3	21.8	20.9	20.7	24.7	27.8	29.5	28.3	29.5
2001	32.2	29.0	28.5	26.9	23.6	22.2	21.3	26.7	28.7	29.5	27.6	29.4
2002	32.1	30.5	31.1	28.9	25.9	21.0	22.6	25.7	27.2	30.0	30.7	30.1
2003	31.1	32.3	32.1	30.3	25.4	21.7	22.7	24.6	29.5	31.3	30.5	32.4
2004	29.4	28.8	26.8	25.7	24.2	20.9	20.7	26.3	27.8	31.0	33.2	30.2
2005	31.5	32.6	29.0	26.4	26.5	25.8	23.5	29.5	32.8	34.1	32.2	31.5
2006	28.7	29.0	26.4	25.7	20.7	21.5	24.0	23.2	28.5	32.0	30.6	32.9
2007	33.3	34.7	32.8	28.6	25.4	22.2	21.4	25.8	31.2	26.9	29.4	28.3
2008	28.1	30.9	28.0	26.7	25.2	23.4	22.8	26.9	30.1	33.5	30.4	31.9
2009	30.9	29.8	29.5	29.2	25.8	23.4	21.3	25.7	31.7	31.6	29.7	32.2
2010	30.9	32.7	32.3	25.9	25.9	23.0	23.0	26.1	32.0	34.5	31.1	31.4
2011	30.8	32.0	32.1	26.4	25.7	23.4	21.2	25.7	31.3	31.7	33.2	31.2
2012	32.4	34.5	32.3	28.0	28.4	24.3	25.3	27.8	29.0	30.6	31.4	30.1
2013	32.6	34.7	31.9	28.2	26.9	25.5	24.1	26.0	31.6	31.6	33.3	30.6
2014	33.4	33.6	28.2	26.6	26.4	23.9	22.9	27.0	32.7	33.4	32.2	31.9
2015	33.4	35.4	34.4	30.3	30.9	24.9	26.0	30.8	31.7	36.3	34.9	36.5
2016	34.4	35.1	30.9	30.1	24.7	23.5	22.8	26.8	31.0	32.5	31.0	31.6
2017	30.4	29.9	31.0	27.8	25.1	24.7	24.9	25.8	32.0	30.2	32.7	32.6
Ave	30.7	30.8	29.4	27.2	24.9	22.3	22.3	25.3	29.3	30.3	30.2	30.5
Max	34.4	35.4	34.4	30.3	30.9	25.8	26.0	30.8	32.8	36.3	34.9	36.5
Min	26.4	25.8	25.8	23.7	20.7	19.6	19.9	21.6	24.9	24.3	25.3	27.6

LEGEND

Average of the daily minimum **temperatures** (in °C) by month

*** indicates data is missing or is not yet available in the current month

--- indicates that data is unavailable or was not requested

= indicates that the average is unreliable due to missing daily values

Average Daily Minimum Temperature (C) Data for station [0589594 1] - WARMBAD TOWOOMBA

Measured at 08:00

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1981	17.4	15.6	13.7	10.5	5.2	0.8	2.0	4.4	8.9	9.6	15.8	15.5
1982	16.2	16.2	14.6	10.6	5.4	1.9	3.2	5.4	10.3	13.2	15.2	16.9
1983	17.6	16.9	16.4	13.1	8.3	4.9	4.1	5.0	10.0	13.8	16.2	16.6
1984	16.5	16.3	15.9	10.4	5.8	3.5	4.5	6.3	11.0	15.0	14.5	16.2
1985	17.7	17.1	15.3	9.8	6.9	3.5	2.6	7.6	11.3	14.7	15.5	16.3
1986	17.5	16.3	15.1	13.1	7.7	3.9	3.8	8.2	10.5	13.7	14.9	16.2
1987	16.9	18.4	15.8	12.5	8.0	2.1	2.2	5.6	11.7	13.1	16.7	17.7
1988	17.4	17.6	16.5	14.8	6.0	4.0	2.9	6.4	10.2	13.8	14.5	16.1
1989	17.2	16.9	14.8	11.1	7.9	6.1	2.9	8.2	8.9	13.1	14.6	15.8
1990	17.1	15.6	15.4	12.5	6.5	3.3	3.7	4.8	8.7	13.7	16.1	17.1
1991	17.9	17.0	15.7	9.3	6.6	4.3	2.6	5.9	11.7	14.5	15.5	16.2
1992	17.5	18.1	15.4	12.9	6.0	3.7	3.3	5.6	14.2	14.6	15.3	17.6
1993	17.2	16.9	14.7	11.6	7.6	2.7	4.8	5.5	10.8	15.7	14.9	17.5
1994	17.2	16.6	15.0	11.3	5.4	2.2	0.2	5.6	10.1	12.4	16.1	16.8
1995	17.5	17.4	16.3	11.8	8.7	2.4	3.4	7.6	11.5	15.4	16.7	15.4
1996	17.8	17.3	14.0	10.3	7.8	3.3	1.9	6.2	10.0	14.6	15.8	16.2
1997	17.5	16.9	15.5	9.7	5.8	3.0	3.1	6.0	11.6	12.6	14.8	16.7
1998	17.2	17.2	16.2	12.2	5.5	2.7	3.6	4.4	10.8	14.1	14.8	16.1
1999	16.5	16.1	15.2	11.6	8.1	3.1	4.5	5.4	9.2	12.0	16.7	16.7
2000	16.1	17.1	16.4	11.1	5.2	4.9	1.5	5.3	9.7	13.7	14.1	15.8
2001	16.5	16.5	14.7	12.4	6.4	3.4	2.6	7.3	10.4	14.5	16.2	16.5
2002	18.0	17.1	14.8	12.0	7.1	3.9	0.9	8.2	9.8	12.7	13.8	17.3
2003	17.0	18.2	14.8	13.2	6.6	4.6	1.9	4.8	10.2	14.7	17.7	18.7
2004	18.6	16.8	16.0	13.1	6.8	2.9	1.2	6.5	7.9	13.9	16.5	17.0
2005	18.4	17.4	15.1	12.2	7.4	5.9	2.2	8.0	11.6	14.6	17.1	17.1
2006	18.6	18.0	15.6	11.5	5.0	3.0	3.1	4.1	7.7	13.7	14.9	17.1
2007	15.8	16.2	15.4	11.9	4.9	3.5	1.7	3.8	12.0	13.2	14.8	14.9
2008	15.8	15.1	14.0	8.1	6.3	2.9	2.0	5.3	7.6	14.3	16.0	16.7
2009	17.9	17.3	15.3	11.0	7.8	6.1	1.7	5.4	11.8	15.3	15.2	16.8
2010	18.2	17.2	16.2	14.2	9.2	3.1	4.8	5.5	10.4	14.9	16.8	17.2
2011	18.0	16.8	16.4	13.0	8.4	3.4	2.0	5.5	10.5	13.8	16.1	17.6
2012	17.7	18.1	15.6	11.2	8.0	4.4	4.3	6.7	10.3	13.9	15.8	16.9
2013	17.7	17.3	15.3	11.2	6.9	4.4	5.4	6.1	12.2	13.3	16.2	18.1
2014	18.6	18.6	16.5	9.7	6.5	2.6	2.4	7.3	12.1	14.6	16.9	18.6
2015	18.7	18.4	17.1	13.8	10.1	5.8	7.0	9.2	13.8	16.7	17.1	20.1
2016	19.5	19.4	15.4	12.8	7.8	5.4	3.9	6.0	11.6	14.4	15.8	17.3
2017	17.0	17.0	14.0	11.8	7.1	4.6	4.9	6.5	11.0	12.7	13.9	16.3
Ave	17.5	17.1	15.4	11.7	6.9	3.7	3.0	6.1	10.6	13.9	15.7	16.9
MAX	19.5	19.4	17.1	14.8	10.1	6.1	7.0	9.2	14.2	16.7	17.7	20.1
Min	15.8	15.1	13.7	8.1	4.9	0.8	0.2	3.8	7.6	9.6	13.8	14.9

LEGEND

Total of the daily rainfall (in mm) by month

*** indicates data is missing or is not yet available in the current month

--- indicates that data is unavailable or was not requested

= indicates that the average is unreliable due to missing daily values

Monthly Daily Rain (mm) Data for station [0589594 1] - WARMBAD TOWOOMBA

Measured at 08:00

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1981	181.5	48.7	80.7	21.5	3.0	3.9	0.0	16.5	11.4	70.5	72.5	79.8
1982	194.8	41.6	39.0	41.0	0.0	0.0	6.4	0.0	0.0	63.1	40.2	92.4
1983	155.7	44.0	118.1	23.1	2.9	11.3	5.8	25.7	1.3	90.1	137.7	159.5
1984	122.8	16.7	138.6	1.8	1.0	25.0	12.6	0.0	0.0	80.7	50.7	143.0
1985	118.6	101.4	84.0	1.0	14.2	0.0	4.0	15.6	22.6	65.5	39.6	149.8
1986	44.9	76.4	69.4	49.9	0.0	4.9	0.0	0.3	4.0	98.1	140.9	290.9
1987	122.3	125.7	67.0	1.6	0.0	0.0	0.0	8.0	71.3	33.4	167.4	163.3
1988	39.0	88.3	107.2	43.9	0.0	6.3	0.0	1.9	36.2	133.0	18.4	75.0
1989	32.4	155.9	101.7	64.5	0.0	26.2	0.0	26.8	0.0	40.8	138.6	264.6
1990	44.2	81.6	92.8	48.7	11.0	0.0	5.0	0.0	6.2	27.4	30.2	97.9
1991	131.8	118.7	132.4	0.0	2.0	4.6	0.0	0.0	6.7	80.1	69.9	130.4
1992	24.0	83.6	41.4	7.0	0.0	18.0	0.0	0.6	0.0	51.3	75.8	154.4
1993	125.2	60.0	45.5	5.0	2.0	0.0	0.0	0.0	1.0	123.4	74.0	74.2
1994	114.9	139.8	29.7	3.7	0.0	0.0	0.0	0.0	0.0	67.7	80.0	106.4
1995	116.8	39.0	111.6	52.2	35.0	0.0	0.0	0.0	0.0	48.9	109.5	136.5
1996	159.2	213.1	38.5	2.1	42.6	0.0	22.3	0.0	0.0	48.6	122.2	154.8
1997	49.8	114.2	239.5	29.6	73.9	2.0	1.0	2.2	25.6	81.5	107.6	106.7
1998	174.6	39.6	52.7	12.2	0.0	0.0	0.0	0.0	23.9	78.1	188.1	244.4
1999	92.7	13.6	35.0	18.4	43.1	2.3	0.0	0.0	3.5	12.8	45.4	209.9
2000	169.1	207.8	112.4	78.4	16.0	14.4	0.0	1.3	0.0	27.1	136.2	151.6
2001	28.6	79.3	14.1	57.6	26.0	8.6	0.0	0.0	10.3	47.3	118.9	38.9
2002	32.4	71.6	10.0	32.0	28.3	1.0	0.0	49.3	4.0	79.9	14.6	138.2
2003	68.2	28.4	12.0	16.0	0.0	0.0	0.0	0.0	4.3	0.0	52.0	108.7
2004	110.8	128.6	196.5	23.9	18.5	0.0	0.0	0.0	0.0	12.5	48.8	91.1
2005	54.9	69.3	58.0	46.8	11.7	0.0	0.0	0.0	0.0	0.0	102.3	40.2
2006	219.2	137.5	93.8	0.0	0.0	0.0	0.0	6.0	0.0	33.4	48.8	87.6
2007	28.2	4.2	0.0	34.6	0.0	27.4	7.2	0.0	36.6	116.4	138.6	81.6
2008	298.4	25.2	94.0	9.2	20.4	1.2	0.0	0.0	0.0	13.4	123.2	64.8
2009	169.8	97.6	182.4	0.0	17.0	33.2	3.4	0.0	16.6	58.8	70.4	125.6
2010	121.2	10.4	94.0	188.0	0.0	0.0	0.4	0.0	0.0	65.0	29.8	115.2
2011	3.2	6.0	102.0	103.8	2.6	0.0	0.0	0.0	0.0	46.4	37.2	117.8
2012	86.4	40.4	41.6	7.6	0.4	0.2	0.0	0.2	49.8	106.0	51.6	60.8
2013	81.8	85.6	105.8	75.8	0.0	0.0	0.0	0.8	4.0	105.4	141.8	147.0
2014	65.8	101.0	221.2	4.4	0.0	0.0	0.0	0.0	0.2	10.0	92.4	132.2
2015	59.6	7.6	23.8	50.8	0.0	0.0	1.0	0.0	45.2	18.4	42.8	149.6
2016	169.6	56.2	80.8	21.2	25.0	11.4	5.6	0.0	4.4	85.4	107.4	121.0
2017	290.8	69.0	24.6	72.4	51.8	0.0	0.8	0.0	0.0	84.4	29.6	72.6
Ave	110.9	76.4	83.6	33.8	12.1	5.5	2.0	4.2	10.5	59.6	83.7	126.4
MAX	298.4	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.6	38.9
Min	3.2	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.6	38.9

APPENDIX 3: TRAFFIC DATA

Station Information

Road Name	R10108N
Location	Between Modimolle and Bela Bela
GPS Latitude	-24.868616 S
GPS Longitude	28.323095 E
Province/Region	Limpopo
Client	ITS Global
Owner	ITS Global
Project	P18/220
Number Of Lanes	2
Direction 1 To	(Main) North To Modimolle
Direction 2 To	(Main) South To Bela Bela
Speed Limit	80 km/h
Survey Type	C1 Inductive Loops Traffic Monitoring
Operation Type	Temporary
Survey Dates	20181024 - 20181101
Logging Interval	15 Minutes
Survey Period	7 Days: 23 Hours: 0 Minutes

Average 7-Day Statistics

Average 7-Day Statistics		
Average Daily Traffic (ADT)	7488	
Average Daily Truck Traffic (ADTT)	1054	
Heavy Vehicle %	14.10%	
Average Weekday Daily Traffic (AWDT)	7631	
Directional % Split	49.4 : 50.6	
Direction 1 Short:Medium:Long HV %	62:10:29	
Direction 2 Short:Medium:Long HV %	63:9:28	
Night ADT	1476	19.70%
Night ADTT	238	22.60%

7-Day Average Totals

	Mon	Tues	Wed	Thur	Fri	Sat	Sun
Daily Averages	7287	6799	6954	7264	9851	7070	7192
Expansion Factor	0.973	0.908	0.929	0.97	1.316	0.944	0.96

15 Min Highest Hourly Volume

	Volume	HV %	End Time	Day	Date
Highest Hourly Volume In A Lane (Lane1)	484	10.7	16H00	Fri	18/10/26
Highest Hourly Volume Road	792	10.7	17H00	Fri	18/10/26
Highest Hourly Volume In Direction 1	484	10.7	16H00	Fri	18/10/26
Highest Hourly Volume In Direction 2	465	5.2	17H00	Sun	18/10/28

15 Min Peak Hour

	Volume	HV %	Start Time	Dir1:Dir2	K-Factor
Weekday AM Peak Hour	601	10.30%	06H45	51.9 : 48.1	0.08
Weekday PM Peak Hour	594	14.00%	16H30	48.0 : 52.0	0.079
Friday PM Peak Hour	828	11.80%	15H45	60.7 : 39.3	0.111
Saturday Peak Hour	557	9.50%	10H45	48.7 : 51.3	0.074

Peak Hour Factors

	Dir1	Dir2	Road
AM Peak Hour Factors	0.918	0.872	0.905
PM Peak Hour Factors	0.938	0.94	0.958

Average Speeds

	Dir1	Dir2	Road
Arithmetic Mean Speed	73.9	77.2	75.5
Arithmetic Mean Speed - Light Vehicles	74.5	77.7	76.1
Arithmetic Mean Speed - Heavy Vehicles	69.8	74.1	72
Harmonic Mean Speed	69.8	73.4	71.6

Speed Behaviour

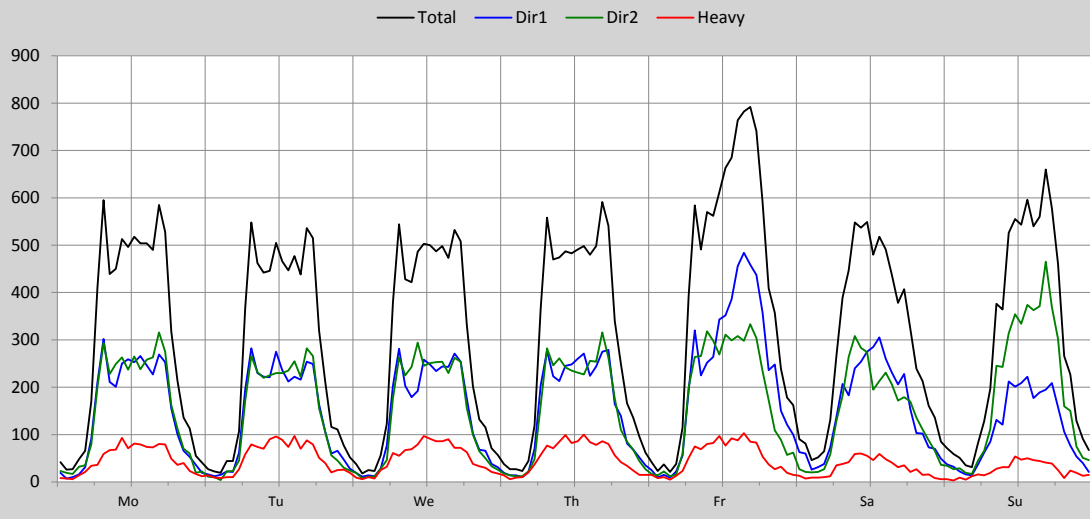
Vehicles Exceeding speed Limit	35.90%
Vehicles Headway Less Than 2s	23.90%

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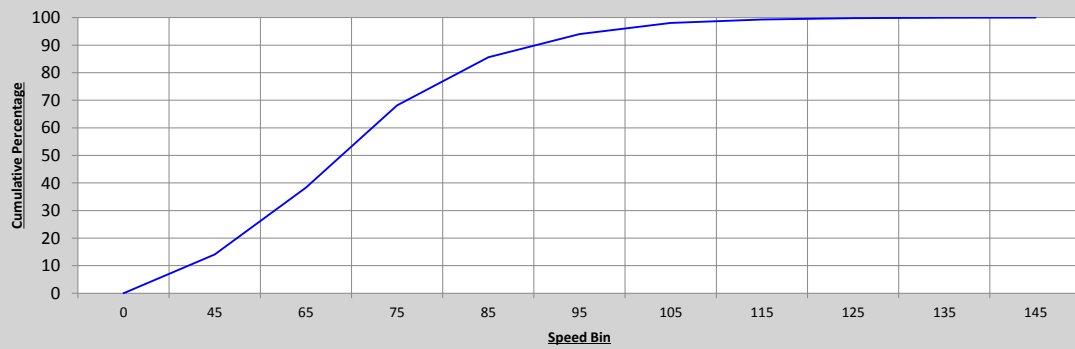
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1426 Average 7-Day Hourly Flow

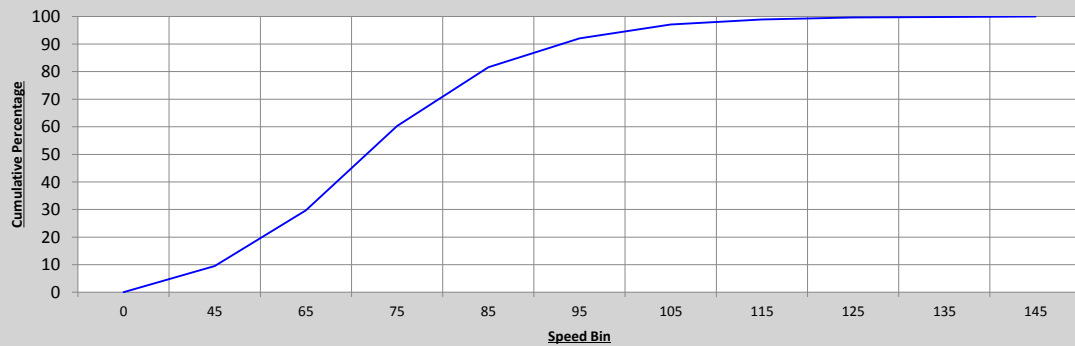


1426 Direction 1 Speed Bin Cumulative Distribution



Direction 1 Speed Percentiles 15th - 45.8 km/h 85th - 84.6 km/h

1426 Direction 2 Speed Bin Cumulative Distribution



Direction 2 Speed Percentiles 15th - 50.5 km/h 85th - 88.2 km/h

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Station Information

Road Name	R10108N
Location	Between Modimolle and Bela Bela
GPS Latitude	-24.840901 S
GPS Longitude	28.341260 E
Province/Region	Limpopo
Client	ITS Global
Owner	ITS Global
Project	P18/220
Number Of Lanes	3
Direction 1 To	(Slow:Fast) North To Modimolle
Direction 2 To	(Main) South To Bela Bela
Speed Limit	80 km/h
Survey Type	C1 Inductive Loops Traffic Monitoring
Operation Type	Temporary
Survey Dates	20181024 - 20181101
Logging Interval	15 Minutes
Survey Period	7 Days: 22 Hours: 15 Minutes

Average 7-Day Statistics

Average 7-Day Statistics		
Average Daily Traffic (ADT)	4788	
Average Daily Truck Traffic (ADTT)	402	
Heavy Vehicle %	8.40%	
Average Weekday Daily Traffic (AWDT)	4781	
Directional % Split	48.8 : 51.2	
Direction 1 Short:Medium:Long HV %	85:10:5	
Direction 2 Short:Medium:Long HV %	81:10:9	
Night ADT	967	20.20%
Night ADTT	84	20.90%

7-Day Average Totals

	Mon	Tues	Wed	Thur	Fri	Sat	Sun
Daily Averages	4571	4250	4203	4502	6381	4627	4981
Expansion Factor	0.955	0.888	0.878	0.94	1.333	0.966	1.04

15 Min Highest Hourly Volume

	Volume	HV %	End Time	Day	Date
Highest Hourly Volume In A Lane (Lane3)	393	3.6	17H00	Sun	18/10/28
Highest Hourly Volume Road	536	3.2	17H00	Sun	18/10/28
Highest Hourly Volume In Direction 1	319	8.8	16H00	Fri	18/10/26
Highest Hourly Volume In Direction 2	393	3.6	17H00	Sun	18/10/28

15 Min Peak Hour

	Volume	HV %	Start Time	Dir1:Dir2	K-Factor
Weekday AM Peak Hour	407	8.40%	06H45	51.4 : 48.6	0.085
Weekday PM Peak Hour	370	8.40%	16H15	45.9 : 54.1	0.077
Friday PM Peak Hour	538	9.90%	15H45	59.3 : 40.7	0.112
Saturday Peak Hour	357	6.40%	10H30	49.0 : 51.0	0.075

Peak Hour Factors

	Dir1	Dir2	Road
AM Peak Hour Factors	0.871	0.917	0.933
PM Peak Hour Factors	0.885	0.924	0.944

Average Speeds

	Dir1	Dir2	Road
Arithmetic Mean Speed	88.3	99.7	94.1
Arithmetic Mean Speed - Light Vehicles	89.4	100.4	95.1
Arithmetic Mean Speed - Heavy Vehicles	78.3	91.2	84
Harmonic Mean Speed	83.7	96.6	89.8

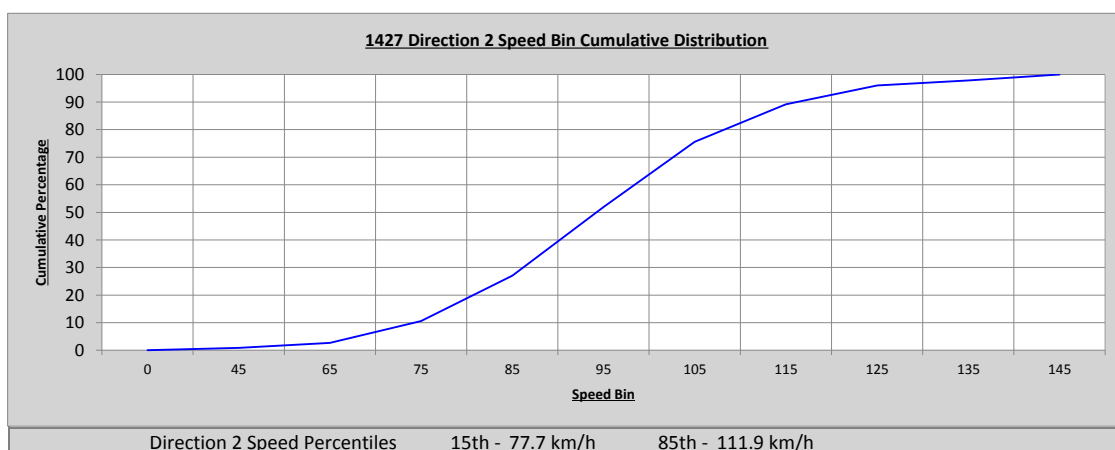
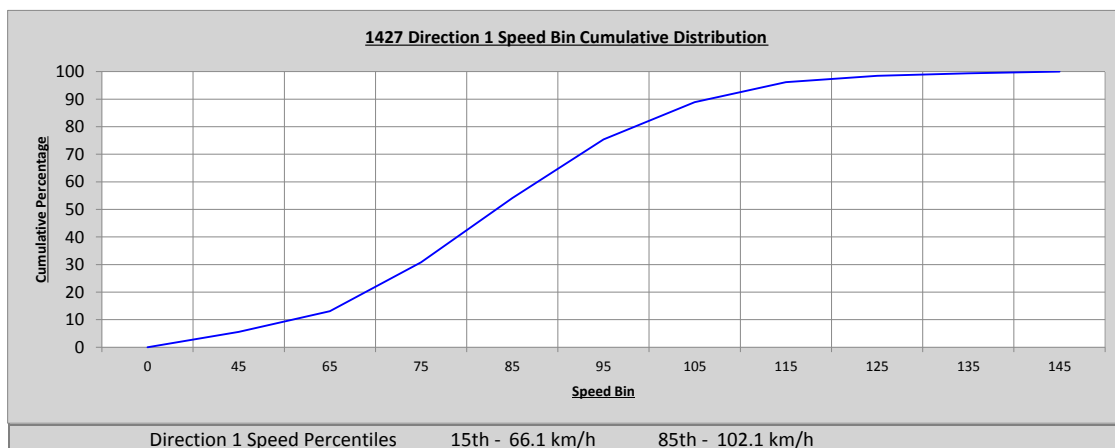
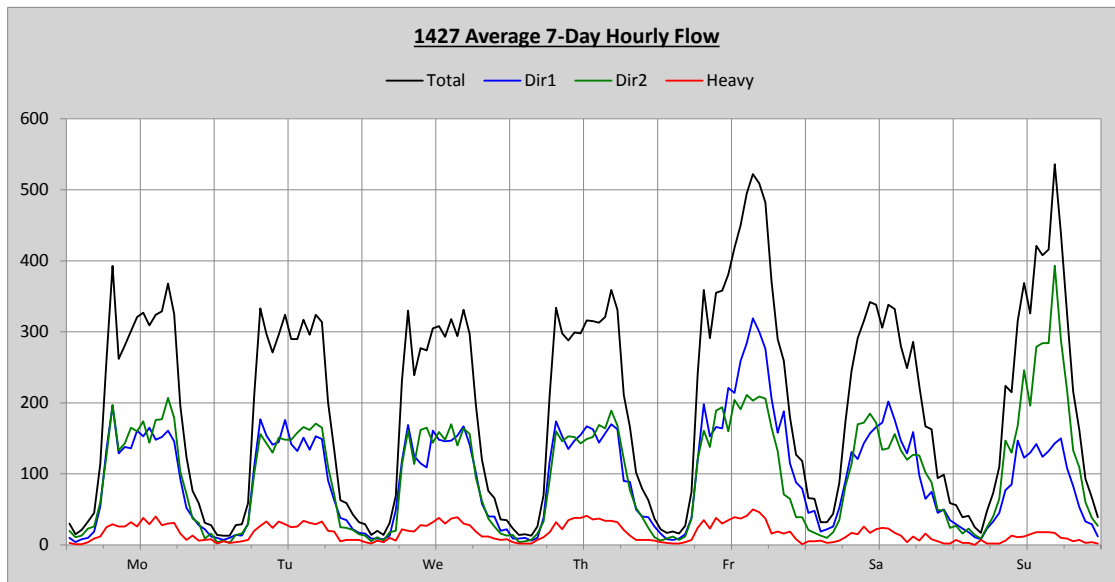
Speed Behaviour

Vehicles Exceeding speed Limit	79.50%
Vehicles Headway Less Than 2s	13.10%

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Phone: +27 12 991 0411
e-mail: info@tes.co.za





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 Boschkop - Pretoria
 Phone: +27 12 991 0411
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Station Information

Road Name	R10108N
Location	Between Modimolle and Bela Bela
GPS Latitude	-24.719330 S
GPS Longitude	28.380511 E
Province/Region	Limpopo
Client	ITS Global
Owner	ITS Global
Project	P18/220
Number Of Lanes	2
Direction 1 To	(Main) North To Modimolle
Direction 2 To	(Main) South To Bela Bela
Speed Limit	100 km/h
Survey Type	C1 Inductive Loops Traffic Monitoring
Operation Type	Temporary
Survey Dates	20181024 - 20181101
Logging Interval	15 Minutes
Survey Period	7 Days: 21 Hours: 30 Minutes

Average 7-Day Statistics

Average 7-Day Statistics		
Average Daily Traffic (ADT)	4431	
Average Daily Truck Traffic (ADTT)	398	
Heavy Vehicle %	9.00%	
Average Weekday Daily Traffic (AWDT)	4451	
Directional % Split	48.8 : 51.2	
Direction 1 Short:Medium:Long HV %	86:9:5	
Direction 2 Short:Medium:Long HV %	83:9:9	
Night ADT	930	21%
Night ADTT	88	22.10%

7-Day Average Totals

	Mon	Tues	Wed	Thur	Fri	Sat	Sun
Daily Averages	4332	3908	3884	4214	5919	4124	4638
Expansion Factor	0.978	0.882	0.877	0.951	1.336	0.931	1.047

15 Min Highest Hourly Volume

	Volume	HV %	End Time	Day	Date
Highest Hourly Volume In A Lane (Lane2)	333	2.7	17H00	Sun	18/10/28
Highest Hourly Volume Road	472	9.5	16H00	Fri	18/10/26
Highest Hourly Volume In Direction 1	281	7.1	16H00	Fri	18/10/26
Highest Hourly Volume In Direction 2	333	2.7	17H00	Sun	18/10/28

15 Min Peak Hour

	Volume	HV %	Start Time	Dir1:Dir2	K-Factor
Weekday AM Peak Hour	377	8.20%	06H45	52.0 : 48.0	0.085
Weekday PM Peak Hour	342	8.80%	16H30	45.3 : 54.7	0.077
Friday PM Peak Hour	476	9.50%	15H15	59.9 : 40.1	0.107
Saturday Peak Hour	307	9.40%	10H00	43.6 : 56.4	0.069

Peak Hour Factors

	Dir1	Dir2	Road
AM Peak Hour Factors	0.831	0.812	0.842
PM Peak Hour Factors	0.76	0.904	0.814

Average Speeds

	Dir1	Dir2	Road
Arithmetic Mean Speed	99.5	98	98.7
Arithmetic Mean Speed - Light Vehicles	100	98.7	99.4
Arithmetic Mean Speed - Heavy Vehicles	94	91.1	92.5
Harmonic Mean Speed	96	94.7	95.3

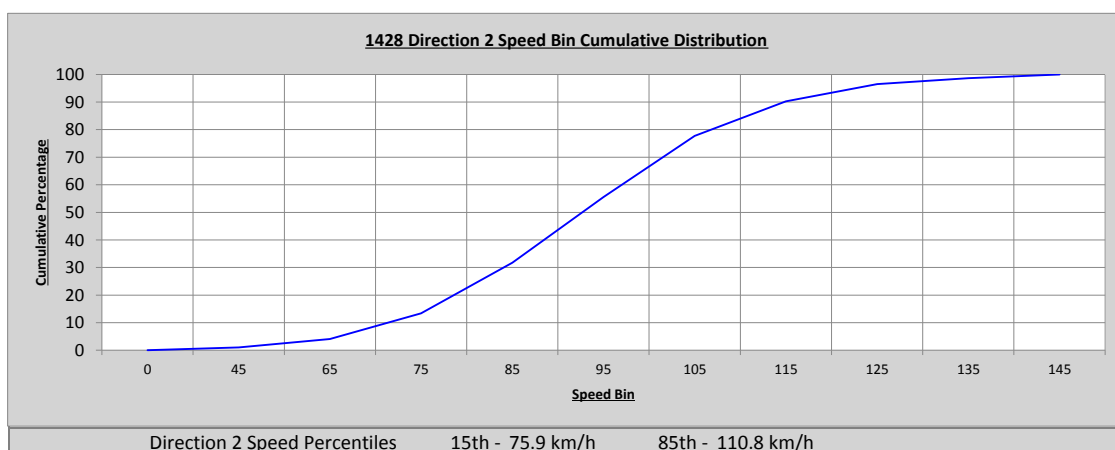
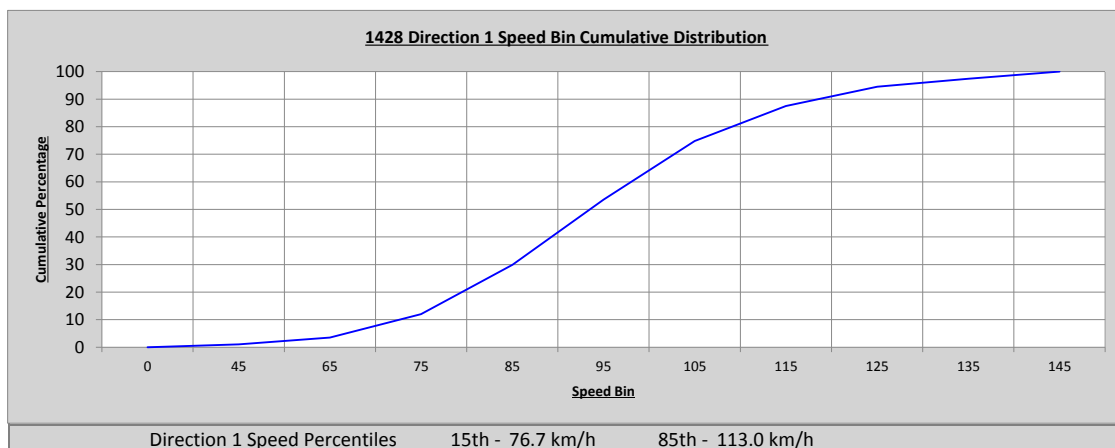
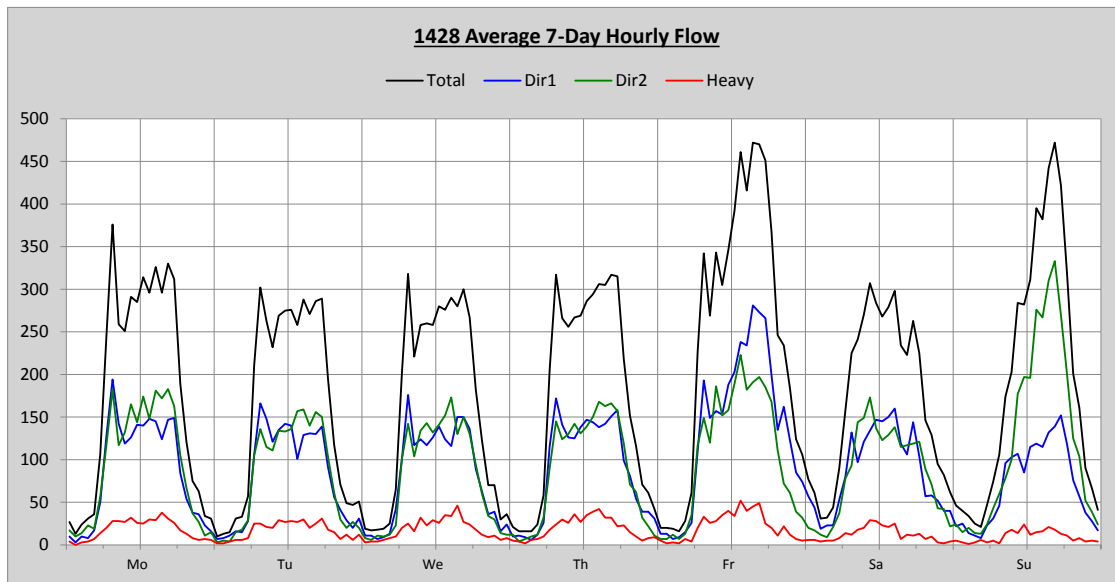
Speed Behaviour

Vehicles Exceeding speed Limit	45.40%
Vehicles Headway Less Than 2s	13.80%

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 Boschkop - Pretoria
 Phone: +27 12 991 0411
 e-mail: info@tes.co.za





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 Boschkop - Pretoria
 Phone: +27 12 991 0411
 e-mail: info@tes.co.za



APPENDIX 4: ROUGHNESS DATA (NOT APPLICABLE)

APPENDIX 5: AGREEMENT TO OCCUPY SANRAL'S PROPERTY

1. Definitions

For the purpose of this clause, the following words, phrases and expressions shall have the respective meanings assigned to each of them as set out hereunder:

- 1.1 "Commencement Date" shall mean ***.
- 1.2 "Designated Person" shall mean an employee, director, agent, independent contractor and/or representative of SANRAL, as the case may be;
- 1.3 "the Property" shall mean the property delineated on the plan annexed hereto marked "Appendix A";
- 1.4 "Termination Date" shall mean ***.

2. Option to occupy the Property

- 2.1 SANRAL hereby grants the Contractor an option to occupy the Property for the purpose of:
 - 2.1.1 ***;
 - 2.1.2 ***.
- 2.2 The Contractor may exercise the option referred to above by notifying SANRAL, within 30 (thirty) days of the Tender Award that it intends to use the Property, failing which this option will lapse and be of no further force or effect.

3. Use of the Property

- 3.1 In the event that the Contractor exercises the option to occupy the Property, it may do so with effect from the Commencement Date,
- 3.2 The Property may not be used for any purpose other than that prescribed above without the prior written approval of SANRAL.
- 3.3 If SANRAL is unable to give the Contractor occupation of the Property on the Commencement Date for any reason whatsoever, whether or not occasioned by the negligence of SANRAL and/or the Designated Person, the Contractor shall have no claim of whatsoever nature against SANRAL or the Designated Person.
- 3.4 SANRAL does not warrant that the Property is or will be suitable for any of the purposes for which the Contractor requires the Property.
- 3.5 SANRAL does not warrant that the Contractor will be granted or provided with any licences, consents, authorities, services or permits in respect of the Property for the proposed use thereof by the Contractor.
- 3.6 The Contractor shall comply with all laws, by-laws and regulations (including but not limited to the requirements of the Occupational Health and Safety Act 85 of 1993) relating to the Property and shall not contravene or permit contravention of any of the conditions of title under which the Property is held by SANRAL or any of the provisions of the town planning scheme applicable to the Property, nor do or cause or permit to be done in or about the Property anything which may be or cause a nuisance or disturbance to occupiers of neighbouring properties.
- 3.7 The Contractor's right to occupy the Property shall terminate on completion of Contract No. ***.

4. Electricity, water and other services

- 4.1 The Contractor may not install or arrange for any services such as water and electricity to be installed on the Property without the prior written consent of SANRAL.
- 4.2 In the event that SANRAL grants the consent referred to above, the Contractor shall be liable for the payment of all amounts due for the consumption of such services on the Property.
- 4.3 The Contractor hereby indemnifies and holds SANRAL harmless against any claim for payment for the consumption of services on the Property or any claim of whatsoever nature arising therefrom.

5. Exclusion of claims

- 5.1 The Contractor shall have no remedy against SANRAL and/or the Designated Person:
 - 5.1.1 by reason of the Property or any part thereof or any improvement thereto being in a defective condition or in a state of disrepair;
 - 5.1.2 in respect of any damage caused to furniture, equipment or any assets of any nature whatsoever kept on the Property by the Contractor, its employees, invitees, agents, directors or representatives;
 - 5.1.3 in respect of any claim of whatsoever nature for loss or damages allegedly suffered by the Contractor, its servants, invitees, agents, directors, clients or representatives arising from loss of life and/or injury to persons on the Property.
- 5.2 The Contractor hereby indemnifies and holds harmless SANRAL and/or the Designated Person against any claim arising from the Contractor's occupation of the Property.

6. Sub-letting

The Contractor shall not be entitled, except with the prior written consent of SANRAL:

- 6.1 to cede all or any of the rights of occupation of the Property; or
- 6.2 to sublet or give up possession of the Property, in whole or part, to any third party.

7. SANRAL's Right of Entry

SANRAL and/or the Designated Person shall be entitled to enter the Property at all reasonable times for the purpose of inspecting it in order to determine that the Contractor is complying with the rights and obligations granted to it with respect to the Property.

8. Obligation to maintain the Property

- 8.1 Prior to the Contractor taking occupation of the Property, SANRAL and the Contractor shall jointly inspect the Property.
- 8.2 During such inspection, the Contractor shall record the condition of the Property and any improvements thereto on the Inspection Form attached hereto marked "Appendix B". In the event that the Contractor does not arrange for the completion of such form, the Contractor shall be deemed to have accepted the Property as being without defect and in good order and repair.
- 8.3 At all times during the Contractor's occupation of the Property, the Contractor shall care for and maintain the Property in good order and repair, including any improvements thereto.

- 8.4 On the Termination Date or the date of termination of the Contractor's occupation of the Property, as the case may be, the Contractor shall return the Property and any improvements thereto in good order, condition and repair, fair wear and tear excepted, provided that SANRAL shall not be obliged to compensate the Contractor for any expenditure incurred by the Contractor in complying with the Contractor's obligations of maintenance, repair and replacement provided for herein.
- 8.5 Prior to the date of termination of occupation of the Property by the Contractor, SANRAL and the Contractor shall arrange a joint inspection of the Property and improvements thereto. Such inspection is to take place within a period of 3 (three) days prior to the date of termination with a view to ascertain if there was any damage caused to the Property or improvements thereto before the Contractor vacates the Property. SANRAL and the Contractor shall record the result of their inspection on the Inspection Form annexed hereto marked "Appendix C".
- 8.6 SANRAL and the Contractor shall make reference to the initial Inspection Form attached hereto marked Appendix "B" when undertaking the inspection prior to termination of the Contractor's occupation and shall record any damages or lost items which shall be repaired or replaced by the Contractor before the Contractor vacates the Property.
- 8.7 Should the Contractor fail to repair such damages to the Property or improvements thereto or fail to replace any missing articles, SANRAL may attend thereto and recover the cost thereof from the Contractor.
- 8.8 Should the Contractor fail to respond to SANRAL's request for an inspection, SANRAL shall, on termination of the Contractor's occupation of the Property, inspect the Property within 7 (seven) days from such termination in order to assess any damages or loss which occurred during the Contractor's occupancy, and may recover such loss or damages from the Contractor.

9. The Contractor's Employees

- 9.1 The Contractor shall not allow any of its employees and/or their relatives to live on the Property.
- 9.2 The Contractor shall be held liable for all persons entering onto the Property and such persons shall be considered to be under the control of the Contractor.
- 9.3 On the termination of the Contractor's occupation of the Property, the Contractor shall ensure that the Property is returned to SANRAL vacant and free of any unlawful or lawful occupiers.
- 9.4 In the event that any person remains in occupation of the Property on termination of the Contractor's occupation of the Property, and SANRAL is obliged to obtain a Court Order to enable it to evict such person, the Contractor shall be liable for all and any costs in this respect, including but not limited to legal costs and costs for relocating such person.

10. Remedies for Breach and Cancellation

Should the Contractor:

- 10.1 fail to comply with any of the terms and conditions relating to its occupation of the Property, as provided for herein; or
- 10.2 abandon the Property,

then, after having received written notification to remedy such breach within 7 (seven) days and having failed to do so, SANRAL shall have the right, but not be obliged to either:

- immediately terminate the Contractor's right to occupy the Property further notice; and/or
- take possession of the Property and claim damages arising from such breaches.

11. Early Termination of the Right to Occupy

- 11.1 Notwithstanding the rights granted to the Contractor in terms hereof, the Contractor acknowledges that SANRAL may terminate such rights prematurely in the event that SANRAL requires the Property for anything related to the construction, maintenance or operation of a national road.
- 11.2 Should SANRAL be required to terminate the Contractor's right of use of the Property, SANRAL shall be required to give no more than 3 (three) months' written notice to the Contractor of the required premature termination, and the Contractor shall:
- 11.2.1 vacate the Property on the premature termination date required by SANRAL;
 - 11.2.2 have no remedy against SANRAL as a result of such premature termination or its relocation arising from such premature termination.

12. Alterations and Improvements

- 12.1 The Contractor shall not make any alterations or improvements to the Property without SANRAL'S prior written consent.
- 12.2 In the event that SANRAL grants approval for alternations or improvements, this shall not preclude the Contractor from having to obtain any consent or approval that may be necessary from any applicable authority.
- 12.3 SANRAL shall not be liable for compensating the Contractor for the value of any improvements or alterations to the Property.

13. Development of the Property and/or Underground Services

- 13.1 SANRAL shall be entitled at any and at all times during the currency of the Contractor's occupation of the Property to affect such alterations, improvements and/or additions to the Property as SANRAL may deem necessary.
- 13.2 The Contractor shall have no claim against SANRAL for compensation, damages or otherwise, by reason of any interference with its occupation of the Property occasioned by any such alterations, improvements and/or additions, or arising from any failure or interruption in the supply of water and/or electricity and/or other services to the Property.
- 13.3 Where relevant, the Contractor shall bear the onus of investigating, at its expense, the existence or otherwise of any live or defunct underground services on or adjacent to the Property by making appropriate enquiries from the local municipality or any other competent authority.
- 13.4 Save in circumstances where SANRAL has in writing agreed to assume specific obligations to deal with underground services, whether live or abandoned, existing on the Property, the Contractor agrees that it shall have no claim whatsoever against SANRAL for the removal and/or modification of any underground services or abandoned services that may exist on the Property, nor for any direct or consequential losses which may be suffered by the Contractor arising out of any removal and/or modification or failure to remove and/or modify any of the said underground services or abandoned services.
- 13.5 SANRAL shall have the right to lay and use or continue using underground services of any nature on or under the Property and may grant such right to any third party without being liable for any loss or damage suffered by the Contractor as a result thereof. The Contractor shall not in any way, directly or indirectly, interfere or obstruct the laying or using of such underground services. SANRAL and/or any third party shall at all reasonable times have free access of the Property for the purpose of construction, maintenance, repairs, replacement or removal of such services.

14. **General**

- 14.1 No amendment or consensual cancellation of any of the above terms and conditions shall be binding unless recorded in a written document signed by SANRAL and the Contractor.
- 14.2 No extension of time, waiver, indulgence or relaxation or suspension of any of the provisions or terms applicable to the Contractor's occupation of the Property shall be binding unless recorded in a written document signed by the parties. Any such extension, waiver or relaxation or suspension which is so given or made shall be strictly construed as relating strictly to the matter in respect whereof it was made or given.

APPENDIX 5.1: PLAN OF THE PROPERTY

APPENDIX 5.2: PRE-OCCUPATION INSPECTION FORM

Exterior of the Property:

EXTERIOR	Good	Fair	Poor	None Present
ROOF				
WALLS / FENCE				
GATE				
GUTTERS				
PAVING				
GARDEN (outside taps)				
Carport				
GARAGE				

List other exterior improvements or defects not indicated above:

Improvements on the Property:

EXTERIOR	Good	Fair	Poor	None Present
GUTTERS				
PAVING				
OUTSIDE TAPS				
Carport				
GARAGE				
ROOMS OR OFFICES				
PARTITIONING				
FLOOR COVERING				
WALL COVERING				
CEILING				
KITCHEN				
BATHROOM & TOILET				
SECURITY GATE				
BURGLAR PROOFING				
INTERIOR DOORS				
EXTERIOR DOORS				
LOCKS				
LIGHT FITTINGS				

Details of any other improvements:

Occupancy Status:

- ☐ Verified – No occupants found on the Property.
- ☐ Illegal occupants: *Full details of location and names (add page with details)*

SIGNED AT: ON THIS DAY OF 20

.....
SIGNATURE

.....
SIGNATURE

.....
FULL NAME OF SANRAL'S REPRESENTATIVE

.....
FULL NAME OF CONTRACTOR'S
REPRESENTATIVE

APPENDIX 5.3: PRE-TERMINATION INSPECTION

a. Verify if the status or condition of any of the items as listed during the Pre-occupation inspection have changed. If so, furnish full detail, costs to repair damages and/or replace lost keys, etc.

b. Results:

☐ Property inspected – No damages found

OR

☐ Damages found – The following must be repaired or replaced:

ITEM TO BE REPAIRED / REPLACED	REPAIR?	REPLACE?	COST

☐ Property inspected: Property vacant

OR

☐ Property inspected: Property not vacant:

Number of persons remaining on Property:

SIGNED AT: ON THIS DAY OF 20

.....
SIGNATURE

.....
SIGNATURE

.....
FULL NAME OF SANRAL'S REPRESENTATIVE

.....
FULL NAME OF CONTRACTOR'S
REPRESENTATIVE

DISPUTE ADJUDICATION AGREEMENT

between

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

(Reg No. 1998/009584/06)

(**“Employer”**)

and

(Reg No. _____)

(**“Contractor”**)

and

(**“Member”**)

1. DEFINITIONS AND INTERPRETATIONS

- 1.1 In this Dispute Adjudication Agreement, unless the context otherwise indicates :
- 1.1.1 **“Contract”** means Contract SANRAL ... *(insert contract number)* for the *(insert contract description)* entered into between the Employer and the Contractor.
- 1.1.2 **“Contractor”** means ... *(insert contractor's details)* appointed by the Employer under the Contract.
- 1.1.3 **“DAB”** means the three person Dispute Adjudication Board as contemplated in clause 20 of the Conditions of Contract for Construction for Building and Engineering Works designed by the Employer, published by the Fédération Internationale des Ingénieurs-Conseils (hereinafter referred to as “GCC”), in accordance with the terms and conditions as set out in this Dispute Adjudication Agreement.
- 1.1.4 **“Dispute Adjudication Agreement”** means the tripartite agreement between the Employer, Contractor and Member.
- 1.1.5 **“Effective Date”** means the date that this Dispute Adjudication Agreement shall take effect, and unless otherwise stated, it shall be the latest date when the Employer, the Contractor, Member and each of the Other Members have respectively signed a Dispute Adjudication Agreement.
- 1.1.6 **“Employer”** means the South African National Roads Agency SOC Limited, Registration No. 1998/009584/06
- 1.1.7 **“Engineer”** means ... *(insert engineer's details)*.
- 1.1.8 **“Member”** means Mr _____, who *(Note to compiler: Delete the following for members other than for the Chairperson's agreement)* will act as chairman of the DAB and who is one of the three persons who are jointly called the DAB.
- 1.1.9 **“Other Members”** means the persons other than the Member, forming part of the DAB
- 1.1.10 **“Parties”** means the Employer, Contractor and Member
- 1.2 In the Dispute Adjudication Agreement, words and expressions which are not otherwise defined shall have the meanings assigned to them in the Contract

2. GENERAL PROVISIONS

- 2.1 Following the Effective Date, the Employer and the Contractor shall each give notice to the Member accordingly. If the Member does not receive either notice within six months after entering into the Dispute Adjudication Agreement, it shall be void and ineffective.
- 2.2 This employment of the Member is a personal appointment. At any time, the Member may give not less than 70 days' notice of resignation to the Employer and to the Contractor, and the Dispute Adjudication Agreement shall terminate upon the expiry of this period.
- 2.3 No assignment or subcontracting of the Dispute Adjudication Agreement is permitted without the prior written agreement of all the Parties to it and of the Other Members.
- 2.4 The Dispute Adjudication Agreement shall be governed by the law of the Republic of South Africa.
- 2.5 All disputes will be heard in _____, Republic of South Africa, unless otherwise agreed by the Parties.

3. WARRANTIES

- 3.1 The Member warrants and agrees that he/she is and shall be impartial and independent of the Employer, the Contractor and the Engineer. The Member shall promptly disclose, to each of them

and to the Other Members, any fact or circumstance which might appear inconsistent with his/her warranty and agreement of impartiality and independence.

- 3.2 When appointing the Member, the Employer and the Contractor relies upon the Members' representations that he/she is:
- a) experienced in the work which the Contractor is to carry out under the Contract,
 - b) experienced in the interpretation of contract documentation, and
 - c) fluent in the language for communications defined in the Contract.

4. APPOINTMENT

- 4.1 The Employer and the Contractor hereby jointly appoint the Member as a Member of a three-person DAB on the terms and conditions as set out in the Dispute Adjudication Agreement, which appointment the Member by his/her signature hereto accepts;
- 4.2 The conditions of the Dispute Adjudication Agreement comprise the following:
- a) The Dispute Adjudication Agreement together with any addenda or schedules hereto; including the procedural rules;
 - b) The GCC, as amended by any particular conditions, to the extent that it is applicable to the DAB and the Member.

5. GENERAL OBLIGATIONS OF THE MEMBER

Note to compiler: Delete this clause for members other than the Chairperson's agreement

- 5.1 The Member shall act as chairman of the DAB and shall; ensure smooth administration; keep all records; ensure compliance to procedural rules; ensure the ethics of the DAB remain unchallenged; coordinate between the Parties and the DAB; chair meetings and site visits; ensure procedural correctness of all recommendations and decisions of the DAB.
- 5.2 The Member shall have no interest financial or otherwise in the Employer, the Contractor or the Engineer, nor any financial interest in the Contract except for payment under the Dispute Adjudication Agreement.
- 5.3 The Member shall not previously have been employed as a consultant or otherwise by the Employer, the Contractor or the Engineer, except in such circumstances as were disclosed in writing to the Employer and the Contractor before they signed the Dispute Adjudication Agreement.
- 5.4 The Member shall have disclosed in writing to the Employer, the Contractor and the Other Members, before entering into the Dispute Adjudication Agreement and to his/her best knowledge and re-collection, any professional or personal relationships with any director, officer or employee of the Employer, the Contractor or the Engineer, and any previous involvement in the overall project of which the Contract forms part.
- 5.5 The Member shall not, for the duration of the Dispute Adjudication Agreement, be employed as a consultant or otherwise by the Employer, the Contractor, any member/partner of the Contractor or the Engineer, except as may be agreed in writing by the Employer, the Contractor and the Other Members. Notwithstanding this restriction, the Member shall not be restricted to be employed as a consultant or otherwise by the Employer, the Contractor or the Engineer on another contract or matter, but shall disclose to the Employer, the Contractor, and the Other Members, before he/she consult, advises or accepts any instructions from either the Employer, the Contractor, any member/partner of the Contractor, or the Engineer and confirming that such advice, consultation or other instruction taken from such person shall not affect the Member's ability to be unbiased in relation to his/her duties under the Dispute Adjudication Agreement.
- 5.6 The Member shall comply with the annexed procedural rules and Sub-Clause 20.4 of the conditions of Contract.
- 5.7 The Member shall not give advice to the Employer, the Contractor, the Employer's personnel or the Contractor's personnel concerning the conduct of the Contract, other than in accordance with the annexed procedural rules.

- 5.8 The Member shall not while a Member enter into discussions or make any agreement with the Employer, the Contractor or the Engineer regarding employment by any of them, whether as a consultant or otherwise, after ceasing to act under this Dispute Adjudication Agreement.
- 5.9 The Member shall ensure his/her availability for all site visits and hearings as are necessary.
- 5.10 The Member shall become conversant with the Contract and with the progress of the Works (and of any parts of the project of which the Contract forms part) by studying all documents received which shall be maintained in a current working file.
- 5.11 The Member shall treat the details of the Contract and all the DAB's activities and hearings as private and confidential, and not publish or disclose them without the prior written consent of the Employer, the Contractor and the Other Members.
- 5.12 The Member shall be available to give advice and opinions, on any matter relevant to the Contract when requested by both the Employer and the Contractor, subject to the agreement of the Other Members.

6. GENERAL OBLIGATIONS OF THE EMPLOYER AND THE CONTRACTOR

- 6.1 The Employer, the Contractor, the Employer's personnel and the Contractor's personnel shall not request advice from or consultation with the Member regarding the Contract, otherwise than in the normal course of the DAB's activities under the Contract and the Dispute Adjudication Agreement, and except to the extent that prior agreement is given by the Employer, the Contractor and the Other Members. The Employer and the Contractor shall be responsible for compliance with this provision, by the Employer's personnel and the Contractor's personnel respectively.
- 6.2 The Employer and the Contractor undertake to each other and to the Member that the Member shall not, except as otherwise agreed in writing by the Employer, the Contractor, the Member and the Other Members:
- a) be appointed as an arbitrator in any arbitration under the Contract;
 - b) be called as a witness to give evidence concerning any dispute before arbitrator(s) appointed for any arbitration under the Contract;
 - c) be called as a witness or act on behalf of the Employer or Contractor, concerning any dispute that became the subject of litigation under the Contract; or
 - d) be liable for any claims for anything done or omitted in the discharge or purported discharge of the Members functions unless the act or omission is shown to have been in bad faith.
- 6.3 The Employer and the Contractor hereby jointly and severally indemnify and hold the Member harmless against and from claims from which he/she is relieved from liability under the preceding paragraph.

7. PAYMENT

- 7.1 The Member shall be paid a retainer fee of R... (excluding VAT) per calendar month, which shall be considered as payment in full for:
- i) being available on 28 days' notice for all site visits and hearings;
 - ii) becoming and remaining conversant with all project developments and maintaining relevant files;
 - iii) all office and overhead expenses including secretarial services, photocopying and office supplies incurred in connection with his/her duties; and
 - iv) all services performed hereunder except those referred to in sub-paragraphs 7.4, 7.5, 7.6 and 7.7 of this Clause.
- 7.2 The retainer fee shall be paid with effect from the last day of the calendar month in which the Dispute Adjudication Agreement becomes effective; until the last day of the calendar month in which the Taking-Over Certificate is issued for the whole of the Works.
- 7.3 With effect from the first day of the calendar month following the month in which the Taking-Over Certificate is issued for the whole of the Works, the retainer fee shall be reduced by 50%. This reduced fee shall be paid until the first day of the calendar month in which the Member resigns or the Dispute Adjudication Agreement is otherwise terminated.

- 7.4 The Member shall be paid a site visit daily fee of R... (excluding VAT), (reduced to an hourly fee of one eighth the daily fee, for part of a day), which shall be considered as payment in full for:
- i) each day or part of a day up to a maximum of one day's travel time in each direction for the journey between the Member's home and the site or another location of a meeting with the Other Members, as agreed by the Parties.
 - ii) each working day or part of a day on site visits.
- 7.5 The Member shall be paid a dispute analysis daily fee of R... (excluding VAT), (reduced to an hourly fee of one eighth the daily fee, for part of a day), which shall be considered as payment in full for:
- i) each day or part of a day spent on dispute analysis, hearings or preparing decisions; and
 - ii) each day or part of a day spent reading submissions in preparation for a hearing.
- 7.6 The Member shall be paid a pupillage daily fee of R... (excluding VAT), (reduced to an hourly fee of one eighth the daily fee, for part of a day), which shall be considered as payment in full for:
- i) each day or part of a day spent on preparation for pupillage.
 - ii) each day or part of a day spent on offering practical experience and mentoring to assigned pupil.
- 7.7 The Member shall be paid all reasonable expenses incurred in connection with the Member's duties, including the cost of the following:
- i) Travel expenses :-
 - Own car - motor vehicle travel expenses will be recovered at the relevant South African Automobile Association rates,
 - Car hire – group B or similar,
 - Flights – economy class.
 - ii) Accommodation – any type of accommodation up to R1,300.00 per day all inclusive,
 - iii) Subsistence costs.
- 7.8 The Member shall be paid all Value Added Taxes as per the law.
- 7.9 The retainer fee and daily fees shall remain fixed for the 1st 24 calendar months and shall thereafter be adjusted by the twelve-month year on year CPI index (as published in the monthly bulletin P0141 of Statistics South Africa under table B) at each anniversary of the Effective Date. The base month shall be the 12th month following the Effective Date.
- 7.10 The Member shall be paid in South African Rands.
- 7.11 The member shall submit invoices for payment of the monthly retainer and may include an estimate of the next month's airfares which will be incurred (and which will be reconciled and adjusted in the subsequent invoice). Invoices for other expenses and for daily fees shall be submitted following the conclusion of a site visit or hearing. All invoices shall be accompanied by a DAB fee claim containing records of previous fee claims and a breakdown of activities performed during the relevant period and shall be addressed to the Contractor.
- 7.12 Notwithstanding the fact that the appointment is of the Member in his/her personal capacity the Member may invoice and receive payment to a legal entity of which he/she is a member, shareholder or partner.
- 7.13 The Contractor shall pay the Member's invoices in full within 30 calendar days after receiving each valid invoice, half of which shall be recovered by the Contractor from the Employer.
- 7.14 If the Member does not receive payment of the amount due within 70 days after submitting a valid invoice, the Member may (i) suspend his/her services (without notice) until the payment is received and/or (ii) resign his/her appointment by giving notice under Clause 8.

8. TERMINATION

- 8.1 At any time: (i) the Employer and the Contractor may jointly terminate the Dispute Adjudication Agreement by giving 42 days' notice to the Member; or (ii) the Member may resign as provided for under Clause 2.

- 8.2 If the member fails to comply with the Dispute Adjudication Agreement, the Employer and the Contractor may, without prejudice to their other rights, terminate it by notice to the Member. The notice shall take effect when received by the Member.
- 8.3 If the Employer or the Contractor fails to comply with the Dispute Adjudication Agreement, the Member may, without prejudice to his/her other rights, terminate it by notice to the Employer and the Contractor. The notice shall take effect when received by them both.
- 8.4 Any such notice, resignation and termination shall be final and binding on the Employer, the Contractor and the Member. However, a notice by the Employer or the Contractor, but not by both, shall be of no effect.

9. DEFAULT OF THE MEMBER

- 9.1 If the Member fails to comply with any obligation under Clause 5, he/she shall not be entitled to any fees or expenses hereunder and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses received by the Member and the Other Members, for proceedings or decisions (if any) of the DAB which are rendered void or ineffective.

10. DISPUTES

- 10.1 Any dispute or claim arising out of or in connection with the Dispute Adjudication Agreement, or the breach, termination or invalidity thereof, shall be finally settled by arbitration under the Rules of Arbitration of the Association of Arbitrators of Southern Africa by one Arbitrator appointed by agreement of the Member, the Employer and the Contractor or, failing such agreement, by the Chairman for the time being of the Association of Arbitrators.

11. DOMICILIA AND NOTICES

- 11.1 The Parties choose as their *domicilia citandi et executandi* for all purposes under the Dispute Adjudication Agreement, whether in respect of notices or other documents or communications of whatsoever nature (including the exercise of any option), the following addresses:

11.1.1 Employer (*domicilia citandi et executandi*):

Address: South African National Roads Agency SOC Limited
48 Tambotie Avenue, Val de Grace, Pretoria, 0184
Reference: ... CEO

Employer (*General Communication*)

Address: South African National Roads Agency SOC Limited
... Region, ..., ..., ...
Fax Number: ...
Tel. Number: ...
Reference: ... Regional Manager, ... Region

11.1.2 Contractor:

Address: ...
...
Fax Number: ...
Tel. Number: ...
Reference: ..., Contract Director

11.1.3 Member:

Address: ...
...
Fax Number: ...

Tel. Number: ...
Reference: ...,

- 11.2 Any notice or communication required or permitted to be given in terms of the Dispute Adjudication Agreement shall be valid and effective only if in writing, but it shall be competent to give notice by telefax or registered mail.
- 11.3 Any Party may by notice to the other Party change the physical address chosen as its *domicilium citandi et executandi* vis-à-vis that Party to another physical address in the Republic of South Africa or its telefax number, provided that the change shall become effective vis-à-vis that addressee on the 7th business day from the deemed receipt of the notice by the addressee.
- 11.4 Notwithstanding anything to the contrary herein contained a written notice or communication actually received by a Party shall be an adequate written notice or communication to it notwithstanding that it was not sent to or delivered at its chosen *domicilium citandi et executandi*.

12. SIGNATORIES

- 12.1 Signed for and on behalf of the Employer by:

.....
Name Signature of duly authorised representative
.....
Date

In the presence of Witness:

.....
Name Signature
.....
Date

- 12.2 Signed for and on behalf of the Contractor by:

.....
Name Signature of duly authorised representative
.....
Date

In the presence of Witness:

.....
Name Signature
.....
Date

- 12.3 Signed by the Member:

.....
Name Signature
.....
Date

In the presence of Witness:

.....
Name Signature

.....
Date

ANNEXURE 1

PROCEDURAL RULES

1. Unless otherwise agreed by the Employer and the Contractor, the DAB shall visit the site at intervals of not more than 140 days, including times of critical construction events, at the request of either the Employer or the Contractor. Unless otherwise agreed by the Employer, the Contractor and the DAB, the period between consecutive visits shall not be less than 70 days, except as required to convene a hearing as described below.
2. The timing of and agenda for each site visit shall be as agreed jointly by the DAB, the Employer and the Contractor, or in the absence of agreement, shall be decided by the DAB. The purpose of site visits is to enable the DAB to become and remain acquainted with the progress of the Works and of any actual or potential problems or claims.
3. Site visits shall be attended by the Employer, the Contractor and the Engineer and shall be co-ordinated by the Employer in co-operation with the Contractor. The Employer shall ensure the provision of appropriate conference facilities and secretarial and copying services. At the conclusion of each site visit and before leaving the site, the DAB shall prepare a report on its activities during the visit and shall send copies to the Employer and the Contractor.
4. The Employer and the Contractor shall furnish to each member of the DAB one copy of all documents which the DAB may request, including Contract documents, progress reports, variation instructions, certificates and other documents pertinent to the performance of the Contract. All communications between the DAB and the Employer or the Contractor shall be copied to the other Party.
5. If any dispute is referred to the DAB in accordance with Sub-clause 20.4 of the GCC, the DAB shall proceed in accordance with Sub-clause 20.4 and these Rules. Subject to the time allowed to give notice of a decision and other relevant factors, the DAB shall:
 - a) act fairly and impartially as between the Employer and the Contractor, giving each of them a reasonable opportunity of putting his case and responding to the other's case, and
 - b) adopt procedures suitable to the dispute, avoiding unnecessary delay or expense.
6. The DAB may conduct a hearing on the dispute, in which event it will decide on the date and place for the hearing and may request that written documentation and arguments from the Employer and the Contractor be presented to it prior to or at the hearing.
7. Except as otherwise agreed in writing by the Employer and the Contractor, the DAB shall have power to adopt an inquisitorial procedure, to refuse admission to hearings or audience at hearings to any persons other than representatives of the Employer, the Contractor and the Engineer, and to proceed in the absence of any party whom the DAB is satisfied received notice of the hearing; but shall have discretion to decide whether and to what extent this power may be exercised.
8. The Employer and the Contractor empower the DAB, among other things, to:
 - a) establish the procedure to be applied in deciding a dispute,
 - b) decide upon the DABs' own jurisdiction, and as to the scope of any dispute referred to it,
 - c) conduct any hearing as it thinks fit, not being bound by any rules or procedures other than those contained in the Contract and these Rules,
 - d) take the initiative in ascertaining the facts and matters required for a decision,
 - e) make use of its own specialist knowledge, if any,
 - f) decide upon the payment of financing charges in accordance with the Contract,
 - g) decide upon any provisional relief such as interim or conservatory measures, and
 - h) open up, review and revise any certificate, decision, determination, instruction, opinion or valuation of the Engineer, relevant to the dispute.

9. The DAB shall not express any opinions during any hearing concerning the merits of any arguments advanced by the Parties, unless requested by both the Employer and Contractor. Prior to giving notice to its decision:
- a) it shall convene in private after a hearing, in order to have discussions and prepare its decision;
 - b) it shall endeavour to reach a unanimous decision: if this proves impossible the applicable decision shall be made by a majority of the Members' who may require the minority Member to prepare a written report for submission to the Employer and the Contractor; and
 - c) if a Member fails to attend a meeting or hearing, or to fulfil any required function, the other two Members may nevertheless proceed to make a decision, unless:
 - i) either the Employer or the Contractor does not agree that they do so, or
 - ii) the absent Member is the chairman and he/she instructs the other Members not to make a decision.

Thereafter, the DAB shall make and give notice to its decision in accordance with Sub-clause 20.4 or as otherwise agreed by the Employer and the Contractor in writing.

COMPULSORY DECLARATION (INCORPORATING SBD4)

The following particulars must be furnished. In the case of a joint venture, separate declarations in respect of each partner must be completed and submitted.

Section 1: Enterprise details

Section 1: Enterprise details	
Name of enterprise	
Contact person	
E-mail	
Telephone	
Cell	
Fax	
Physical address	
Postal address	

Section 2: Particulars of companies and close corporations

Company / Close Corporation registration number	
---	--

Section 3: SARS information

Tax reference number	
VAT registration number	(state Not Registered if not registered for VAT)

Section 4: CIDB registration number

CIDB Registration number	
--------------------------	--

Section 5: Particulars of principals

Principal: means a natural person who is a partner in a partnership, a sole proprietor, a director of a company established in terms of the Companies Act of 2008 (Act No. 71 of 2008) or a member of a close corporation registered in terms of the Close Corporations Act, 1984, (Act No. 69 of 1984)

[illegible]

Attach separate page if necessary.

Section 6: Record in the service of the state:

Indicate by marking the relevant boxes with a cross, if any principal is currently or has been within the last 12 months in the service of any of the following:

- | | |
|--|--|
| <input type="checkbox"/> a member of any municipal council | <input type="checkbox"/> an employee of any department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999) |
| <input type="checkbox"/> a member of any provincial legislature | |
| <input type="checkbox"/> a member of the National Assembly or the National Council of Province | <input type="checkbox"/> a member of an accounting authority of any national or provincial public entity |
| <input type="checkbox"/> a member of the board of directors of any municipal entity | <input type="checkbox"/> an employee of Parliament or a provincial legislature |
| <input type="checkbox"/> an official of any municipality or municipal entity | |

If any of the above boxes are marked, disclose the following:

Name of principal	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

Insert separate page if necessary.

Section 7: Record of family member in the service of the state:

Family member: a person's spouse, whether in a marriage or in a customary union according to indigenous law, domestic partner in a civil union, or child, parent, brother, sister, whether such relationship results from birth, marriage or adoption

Indicate by marking the relevant boxes with a cross, if any family member of a principal as defined in section 5 is currently or has within the last 12 months been in the service of any of the following:

- | | |
|--|--|
| <input type="checkbox"/> a member of any municipal council | <input type="checkbox"/> an employee of any department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999) |
| <input type="checkbox"/> a member of any provincial legislature | |
| <input type="checkbox"/> a member of the National Assembly or the National Council of Province | <input type="checkbox"/> a member of an accounting authority of any national or provincial public entity |
| <input type="checkbox"/> a member of the board of directors of any municipal entity | <input type="checkbox"/> an employee of Parliament or a provincial legislature |
| <input type="checkbox"/> an official of any municipality or municipal entity | |

If any of the above boxes are marked, disclose the following:

Name of family member	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

Insert separate page if necessary

Section 8: Record of termination of previous contracts with an organ of state

Was any contract between the tendering entity, including any of its joint venture partners, terminated during the past five years for reasons other than the employer no longer requiring such works or the employer failing to make payment in terms of the contract?

☐ Yes ☐ No (tick appropriate box)

If yes, provide particulars:

Insert separate page if necessary

Section 9: Declaration

The undersigned, who warrants that he/she is duly authorised to do so on behalf of the tendering entity, confirms that the contents of this Declaration are within my personal knowledge, save where stated otherwise in an attachment hereto, and to the best of my belief is both true and correct, and that:

- i) neither the name of the tendering entity, nor any of its principals, appears on:
 - a) the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004 (Act No. 12 of 2004); or
 - b) National Treasury's Database of RestrictError! Hyperlink reference not valid.ww.treasury.gov.za);
- ii) the tendering entity or any of its principals has not been convicted of fraud or corruption by a court of law (including a court outside of the Republic of South Africa) within the last five years;
- iii) any principal who is presently employed by the state has the necessary permission to undertake remunerative work outside such employment (attach permission to this declaration);
- iv) the tendering entity is not associated, linked or involved with any other tendering entities submitting tender offers;
- v) the tendering entity has not engaged in any prohibited restrictive horizontal practices, including consultation, communication, agreement, or arrangement with any competing or potential tendering entity regarding prices, geographical areas in which goods and services will be rendered, approaches to determining prices or pricing parameters, intentions to submit a tender or not, the content of the submission (specification, timing, conditions of contract, etc.) or intention to not win a tender;
- vi) the tendering entity has no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest;
- vii) neither the tenderer nor any of its principals owes municipal rates and taxes or municipal service charges to any municipality or a municipal entity, and are not in arrears for more than three months;
- viii) SARS may, on an on-going basis during the term of the contract, disclose the tenderer's tax compliance status to the Employer and, when called upon to do so, obtain the written consent of any subcontractors who are subcontracted to execute a portion of the contract that is entered into in excess of the threshold prescribed by National Treasury, for SARS to do likewise.

I, the undersigned
certify that the information furnished in this form above is correct. I accept that the Employer may cancel this agreement should this declaration prove to be false.

.....
Signature (duly authorised)

.....
Date

.....
PositionName of Enterprise

NOTE 1: Section 30(1) of the Public Service Act, 1994, prohibits an employee (person who is employed in posts on the establishment of departments) from performing or engaging remunerative work outside his or her employment in the relevant department, except with the written permission of the executive authority of the department. When in operation, Section 8(2) of the Public Administration Management Act, 2014, will prohibit an employee of the public administration (i.e. municipalities and all national departments, national government components listed in Part A of Schedule 3 to the Public Service Act, provincial departments including the office of the premier listed in Schedule 1 of the Public Service Act and provincial departments listed in schedule 2 of the Public Service Act, and provincial government components listed in Part B of schedule 3 of the Public Service Act) or persons contracted to executive authorities in accordance with the provisions of section 12A of the Public Service Act of 1994 or persons performing similar functions in municipalities, from conducting business with the State or to be a director of a public or private company conducting business with the State. The offence for doing so is a fine or imprisonment for a period not exceeding five years, or both. It is also a serious misconduct which may result in the termination of employment by the employer.

NOTE 2: Regulation 44 of Supply Chain Management regulations issued in terms of the Municipal Finance Management Act of 2003 requires that municipalities and municipal entities should not award a contract to a person who is in the service of the State, a director, manager or principal shareholder in the service of the State or who has been in the service of the State in the previous twelve months.

NOTE 3: Regulation 45 of Supply Chain Management regulations requires a municipality or municipal entity to disclose in the notes to the annual statements particulars of any award made to a close family member in the service of the State.

NOTE 4: Corrupt activities which give rise to an offence in terms of the Prevention and Combating of Corrupt Activities Act of 2004, include improperly influencing in any way the procurement of any contract, the fixing of the price, consideration or other moneys stipulated or otherwise provided for in any contract, and the manipulating by any means of the award of a tender.

NOTE 5: Section 4 of the Competition Act of 1998 prohibits restrictive horizontal practice, including agreements between parties in a horizontal relationship, which have the effect of substantially preventing or lessening competition, directly or indirectly fixing prices or dividing markets or constituting collusive tendering. Section 5 also prohibits restrictive vertical practices. Any restrictive practices that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties.

TAX COMPLIANCE PERMISSION DECLARATION

I, (name)
the undersigned in my capacity as (position)
on behalf of
..... (name of company)
herewith grant consent that SARS may disclose to the South African National Roads Agency SOC
Limited (SANRAL) our tax compliance status on an ongoing basis for the contract term.

For this purpose, our unique security personal identification number (PIN) is
our tax reference number is and our tax clearance certificate number is

SIGNATURE:

DATE:

APPENDIX 7: IMPORTED CONTENT DECLARATION

ANNEX D: IMPORTED CONTENT DECLARATION – SUPPORTING SCHEDULE TO ANNEX C

(D1)	Tender No.:										
(D2)	Tender Description:										
(D3)	Designated Product(s):										
(D4)	Tender Authority:										
(D5)	Tendering Entity Name:										
(D6)	Tender Exchange Rate:	Pula	P		EU	€		GBP	£	Note: VAT to be excluded from all calculations	

A. Exempted imported content				Calculation of imported content						Summary	
Tender item no's	Description of imported content	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Exchange Rate	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl. VAT	Tender Qty	Exempted imported value
(D7)	(D8)	(D9)	(D10)	(D11)	(D12)	(D13)	(D14)	(D15)	(D16)	(D17)	(D18)
(D19) Total exempt imported value										R0	
This total must correspond with Annex C - C 21											

B. Imported directly by the Tenderer				Calculation of imported content						Summary	
Tender item no's	Description of imported content	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Exchange Rate	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl. VAT	Tender Qty	Exempted imported value
(D33)	(D34)	(D35)	(D36)	(D37)	(D38)	(D39)	(D40)	(D41)	(D42)	(D43)	(D44)
(D45) Total imported value by 3 rd party										R0	

C. Imported by a 3 rd party and supplied to the Tenderer				Calculation of imported content						Summary	
Description of imported content	Unit of measure	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Rate of Exchange	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl. VAT	Quantity imported	Total imported value
(D33)	(D34)	(D35)	(D36)	(D37)	(D38)	(D39)	(D40)	(D41)	(D42)	(D43)	(D44)
(D45) Total imported value by 3 rd party											R 0

D. Other foreign currency payments			Calculation of foreign currency payments		Summary of payments
Type of payment	Local supplier making the payment	Overseas beneficiary	Foreign currency value paid	Tender Rate of Exchange	
(D46)	(D47)	(D48)	(D49)	(D50)	
(D52) Total of foreign currency payments declared by tenderer and/or 3 rd party					R 0

Signature of tenderer from Annexure B:
(SATS 1286.2011)

(D53) Total of imported content & foreign currency payments -
(D32), (D45) & (D52) above

R 0

This total must correspond with Annex C - C 23

Date:

ANNEX E: IMPORTED CONTENT DECLARATION - SUPPORTING SCHEDULE TO ANNEX C

(E1)	Tender No.:		Note: VAT to be excluded from all calculations
(E2)	Tender Description:		
(E3)	Designated Product(s):		
(E4)	Tender Authority:		
(E5)	Tendering Entity Name:		

Local Products (Goods, Services and Works)	Description of items purchased	Local suppliers	Value
	(E6)	(E7)	(E8)
(E9) Total local products (Goods, Services and Works)			R 0
(E10)	Manpower costs	(Tenderer's manpower cost)	R 0
(E11)	Factory overheads	(Rental, depreciation & amortisation, utility costs, consumables etc.)	R 0
(E12)	Administration overheads and mark-up	(Marketing, insurance, financing, interest etc.)	R 0
(E13) Total local content			R 0
This total must correspond with Annex C - C24			

Signature of tenderer from Annexure B:
(SATS 1286.2011)

Date:

Process when requesting exemption letters

For exemption requests on designated products and the minimum threshold for local content cannot be met for various reasons, bidders must apply for exemption per tender. After checking with the industry, **the dti** will decide whether to grant an exemption or not.

In the official request (signed letter), the following information should be included:

- Procuring entity/government department/state owned company.
- Tender/bid number.
- Closing date.
- Item(s) for which the exemption is being requested for.
- Description of the goods, services or works for which the requested exemption item will be used for and the local content that can be met.
- Reason(s) for the request.
- Supporting letters from local manufacturers and suppliers.

NB - Exemption letters are tender specific and applications are not transferrable.

The turnaround time in response to exemption letters for all designated products is five working days with the exception of rail and boats/vessels which is seven working days.

Request for exemption letters are to be directed to:

Dr Tebogo Makube

Chief Director: Industrial Procurement

Tel: 012 394 3927

E-mail: tmakube@thedti.gov.za.

The turnaround time in response to textile, clothing, leather and footwear exemption letters request is two working days and requests are to be directed to:

Patricia Khumalo

Tel: 012 394 1390

E-mail: khumaloP@thedti.gov.za.

Guidance Document for the Calculation of Local Content

1. DEFINITIONS

Unless explicitly provided in this guideline, the definitions given in SATS 1286:2011 apply.

2. GENERAL

2.1. Introduction

This guideline provides tenderers with a detailed description of how to calculate local content of products (goods, services and works) by components/material/services and enables them to keep an updated record for verification requirements as per the SATS 1286:2011 Annexure A and B.

The guideline consists of two parts, namely:

- a written guideline; and
- three declarations that must be completed:
 - Declaration C: “Local Content Declaration – Summary Schedule” (see Annexure C);
 - Declaration D: “Imported Content Declaration – Supporting Schedule to Annex C” (see Annexure D); and
 - Declaration E: “Local Content Declaration – Supporting Schedule to Annex C” (see Annexure E).

The guidelines and declarations should be used by tenderers when preparing a tender. A tenderer must complete Declarations D and E, and consolidate the information on Declaration C.

Annexure C must be submitted with the tender by the closing date and time as determined by the Tender Authority. The Tender Authority reserves the right to request that Declarations D and E also be submitted.

If the tender is successful, the tenderer must continuously update Declarations C, D and E with actual values for the duration of the contract.

NOTE:

Annexure A is a note to the purchaser in SATS 1286:2011; and
Annexure B is the Local Content Declaration IN SATS 1286:2011.

2.2. What is local content?

According to SATS 1286:2011, the local content of a product is the tender price less the value of imported content, expressed as a percentage. It is, therefore, necessary to first compute the imported value of a product to determine the local content of a product.

2.3. Categories: Imported and Local Content

The tenderer must differentiate between imported content and local content.

Imported content of a product by components/material/services is separated into two categories, namely:

- products imported directly by the tenderer; and
- products imported by a third party and supplied to the tenderer.

2.3.1. Imported Content

Identify the imported content, if any, by value for products by component/material/services. In the case of components/materials/services sourced from a South African manufacturer, agent, supplier or subcontractor (i.e. third party), obtain that information and Declaration D from the third party.

Calculate the imported content of components/materials/services to be used in the manufacture of the total quantity of the products for which the tender is to be submitted.

As stated in clause 3.2.4 of SATS 1286:2011: "If information on the origin of components, parts or materials is not available, it will be deemed to be imported content."

2.3.1.1. Imported directly by the tenderer:

When the tenderer import products directly, the onus is on the tenderer to provide evidence of any components/materials/services that were procured from a non-domestic source. The evidence should be verifiable and pertain to the tender as a whole. Typical evidence will include commercial invoices, bills of entry, etc.

When the tenderer procures imported services such as project management, design, testing, marketing, etc and makes royalty and lease payments, such payments relating to the tender must be included when calculating imported content.

2.3.1.2. Imported by a third party and supplied to the tenderer:

When the tenderer supplies components/material/services that are imported by any third party (for example, a domestic manufacturer, agent, supplier or subcontractor in the supply chain), the onus is on the tenderer to obtain verifiable evidence from the third party.

The tenderer must obtain Declaration D from all third parties for the related tender. The third party must be requested by the tenderer to continuously update Declaration D. Typical evidence of imported content will include commercial invoices, bills of entry etc.

When a third party procures imported services such as project management, design, testing, marketing etc. and makes royalty and lease payments, such payments relating to the tender must be included when calculating imported content.

2.3.1.3. Exempt Imported Content:

Exemptions, if any, are granted by the Department of Trade and Industry (**the dti**). Evidence of the exemptions must be provided and included in Annexure D.

2.3.2. Local Content

Identify and calculate the local content, by value for products by components/materials/services to be used in the manufacture of the total quantity of the products.

3. ANNEXURE C

3.1. Guidelines for completing Annexure C: Local Content Declaration – Summary Schedule

Note: The paragraph numbers correspond to the numbers in Annexure C.

C1. Tender Number

Supply the tender number that is specified on the specific tender documentation.

C2. Tender description

Supply the tender description that is specified on the specific tender documentation.

C3. Designated products

Supply the details of the products that are designated in terms of this tender (i.e. buses).

C4. Tender Authority

Supply the name of the tender authority.

C5. Tendering Entity name

Provide the tendering entity name (for example, Unibody Bus Builders (Pty) Ltd).

C6. Tender Exchange Rate

Provide the exchange rate used for this tender, as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

C7. Specified local content %

Provide the specified minimum local content requirement for the tender (i.e. 80%), as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MDB) 6.2.

C8. Tender item number

Provide the tender item number(s) of the products that have a local content requirement as per the tender specification.

C9. List of items

Provide a list of the item(s) corresponding with the tender item number.
This may be a short description or a brand name.

Calculation of local content

C10. Tender price

Provide the unit tender price of each item excluding VAT.

C11. Exempted imported content

Provide the ZAR value of the exempted imported content for each item, if applicable. These value(s) must correspond with the value(s) of column D16 on Annexure D.

C12. Tender value net of exempted imported content

Provide the net tender value of the item, if applicable, by deducting the exempted imported content (C11) from the tender price (C10).

C13. Imported value

Provide the ZAR value of the items' imported content.

C14. Local value

Provide the local value of the item by deducting the Imported value (C13) from the net tender value (C12).

C15. Local content percentage (per item)

Provide the local content percentage of the item(s) by dividing the local value (C14) by the net tender value (C12) as per the local content formula in SATS 1286.

Tender Summary

C16. Tender quantity

Provide the tender quantity for each item number as per the tender specification.

C17. Total tender value

Provide the total tender value by multiplying the tender quantity (C16) by the tender price (C10).

C18. Total exempted imported content

Provide the total exempted imported content by multiplying the tender quantity (C16) by the exempted imported content (C11). These values must correspond with the values of column D18 on Annexure D.

C19. Total imported content

Provide the total imported content of each item by multiplying the tender quantity (C16) by the imported value (C13).

C20. Total tender value

Total tender value is the sum of the values in column C17.

C21. Total exempted imported content

Total exempted imported content is the sum of the values in column C18. This value must correspond with the value of D19 on Annexure D.

C22. Total tender value net of exempted imported content

The total tender value net of exempt imported content is the total tender value (C20) less the total exempted imported content (C21).

C23. Total imported content

Total imported content is the sum of the values in column C19. This value must correspond with the value of D53 on Annexure D.

C24. Total local content

Total local content is the total tender value net of exempted imported content (C22) less the total imported content (C23). This value must correspond with the value of E13 on Annexure E.

C25. Average local content percentage of tender

The average local content percentage of tender is calculated by dividing total local content (C24) by the total tender value net of exempted imported content (C22).

4. ANNEXURE D

4.1. Guidelines for completing Annexure D: “Imported Content Declaration – Supporting Schedule to Annexure C”

Note: The paragraph numbers correspond to the numbers in Annexure D.

D1. Tender number

Supply the tender number that is specified on the specific tender documentation.

D2. Tender description

Supply the tender description that is specified on the specific tender documentation.

D3. Designated products

Supply the details of the products that are designated in terms of this tender (i.e. buses).

D4. Tender authority

Supply the name of the tender authority.

D5. Tendering entity name

Provide the tendering entity name (i.e. Unibody Bus Builders (Pty) Ltd).

D6. Tender exchange rate

Provide the exchange rate used for this tender, as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

Table A. Exempted Imported Content

D7. Tender item number

Provide the tender item number(s) of the product(s) that have imported content.

D8. Description of imported content

Provide a list of the exempted imported product(s), if any, as specified in the tender.

D9. Local supplier

Provide the name of the local supplier(s) supplying the imported product(s).

D10. Overseas supplier

Provide the name(s) of the overseas supplier(s) supplying the exempted imported product(s).

D11. Imported value as per commercial invoice

Provide the foreign currency value of the exempted imported product(s) disclosed in the commercial invoice accepted by the South African Revenue Service (SARS).

D12. Tender exchange rate

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

D13. Local value of imports

Convert the value of the exempted imported content as per commercial invoice (D11) into the ZAR value by using the tender exchange rate (D12) disclosed in the tender documentation.

D14. Freight costs to port of entry

Provide the freight costs to the South African Port of the exempted imported item.

D15. All locally incurred landing costs and duties

Provide all landing costs including customs and excise duty for the exempted imported product(s) as stipulated in the SATS 1286:2011.

D16. Total landed costs excl VAT

Provide the total landed costs (excluding VAT) for each item imported by adding the corresponding item values in columns D13, D14 and D15. These values must be transferred to column C11 on Annexure C.

D17. Tender quantity

Provide the tender quantity of the exempted imported products as per the tender specification.

D18. Exempted imported value

Provide the imported value for each of the exempted imported product(s) by multiplying the total landed cost (excl. VAT) (D16) by the

tender quantity (D17). The values in column D18 must correspond with the values of column C18 of Annexure C.

D19. Total exempted imported value

The total exempted imported value is the sum of the values in column D18. This total must correspond with the value of C21 on Annexure C.

Table B. Imported Directly By Tenderer

D20. Tender item numbers

Provide the tender item number(s) of the product(s) that have imported content.

D21. Description of imported content:

Provide a list of the product(s) imported directly by tender as specified in the tender documentation.

D22. Unit of measure

Provide the unit of measure for the product(s) imported directly by the tenderer.

D23. Overseas supplier

Provide the name(s) of the overseas supplier(s) supplying the imported product(s).

D24. Imported value as per commercial Invoice

Provide the foreign currency value of the product(s) imported directly by tenderer disclosed in the commercial invoice accepted by the South African Revenue Service (SARS).

D25. Tender rate of exchange

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

D26. Local value of imports

Convert the value of the product(s) imported directly by the tenderer as per commercial invoice (D24) into the ZAR value by using the tender exchange rate (D25) disclosed in the tender documentation.

D27. Freight costs to port of entry

Provide the freight costs to the South African Port of the product(s) imported directly by the tenderer.

D28. All locally incurred landing costs and duties

Provide all landing costs including customs and excise duty for the product(s) imported directly by the tenderer as stipulated in the SATS 1286:2011.

D29. Total landed costs excl VAT

Provide the total landed costs (excluding VAT) for each item imported directly by the tenderer by adding the corresponding item values in columns D26, D27 and D28.

D30. Tender quantity

Provide the tender quantity of the product(s) imported directly by the tenderer as per the tender specification.

D31. Total imported value

Provide the total imported value for each of the product(s) imported directly by the tenderer by multiplying the total landed cost (excl. VAT) (D29) by the tender quantity (D30).

D32. Total imported value by tenderer

The total value of imports by the tenderer is the sum of the values in column D31.

Table C. Imported by Third Party and Supplied to the Tenderer

D33. Description of imported content

Provide a list of the product(s) imported by the third party and supplied to the tenderer as specified in the tender documentation.

D34. Unit of measure

Provide the unit of measure for the product(s) imported by the third party and supplied to tenderer as disclosed in the commercial invoice.

D35. Local supplier

Provide the name of the local supplier(s) supplying the imported product(s).

D36. Overseas supplier

Provide the name(s) of the overseas supplier(s) supplying the imported products.

D37. Imported value as per commercial invoice

Provide the foreign currency value of the product(s) imported by the third party and supplied to the tenderer disclosed in the commercial invoice accepted by SARS.

D38. Tender rate of exchange

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

D39. Local value of imports

Convert the value of the product(s) imported by the third party as per commercial invoice (D37) into the ZAR value by using the tender exchange rate (D38) disclosed in the tender documentation.

D40. Freight costs to port of entry

Provide the freight costs to the South African Port of the product(s) imported by third party and supplied to the tenderer.

D41. All locally incurred landing costs and duties

Provide all landing costs including customs and excise duty for the product(s) imported by third party and supplied to the tenderer as stipulated in the SATS 1286:2011.

D42. Total landed costs excluding VAT

Provide the total landed costs (excluding VAT) for each product imported by third party and supplied to the tenderer by adding the corresponding item values in columns D39, D40 and D41.

D43. Quantity imported

Provide the quantity of each product(s) imported by third party and supplied to the tenderer for the tender.

D44. Total imported value

Provide the total imported value of the product(s) imported by third party and supplied to the tenderer by multiplying the total landed cost (D42) by the quantity imported (D43).

D45. Total imported value by third party

The total imported value from the third party is the sum of the values in column D44.

Table D. Other Foreign Currency Payments

D46. Type of payment

Provide the type of foreign currency payment. (i.e. royalty payment for use of patent, annual licence fee, etc).

D47. Local supplier making the payment

Provide the name of the local supplier making the payment.

D48. Overseas beneficiary

Provide the name of the overseas beneficiary.

D49. Foreign currency value paid

Provide the value of the listed payment(s) in their foreign currency.

D50. Tender rate of exchange

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

D51. Local value of payments

Provide the local value of each payment by multiplying the foreign currency value paid (D49) by the tender rate of exchange (D50).

D52. Total of foreign currency payments declared by tenderer and/or third party

The total of foreign currency payments declared by tenderer and/or a third party is the sum of the values in column D51.

D53. Total of imported content and foreign currency payment

The total imported content and foreign currency payment is the sum of the values in column D32, D45 and D52. This value must correspond with the value of C23 on Annexure C.

5. ANNEXURE E

5.1. Guidelines to completing Annexure E: “Local Content Declaration-Supporting Schedule to Annexure C”

The paragraph numbers correspond to the numbers in Annexure E

E1. Tender number

Supply the tender number that is specified on the specific tender documentation.

E2. Tender description

Supply the tender description that is specified on the specific tender documentation.

E3. Designated products

Supply the details of the products that are designated in terms of this tender (for example, buses/canned vegetables).

E4. Tender authority

Supply the name of the tender authority.

E5. Tendering entity name

Provide the tendering entity name (for example, Unibody Bus Builders (Pty) Ltd) Ltd).

Local Goods, Services and Works

E6. Description of items purchased

Provide a description of the items purchased locally in the space provided.

E7. Local supplier

Provide the name of the local supplier that corresponds to the item listed in column E6.

E8. Value

Provide the total value of the item purchased in column E6.

E9. Total local products (Goods, Services and Works)

Total local products (goods, services and works) is the sum of the values in E8.

E10. Manpower costs:

Provide the total of all the labour costs accruing only to the tenderer (i.e. not the suppliers to tenderer).

E11. Factory overheads:

Provide the total of all the factory overheads including rental, depreciation and amortisation for local and imported capital goods, utility costs and consumables. (Consumables are goods used by individuals and businesses that must be replaced regularly because they wear out or are used up. Consumables can also be defined as the components of an end product that are used up or permanently altered in the process of manufacturing, such as basic chemicals.)

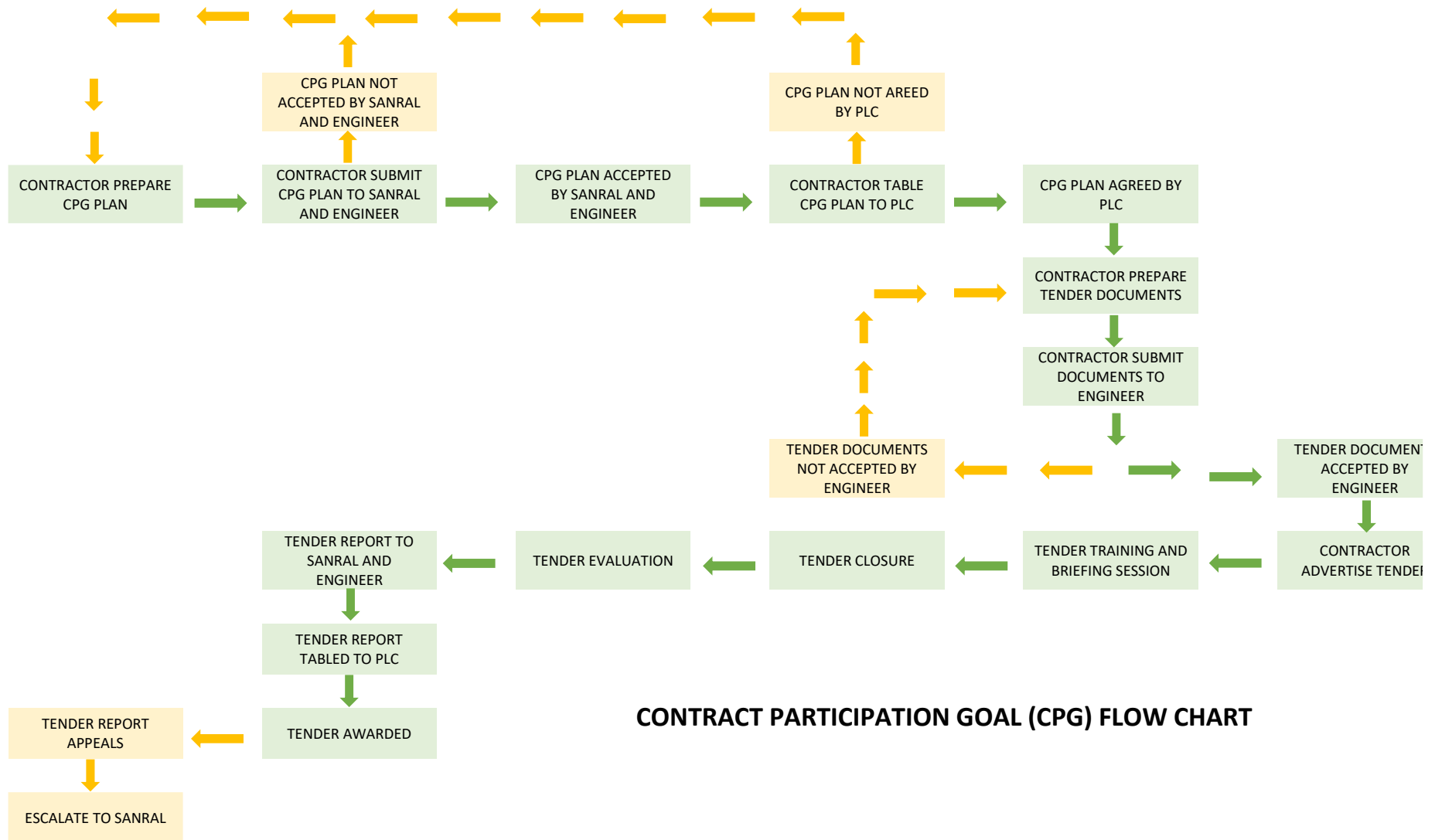
E12. Administration overheads and mark-up:

Provide the total of all the administration overheads, including marketing, insurance, financing, interest and mark-up costs.

E13. Total local content:

The total local content is the sum of the values of E9, E10, E11 and E12. This total must correspond with C24 of Annexure C.

APPENDIX 8: CONTRACT PARTICIPATION GOAL (CPG) PLAN FORMAT



Contractor Logo and details

Contract Participation Goal Plan

SANRAL Contract Number: XXXX

Contract Name: XXXX

(SANRAL Logo)



Author:
Date:
Version

1. INTRODUCTION

2. OBJECTIVE

3. TARGETED ENTERPRISES

- a. List of Work Packages for Targeted Enterprises
- b. List of Work Packages for Main Contractor

Table 1: CPG Expenditure Breakdown

Project Number				
Project Name				
Designated Groups	Final Contract Value		R	
	Min (TE) CPG Target		%	
	Min (TE CPG Target Amount		R	
Description of CPG Category	CPG Target as per Contract		CPP Planned Achievement	
	Min. Target % as per Contract	Target Amount	Min. Allocated % as per Market Analyses	Expected Amount
Targeted Labour (TL)	Min. xx% of Final Contract Value	R	%	R
Youth				
Women				
Disabled				
Other				
Targeted Enterprise (TE)	Min. xx% of Final Contract Value	R	%	R
Youth				
Women				
Military Veterans				
Disabled				
CIDB 1 and 2				
CIDB 3 and 4				
Other				

c. Breakdown of Work Packages

The table below describes the work package breakdown with reference to Designated Groups and Functionality:

Table 1: Breakdown of Work Packages

Project Number															
Project Name															
Contract Price															
CPG Target %															
CPG Target Value															
No.	Type of Work Package	EME or QSE	TE Amount	% of CPG Value	Proposed CIDB Grading	Tender Value Limit	Proposed No. of Work Packages	Proposed TE Target Group Amount					CIDB Expenditure		
								Black Youth	Black Woman	Black Military Veterans	Black Disabled	Other	Black 1&2CE	Black 3&4 CE	Comment
TE Sub-contractors															
1															
2															
3															
TE Suppliers and Service Providers															
4															
5															
6															
TE Sub-contractor Sub-total															
TE Supplier/Service Provider Sub-total															
Provisional Total															
Provisional %															
Target Amount															
Target %															

d. Schedule of works and CPG Expenditure Plan

i. Schedule of work (Insert Programme)

ii. CPG Expenditure Plan

Table 3: Example: CPG Expenditure Plan

Planned CPG Expenditure					
Final Contract Value	R 100 000 000				
CPG (TE) Value	R 30 000 000				
Timeline	2021/2022	2021/2022	2021/2022	2021/2022	Total
Project Expenditure	R 20 000 000	R 30 000 000	R 30 000 000	R 20 000 000	R 100 000 000
Work Packages (CPG %) Expenditure	R 6 000 000	R 9 000 000	R 9 000 000	R 6 000 000	R 30 000 000
Cumulative % Spend	20%	50%	80%	100%	
Cumulative Amount Spend	R 6 000 000	R 6 000 000	R 6 000 000	R 6 000 000	R 6 000 000
Package 1	R 2 000 000				
Package 2	R 2 000 000				
Package 3	R 2 000 000				
Total	R 6 000 000	R	R	R	R

e. Targeted Enterprises Procurement Program

Table 4: Example: Targeted Enterprise Procurement program

Item	Activity Name	Duration (Days)	Start	Finish

f. Procedures for Targeted Enterprises Sub-contracting (*As Per Section D1000 of the Specifications*)

i. Tender Preparation

1. Compilation of TE Work Packages
2. Establishment of a Help Desk
3. Market Analysis and Resources and Skills Audit
4. Compilation of Tender Documents

ii. Tender Process

1. Advertising of Works Packages

2. Tender Briefing Sessions
3. Minimum Tender Submission Documents
4. Tender Closure and Opening of Tenders
- iii. Tender Evaluation
 1. Eligibility
 2. Functionality
 3. Price and Preference
 4. Compliance Check
- iv. Appointment of Successful Targeted Enterprise
 1. Price and Rates Discussion
 2. Sub-contract Agreement

4. TARGETED LABOUR

- g. Appointment of Targeted Labour

5. TRAINING DEVELOPMENT AND IMPLEMENTATION PLAN

- h. General Overview
- i. Purpose of the Training Interventions
- j. Proposed Training for Targeted Enterprises and Targeted Labour

The table below depicts the proposed training for the Targeted Enterprises.

Table 5: Proposed Targeted Enterprise Training

Training Summary							
No.	Course Content	Facilitator or Mentor	No. of Participants	Duration of the Course	Training Type	Start Date	Comments
1							
2							
3							
4							
5							
Etc.							

The table below depicts the proposed training for the Targeted Labour.

Table 6: Proposed Targeted Labour Training

Training Summary							
No.	Course Content	Facilitator or Mentor	No. of Participants	Duration of the Course	Training Type	Start Date	Comments
1							
2							
3							
4							
5							
Etc.							

- k. Training Methodology
- l. Selection of Participants
- m. Targeted Participants
- n. Training Materials
- o. Training Times
- p. Training Implementation Plan
- q. Supporting Documents

APPENDIX 9: SANRAL PROJECT LIAISON COMMITTEE AND PROJECT LIAISON OFFICER FORMS

FORM A1: PROJECT LIAISON COMMITTEE – MEMBER NOMINATION FORM

Notes to Nominators and Nominees:

(a) General Principles of Membership:

- i) Membership is open to any person residing within the boundaries of the Project Area and that are duly nominated by their constituency.
- ii) Persons nominated as co-opted members do not necessarily have to reside within the boundaries of the Project Area (see explanation in c) below).
- iii) The nomination process will be conducted in consultation with the Local Municipalities within the Project Area.

(b) Nominations for Membership

- i) Nominators will submit this prescribed nomination form and include the following information:
 - a. Name of the nominee,
 - b. Name of the proposer and five (5) seconders,
 - c. Residential address of the nominee,
 - d. Constituency whom the nominee will represent, and
 - e. Acceptance of nomination by the nominee.

(c) Co-opted Members

- i) Co-opted members are members that the PLC chooses to add in addition to PLC members selected through the representative nomination process.
- ii) Co-opted members may include a PLC member from the RRM PLC within the Project Area, Councillors, and specialists such as environmental specialists, etc.
- iii) Co-opted members will have limited participation rights in PLC meetings, will not have voting rights and will not receive any seating allowance for participating in the PLC meeting.

(d) Duration of Membership

- i) The duration of a nominee's membership of the PLC will depend on the duration of the project or the duration of the PLC, whichever occurs first.
- ii) A nominee's membership will end with immediate effect in terms of the Rules of Engagement for PLC members.

1. Details of individual or organisation making the nomination:

I,, representing
hereby nominate
to be a member of the PLC for Project
.....

Signature Date

2. Details of the seconders (individuals supporting the nomination):

	Name	Surname	Organisation	Signature
1				
2				
3				
4				
5				

3. Details of the individual accepting the nomination (nominee):

Name and Surname	
Organisation	
Residential Address	
Ward Number	
Municipality	

I,, I.D. number

hereby accept the nomination to be a member of the PLC for Project

.....

I further accept to be bound by the rules, responsibilities and duties prescribed for the Project Liaison Committee Members and the Project Liaison Officers and will always act in good faith.

Signature Date

Witnesses:

Name and Surname Signature

Name and Surname Signature

FORM A2: PROJECT LIAISON COMMITTEE – RULES, RESPONSIBILITIES AND DUTIES (Derived from D1004.03)

The PLC is the official communication channel through which SANRAL, the Engineer, Contractor and project Stakeholders and affected Communities communicates on project matters. This platform is also used to communicate the impact that the project has or may have on project Stakeholders and the affected Communities. This part of Section D of the Specifications describes the general processes pertaining to the PLC, as well as its role and responsibilities.

1. Establishment of the PLC

The PLC will be established prior to commencement of the Contract or as soon as possible by SANRAL. The PLC consists of SANRAL, the Engineer, Contractor and representatives of project Stakeholders and affected Communities. To ensure that all relevant Stakeholders are represented in the PLC, SANRAL did, or will, consult with the Executive Mayor's office, as well as with the LED Department of the Local Municipalities in the Project Area. Once the PLC has been established, the Employer's further Stakeholder engagement activities shall not prevent the Contractor from continuing with construction.

Typical Stakeholder representation on the PLC may include:

- a) A PLC member from the relevant RRM PLC.
- b) Local Municipality LED Office.
- c) Traditional leadership representation.
- d) Forums representing people with disabilities.
- e) Forums representing women.
- f) Forums representing youth.
- g) Forums representing business sector.
- h) Forums representing transport sector.
- i) Any other Stakeholder forum/organisation recognised by SANRAL and the Local Municipality's LED Office.

Every forum/organisation/constituency may have one (1) representative on the PLC, which representation will be confirmed by a duly signed nomination form.

It should be noted that the PLC is not a political platform. While Councillors may be invited to some PLC meetings, they may not be PLC members and hence, will not have voting rights when attending a PLC meeting.

2. Seating Allowance for PLC Members

PLC membership is voluntary and PLC members will not be remunerated for any time spent or work done associated with representing their constituency on the PLC.

Provision has been made in the Contract for a seating allowance (stipend) to PLC members for actual costs incurred in executing their PLC duties (other than time or work related). The Contractor will determine and table to the PLC a realistic seating allowance which will be substantiated by an outline of the anticipated actual costs envisaged to be incurred by PLC members.

The seating allowance will be increased annually based on the CPI figure contained in Table B2 of Statistical Release P0141 by StatsSA.

3. Induction of the PLC

SANRAL will conduct an induction meeting with the PLC to acquaint PLC members with the following information:

- a) SANRAL's Horizon 2030 Strategy.

- b) SANRAL's Fourteen Point Plan.
- c) The role and responsibilities of PLC members.
- d) SANRAL's Transformation Policy.
- e) How the Transformation Policy impacts on SMMEs.
- f) Relevant details of the Contract, e.g.
 - i) Start and end dates
 - ii) Important milestones
 - iii) CPG targets
 - iv) Envisaged Targeted Enterprise packages
 - v) Envisaged work for other SMMEs (non-CPG).

2. Rules of Engagement for the PLC

In the execution of their duties, members of the PLC shall adhere to the undertakings listed below and the Contractor shall inform the Engineer of any transgression of these undertakings.

a) General Matters and Membership

- i) A PLC member may not be a politically elected representative, and political party representation will not be allowed in the PLC.
- ii) Ward Councillors may interact with the project team through the Mayor's Office.
- iii) If required, and in consultation with SANRAL, a Political Steering Committee (PSC) may be established to address political matters. A PSC will only be established where the Project Area traverse over more than one municipal area.

b) Term of Office for the PLC

- i) The duration of PLC members' participating in the PLC (term of office) shall depend on the duration of the project.
- ii) If SANRAL finds the performance of a PLC member to be below expectation or their conduct to be unacceptable, the affected member will be discharged from their obligations and a new nomination process shall commence.

c) Targeted Enterprise and Targeted Labour

PLC members shall:

- i) ensure that they, or companies in which they hold equity, will not tender on the Contract for any work or sub-contract that may be issued. Should they tender, this will be treated as a conflict of interest and the tender proposal submitted will not be evaluated.
- ii) not have private or business interests in any of the sub-contract tenders tabled to the PLC or considered in this Contract.
- iii) shall recuse themselves from discussions that deal with a sub-contract tender if any other member is of the opinion that a member's participation in deliberations, which is rightly or wrongly construed as improper or irregular, may lead to the award of a sub-contract to a tenderer known to the member or to the member itself.
- iv) recuse themselves from the operations of the PLC following a situation as described in paragraphs ii) above and shall cease to be a PLC member for this Contract.
- v) during the tender and tender evaluation processes, neither deliberately favoured nor prejudiced a person or tenderer, as intended, or contemplated in treasury Regulation 16, A8.3 (a), (b) & (c).
- vi) ensure that no conflict of interest arises from members' involvement in the PLC and potential involvement in targeted labour recruitment and/or targeted enterprises procurement and/or any other supplier/sub-contractor/service provider procurement or involvement in the contract.

d) Confidentiality

- i) PLC members shall accept that all information, documentation, and decisions regarding any matter serving before the PLC are confidential and undertake not to communicate decisions or discussions of PLC meetings to external or internal parties unless so directed and approved by the Project Manager.
 - ii) Information for public dissemination shall be clearly indicated by the committee to ensure that sensitive information is only disseminated to the correct audience.
- e) Removal from Office
 - i) PLC members who violate the provisions of these Rules of Engagement for PLCs will be removed from their role as a PLC member at the sole discretion of SANRAL.
 - ii) SANRAL reserves the right to recover any costs from PLC members whose actions can be regarded as detrimental to SANRAL or to the execution of the project.
 - iii) SANRAL also reserves the right to recommend criminal prosecution if the offence warrants such action.
 - iv) SANRAL reserves the right to dissolve the entire PLC should it believe that such an action is in its best interest, or that of the project. SANRAL will not be obliged to reconstitute the PLC if such a dissolution occurs.

3. Responsibilities and Duties of the PLC

The PLC will execute specific duties during the design and construction phases of the project.

Some of the PLC's duties during the design and construction stages overlap and hence, for completeness, a description of the PLC's duties in both project stages is provided here.

The PLC will execute the following duties:

- a) Project Design Stage
 - i) Meet as often as required to discuss and resolve the project's design stage matters which are of interest or concern to the parties to the PLC.
 - ii) Peruse the Project Liaison Committee rules, responsibilities and duties outlined in this Form and agree on the rules, responsibilities, and duties of, and procedures to be followed by, the PLC to fulfil its duties.
Note: The principles outlined in this Form shall not be amended, but duties and procedures may be altered to be project specific and to improve the functionality of the PLC.
 - iii) Act in accordance with the agreed terms of reference for the PLC.
 - iv) Inform SANRAL of any training that project Stakeholder and affected Community representatives of the PLC require to execute their duties.
 - v) Assist the Engineer to source suitable candidates, based on SANRAL's qualifying criteria, for the position of PLO.
 - vi) Observe and verify that the qualifying criteria and procedures applied by the Engineer to select and employ the PLO were executed in a fair and transparent manner and were within the prescripts of the relevant labour legislation and regulations.
 - vii) Assist the Engineer to identify the project's Target and Project Area(s) from which Targeted Labour and Targeted Enterprises could be employed and sub-contracted, respectively.
 - viii) Assist the Engineer to identify the project's Target Groups for inclusion in the Tender Documents and agree to and support the identified Target Groups.
- b) Project Construction Stage
 - i) Meet formally prior to SANRAL's monthly site meeting, or as may be required, to discuss and resolve project matters which are of interest or concern to the parties to the PLC.

- ii) Assist the Contractor to establish the selection criteria and process to employ Targeted Labour
- iii) Assist the Contractor to identify the eligibility, functionality, preference, and compliance criteria to select and sub-contract Targeted Enterprises.
- iv) Agree to and support the Databases compiled by the PLO and the Contractor from which Targeted Labour will be selected and employed and Targeted Enterprises will be sub-contracted, respectively.
- v) Verify that the criteria and methodologies applied by the Contractor to select and employ Targeted Labour and sub-contract Targeted Enterprises are executed in a fair and transparent manner and are within Government legislation and regulations and SANRAL's Policies.
- vi) Verify that the conditions of employment and the conditions of sub-contracting, in the employment of Targeted Labour and sub-contracting of Targeted Enterprises are applied in a fair and transparent manner and according to SANRAL's employment and sub-contracting requirements.
- vii) Make recommendations to the Contractor on the training needs, eligibility criteria and selection criteria for the provision of training to Targeted Labour, Targeted Enterprises, Designated Groups, project Stakeholders and the affected Communities.
- viii) Verify that training and skills development programmes, which the Contractor committed to, are implemented, and executed as approved and intended.
- ix) Inform the entities whom they represent of any project matters which the respective party to the PLC wishes to communicate with each other.
- x) Inform the entities whom they represent of any project matters that are impacting or may impact, either positively or negatively, on the respective parties to the PLC.
- xi) Inform the Contractor of Stakeholder and/or Community requests and/or needs, which could possibly be addressed within the project's Scope of Work.
- xii) Inform the SANRAL, the Engineer and Contractor of any road safety concerns within the Project Area(s) and advise them of possible mitigating measures and/or road safety programs that will be most suitable for acceptance by the affected Communities to promote road safety.
- xiii) Agree on a dispute resolution mechanism to resolve any disputes that may arise between the parties to the PLC.
- xiv) Assist parties to the PLC to liaise with their respective entities to resolve any disputes amongst the parties which may occur due to the project.

4. PLC Meetings

- a) Frequency
 - i) Meetings will be conducted monthly or as required by the Stakeholders or the project matters.
- b) Notice of meetings
 - i) The notice of the PLC meeting shall be given at least seven (7) calendar days prior to the meeting date.
 - ii) Where meetings have been diarised over a period by the PLC, it shall be the duty of each PLC member to ensure his/her attendance on the set dates.
 - iii) Where a PLC member has missed any meeting, he/she bears the onus of establishing the date and venue of the next meeting.
- c) Venue
 - i) The venue for PLC meetings shall be the project site office or any other venue agreed to by the members of the PLC and approved by SANRAL.
 - ii) During the Covid 19 lockdown, or any other lockdown as announced by government, the meetings shall be held on an online platform such as WhatsApp, Teams, Zoom or similar.

- d) Agenda
 - i) An agenda shall be made available or displayed to all participants at the commencement of such meetings or the minutes of the previous meeting will serve as the agenda of such meetings.
 - ii) The agenda shall not be amended without prior approval from SANRAL.
- e) Chairperson
 - i) PLC meetings shall be chaired by SANRAL which will typically be the SANRAL's Project Manager, or a SANRAL staff member with decision-making delegation, or the Engineer.
 - ii) The Chairperson shall:
 - a. chair all meetings of the PLC,
 - b. co-ordinate all the activities of PLC,
 - c. ensure that members are fulfilling their tasks as assigned by the PLC,
 - d. see to the execution of decisions taken by the PLC,
 - e. ensure the validity of members' claim for allowance,
 - f. ensure compliance of all activities of the PLC with current rules, law and general SANRAL policy, and
 - g. be a co-signatory to all official documents of the PLC.
- f) Secretariate
 - i) The Engineer's staff shall provide a secretarial service to take minutes of PLC meetings.
 - ii) Secretarial support other than taking minutes at PLC meetings shall be provided by the PLO.
- g) Quorum
 - i) The quorum for PLC meetings shall be constituted by 50%+1 ratio excluding co-opted members.
- h) Apologies and Non-attendance
 - i) Apologies shall be in writing except in emergency where the member apologising cannot communicate the apology in writing.
 - ii) Apologies may be sent through any media agreed to prior by the PLC for example through SMS or WhatsApp messaging or similar application.
 - iii) The organization, represented by a member who fails to attend three (3) consecutive meetings without an apology, will be informed in writing and asked to nominate a replacement member.
- i) Language
 - i) The meetings will be conducted in English to enable all participants at the meeting to understand the discussions of the meeting.
 - ii) However, care and consideration must be given to provide non-English speakers an opportunity to participate. Therefore, where desirable, any of the 11 official languages maybe be used to conduct the meeting. If another language other than English is used, the minutes of the meeting will need to be transcribed, translated, and recorded in English.
- j) Other
 - i) The PMT shall provide a finger lunch for PLC members at PLC meetings.

5. Amendments or Additions

The rules, responsibilities, and duties for PLC members in this Form are adopted and will be in force with effect from this day of 20.....

	Name and Surname	Signature	Date
Accepted for SANRAL			
Accepted for Engineer			
Accepted for Contractor			
Accepted for PLC			
Accepted by PLC			

FORM A3: CHECKLIST – PROJECT LIAISON COMMITTEE – MEMBER APPOINTMENT

Notes:

- a) The checklist consists of several sections. Only print the relevant sections.
- b) Indicate what has been completed and sign off at the end.
- c) While other individuals can assist in this process, the Project Manager (PM) remains accountable for all deliverables.
- d) All forms/records to be kept by the PM and availed to line management upon request.

Form No.	Item	Explanatory Note for Compliance Check	Responsibility	Complete (Yes/No or N/A)
A3.1	PLC Member Appointment:			
1	Nomination forms completed.	a)	Form must indicate the nominee and the individual or organisation making the nomination.	Stakeholder Coordinator (SC) /Contracts Engineer (CE)
		b)	Forms circulated with the assistance of Municipality's LED office.	SC/CE
		c)	All completed forms collected from the Municipality's LED office.	SC/CE
2	Members selected.	a)	Confirm the membership of the PLC.	SC/Project Management Team (PMT)
		b)	Where there are multiple entries, the team can select the member with the highest number of nominations.	SC/PMT
		c)	Where there is an equal number of nominations, the team will request the nominating organisation to confirm the member who should join the PLC.	SC/PMT
		d)	The last alternative is to allow for a snap election in a community meeting.	SC/PMT
		e)	Communicate the PLC membership to the affected stakeholders.	SC/PMT
3	Formal appointment to PLC signed.	a)	Ensure that the PLC membership is confirmed in line with Form A3.2	SC/Project Manager (PM)

Form No.	Item	Explanatory Note for Compliance Check		Responsibility	Complete (Yes/No or N/A)
		b)	All members must be provided with a copy of the PLC Duties and Responsibilities (extract from D1004.03). The signed duties and responsibilities must be scanned and shared with all members. The PM retains a copy for future reference.	SC/PMT	
		c)	Document must be signed again when the membership changes. The PM must add the version of the document to ensure that the various versions can be tracked.	PM	
Stakeholder Coordinator:					
Name		Sign		Date	
Project Manager:					
Name		Sign		Date	

FORM A3.2: PROJECT LIAISON COMMITTEE – MEMBER LIST

No.	Sector/Entity/Forum	Name and Surname	Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FORM A4: CHECKLIST – PROJECT LIAISON OFFICER – APPOINTMENT

Notes:

- The checklist consists of several sections. Only print relevant sections.
- Indicate what has been completed and sign off at the end.
- While other individuals can assist in this process, the Project Manager (PM) remains accountable for all deliverables.
- All forms/records to be kept by the PM and availed to line management upon request.

Form No.	Item	Explanatory Note for Compliance Check	Responsibility	Complete (Yes/No or N/A)	
A4	PLO Appointment:				
1	Post advertised in local media.	a)	Job profile prepared.	CE/PMT	
		b)	Post advertised in the media.	CE/PMT	
		c)	Copy of advert kept on file.	CE/PMT	
2	Shortlisting completed.	a)	All CVs received collated.	CE/PMT	
		b)	Shortlisting done by the PMT.	CE/PMT	
		c)	PLC provided with the final shortlist.	CE/PMT	
3	Interviews held.	a)	Candidates invited.	CE/PMT	
		b)	Interview grid prepared.	CE/PMT	
		c)	The PLC can nominate a member to sit on the interview panel as an observer to ensure transparency in the process.	CE/PMT	
		d)	Formal interviews carried out.	CE/PMT	
		e)	Interview scores collated.	CE/PMT	
4	Formal appointment of PLO.	a)	PLO appointment letter issued.	CE	
		b)	PLO employment contract signed.	CE	
		c)	PLO performance agreement signed.	CE	
Stakeholder Coordinator:					

Form No.	Item	Explanatory Note for Compliance Check		Responsibility		Complete (Yes/No or N/A)
Name		Sign		Date		
Project Manager:						
Name		Sign		Date		

FORM A5: CHECKLIST – PROJECT LIAISON COMMITTEE – MEETINGS

Notes:

- a) The checklist consists of several sections. Only print relevant sections.
- b) Indicate what has been completed and sign off at the end.
- c) While other individuals can assist in this process, the Project Manager (PM) remains accountable for all deliverables.
- d) All forms/records to be kept by the PM and availed to line management upon request.

Form No.	Item	Explanatory Note for Compliance Check	Responsibility	Complete (Yes/No or N/A)	
A5	PLC Meeting Checklist:				
1	Attendance register completed.	a)	All members of the PLC to sign the attendance register in ink.	PLO/PM	
		b)	Where meetings are on an online platform such as MS Teams, the attendance list must be downloaded from that platform.	PLO/PM	
2	Quorum met.	a)	The quorum for PLC meetings shall be constituted by 50% + 1 ratio excluding co-opted members.	PLO/PM	
3	Agenda approved.	a)		PM	
4	Previous minutes approved.	a)	Minutes must be prepared, signed off and dated by the Chairperson at the following meeting.	PLO/PM	
5	Minutes and resolutions captured.	a)		RE/PLO	
6	Declaration of interest completed.	a)	All members of the PLC to sign the DoL in ink.	PLO/PM	
Stakeholder Coordinator:					
Name		Sign		Date	
Project Manager:					
Name		Sign		Date	

FORM A6: PROJECT LIAISON COMMITTEE – DECLARATION OF INTEREST**Notes:**

- k) This declaration of interest shall be signed by all attendees at every PLC meeting.

THE SOUTH AFRICAN NATIONAL ROADS AGENCY LTD		
PROJECT LIAISON COMMITTEE - DECLARATION OF INTEREST		
<p>We, as members of the PLC and persons present in the meeting, hereby solemnly swear and declare that we have no private or business interest or stake in any of the Work Packages or Tender Reports tabled here today or to be discussed in this project.</p> <p>If one of us is of the opinion/view that some people may, rightly or wrongly construe as improper/irregular, his/her participation/involvement in deliberations that may lead to the award of a tender to a tenderer known to him/her, that person shall then recuse himself/herself from the proceedings/discussions that deal with that Work Package or Tender Report. Additionally, such a member shall recuse himself/herself from the operations of this PLC going forward and shall cease to be a PLC member for this project.</p> <p>We certify that we, during the process neither deliberately favoured nor prejudiced and person or tenderer, as intended or contemplated in treasury Regulation 16, A8.3 (a), (b) & (c).</p> <p>We further accept that all information, documentation, and decisions regarding any matter serving before the Committee are confidential. We, therefore, undertake not to communicate decisions/discussions of the meeting to external or internal parties unless so directed and approved by the Project Manager.</p>		
Members	Signature	Date

FORM B: CHECKLIST – TARGETED ENTERPRISE TENDERING PROCESS

Form No.	Item	Explanatory Note for Compliance Check		Responsibility	Complete (Yes/No or N/A)	Source Document
B1	Target Area:					
1	Target Area Defined by PLC.	a)	Target Area for Targeted Labour and Targeted Enterprises identified and disseminated to the PLC.	PLO/PM		
		b)	Target Groups identified and disseminated to the PLC.	PLO/PM		
2	Database of Contractors and Suppliers.	a)	Database criteria setup and disseminated to the PLC.	PLO/PM		
		b)	Signed off database criteria handed over to PLC.	PLO/PM		
B2	Tender Phase:					
1	Tender Advert.	a)	Copy of advert on file.	Contractor		
		b)	Proof of publication in selected local publications.	Contractor		
		c)	Proof of publication on SANRAL website.	Contractor		
2	Tender Document.	a)	Copy of specification available on file, copy of the Tender CD, or printed.	Contractor		
3	Clarification Meeting Attendance register.	a)	Attendance register signed by all attendees of the clarification meeting	Contractor		
4	Clarification Meeting Minutes.	a)	Minutes must be prepared, signed off and dated by the Chairperson	Contractor		

Form No.	Item	Explanatory Note for Compliance Check		Responsibility	Complete (Yes/No or N/A)	Source Document
			within 14 days of the date of the meeting			
5	Clarification Meeting Presentation.	a)	Copy of the presentation on file.	Contractor		
6	Addenda	a)	All addenda issued must be recorded on the file.	Contractor		
		b)	Proof (e-mail) of those persons that the addenda was sent to (if applicable).	Contractor		
7	Register of tenders issued (if applicable).	a)	Record the names of persons / companies that collected tender documents (website/by hand).	Contractor		
B3	Tender Opening:					
1	Register of Tenders Received.	a)	Record the names of persons / companies that submitted tender offers.	Contractor		
2	Tender Opening, Declaration of Interest.	a)	Declaration by SANRAL officials at the opening.	Contractor		
3	Tender Opening, Attendance Register.	a)	Record the names of persons present at the opening of tenders.	Contractor		
4	Register for late tenders received.	a)	Record names and time of late tenders received.	Contractor		
5	Tender Opening, Opening Data.	a)	Register of the opening of the Technical Offer on the Tender Data sheet.	Contractor		
B4	Tender Evaluation:					
1	Extension of validity period.	a)	Confirmation of issue of letters of extension of validity period.	Contractor		

Form No.	Item	Explanatory Note for Compliance Check		Responsibility	Complete (Yes/No or N/A)	Source Document
		b)	Confirmation of response on extension of validity period by the bidders.	Contractor		
2	Declaration of Interest.	a)	All members of the Bid Evaluation Committee to sign the DoI in ink.	Contractor		
3	Attendance Register.	a)	All members of the BEC to sign the attendance register in ink.	Contractor		
4	Minutes	a)	Minutes must be prepared, signed off and dated by the Chairperson within 14 days of the date of the meeting.	Contractor		
5	Signed evaluation report.	a)	Report signed by the Chairperson of the BEC detailing deliberations and discussions of the BEC meeting.	Contractor		
6	PPPFA Scoring sheet	a)	Scoring sheet detailing the scores of all tenders evaluated as per the PPPFA.	Contractor		
7	CSD Compliance Report.	a)	Printout of the CSD Report for compliance verification for the successful tenderer.	Contractor		
8	CIDB grade confirmation (if applicable).	a)	Verification of active status.	Contractor		
		b)	JV calculator for Joint Ventures.	Contractor		
9	B-BBEE Certificate.	a)	B-BBEE Certificate of winning tenderer on file for verification of preference points.	Contractor		
10	SANRAL List of Restricted Bidders.	a)	Verification that the winning tenderer is not restricted from doing business with SANRAL.	Contractor		

Form No.	Item	Explanatory Note for Compliance Check		Responsibility	Complete (Yes/No or N/A)	Source Document
11	Clarification correspondence after tender closing (individual tenderers or all).	a)	All correspondence relating to RFT correction of arithmetic errors/balancing of rates etc.	Contractor		
12	Report for the award of the contract.	a)	Report detailing information from tender phase to evaluation phase, and a recommendation with motivation for the approval of the winning tenderer.	Contractor		
13	Review Report.	a)	Receive high level reports and ensure transparency in the appointment of Targeted Enterprises. The reports must exclude sensitive evaluation information.	PLC /PLO/PM	Report not to be supplied to PLC*.	
B5	Award of Contract:					
1	BAC Declaration of Interest.	a)	All members of the BAC to sign the DoI in ink.	Project Bid Adjudication Committee Secretariat (PBAC)		
2	BAC Attendance Register.	a)	All members of the BAC to sign the attendance register in ink.	PBAC Secretariat		
3	BAC Minutes.	a)	Minutes must be prepared, signed off and dated by the Chairperson within 14 days of the date of the meeting.	PBAC Secretariat		

FORM C: CHECKLIST – TARGETED ENTERPRISE CONTRACT ADMINISTRATION

Form No.	Item	Explanatory Note for Compliance Check	Responsibility	Complete (Yes/No or N/A)	Source Document
C	Contract Administration Phase				
1	Letter of award / Letter of Acceptance.	a)	Copy of letter issued to the successful bidder.	Contractor	
2	Letters to unsuccessful bidder(s).	a)	Standard letter informing unsuccessful bidders of the tender outcome with proof of emails.	Contractor	
3	Publication of award, within 7 working days from date of award.	a)	Proof of publication on SANRAL website.	Contractor / PLO / Project Manager	
4	Contract document.	a)	Original signed contract on file.	End-User / Contractor	
5	Closure of contract.	a)	Copy of close-out report (SIPDM).	End-User / Contractor	
6	Performance report (for Engineering contracts).	a)	Copy of contractor performance report.	End-User / Contractor	
Project Manager:					
Name		Sign		Date	

APPENDIX 10: CHECKLIST FOR PLCS AND PLOS

Not applicable

APPENDIX 11: PROFORMA SUBCONTRACT DOCUMENT FOR TARGETED ENTERPRISES



THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONSTRUCTION WORKS SUBCONTRACT PROFORMA

VERSION 1: AUGUST 2020

Aligned with Proforma Document for Construction 2019.1, 2020.1, 2020.2 and 2020.3

GENERAL NOTES TO COMPILER:

1. Before proceeding, accept all changes in the proforma document, then select "Track Changes" to clearly indicate all of the Compiler's changes in the draft document (i.e. highlighted for inclusions and crossed out for deletions).
2. All notes to Compiler are to be addressed and then removed from the draft and final documents. However, do not amend the document footer indicating the proforma document version used.
3. Confirm with the Engineer the number of copies of the draft documentation to be submitted to the Engineer.
4. Where possible, the draft documentation should be printed double-sided to reduce the volume of the documentation.
5. On submission of the draft documentation to the Engineer, the Contractor shall also submit on its letterhead a duly signed and dated version of the disclaimer below. This disclaimer is given as an example of an acceptable format of the disclaimer, but submission of this page with the example completed shall not be accepted. The disclaimer shall not form part of the final tender documents.
6. Following the discussion or review of the draft documents by the Engineer, the Contractor is to accept all the tracked changes and incorporate the comments from the Engineer again through track changes for record purposes. These changes are then to be accepted into a final tender document. A CD containing the final tender document as well as all versions with all the changes indicated as tracked changes is to be submitted to the Engineer. Any major Deviations from this Pro-Forma document is to be done in consultation with Sanral Project Manager.
7. Although the document is submitted for review to the Engineer, the Contractor is still ultimately responsible for the correctness and applicability of the information supplied in the document.
8. These pages containing Notes to the Compiler do not form part of the tender document and must be deleted before submission of the draft documentation.
9. The Subcontract number and description is linked to the title page and page T1-3. **Insert a unique subcontract package number after SUBCONTRACT NO., Insert a unique subcontract package description after FOR, Insert the main SANRAL contract number after UNDER CONTRACT SANRAL, and Insert main SANRAL contract description title after FOR THE,** on the Title page and on Page T1-3. The links in the document to be updated (on opening the document a request if the links is to be updated is to be accepted to update all the links in the document). Additional links can be added for other information repeated multiple times in the document to assist with future document preparation.
10. In the document different options are provided for tender document collection, tender training, tender briefing and tender submission. Provision is either made for the above processes by remote electronic means (Option 1) or by physical means (Option 2 and 3). The selection of the appropriate option will depend on the access and availability of electronic means. Option 1 is preferred in terms of the Standard Operating Procedure: SMME Procurement under COVID-19 Lockdown conditions.
11. This Pro-Forma is a generic document intended for use for all subcontract tenders. However, special attention to wording and requirements to be made where to be utilised for tenders aimed at CIDB 1 & 2 contractors. The document can also be utilised as basis for Supplier tenders with adaptation of Contract conditions and Specification.

EXAMPLE OF A DISCLAIMER TO ACCOMPANY A TENDER DOCUMENT FOR WHICH THE PROJECT SPECIFICATIONS HAVE BEEN SUBMITTED BY A CONTRACTOR

**SUBCONTRACT NO.
FOR
UNDER CONTRACT SANRAL
FOR THE**

I, the Construction Manager,
acting on behalf of AB CONTRACTOR (*Compiler to insert name of the Contractor*)

declare that it has no material interest in any of the project specifications submitted and that the project specifications do not in any way whatsoever support a single product or system. All the project specifications are submitted based on SANRAL's latest requirements as well as on current industry and international best practice, the information for which are at the Engineer's disposal.

Signed for on behalf of

.....
(*Insert the full name of the Contractor*)

Contractor's Details:

Signature:

Print Name:

Date:



THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

SUBCONTRACT DOCUMENT

BASE DATE:

(Note to compiler: Insert Base date

Base date is 28 days prior to submission of Subcontract Offer

TENDER DOCUMENT

VOLUME 3

(Note to compiler: Insert Contractors details and address)

AB CONTRACTORS

Street address

Suburb

Town

Code

NAME OF TENDERER:

Set sequential number

SUBCONTRACT NO.
FOR
UNDER CONTRACT SANRAL
FOR THE
SUBCONTRACT DOCUMENT

(Note to Compiler: Enter relevant Contractor's details. In the case of a Joint Venture, enter the details of both Firm A and Firm B)

THIS DOCUMENT COMPILED BY:

AB CONTRACTORS
Street address
Suburb
Town
Code

Joint Venture

*(Note to Compiler: Delete
this column if no JV
information is to be
recorded)*

Tel:
Fax:
e-mail:

ABC CONTRACTORS
Street address
Suburb
Town
Code

Tel:
Fax:
e-mail:

*(Note to Compiler: Delete
this column if no JV
information is to be
recorded)*

UNDER THE DIRECTION OF:

(Note to Compiler: complete the relevant regional details)

The Regional Manager
(Northern/ Southern/ Eastern/ Western Region)
The South African National Roads Agency SOC Ltd
Street address
Suburb
Town
Code

Tel: (...)

Fax:(...)

LIST OF CONTRACT DOCUMENTS

The following documents form part of this contract:

VOLUME 1: The Conditions of Subcontract for Construction for Building and Engineering Works Designed by the Employer First Edition (2011), published by the International Federation of Consulting Engineers (FIDIC).

VOLUME 2: The COLTO Standard Specifications for Road and Bridge Works for State Road Authorities (1998 edition), issued by the Committee of Land Transport Officials which the tenderer shall purchase himself. (See Note to Tenderer 2 below).

Note to Compiler: For projects that include other disciplines such as electrical, lighting or building, reference to the applicable standard specifications applicable to each discipline is to be added as Volume 2B, Volume 2C etc. for example for electrical and lighting work the following to be added:

- *SANS 1200: Standardised Specifications for Civil Engineering Construction (1990, including later editions and amendments).*
- *SANS 10098-1:2007 or as per latest amendments for South African National Roads Standard public lighting.*
- *SANS 60598-1:2014 Edition 6 IEC 60598-1:2014 General requirements and tests on lights.*
- *SANS 10142-1 and SANS 10142-2 Part 2: Medium-voltage installations above 1 kV a.c. not exceeding 22 kV a.c. and up to and including 3 MVA installed capacity.*

VOLUME 3: Project Document.

VOLUME 4: Contract Drawings. *(Note to Compiler: Delete if there are no drawings applicable)*

Notes to Tenderer:

1. Volume 1 is obtainable from CESA
P. O. Box 68482, Bryanston, 2021.
Tel: (011) 463 2022 Fax: (011) 463 7383 Email: general@cesa.co.za
2. Volume 2 is obtainable from SAICE, Private Bag X200, Halfway House, 1685. Tel: (011) 8055947/8, e-mail: civilinfo@saice.org.za or can be purchased from the Employer.
3. Volume 3 is this document issued at tender stage.

The standard conditions of tender (SANS 10845-3) is obtainable from the South African Bureau of Standards
Private Bag X191, Pretoria, 0001
Tel: (012) 428 7911 Fax: (012) 344 1568 Website: www.sabs.co.za

At contract stage Volume 3 will be a bound signed paper copy containing the following documents:

- Returnable schedules relevant to the project
- Agreements and Contract Data
- Pricing Data
- Scope of Work
- Site Information

4. **SUBMISSION OF TENDER** – Of the contract documents, only the following elements of Volume 3 needs to be submitted:

(Note to Compiler: Option 1: Where remote electronic means are available)

Submitted electronically by e-mail or uploaded to share drive, in the following order:

- a) Form of Offer (signed and scanned as pdf)
- b) All returnable schedules and attachments (signed and scanned as pdf)
- c) Completed Pricing Schedule (scanned copy in pdf and copy in excel)

(Note to Compiler: Option 2: Where remote electronic means are not feasible)

Submitted electronically on a CD or USB device, in the following order:

- a) Form of Offer (signed and scanned as pdf)
- b) All returnable schedules and attachments (signed and scanned as pdf)
- c) Completed Pricing Schedule (scanned copy in pdf and copy in excel)

(Note to Compiler: Option 3: Where options 1 and 2 is not feasible)

Submitted in hardcopy in a neatly bound file and in the following order:

- a) Form of Offer (paper copy)
- b) All returnable schedules and attachments (paper copy)
- c) Completed Pricing Schedule (paper copy)
- d) Completed Pricing Schedule (electronically completed on CD in excel) *(Note to Compiler: Decide on only paper copy or paper and electronic copy based on the size of the pricing schedule)*

(Note to Compiler: Confirm that the above is similarly reflected in the tender data and pricing instructions)

Information provided by a tenderer over and above the above elements of Volume 3 shall be treated as information only and will only be bound into the contract document if the information has a bearing on the tender price and/or project specifications.

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PART C3:	SCOPE OF WORKS.....	C3.1
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PART T1: TENDERING PROCEDURES

PART T1 TENDERING PROCEDURES

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AB CONTRACTOR (Compiler to insert name of the Contractor)

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

T1.1 TENDER NOTICE AND INVITATION TO TENDER (Incorporating SBD1)

Notes to Compiler:

1. *All notes to the Compiler are to be addressed and then removed from the draft and final documents and the chapter heading moved to a position at one third from the top of the page.*
2. *The Engineer and relevant Regional SANRAL Project Engineer must be consulted prior to the placement of the tender advertisement. The tender notice shall be sent to the Engineer and relevant Regional SANRAL Project Engineer 3 weeks before the intended placement of the tender advertisement for checking.*

AB CONTRACTOR *(Compiler to insert name of the Contractor)*

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

T1.1 TENDER NOTICE AND INVITATION TO TENDER (SBD1)

AB CONTRACTORS invites tenders from experienced EME/QSE subcontractors / suppliers for Contract SANRAL..... *(Note to Compiler: insert main contract number)* FOR THE *(Note to compiler: insert main contract description)* endorsed by The South African National Roads Agency SOC Limited (SANRAL). This project is in the province of *(Compiler to insert province)* and in the *(Compiler to insert local municipality or District Municipality based on the target area for the package)*

Subcontractors are required for the following subcontracts:

.....: for

.....: for

.....: for

.....: for

(Note to Compiler: Add the subcontract no. and package description for the subcontract being advertised. For multiple work packages being advertised concurrently add the information for each package)

The approximate duration is months. *(Compiler to insert same duration as Contract Data C1.1.31)*

Only tenderers who comply with the definition of a Targeted Enterprise under clause 4.1.1 and are at least 51% Black owned and who is an EME or QSE or cooperative, are eligible to tender.

Only tenderers that meet all the eligibility criteria under clause 4.1.1 of the Tender Data will be considered.

Only tenderers who meet the minimum functionality score as stated in clause 5.11.9 will be evaluated further on price and preference

It is estimated that tenderers should have a CIDB contractor grading designation ofCE *(Notes to Compiler: State applicable CIDB grading and class dependent on type of work – similarly in Tender Data where applicable)* or higher, however tenderers attention is drawn to clause 4.1.1 of the Tender Data when submitting their tender.

(Notes to Compiler:

- 1. Delete this sentence and replace with the table and sentence below when advertising multiple work packages simultaneously***
- 2. If the estimated construction value is within 20% of one of the limits set by CIDB, the advertisement must indicate the lower category. For example, if your estimated value is 20% within the bottom range of a category then rather specify one category lower.***
- 3. In terms of CIDB Regulation 25(1B), the CIDB grading designation to be inserted is to be based on the estimated annual value of the contract. Therefore if the nature of work for the package is repetitive over a long duration then 25(1B) to apply, else the grading designation is to be based on the estimated contract value.***
- 4. For tenders for supplier subcontracts, or work which do not have an appropriate CIDB grading designation, all reference to CIDB requirements is to be deleted and sentences accordingly amended.)***

It is estimated that tenderers should have a CIDB contractor grading designation as indicated in the table below:

Works Package	CIDB requirement
<i>(Note to Compiler: Insert relevant package numbers and CIDB gradings, e.g.:</i>	1 CE

N.001-090-2014/1_SC1	
N.001-090-2014/1_SC2	2 CE
N.001-090-2014/1_SC3:	3 CE

The tenderers attention is drawn to clause 4.1.1 of the Tender Data for each work package when submitting their tender.

Tenders from tenderers registered as potentially emerging enterprises but with a CIDB contractor grading designation lower than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations, will not be accepted. *(Note to Compiler: Delete reference to 25(1B) above if the nature of the work for the package is not repetitive over a long duration)*

Only locally produced or locally manufactured products and components for construction will be considered.

Preferences are offered to tenderers who comply with the criteria stated in the Tender Data.

SUBCONTRACT TENDER DOCUMENTS

Tender documents are available :

- At no cost in electronic format via share drive / via website / via e-mail *(Compiler to select appropriate where remote electronic means are available)* . Prospective tenderers may send a request for a link to the document to the following address *(Compiler to insert e-mail address for requests)* Tenderers must have access to Microsoft Office © 2013 and Acrobat Adobe © 9.0, or similar compatible software, or
- At no cost for collection in electronic format on CD / USB device *(Compiler to select appropriate)*. Tenderers must have access to Microsoft Office © 2013 and Acrobat Adobe © 9.0, or similar compatible software. The physical address for collection of tender documents is the, *(compiler to state the street address of the relevant office)* where documents may be collected during the hours 09h00 to 16h00 (Monday to Friday), from *(Compiler to state date)*. Prospective tenderers who can not access the information on the CD / USB device must pre-book for access to a computer workstation on site on a specific day and time. A request for access to a computer workstation is to be sent to the following address *(Compiler to insert e-mail address and/or telephone number for requests)*, or
- At no cost for collection in Hardcopy. The physical address for collection of tender documents is the, *(Compiler to state the street address of the relevant office)* where documents may be collected during the hours 09h00 to 16h00 (Monday to Friday), from *(Compiler to state date)*

TENDERERS' BRIEFING AND TRAINING

(Note to Compiler: Option 1: where remote electronic means are available – preferred during COVID limitations -refer to SOP SMME Procurement under COVID-19 Lockdown conditions)

A tender clarification briefing presentation / pre-recorded video and training presentation / pre-recorded video are available to be downloaded via share drive / via website / via e-mail *(Compiler to select appropriate)* .Prospective tenderers may send a request for a link to the clarification briefing and training documents to the following address *(Compiler to insert e-mail address for requests)*

(Note to Compiler: Option 2: where option 1 is not feasible but electronic means are available)

A tender clarification briefing presentation / pre-recorded video and training presentation / pre-recorded video are available to be collected on a CD / USB device. The physical address for collection of the clarification briefing and training documents is, *(Compiler to state the street address of the relevant office)* where documents may be collected during the hours 09h00 to 16h00 (Monday to Friday), from *(Compiler to state date)*. Prospective tenderers who cannot access the information on the CD / USB device must pre-book for access to a computer workstation on site on a specific day and time. A request for access to a computer workstation is to be sent to the following address *(Compiler to insert e-mail address and/or telephone number for requests)*

(Note to Compiler: Option 3: where option 1 and option 2 is not feasible)

A compulsory tender clarification briefing and training session(s) with representatives of the Contractor and Engineer will take place at *(Compiler to state the street address)*. Prospective tenderers must pre-book for the clarification briefing and training session, due to venue size limitations. A request for a clarification briefing and training session date and time is to be sent to the following

address *(Compiler to insert e-mail address and/or telephone number for requests)*. Tenders from tenderers who arrived late at the clarification briefing session **will not be allowed, and their submissions shall be declared non-responsive.**

A tenderer's representative cannot represent more than one tenderer at the clarification briefing session.

COMPLETION AND DELIVERY OF TENDERS

The closing time for receipt of tenders is 10:00 on *(Compiler to insert date)*

(Note to Compiler: Option 1: where remote electronic means are available – preferred during COVID limitations -refer to SOP SMME Procurement under COVID-19 Lockdown conditions)

Only tender offers submitted electronically by e-mail / uploaded to share drive *(Compiler to select appropriate)* as specified in the Tender Data will be accepted.

Tenders may only be submitted in the format as stated in the Tender Data.

(Note to Compiler: Option 2 or 3: where option 1 is not feasible)

Only tender offers submitted in Hardcopy / electronic format on CD or USB device *(Compiler to select appropriate)* and delivered to the address specified in the Tender Data will be accepted.

Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the Tender Data.

Tenders may only be submitted in the format as stated in the Tender Data.

Queries relating to issues arising from the tenderer's clarification briefing presentation / video or these documents may be addressed to the following: *(Compiler to insert relevant contractor information)*

Enquiries	
Contact Person:	<i>(insert the contractor contact info)</i>
Fax No:	
E-mail:	

T1.7

AB CONTRACTOR (*Compiler to insert name of the Contractor*)

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

T1.2 TENDER DATA

T1.2 TENDER DATA

The conditions of tender are the standard conditions of tender as contained in SANS 10845-3:2015 Edition 1.

The standard conditions of tender make several references to the tender data for details that apply specifically to this tender. The tender data shall have precedence in the interpretation of any ambiguity or inconsistency between the tender data and the standard conditions of tender.

Each item of data given below is cross-referenced to the clause in the standard conditions of tender to which it mainly applies.

Clause Number	Data
2.1	Wherever reference is made in the documentation to bill of quantities it shall also mean pricing schedule.
3.1	<p>The Contractor is <i>(Note to Compiler: Insert name of Contracting Firm)</i></p> <p>The Contractor's <i>domicilium citandi et executandi</i> (permanent physical business address) is:</p> <p><i>Insert Physical business address</i></p> <p>The Contractor's address for communication relating to this contract is:</p> <p><i>Insert relevant address</i></p> <p>Where in the standard conditions of tender (SANS 10845-3:2015) reference is made to "the Employer", it shall mean "the Contractor" as defined above.</p> <p>Main Contract Details:</p> <p>Contract Number: <i>(Note to Compiler: Insert number of contract)</i></p> <p>Employer: The South African National Roads Agency SOC Limited</p> <p>Engineer: <i>(Note to Compiler: Insert Name of Consulting Engineering Firm)</i></p> <p>The Contractor: <i>(Note to Compiler: Insert Name of Contracting Firm)</i></p> <p>The Conditions of Contract for the Main contract is: "Conditions of Contract for Building and Engineering Works designed by the Employer" (1999) published by the International Federation of Consulting Engineers (FIDIC) (Red book).</p>
3.2	<p>The tender documents issued by the Contractor comprise:</p> <p>Part T1: Tendering Procedures</p> <ul style="list-style-type: none"> • T1.1 Tender Notice and Invitation to tender • T1.2 Tender data <p>Part T2: Returnable documents</p> <ul style="list-style-type: none"> • T2.1 List of returnable documents • T2.2 Returnable schedules <p>Part C1: Agreements and contract data</p> <ul style="list-style-type: none"> • C1.1 Form of Offer and Acceptance • C1.2 Contract data <p>Part C2: Pricing data</p> <ul style="list-style-type: none"> • C2.1 Pricing instructions (assumptions) • C2.2 Pricing Schedules/Bill of quantities <p>Part C3: Scope of work</p> <p>Part C4: Site information</p> <p>Part C5: Annexure</p>

3.4	<p>The language for communications is English.</p> <p>The Contractor's contact details is: <i>(Note to Compiler: Insert Name of the contracting firm)</i> Address: Telephone number: E-mail):</p>																				
3.5	<p>The tender process may be cancelled if:</p> <p>a) Due to changed circumstances, there is no longer a need for the goods or services specified in the invitation;</p> <p>b) Funds are no longer available to cover the total envisaged expenditure;</p> <p>c) No acceptable tender is received; or</p> <p>d) There is a material irregularity in the tender process</p> <p>The period of six months shall not apply.</p>																				
4.1.1	<p>Only those tenderers who satisfy the following criteria are eligible to submit tenders. If the tenderer fails to meet any of the eligibility criteria, he will be given 5 calendar days to become compliant. If the tenderer fails to submit the requested information in the required timeframe, his tender shall be deemed non-compliant.</p> <p>a) CIDB registration (Form A12) <i>(Note to Compiler: Delete this clause for supplier subcontract tenders or work without CIDB category, where CIDB registration is not required)</i></p> <p>Registered with the CIDB, at close of tender, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) <i>(Note to Compiler: Delete reference to 25(1B) if the nature of the work for the package is not repetitive over a long duration)</i> or 25(7A) of the Construction Industry Development Regulations, for a CE class of construction work. Tenderers whose CIDB registration expires within the tender validity period, need to demonstrate that there is a reasonable chance of being registered in the appropriate grading designation during the tender evaluation period, by submitting a copy of their timely application for CIDB registration, with their tender submission. Tenders received from such tenderers who are not capable of being registered in the required contractor designation, within 21 working days after either expiry of their registration or after being requested to provide proof of registration, will be considered non-responsive. Note that in terms of the Construction Industry Development Board Act, 2000 (Act No. 38 of 2000) a registered contractor must apply for renewal of registration three months before the existing registration expires.</p> <p>Tenderers registered as potentially emerging enterprises but with a CIDB contractor grading designation lower than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) <i>(Note to Compiler: Delete reference to 25(1B) if the nature of the work for the package is not repetitive over a long duration)</i> or 25(7A) of the Construction Industry Development Regulations, are not eligible to have their tenders evaluated.</p> <table><tr><th>Category of tender</th><th>Upper limits per CIDB Regulation 17 (effective 7 October 2019)</th><th>Contractor's allowable margins (Incl. VAT)</th></tr><tr><td>CE 1</td><td>R500 000</td><td rowspan="8">The Contractor will use its discretion in terms of CIDB Practice Note 3 on allowable margins to be accepted</td></tr><tr><td>CE 2</td><td>R1 000 000</td></tr><tr><td>CE 3</td><td>R3 000 000</td></tr><tr><td>CE 4</td><td>R6 000 000</td></tr><tr><td>CE 5</td><td>R10 000 000</td></tr><tr><td>CE 6</td><td>R20 000 000</td></tr><tr><td>CE 7</td><td>R60 000 000</td></tr><tr><td>CE 8</td><td>R200 000 000</td></tr></table> <p>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. <i>(Note to Compiler: Delete this sentence if reference to 25(1B) was removed in the clauses</i></p>	Category of tender	Upper limits per CIDB Regulation 17 (effective 7 October 2019)	Contractor's allowable margins (Incl. VAT)	CE 1	R500 000	The Contractor will use its discretion in terms of CIDB Practice Note 3 on allowable margins to be accepted	CE 2	R1 000 000	CE 3	R3 000 000	CE 4	R6 000 000	CE 5	R10 000 000	CE 6	R20 000 000	CE 7	R60 000 000	CE 8	R200 000 000
Category of tender	Upper limits per CIDB Regulation 17 (effective 7 October 2019)	Contractor's allowable margins (Incl. VAT)																			
CE 1	R500 000	The Contractor will use its discretion in terms of CIDB Practice Note 3 on allowable margins to be accepted																			
CE 2	R1 000 000																				
CE 3	R3 000 000																				
CE 4	R6 000 000																				
CE 5	R10 000 000																				
CE 6	R20 000 000																				
CE 7	R60 000 000																				
CE 8	R200 000 000																				

	<p><i>above and the nature of the work for the package is not repetitive over a long duration)</i></p> <p>Joint Ventures are eligible to submit tenders provided that:</p> <ul style="list-style-type: none"> - every member of the joint venture is registered with the CIDB; - the lead partner has a contractor grading designation of not lower than one level below the required grading designation in the class of construction works under consideration and possesses the required recognition status; and - the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a CE class of construction work or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations. <p>b) National Treasury Central Supplier Database</p> <p>Tenderers, or in the event of a joint venture, each member of the joint venture, shall be registered on the National Treasury Central Supplier Database at the closing date for tender submissions.</p> <p>c) Criteria for preferential procurement</p> <p>Only tenderers who comply with the definition of a Targeted Enterprise which is:</p> <ul style="list-style-type: none"> a. an EME or QSE which is at least 51% owned by black people; b. an EME or QSE which is at least 51% owned by black people who are youth; c. an EME or QSE which is at least 51% owned by black people who are women; d. an EME or QSE which is at least 51% owned by black people with disabilities; e. an EME or QSE which is 51% owned by black people living in rural or underdeveloped areas or townships; f. a cooperative which is at least 51% owned by black people; g. an EME or QSE which is at least 51% owned by black people who are military veterans; or h. more than one of the categories referred to in paragraphs a to g; and i. which is tax and COID compliant <p>The tenderer shall submit a valid B-BBEE certificate as proof of eligibility.</p>
4.6	<p>Failure to apply instructions contained in addenda may render a tenderer's offer non-responsive in terms of condition of tender 5.8.</p>
4.7	<p>The arrangements for a clarification briefing and tender training session are: <i>(Note to Compiler: Select appropriate option and insert relevant data and ensure that it is the same as it appears in the Tender Notice)</i></p> <p><i>(Note to Compiler: Option 1: where remote electronic means are available – preferred during COVID limitations -refer to SOP SMME Procurement under COVID-19 Lockdown conditions)</i></p> <p>A tender clarification briefing presentation / pre-recorded video and training presentation / pre-recorded video are available to be downloaded via share drive / via website / via e-mail <i>(Compiler to select appropriate)</i>. Prospective tenderers must send a request for a link to the clarification briefing and training documents to the following address <i>(Compiler to insert e-mail address for requests)</i></p> <p>The onus rests with the tenderer to ensure that the representative reading / viewing the clarification briefing presentation / video is appropriately qualified to understand all directives and clarifications given in the presentation / video.</p> <p>The signature on the duly completed and signed Form A1 shall be considered proof that the tenderer read/viewed the whole clarification briefing presentation / video and clearly understood all directives and clarifications given in the presentation / video.</p> <p><i>(Note to Compiler: Option 2: where option 1 is not feasible but electronic means are available)</i></p> <p>A tender clarification briefing presentation / pre-recorded video and training presentation / pre-recorded video are available to be collected on a CD / USB device. The physical address for collection of the clarification briefing and training documents is the,</p>

	<p><i>(Compiler to state the street address of the relevant office)</i> where documents may be collected during the hours 09h00 to 16h00 (Monday to Friday), from <i>(Compiler to state date)</i> Prospective tenderers who can not access the information on the CD / USB device must pre-book for access to a computer workstation on site on a specific day and time. A request for access to a computer workstation is to be sent to the following address <i>(Compiler to insert e-mail address and/or telephone number for requests)</i></p> <p>The onus rests with the tenderer to ensure that the representative reading / viewing the clarification briefing presentation / video is appropriately qualified to understand all directives and clarifications given in the presentation / video.</p> <p>The signature on the duly completed and signed Form A1 shall be considered proof that the tenderer read/viewed the whole clarification briefing presentation / video and clearly understood all directives and clarifications given in the presentation / video.</p> <p><i>(Note to Compiler: Option 3: where option 1 and option 2 is not feasible)</i></p> <p>A compulsory tender clarification briefing and training session(s) with representatives of the Contractor and Engineer will take place at <i>(Compiler to state the street address)</i> Prospective tenderers must pre-book for the clarification briefing and training session, due to venue size limitations. A request for a clarification briefing and training session date and time is to be sent to the following address <i>(Compiler to insert e-mail address and/or telephone number for requests)</i></p> <p>The clarification briefing session shall start strictly at the time indicated. Only then will the Contractor's Representative circulate the attendance register for completion by those present. During this time, prospective tenderers may enter and complete the register. On completion by all present the Contractor's Representative will:</p> <ul style="list-style-type: none"> (a) read out from the collected lists calling for confirmation that all have signed; (b) close the door and not allow late arrivals to participate in the briefing session and their submissions shall be declared non-responsive. <p>The signatures on the attendance register and duly completed and signed Form A1 shall be considered proof that the tenderer attended the whole briefing session and was available to hear all directives and clarifications given at the briefing session.</p> <p>Tenderers shall sign the attendance list in the name of the tendering entity or in the name of a member of the tendering entity. Addenda will be issued to, and tenders will be received only from, those tendering entities appearing on the attendance list.</p> <p>Tenders from tenderers who arrived late at the clarification briefing session will not be allowed, and their submissions shall be declared non-responsive.</p> <p>The onus rests with the tenderer to ensure that the person attending the clarification briefing on its behalf is appropriately qualified to understand all directives and clarifications given at the briefing.</p> <p>A tenderer's representative cannot represent more than one tenderer at the clarification briefing.</p>
4.8	Request clarifications at least 7 working days before the closing time.
4.9	Limited insurance will be provided by the Contractor.
4.10	Tenderers are required to state the rates and prices in Rand.
4.12	Alternative tender offers will not be considered.
4.13.1	<p>Alternative offers will not be considered.</p> <p>In the event of any discrepancy between the contents of the electronically priced schedule (if applicable), the print-out thereof and the electronically provided pricing schedule (if applicable) 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.</p>
4.13.4	Tenderers are required to submit all certificates as listed in the Schedule of Tender Compliance (Form D1).
4.13.5	Only the following needs to be submitted.

(Note to Compiler: Option 1: where remote electronic means are available – preferred during COVID limitations -refer to SOP SMME Procurement under COVID-19 Lockdown conditions)

The following information to be submitted electronically by e-mail / uploaded to share drive *(Compiler to select appropriate)*, in the following order:

- a) Form of Offer (signed and scanned as pdf)
- b) All returnable schedules and attachments (signed and scanned as pdf)
- c) Completed Pricing Schedule (scanned copy in pdf and copy in excel)

Prospective tenderers must submit the completed tender document in a folder marked “Subcontract number & Tenderer name” to *(Compiler to insert e-mail address)* / loaded to share drive with the following link *(Compiler to insert link)* *(Compiler to select appropriate method)*

(Note to Compiler: Option 2: where remote electronic means are not feasible)

The following information to be submitted in electronic format on CD or USB device, in the following order:

- a) Form of Offer (signed and scanned as pdf)
- b) All returnable schedules and attachments (signed and scanned as pdf)
- c) Completed Pricing Schedule (scanned copy in pdf and copy in excel)

Place and seal the CD or USB device containing the completed tender document in an envelope clearly marked “TENDER” and bearing the Contractor’s name, physical address and contact number, the tender subcontract number and description, the tenderer’s name, the tenderer’s physical address and contact telephone numbers.

The details to be shown on each tender offer package are:

TENDER CLOSING TIME: Time on Day, Date *(Note to Compiler: State time, day and date)*

FOR SUBCONTRACT *(Note to Compiler: Insert Contract number and description)*

CONTRACTOR:

Name of Contractor

Address

Contact Number

(Note to Compiler: Insert relevant office physical address and contact number)

TENDERER:

Name:

Physical address:

Contact Numbers:

Tenders must be submitted during office hours (09:00 to 16:00) Monday to Friday at the Contractor’s address. *(Note to Compiler: Insert location map of relevant submission office)*

It is in the tenderer’s interest to ensure that the delivery of the tender offer is recorded in the Contractors tenders received register.

(Note to Compiler: Option 3: where options 1 and 2 are not feasible)

The following information to be submitted in hard copy, in a neatly bound file and in the following order:

- a) Form of Offer (signed printed paper)
- b) All returnable schedules and attachments (signed printed paper)
- c) Completed Pricing Schedule (printed paper)
- d) Completed Pricing Schedule (electronically completed on CD in excel). *(Note to Compiler: Decide on only paper copy or paper and electronic copy based on the size of the pricing schedule)*

Place and seal the completed tender document in an envelope clearly marked “TENDER” and bearing the Contractor’s name, physical address and contact number, the tender subcontract number and description, the tenderer’s name, the tenderer’s physical address and contact telephone numbers.

	<p>The details to be shown on each tender offer package are:</p> <table><tr><td>TENDER CLOSING TIME: Time on Day, Date <i>(Note to Compiler: State time, day and date)</i></td></tr><tr><td>FOR SUBCONTRACT <i>(Note to Compiler : Insert Contract number and description)</i></td></tr><tr><td>CONTRACTOR: Name of Contractor Address Contact Number <i>(Note to Compiler: Insert relevant office physical address and contact number)</i></td></tr><tr><td>TENDERER: Name: Physical address: Contact Numbers:</td></tr></table> <p>Tenders must be submitted during office hours (09:00 to 16:00) Monday to Friday at the Contractor's address. <i>(Note to Compiler: Insert location map of relevant submission office)</i></p> <p>It is in the tenderer's interest to ensure that the delivery of the tender offer is recorded in the Contractor's tenders received register.</p>	TENDER CLOSING TIME: Time on Day, Date <i>(Note to Compiler: State time, day and date)</i>	FOR SUBCONTRACT <i>(Note to Compiler : Insert Contract number and description)</i>	CONTRACTOR: Name of Contractor Address Contact Number <i>(Note to Compiler: Insert relevant office physical address and contact number)</i>	TENDERER: Name: Physical address: Contact Numbers:
TENDER CLOSING TIME: Time on Day, Date <i>(Note to Compiler: State time, day and date)</i>					
FOR SUBCONTRACT <i>(Note to Compiler : Insert Contract number and description)</i>					
CONTRACTOR: Name of Contractor Address Contact Number <i>(Note to Compiler: Insert relevant office physical address and contact number)</i>					
TENDERER: Name: Physical address: Contact Numbers:					
4.14	<p>Provided that the omission is not a material omission, the Contractor reserves the right to condone the omission and may waive any nonconformities in the tender.</p> <p>Provided that the omission is not a material omission, the Contractor reserves the right to condone the omission and may request the tenderer to submit the necessary information or documentation within five (5) working days to rectify non-material non-conformities in the tender related to documentation requirements.</p>				
4.15	<p>The closing time for submission of tender offers is Time on Day, Date <i>(Note to Compiler: Insert relevant time, day and date)</i></p>				
4.16.1	<p>The tender offer validity period is 12 weeks.</p>				
4.16.2	<p>Where a tenderer, at any time after the opening of his tender offer but prior to entering into a contract based on his tender offer:</p> <p>a) withdraws his tender;</p> <p>b) gives notice of his inability to execute the contract in terms of his tender; or</p> <p>c) fails to comply with a request made in terms of 4.17, 4.18 or 5.9,</p> <p>such tenderer may be barred from tendering on any of the Contractor's future tenders for a period to be determined by the Contractor, but not less than six (6) months, from the date of tender closure. This sanction also applies to tenders under evaluation and not yet awarded. This sanction does not apply to tenders under evaluation where a request for extension of the validity period was not accepted by the tenderer. The Contractor may fully or partly exempt a tenderer from the provisions of this condition if he is of the opinion that the circumstances justify the exemption.</p>				
4.18	<p>Any additional information requested under this clause must be provided within five (5) working days of date of request.</p>				
5.1	<p>The Contractor shall respond to clarifications received up to seven (7) working days before tender closing time.</p>				
5.2	<p>The Contractor shall issue addenda until five (5) working days before tender closing time.</p>				
5.4	<p>The time and location for opening of the tender offers shall be:</p> <p>Time: Time on Day, Date <i>(Note to Compiler: Insert relevant time, day and date)</i></p>				

	<p><i>(Note to Compiler: Option 1: where remote electronic means are available – preferred during COVID limitations -refer to SOP SMME Procurement under COVID-19 Lockdown conditions)</i></p> <p>Venue: Opening of the tender offer via live streaming. An Invitation with a link shall be sent to all tenderers that accessed the tender documentation.</p> <p><i>(Note to Compiler: Option 2: where option 1 is not feasible)</i></p> <p>Venue: <i>(Note to Compiler: insert location and address)</i></p>
5.7	<p>Prior to disqualification, the Contractor shall inform the tenderer and give the tenderer an opportunity to make representations within 14 days as to why the tender submitted should not be disqualified and as to why the tenderer should not be restricted by the National Treasury from conducting any business with any organ of state for a period not exceeding 10 years.</p> <p>In the event of disqualification, the Contractor 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 Contractor shall inform SANRAL who in turn will communicate with National Treasury and the CIDB in writing.</p>
5.8	<p>A substantially responsive tender is a tender in which all of the material information and documentation submitted at close of tender contains non-material and non-conformities to the bid specifications but are not related to price. The correction of any such documentation or information, or the condonement for the non-inclusion of any such document or information may not be prejudicial towards the offer and claimed preference of any responsive tender or be construed to be giving an unfair advantage to any tender.</p> <p>A responsive tender is also one that conforms to all the terms, conditions, and scope of work of the tender documents, without material omissions. The test for a material omission is the same as the test for a material deviation or qualification.</p>
5.9	<p>Arithmetical errors, omissions, discrepancies and imbalanced unit rates</p> <p>Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount appearing in the summary to the bill of quantities shall govern.</p> <p>Check responsive tender offers for:</p> <ol style="list-style-type: none"> the gross misplacement of the decimal point in any unit rate; omissions made in completing the pricing schedule or bills of quantities; or arithmetic errors in: <ol style="list-style-type: none"> line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or the summation of the prices. imbalanced unit rates. <p>Notify shortlisted tenderers of all errors, omissions or imbalanced rates that are identified in their tender offers.</p> <p>Where the tenderer elects to confirm the errors, omissions or re-balancing of imbalanced rates the tender offer shall be corrected as follows:</p> <ol style="list-style-type: none"> If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the unit rate shall govern, and the line item total shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted and the unit rate shall be corrected. Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall be corrected. Where the unit rates are imbalanced adjust such rates by increasing or decreasing them and selected others, including rates between the management and operational sections, while retaining the total of the prices derived after any other corrections

	<p>made under (a) and (b) above.</p> <p>Where there is an omission of a line item, no correction is possible, and the offer may be declared non-responsive.</p> <p>Declare as non-responsive and reject any offer from a tenderer who elects not to accept the corrections proposed and subject the tenderer to the sanction under 4.16.2.</p> <p>The tenderer is required to submit balanced unit rates for rate only items in the pricing schedule. The rates submitted for these items will be taken into account in the evaluation of tenders.</p>																																											
5.11.1	<p>The minimum percentage of evaluation points for functionality is not less than ...%. <i>(Note to Compiler: Insert relevant functionality score as agreed with the Engineer and SANRAL)</i></p> <p>The functionality points can be lowered by the Contractor, (typically by 5/100 points or 5%), should an adequate number of tenderers not achieve the functionality threshold. The bench mark for an adequate number of tenderers is ten (10) tenderers that achieve the functionality points, but it is at the Contractor’s discretion and depends on the Works to be subcontracted or any other valid considerations.</p> <p>Score each of the criteria and sub-criteria for functionality (N_F) in accordance with the provisions of the tender data. Calculate the total number of tender evaluation points for functionality using the following formula:</p> <p>$N_F = W_2 \times S_O / M_S$</p> <p>where:</p> <p>M_S is the maximum possible score (100) for functionality in respect of a submission; and W₂ is the maximum possible number of tender evaluation points (100) awarded for the functionality as stated in the tender data.</p> <p>S_O is the score for functionality allocated to the submission under consideration, calculated as follows;</p> <p>a) Each Tenderer will be evaluated, and points will be allocated according to the criteria in the Table below. <i>(Note to Compiler: The below criteria is the latest criteria in the Sanral pro-forma documentation and it might differ from the criteria in the main contract documentation utilized. It is therefore proposed to utilize the latest criteria as indicated below to be agreed with the Engineer and SANRAL)</i></p> <p>b) Information submitted in the returnable Form B3 will be used to allocate points for the respective criteria.</p> <p>c) Only Tenderers who score a minimum of 75 percentage points or more <i>(insert project specific functionality threshold)</i> for functionality will be evaluated further.</p> <table><tr><th rowspan="2">CIDB Grade and Package Value</th><th colspan="3">Maximum Points out of 100</th><th rowspan="2">Total Points</th></tr><tr><th>Locality Table 5.11.1</th><th>CIDB Grading Table 5.11.2</th><th>Designated Groups Table 5.11.3</th></tr><tr><td>1 - R 500 000</td><td>60</td><td>30</td><td>10</td><td>100</td></tr><tr><td>2 - R 1 000 000</td><td>60</td><td>30</td><td>10</td><td>100</td></tr><tr><td>3 - R 3 000 000</td><td>60</td><td>35</td><td>5</td><td>100</td></tr><tr><td>4 - R 6 000 000</td><td>60</td><td>35</td><td>5</td><td>100</td></tr><tr><td>5 - R 10 000 000</td><td>60</td><td>35</td><td>5</td><td>100</td></tr><tr><td>6 - R 20 000 000</td><td>60</td><td>35</td><td>5</td><td>100</td></tr><tr><td>7 - R 60 000 000</td><td>60</td><td>30</td><td>10</td><td>100</td></tr></table>	CIDB Grade and Package Value	Maximum Points out of 100			Total Points	Locality Table 5.11.1	CIDB Grading Table 5.11.2	Designated Groups Table 5.11.3	1 - R 500 000	60	30	10	100	2 - R 1 000 000	60	30	10	100	3 - R 3 000 000	60	35	5	100	4 - R 6 000 000	60	35	5	100	5 - R 10 000 000	60	35	5	100	6 - R 20 000 000	60	35	5	100	7 - R 60 000 000	60	30	10	100
CIDB Grade and Package Value	Maximum Points out of 100			Total Points																																								
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1 - R 500 000	60	30	10	100																																								
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4 - R 6 000 000	60	35	5	100																																								
5 - R 10 000 000	60	35	5	100																																								
6 - R 20 000 000	60	35	5	100																																								
7 - R 60 000 000	60	30	10	100																																								

5.11.1.1 Locality

The points for Locality will be calculated as follows:

- The project area(s) for this subcontract is xxx and xxx (*insert identified project area endorsed by the PLC*)
- For the purposes of this evaluation, “based” shall mean the tenderer’s current physical address as recorded by the Companies and Intellectual Property Commission (CIPC) of the tenderer’s place of business.
- The information provided in the returnable schedules will be used to calculate the points for locality.
- The maximum number of points that can be awarded for locality is **60** (*amend to be project specific*).
- The points for locality will be allocated as follows:

Table 5.11.1.1: Locality

CIDB Package Category		1CE	2CE	3CE	4CE	5CE	6CE
Typical Package Value		Up to R 1 mill		R 1 mill to R 6 mill		R 6 mill to R 20 mill	
Locality	Tenderer is based in the Local Municipality(ies).	60	60	60	60	60	60
	Tenderer is based outside the Local Municipality(ies) but in the District Municipality(ies).	45	45	40	40	40	40
	Tenderer is based outside the District Municipality(ies), but in the Province.	0	0	35	35	35	35
	Tenderer is based outside the Province, but in the RSA.	0	0	0	0	30	30

(Remove the non-applicable CIDB grades and amend the points allocation to be project specific)

5.11.1.2 Targeted CIDB Grade and class

The points for CIDB Grading Designation will be calculated as follows:

- The targeted CIDB grading and class for this subcontract is 3CE PE (*insert the subcontract specific grading and class*)
- The information provided in the returnable schedules will be used to calculate the points for CIDB grading and class.
- The maximum number of points that can be awarded for CIDB grading designation is **35** (*amend to be project specific*)
- The points for Targeted CIDB Grading designation will be allocated as follows:

Table 5.11.1.2: Targeted CIDB Grading Designation

CIDB Package Category		1CE	2CE	3CE	4CE	5CE	6CE
Typical Package Value		Up to R 1 mill		R 1 mill to R 6 mill		R 6 mill to R 20 mill	
CIDB Grading	Tenderer is registered as a CIDB 1	30	30	0	0	0	0
	Tenderer is registered as a CIDB 2	30	30	30	0	0	0
	Tenderer is registered as a CIDB 3	0	0	35	30	0	0
	Tenderer is registered as a CIDB 4	0	0	30	35	30	0

		Tenderer is registered as a CIDB 5	0	0	0	30	35	30	
		Tenderer is registered as a CIDB 6	0	0	0	0	30	35	
		Tenderer is registered as a CIDB 7 and higher	0	0	0	0	0	30	
	(Remove the non-applicable CIDB grade columns and amend the points allocation to be project specific)								
	5.11.1.3 Designated Group ownership								
	The points for Designated Group ownership will be calculated as follows:								
	a)	The targeted Designated Group ownership for this subcontract is Greater than 51% ownership by Black Youth (insert the Designated Group and ownership)							
	b)	The information in the returnable schedules will be used to calculate the points for Designated Group ownership.							
	c)	The maximum number of points that can be awarded for Designated Group ownership is 10 (amend to be project specific)							
	d)	The points for Designated Group ownership will be allocated as follows:							
	Table 5.11.1.3: Designated Group ownership								
	CIDB Package Category			1CE	2CE	3CE	4CE	5CE	6CE
	Typical Package Value			Up to R 1 mill		R 1 mill to R 6 mill		R 6 mill to R 20 mill	
Designated Groups (no max score)	Tenderer is 51%+ owned by black people who are youth.		5	5	5	5	5	5	
	Tenderer is 51%+ owned by black people who are women.		5	5	5	5	5	5	
	Tenderer is 51%+ owned by black people with disabilities.		5	5	5	5	5	5	
	Tenderer is 51%+ owned by black people who are military veterans.		5	5	5	5	5	5	
(Remove the non-applicable CIDB grade columns and amend the Designated Group ownership and/or points allocation to be project specific)									
5.11.4	<p>The procedure for the evaluation of responsive tenders is Method 3.</p> <p>If two or more tenderers score an equal total number of points, and these tenders are also the highest ranked tenders, the contract must be awarded to the tenderer that scored the highest points for B-BBEE.</p> <p>If functionality is part of the evaluation process and two or more tenderers score equal total points and equal preference points, the subcontract must be awarded to the tenderer that scored the highest points for functionality.</p> <p>If two or more tenderers score equal total points in all respects, and these tenders are also the highest ranked tenders the award must be decided by the drawing of lots.</p>								
5.11.7	<p>The value of W_1 is:</p> <p>1. 90 where the financial value inclusive of VAT of the lowest responsive tender offer received has a value in excess of R50,000,000.00; or</p> <p>2. 80 where the financial value inclusive of VAT of the lowest responsive tender offer received equals or is less than R50,000,000.00.</p> <p>A is the number calculated using the formula:</p> $A=(1-(P-P_m)/P_m)$								

	<p>Where:</p> <p><i>P</i> is the comparative offer of the tender offer under consideration; and <i>P_m</i> is the comparative offer of the most favourable comparative offer.</p> <p>In the event that the calculated value is negative, the allocated score shall be 0 (zero).</p>																		
5.11.8	<p>Up to 100 minus <i>W₁</i> tender evaluation points will be awarded to tenderers who submit responsive tenders and who are found to be eligible for the preference claimed.</p> <p>Points are based on a tenderer's scorecard measured in terms of the Broad-Based Black Economic Empowerment Act (B-BBEE, Act 53 of 2003) and the Regulations (2017) to the Preferential Procurement Policy Framework Act (PPPFA, Act 5 of 2000).</p> <p>Points awarded will be according to a tenderer's B-BBEE status level of contributor and summarised in the table below:</p> <table><tr><th>B-BBEE Status Level of Contributor</th><th>Number of points for financial value up to and including R50,000,000</th><th>Number of points for financial value above R50,000,000</th></tr><tr><td>1</td><td>20</td><td>10</td></tr><tr><td>2</td><td>18</td><td>9</td></tr><tr><td>3</td><td>14</td><td>6</td></tr><tr><td>4</td><td>12</td><td>5</td></tr><tr><td>Other</td><td>0</td><td>0</td></tr></table> <p>Eligibility for preference points is subject to the following conditions:</p> <ol style="list-style-type: none">A tenderer's scorecard shall be a B-BBEE Certificate issued in accordance with:<ul style="list-style-type: none">the Amended Construction Sector Codes published in Notice 931 of 2017 of Government Gazette No. 41287 on 1 December 2017 by the Department of Trade and Industry.in the event that the Measured Entity operates in more than one sector or a sub-sector, the scorecard for the sector or sub-sector in which the majority of its core activities (measured in terms of annual revenue) are located will be acceptable; andThe scorecard shall be submitted as a certificate attached to Returnable Schedule Form A11; andThe certificate shall:<ul style="list-style-type: none">be valid at the tender closing date; andhave been issued by a verification agency accredited by the South African National Accreditation System (SANAS); orbe in the form of a sworn affidavit accompanied with an audited financial statement of the year concerned or a certificate issued by the Companies and Intellectual Property Commission in the case of an Exempted Micro Enterprise (EME) with a total annual revenue of less than R3 million if issued in accordance with the amended Construction Sector Codes published in Notice 931 of 2017 of Government Gazette No. 41287 on 1 December 2017 by the Department of Trade and Industry; andhave a date of issue less than 12 (twelve) months prior to the original advertised tender closing date (see Tender Data 4.15); andCompliance with any other information requested to be attached to Returnable Schedule Form A11; andIn the event of a joint venture (JV), a project-specific consolidated B-BBEE verification certificate in the name of the JV must be issued by a verification agency accredited by the South African National Accreditation System (SANAS) shall be submitted.	B-BBEE Status Level of Contributor	Number of points for financial value up to and including R50,000,000	Number of points for financial value above R50,000,000	1	20	10	2	18	9	3	14	6	4	12	5	Other	0	0
B-BBEE Status Level of Contributor	Number of points for financial value up to and including R50,000,000	Number of points for financial value above R50,000,000																	
1	20	10																	
2	18	9																	
3	14	6																	
4	12	5																	
Other	0	0																	
5.13.	<p>The conditions stated in clauses 5.13(a) to (f) of the Conditions of Tender as well as the following additional clauses 5.13(g) to (m) shall be applied as objective criteria in terms of section 2(1)(f) of the Preferential Procurement Policy Framework Act, 2000 (Act No 5 of 2000) and as compelling and justifiable reasons in terms of Conditions of Tender clause 5.11:</p> <p>g) the tenderer or any of its directors is not listed on National Treasury's Register of Tender Defaulters or Restricted Suppliers, in terms of the Prevention and</p>																		

	<p>Combating of Corrupt Activities Act, 2004 (Act No 12 of 2004) as a tenderer or person prohibited from doing business with the public sector;</p> <p>h) the tenderer has not abused the Contractor's supply chain management system.</p> <p>i) the tenderer has not failed to perform on any previous contract and has not been given a written notice to this effect.</p> <p>j) the tenderer has not failed to comply with and complete the Declaration Certificate for Local Production and Content (Form A3.5) and the Local Content Declaration: Summary Schedule (Form A3.6) for each product.</p> <p>k) the tenderer is tax compliant. The recommended tenderer who becomes non-compliant, prior to award, shall be notified and must become compliant within 7 working days of the date of being notified. A recommended tenderer who remains non-compliant after the 7 working days of being notified, shall be declared non-responsive.</p> <p>l) the tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer. The licensed compensation insurer shall be approved by Department of Labour in terms of Section 80 of the Compensation for Injury and Disease Act, 1993 (Act No. 130 of 1993).</p> <p>m) The Contractor has not failed to negotiate acceptable tender sum and/or rates in terms of 5.11.10</p>
5.17	The number of paper copies of the signed contract to be provided by the Contractor is one (1).
5.19	All requests shall be in writing.
ADDITIONAL CONDITIONS OF TENDER CLAUSES:	
Clause Number	Data
3.7	<p>Jurisdiction</p> <p>Unless stated otherwise in the tender data, each tenderer and the Contractor undertake to accept the jurisdiction of the law courts of the Republic of South Africa.</p>
5.11.10	<p>Negotiating acceptable tender sum and/or rates</p> <p>a) High tender sums submitted by Tenderers</p> <p>If the Contractor choose to include work in the subcontract package, for which he has tendered rates for work items in the Main Contract and the tenderer who scored the highest points tendered a higher sum or rates than that of the Contractor, the Contractor may either accept the rates or negotiate with the preferred tenderer.</p> <p>If the Contractor fails to negotiate a reasonable tender sum or rates with the tenderer, he may approach the second highest point scoring, compliant tenderer for negotiation. This process may be repeated until the Contractor manages to negotiate a reasonable tender sum or rates with a compliant tenderer.</p> <p>b) Provisional Sum</p> <p>If a provisional sum in the main contract is provided for the work items in the subcontract package, the Contractor shall report on the feasibility of the highest point scoring compliant tenderer's tender sum and rates to the Engineer.</p> <p>(i) If the highest points scoring compliant tenderer's tender sum and rates are deemed market related by the Engineer, the Contractor shall obtain the approval of SANRAL to utilise the provisional sum provided for the work items.</p> <p>(ii) If the highest points scoring tenderer's tender sum and rates are deemed not market related and SANRAL does not approve the utilisation of the relevant provisional sum, the Contractor may either accept the rates or negotiate with the highest points scoring tenderer for a market related tender sum and rates.</p> <p>If the Contractor fails to negotiate market related tender sum and rates with the tenderer, he may approach the next highest point scoring, compliant tenderer for negotiation. This process may be repeated until the Contractor manages to negotiate a reasonable tender sum and rates with a compliant tenderer.</p>

	<p>c) Low tender sums submitted by Tenderers</p> <p>The Contractor shall report to the Engineer and SANRAL on the feasibility of tender sums, rates or provisional sums of tenderers who tendered exceptionally low. Exceptionally low tender sums, rates or provisional sums are those that are more than ten percent (10%) less than what the Contractor tendered, or in the case of a provisional sum, what is deemed market related by the Engineer.</p> <p>(i) If the tender sums, rates or provisional sums of those tenderers who tendered exceptionally low are deemed to still be feasible by the Engineer, the Contractor may continue to include these tenders in his tender evaluation.</p> <p>(ii) If the tender sums, rates or provisional sums of those tenderers who tendered exceptionally low are deemed not feasible by the Engineer, the Contractor may disqualify these tenders from his tender evaluation.</p>
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PART T2: RETURNABLE SCHEDULES

PART T2: RETURNABLE SCHEDULES

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T2.1 LIST OF RETURNABLE DOCUMENTS**Notes to tenderer:**

1. Returnable documents have been based on the SANS Standard Conditions of Tender for Construction Procurement and incorporate National Treasury requirements contained in their Standard Bidding Document (SBD) within them.
Returnable documents are separated into the following categories:
 - (i) Forms, certificates and schedules for completion by the tenderer for use in the quantitative and qualitative evaluation of the tender (Forms A to C).
 - (ii) A list of all returnable documents for completion by the tenderer (Form D1).
2. Failure to submit fully completed relevant returnable documents may render such a tender offer non-responsive.
3. Tenderers shall note that their signatures appended to each returnable form represents a declaration that they vouch for the accuracy and correctness of the information provided.
4. Notwithstanding any check or audit conducted by or on behalf of the Contractor, the information provided in the returnable documents is accepted in good faith and as justification for entering into a contract with a tenderer. If subsequently any information is found to be incorrect such discovery shall be taken as willful misrepresentation by that tenderer to induce the contract. In such event the Contractor has the discretionary right under FIDIC Particular Condition 15.6 to terminate the contract.
5. These forms must be completed in non-erasable ink and any alterations made prior to tender closure countersigned by an authorised signatory.

(Note to Compiler: All notes are to be addressed and then removed from the draft and final documents)

T2.1 LIST OF RETURNABLE DOCUMENTS**Note to tenderer:**

The list of returnable documents is shown in the following table, as indicated by the status of those documents it will be incorporated into the contract document.

FORM	LIST OF RETURNABLE DOCUMENTS	STATUS
FORM A1:	CLARIFICATION BRIEFING	
FORM A2.1:	CERTIFICATE OF AUTHORITY FOR SIGNATORY	
FORM A2.2:	CERTIFICATE OF SINGLE TENDER SUBMISSION	
FORM A2.3:	CERTIFICATE OF FRONTING PRACTICES	
FORM A3.1 (SBD4):	COMPULSORY DECLARATION	CONTRACT
FORM A3.2 (SBD9):	CERTIFICATE OF INDEPENDENT TENDER	CONTRACT
FORM A3.3 (SBD8):	DECLARATION OF TENDERER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES	CONTRACT
FORM A3.4:	REGISTRATION ON NATIONAL TREASURY CENTRAL SUPPLIER DATABASE	CONTRACT
FORM A3.5 (SBD6.2)	DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS	CONTRACT
FORM A4:	SCHEDULE OF DEVIATIONS OR QUALIFICATIONS BY TENDERER	
FORM A5:	SCHEDULE OF ADDENDA TO TENDER DOCUMENTS	
FORM A6 (SBD2):	CERTIFICATE OF TAX COMPLIANCE	CONTRACT
FORM A7:	TENDERER'S REGISTERED FINANCIAL SERVICE PROVIDER LETTER AND BANK DETAILS	
FORM A8:	SCHEDULE OF CURRENT COMMITMENTS	
FORM A9:	CERTIFICATE OF COMPLIANCE WITH COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT, 1993	CONTRACT
FORM A10:	REGISTRATION WITH CIDB (If applicable)	CONTRACT
FORM A11 (SBD6.1):	PREFERENCING SCHEDULE - TENDERER'S B-BBEE VERIFICATION	CONTRACT
FORM B1:	SCHEDULE OF WORK EXPERIENCE	
FORM B2:	SCHEDULE OF CONTRACTOR'S EQUIPMENT	
FORM B3	FUNCTIONALITY CRITERIA	
FORM C1:	CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS	
FORM D1:	SCHEDULE OF TENDER COMPLIANCE	
C1.1.1 (SBD7):	FORM OF OFFER	CONTRACT
C1.1.2:	FORM OF ACCEPTANCE	CONTRACT
C1.2.3:	CONTRACT DATA – INFORMATION PROVIDED BY THE TENDERER	CONTRACT
C2.2 (SBD3):	PRICING SCHEDULE (PROVIDED ON COMPACT DISC)	CONTRACT

T2.2 RETURNABLE SCHEDULES

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FORM A1: CLARIFICATION BRIEFING**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE**

This is to certify that I,

representative of (tenderer)

of (address)

.....

telephone number

fax number

e-mail.....

(Note to Compiler: Option 1: where electronic means are available)

read / viewed the clarification briefing presentation/pre-recorded video presented by the Contractor.

TENDERER'S REPRESENTATIVE (Signature)

*(Note to Compiler: Option 2: where option 1 is not feasible)*attended the clarification briefing session on (date)
conducted by the Contractor's representative.**Unless the attendee's name, details and signature also appear on the attendance register this Certificate of Attendance shall not be accepted and the tenderer's offer shall be deemed non-responsive and will not be considered.**

TENDERER'S REPRESENTATIVE (Signature):

CONTRACTOR'S REPRESENTATIVE (Signature):

NAME (IN CAPITALS):

FORM A2.1: CERTIFICATE OF AUTHORITY FOR SIGNATORY**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE****Notes to tenderer:**

1. The signatory for the tenderer shall confirm his/her authority thereto by attaching a duly signed and dated copy of the relevant resolution of the board of directors/partners on the tendering company's letterhead.
2. In the event that the tenderer is a joint venture, a certificate is required from each member of the joint venture clearly setting out:
 - authority for signatory,
 - undertaking to formally enter into a joint venture contract should an award be made to the joint venture,
 - name of designated lead member of the intended joint venture, as required by tender condition 4.13.2.
3. The resolution below is given as an example of an acceptable format for authorisation, but submission of this page with the example completed shall not be accepted as authorisation of the tenderer's signatory.

By resolution of the board of directors/partners passed at a meeting held on.....

Mr./Ms.

....., whose signature appears below, has been
 duly authorised to sign all documents in connection with the tender for:

SUBCONTRACT

.....
 (Insert Contract Number and Description)

and any contract which may arise there from on behalf of

..... (enter name of tenderer in block capitals)

SIGNED ON BEHALF OF THE COMPANY:.....

IN THE CAPACITY OF:.....

DATE:.....

SIGNATURE OF SIGNATORY:

WITNESSES:

SIGNATURE

SIGNATURE

NAME (PRINT)

NAME (PRINT)

FORM A2.2: CERTIFICATE OF SINGLE TENDER SUBMISSION**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE****Notes to tenderer:**

1. This certificate serves as a declaration by the tenderer that a single tender was submitted.
2. In the case of a Joint Venture (JV), a separate certificate is to be completed and submitted by each JV member.

DECLARATION

I, the undersigned,
 in submitting the accompanying tender on behalf of the tenderer do hereby make the following statements that I certify to be true and complete in every respect:

1. I have read and understand the notes to, and the contents of, this certificate.
2. I understand that the accompanying tender and any other tender shall be disqualified in the event that I, including a Joint Venture partner, or Key Person, participate in more than 1 (one) tender.

SIGNATURE:

DATE:

NAME:

POSITION:

FORM A2.3: CERTIFICATE OF FRONTING PRACTICES**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE****Fronting Practices**

Window-dressing: This includes cases in which black people are appointed or introduced to an enterprise on the basis of tokenism and may be:

- Discouraged or inhibited from substantially participating in the core activities of an enterprise; and
- Discouraged or inhibited from substantially participating in the stated areas and/or levels of their participation;

Benefit Diversion: This includes initiatives implemented where the economic benefits received as a result of the B-BBEE Status of an enterprise do not flow to black people in the ratio as specified in the relevant legal documentation.

Opportunistic Intermediaries: This includes enterprises that have concluded agreements with other enterprises with a view to leveraging the opportunistic intermediary's favourable B-BBEE status in circumstances where the agreement involves:

- Significant limitations or restrictions upon the identity of the opportunistic intermediary's suppliers, service providers, clients or customers;
- The maintenance of their business operations in a context reasonably considered improbable having regard to resources; and
- Terms and conditions that are not negotiated at arms-length on a fair and reasonable basis.

DECLARATION

I, the undersigned,
in submitting the accompanying tender on behalf of the tenderer do hereby make the following statements that I certify to be true and complete in every respect:

1. I have read and understand the contents of this certificate.
2. I accept that the Employer may report fronting practices to the Department of Trade and Industry and the BEE commissioner.
3. I accept that intentional misrepresentation by measured entities may constitute fraudulent practices that shall be reported to the Department of Trade and Industry and the BEE commissioner.

SIGNATURE:

DATE:

NAME:

POSITION:

FORM A3.1: COMPULSORY DECLARATION (INCORPORATING SBD4)

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

Notes to tenderer:

- 1. Any legal person, including persons employed by the State, or persons having a kinship with persons employed by the State, including a blood relationship, may make an offer or offers in terms of this tender. In view of possible allegations of favouritism, should the resulting tender, or part thereof, be awarded to persons employed by the State, or to persons connected with or related to them, it is required that the tenderer or his/her authorised representative declare his/her position in relation to the evaluating/adjudicating authority where:**
 - the tenderer is employed by the State; and/or
 - the legal person on whose behalf the tender document is signed, has a relationship with person/s who are involved in the evaluation and/or adjudication of the tender, or where it is known that such a relationship exists between the person or persons for or on whose behalf the declarant acts and persons who are involved with the evaluation and/or adjudication of the tender.
- 2. Definitions:**
 - 2.1 "State" means:**
 - a) any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No. 1 of 1999);
 - b) any municipality or municipal entity;
 - c) provincial legislature;
 - d) National Assembly or the National Council of Provinces; or
 - e) Parliament.
 - 1.2 "Shareholder" means a person who owns shares in the company and is actively involved in the management of the enterprise or business and exercises control over the enterprise.**
- 3. In the case of a joint venture (JV), a separate declaration form is to be completed and submitted by each JV member.**

Section 1: Enterprise details

Name of enterprise	
Contact person	
E-mail	
Telephone	
Cell	
Fax	
Physical address	
Postal address	

Company / Close Corporation registration number	
---	--

Tax reference number	
VAT registration number	(state Not Registered if not registered for VAT)

CIDB Registration number	
--------------------------	--

Principal: means a natural person who is a partner in a partnership, a sole proprietor, a director of a company established in terms of the Companies Act of 2008 (Act No. 71 of 2008) or a member of a close corporation registered in terms of the Close Corporations Act, 1984, (Act No. 69 of 1984)

[illegible]

EDMS #5891055

FORM A3.1 (SBD4): COMPULSORY DECLARATION (continued)**Section 6: Record in the service of the state:**

Indicate by marking the relevant boxes with a cross, if any principal is currently or has been within the last 12 months in the service of any of the following:

- | | |
|--|--|
| <input type="checkbox"/> a member of any municipal council | <input type="checkbox"/> an employee of any department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999) |
| <input type="checkbox"/> a member of any provincial legislature | <input type="checkbox"/> a member of an accounting authority of any national or provincial public entity |
| <input type="checkbox"/> a member of the National Assembly or the National Council of Province | <input type="checkbox"/> an employee of Parliament or a provincial legislature |
| <input type="checkbox"/> a member of the board of directors of any municipal entity | |
| <input type="checkbox"/> an official of any municipality or municipal entity | |

If any of the above boxes are marked, disclose the following:

Name of principal	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

Insert separate page if necessary.

Section 7: Record of family member in the service of the state:

Family member: a person's spouse, whether in a marriage or in a customary union according to indigenous law, domestic partner in a civil union, or child, parent, brother, sister, whether such relationship results from birth, marriage or adoption

Indicate by marking the relevant boxes with a cross, if any family member of a principal as defined in section 5 is currently or has within the last 12 months been in the service of any of the following:

- | | |
|--|--|
| <input type="checkbox"/> a member of any municipal council | <input type="checkbox"/> an employee of any department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999) |
| <input type="checkbox"/> a member of any provincial legislature | <input type="checkbox"/> a member of an accounting authority of any national or provincial public entity |
| <input type="checkbox"/> a member of the National Assembly or the National Council of Province | <input type="checkbox"/> an employee of Parliament or a provincial legislature |
| <input type="checkbox"/> a member of the board of directors of any municipal entity | |
| <input type="checkbox"/> an official of any municipality or municipal entity | |

If any of the above boxes are marked, disclose the following:

Name of family member	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

Insert separate page if necessary.

FORM A3.1 (SBD4): COMPULSORY DECLARATION (continued)**Section 8: Record of termination of previous contracts with an organ of state**

Was any contract between the tendering entity, including any of its joint venture partners, terminated during the past five years for reasons other than the employer no longer requiring such works or the employer failing to make payment in terms of the contract?

☐ Yes ☐ No (tick appropriate box)

If yes, provide particulars:

--

Insert separate page if necessary

Section 9: Declaration

The undersigned, who warrants that he/she is duly authorised to do so on behalf of the tendering entity, confirms that the contents of this Declaration are within my personal knowledge, save where stated otherwise in an attachment hereto, and to the best of my belief is both true and correct, and that:

- i) neither the name of the tendering entity, nor any of its principals, appears on:
 - a) the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004 (Act No. 12 of 2004); or
 - b) National Treasury's Database of Restricted Suppliers (see www.treasury.gov.za);
- ii) the tendering entity or any of its principals has not been convicted of fraud or corruption by a court of law (including a court outside of the Republic of South Africa) within the last five years;
- iii) any principal who is presently employed by the state has the necessary permission to undertake remunerative work outside such employment (attach permission to this declaration);
- iv) the tendering entity is not associated, linked or involved with any other tendering entities submitting tender offers;
- v) the tendering entity has not engaged in any prohibited restrictive horizontal practices, including consultation, communication, agreement, or arrangement with any competing or potential tendering entity regarding prices, geographical areas in which goods and services will be rendered, approaches to determining prices or pricing parameters, intentions to submit a tender or not, the content of the submission (specification, timing, conditions of contract, etc.) or intention to not win a tender;
- vi) the tendering entity has no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest;
- vii) neither the tenderer nor any of its principals owes municipal rates and taxes or municipal service charges to any municipality or a municipal entity, and are not in arrears for more than three months;
- viii) SARS may, on an on-going basis during the term of the contract, disclose the tenderer's tax compliance status to the Employer and, when called upon to do so, obtain the written consent of any subcontractors who are subcontracted to execute a portion of the contract that is entered into in excess of the threshold prescribed by National Treasury, for SARS to do likewise.

I, the undersigned
 certify that the information furnished in Form A3 above is correct. I accept that the Employer may reject the tender or act against me in terms of 5.7 of the Conditions of Tender should this declaration prove to be false.

.....
 Signature (duly authorised)

.....
 Date

.....
 Position Name of Enterprise

FORM A3.1 (SBD4): COMPULSORY DECLARATION (continued)

NOTE 1: The Standard Conditions of Tender contained in SANS 10845-3 prohibits anticompetitive practices (clause 3.1) and requires that tenderers avoid conflicts of interest, only submit a tender offer if the tenderer or any of his principals is not under any restriction to do business with the Employer (4.1.1) and submit only one tender either as a single tendering entity or as a member in a joint venture (clause 4.13.1). Clause 5.7 also empowers the Employer to disqualify any tenderer who engages in fraudulent and corrupt practice. Clause 3.1 also requires tenderers to comply with all legal obligations.

NOTE 2: Section 30(1) of the Public Service Act, 1994, prohibits an employee (person who is employed in posts on the establishment of departments) from performing or engaging remunerative work outside his or her employment in the relevant department, except with the written permission of the executive authority of the department. When in operation, Section 8(2) of the Public Administration Management Act, 2014, will prohibit an employee of the public administration (i.e. municipalities and all national departments, national government components listed in Part A of Schedule 3 to the Public Service Act, provincial departments including the office of the premier listed in Schedule 1 of the Public Service Act and provincial departments listed in schedule 2 of the Public Service Act, and provincial government components listed in Part B of schedule 3 of the Public Service Act) or persons contracted to executive authorities in accordance with the provisions of section 12A of the Public Service Act of 1994 or persons performing similar functions in municipalities, from conducting business with the State or to be a director of a public or private company conducting business with the State. The offence for doing so is a fine or imprisonment for a period not exceeding five years, or both. It is also a serious misconduct which may result in the termination of employment by the employer.

NOTE 3: Regulation 44 of Supply Chain Management regulations issued in terms of the Municipal Finance Management Act of 2003 requires that municipalities and municipal entities should not award a contract to a person who is in the service of the State, a director, manager or principal shareholder in the service of the State or who has been in the service of the State in the previous twelve months.

NOTE 4: Regulation 45 of Supply Chain Management regulations requires a municipality or municipal entity to disclose in the notes to the annual statements particulars of any award made to a close family member in the service of the State.

NOTE 5: Corrupt activities which give rise to an offence in terms of the Prevention and Combating of Corrupt Activities Act of 2004, include improperly influencing in any way the procurement of any contract, the fixing of the price, consideration or other moneys stipulated or otherwise provided for in any contract, and the manipulating by any means of the award of a tender.

NOTE 6: Section 4 of the Competition Act of 1998 prohibits restrictive horizontal practice, including agreements between parties in a horizontal relationship, which have the effect of substantially preventing or lessening competition, directly or indirectly fixing prices or dividing markets or constituting collusive tendering. Section 5 also prohibits restrictive vertical practices. Any restrictive practices that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties.

FORM A3.2: CERTIFICATE OF INDEPENDENT TENDER (INCORPORATING SBD9)**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE****Notes to tenderer:**

1. This certificate conforms to Treasury Regulation 16A9 and the requirement of section 4 (1) (b) (iii) of the Competition Act, 1998 (Act No 89 of 1998), as amended, that prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive tendering.
2. Collusive tendering is a conspiracy between businesses that would normally be expected to compete, to agree not to compete, in a tender process.
3. This certificate serves as a declaration by the tenderer that the tender submitted is free from any collusion with a competitor.
4. If the tenderer is a joint venture, a declaration is required from each member of the joint venture.

Declaration

I, the undersigned, in submitting the accompanying tender on behalf of the tenderer do hereby make the following statements that I certify to be true and complete in every respect:

1. I have read and understand the notes to, and the contents of, this Certificate;
2. I understand that the accompanying tender will be disqualified if this Certificate is found to be not true and complete in every respect;
3. I am authorised by the tenderer to sign this Certificate, and to submit the accompanying tender, on behalf of the tenderer;
4. Each person whose signature appears on the accompanying tender has been authorised by the tenderer to determine the terms of, and to sign the tender, on behalf of the tenderer;
5. For the purposes of this Certificate and the accompanying tender, I understand that the word "competitor" shall include any individual or organisation, other than the tenderer, whether or not affiliated with the tenderer, who:
 - a) has been requested to submit a tender in response to this tender invitation;
 - b) could potentially submit a tender in response to this tender invitation, based on their qualifications, abilities or experience; and
 - c) provides the same goods and services as the tenderer and/or is in the same line of business as the tenderer.
6. The tenderer has arrived at the accompanying tender independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium will not be construed as collusive tendering.
7. In particular, without limiting the generality of statement 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - a) prices;
 - b) geographical area where product or service will be rendered (market allocation);
 - c) methods, factors or formulas used to calculate prices;
 - d) the intention or decision to submit, or not to submit, a tender;
 - e) the submission of a tender which does not meet the specifications and conditions of the tender; or
 - f) tendering with the intention not to win the tender.

8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this tender relates.
9. The terms of the accompanying tender have not been, and will not be, disclosed by the tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening or of the awarding of the contract.
10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to tenders and contracts, tenders that are suspicious will be reported to the Competitions Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act, 1998 (Act No 89 of 1998) and/or may be reported to the National Prosecuting Authority for criminal investigation and/or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act, 2004 (Act No 12 of 2004) or any other applicable legislation.

SIGNATURE:

NAME:

POSITION:

DATE:

NAME OF TENDERER:

FORM A3.3: DECLARATION OF TENDERER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES (INCORPORATING SBD8)

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

Notes to tenderer:

1. **This declaration:**
 - (i) **must form part of all tenders submitted: and**
 - (ii) **if the tenderer is a joint venture, a declaration is required from each member of the joint venture.**
2. **This form serves as a declaration to be used by institutions in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.**
3. **The tender of any tenderer may be disregarded if that tenderer or any of its directors has:**
 - (i) **abused the institution's supply chain management system;**
 - (ii) **committed fraud or any other improper conduct in relation to such system; or**
 - (iii) **failed to perform on any previous contract.**
4. **In order to give effect to the above, the following questionnaire must be completed and submitted with this tender.**

4.1	<p>Is the tenderer or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector?</p> <p>Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/ Authority of the institution that imposed the restriction after the <i>audi alteram parlem</i> rule was applied.</p> <p>The Database of Restricted Suppliers now resides on the National Treasury website (www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.</p>	<p>Yes <input type="checkbox"/></p>	<p>No <input type="checkbox"/></p>
4.1.1	<p>If Yes, furnish particulars:</p>		
4.2	<p>Is the tenderer or any of its directors listed on the Register for Tender Defaulters in terms of Section 29 of the Prevention and Combating of Corrupt Activities Act, 2004 (Act No 12 of 2004)?</p> <p>The Register for Tender Defaulters can be accessed on the National Treasury website www.treasury.gov.za by clicking on its link at the bottom of the home page.</p>	<p>Yes <input type="checkbox"/></p>	<p>No <input type="checkbox"/></p>
4.2.1	<p>If Yes, furnish particulars:</p>		

4.3	Was the tenderer or any of its directors convicted by a court of law (including a court outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.3.1	If Yes, furnish particulars:		
4.4	Was any contract between the tenderer and any organ of State terminated during the past five years on account of failure to perform on or comply with the contract?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.4.1	If Yes, furnish particulars:		

DECLARATION

I, the undersigned,
 certify that the information furnished on this declaration form is true and correct.

I accept that, in addition to cancellation of a contract, action may be taken against me should this declaration prove to be false.

SIGNATURE:

POSITION:

DATE:

NAME OF TENDERER:

FORM A3.4: REGISTRATION ON NATIONAL TREASURY CENTRAL SUPPLIER DATABASE
SUBCONTRACT NO.
FOR
UNDER CONTRACT SANRAL
FOR THE

The tenderer shall provide a printed copy of the Active Supplier Listing on the National Treasury Central Supplier Database. (www.treasury.gov.za). In the case of a joint venture (JV), the tenderer shall provide printed copies of the Active Supplier Listing on the National Treasury Central Supplier Database for each member of the JV.

Name of Contractor:

CSD Master Registration Number (Supplier Number):

Supplier Commodity:

Delivery Location:

SIGNED BY TENDERER:

FORM A3.5: DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS (INCORPORATING SBD6.2)

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

The stipulated minimum threshold(s) for local production and content (refer to Annex A of SATS 1286:2011) for this bid are indicated in the below table *(Note to Compiler: The below list of materials to be amended by deleting the materials not applicable to the scope of work in line with the Main Contract minimum threshold):*

1. The Tenderer to confirm that the minimum threshold will be achieved by either indicating the percentage to be achieved or by indicating "Yes" or "✓" in the below table

Description of services, works or goods	Stipulated Minimum threshold	Minimum threshold to be achieved by Tenderer
Steel value-added construction material products		
Fabricated Structural Steel	100%	
Joining/Connecting Components	100%	
Frames	100%	
Roof and Cladding	100%	
Fasteners	100%	
Wire Products	100%	
Ducting and Structural Pipework	100%	
Gutters, downpipes & launders	100%	
Primary steel construction material products		
Plates (>4.5mm thick and supplied in flat pieces)	100%	
Sheets (<4.5mm thick and supplied in coils)	100%	
Galvanised and Colour Coated coils	100%	
WireRod and Drawn Wire	100%	
Sections (Channels, Angles, I-Beams and H-Beams)	100%	
Reinforcing bars	100%	
Electrical cable material products		
Low Voltage	90%	
Low Cost Reticulation	90%	
Medium & High Voltage	90%	
ACR	90%	
Telecom cable material products		
Optical Fibre Cables	90%	
Copper Telecom Cables	90%	
Yellow metal equipment		
Articulated dump trucks (ADT)	60%	
Tractor loader backhoe (TLB)	60%	
Front end loader (FEL)	60%	
Plastic Pipes		
Polyvinyl chloride (PVC) pipes	100%	
High density polyethylene (HDPE) pipes	100%	
Polypropylene (PP) pipes	100%	
Glass reinforced plastic (GRP) pipes	100%	
Textiles, Clothing, Leather and Footwear		
Textiles	100%	

SIGNED BY TENDERER:

FORM A4: SCHEDULE OF DEVIATIONS OR QUALIFICATIONS BY TENDERER
SUBCONTRACT NO.
FOR
UNDER CONTRACT SANRAL
FOR THE

Page	Description

SIGNED BY TENDERER:

FORM A5: SCHEDULE OF ADDENDA TO TENDER DOCUMENTS**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE**

We confirm that the following communications received from the Employer before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer.		
	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

SIGNED BY TENDERER:

FORM A6: CERTIFICATE OF TAX COMPLIANCE (INCORPORATING SBD2)

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

The tenderer shall complete the declaration below.

I, (name)
the undersigned in my capacity as (position)
on behalf of (name of company)
herewith grant consent that SARS may disclose to the Contractor or to the South African National Roads
Agency SOC Limited (SANRAL) our tax compliance status. For this purpose, our unique security
personal identification number (PIN) is
our tax reference number is
and our tax clearance certificate number is

In the event of a joint venture, each member shall comply with the above requirement.

SIGNED BY TENDERER:

FORM A7: TENDERER'S REGISTERED FINANCIAL SERVICE PROVIDER LETTER AND BANK DETAILS *(Note to Compiler: Delete this form for estimated Subcontract amounts less than R1,000,000.00 therefore not required for CIDB 1 and 2)*

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

Notes to tenderer:

1. The tenderer shall attach to this form a letter (dated less than 3 months prior to the tender closing date) from a Registered Financial Service Provider (registered with the FSB) which declares how the entity conducts its account and confirms that the Tenderer has the financial means net of current commitments (independent of any contractual advance payment) available to meet the construction cash flow requirements estimated for the subject contract.
2. Failure to provide the required letter with the tender submission may render the tenderer's offer non-responsive in terms of tender condition 5.8.
3. In the event that the tenderer is a joint venture enterprise, details of all the members of the joint venture shall be similarly provided and attached to this form.
4. The successful tenderer will be requested to demonstrate its financial capability to execute the contract prior to award at the Employer's discretion
5. In the event that the Employer at its sole discretion is not satisfied with the financial capability of the tenderer as a result of whatsoever nature and reason, the Employer reserves the right to invoke the provisions under tender data 5.13. In addition, the Employer reserves the right to perform a full risk assessment as per tender data 5.13. Furthermore, if the aforementioned occurs, any and all report/s will be used to evaluate the Tenderer's ability to perform the contract as stated in sub-clause 5.13.(b) of the SANS Standard Conditions of Tender.
6. The letter shall contain the information as indicated below.

DATE

Bank Name

FSB Number

Bank Address

(Letter to be on the Financial Service Provider's letter head)

RE: ACCOUNT CONDUCT AND CASHFLOW CONFIRMATION

To Whom It May Concern:

We hereby confirm that *(Insert Tenderer Name)* has been banking with xxxx Bank for a period of xxx years and the account has been conducted in a satisfactory manner. *(Insert Tenderer Name)* has the financial means, net of current commitments, available to meet the construction cash flow requirements to the value of R..... for contract *(insert contract number)*.

- i) Name of Account Holder:
- ii) Account Number:
- iii) Bank name:
- iv) Branch Number:
- v) Bank and branch contact details

Yours Sincerely,

Name _____

Signature _____

BANK STAMP

FORM A8: SCHEDULE OF CURRENT COMMITMENTS**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE****Notes to tenderer:**

1. The tenderer shall list below all contracts currently under construction or awarded and about to commence and tenders for which offers have been submitted but awards not yet made.
2. In the event of a joint venture enterprise, details of all the members of the joint venture shall similarly be attached to this form.
3. The lists must be restricted to not more than 10 contracts and 10 tenders. If a tenderer's actual commitments or potential commitments are greater than 10 each, those listed should be in descending order of expected final contract value or sum tendered.

Table 1: CONTRACTS AWARDED				
Employer	Contract	Expected total value of contract (incl. VAT)	Duration (Months)	Expected completion date

Table 2: TENDERS NOT YET AWARDED				
Employer	Contract	Sum Tendered (incl. VAT)	Tendered Duration (Months)	Expected commencement

SIGNED BY TENDERER:

FORM A9: CERTIFICATE OF COMPLIANCE WITH COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT, 1993

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

Notes to tenderer:

- 1. Discovery that the tenderer has failed to make proper disclosure may result in the Contractor terminating a contract that flows from this tender on the ground that it has been rendered invalid by the tenderer's misrepresentation.**
- 2. The tenderer shall attach to this Form evidence that he is registered and in good standing with the compensation fund or with a licensed compensation insurer who is approved by the Department of Labour in terms of section 80 of the Compensation for Occupational Injuries and Diseases Act, 1993 (Act No 130 of 1993) (COID). If the tenderer fails to meet this requirement, the tenderer will be given 5 calendar days to become compliant.**
- 3. The tenderer is required to disclose, by also attaching documentary evidence to this form, all inspections, investigations and their outcomes conducted by the Department of Labour into the conduct of the tenderer at any time during the 36 months preceding the date of this tender.**
- 4. In the event of a joint venture, each and every member of the unincorporated Joint Venture shall comply with the above requirements.**

SIGNED BY TENDERER:

FORM A10: CERTIFICATE OF REGISTRATION WITH CIDB *Note to Compiler – Delete this form for supplier subcontract or work without CIDB category, where CIDB registration is not required)*

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

The tenderer shall provide a printed copy of the Active Contractor's Listing off the CIDB website www.cidb.org.za. Tenderers whose CIDB registration expires within 21 days after close of tender shall attach proof of their application for re-registration (refer to tender data clause 4.1.1). In the case of a Joint Venture, a printed copy of the Active Contractor's Listing must be provided for each member of the Joint Venture.

Complete the following details of his registration with the Construction Industry Development Board.

Name of Contractor:

Contractor Grading Designation:.....

CIDB Contractor Registration Number:

Expiry Date:

SIGNED BY TENDERER:

**FORM A11: PREFERENCING SCHEDULE – TENDERER'S B-BBEE VERIFICATION
(INCORPORATING SBD6.1)**

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

Notes to Tenderer:

1. The tenderer shall attach to this form a valid B-BBEE verification certificate issued in accordance with:
 - the amended Construction Sector Codes published in Notice 931 of 2017 of Government Gazette No. 41287 on 1 December 2017 by the Department of Trade and Industry.
 - in the event that the Measured Entity operates in more than one sector or sub-sector, the scorecard for the sector or sub-sector in which the majority of its core activities (measured in terms of Annual Revenue) are located will be acceptable.
2. The certificate shall:
 - have been issued by a verification agency accredited by the South African National Accreditation System (SANAS); or
 - be in the form of a sworn affidavit or a certificate issued by the Companies and Intellectual Property Commission in the case of an Exempted Micro Enterprise (EME) with a total annual revenue of less than R3 million if issued in accordance with the amended Construction Sector Codes published in Notice 931 of 2017 of Government Gazette No. 41287 on 1 December 2017 by the Department of Trade and Industry; and
 - be valid at the original advertised tender closing date; and
 - have a date of issue less than 12 (twelve) months prior to the original advertised tender closing date (see Tender Data 4.15).
3. In the event of an un-incorporated joint venture (JV), a project specific consolidated B-BBEE verification certificate in the name of the JV shall be attached, as well as a valid B-BBEE verification certificate for each member of the JV on which the JV certificate was calculated.
4. The attached verification certificate and the associated assessment report shall comply with the requirements of Tender Data clause 5.11.8 and shall identify:
 - (a) The name and domicilium citandi et executandi of the tenderer.
 - (b) The registration and VAT number of the tenderer.
 - (c) The dates of granting of the B-BBEE score and the period of validity.
 - (d) The expiry date of the verification certificate.
 - (e) A unique identification number.
 - (f) The standard and/or normative document, including the issue and/or revision used to evaluate the tenderer.
 - (g) The name and/or mark/logo of the B-BBEE verification agency or registered auditor.
 - (h) The category (Generic, QSE, EME) in which the tenderer has been measured.
 - (i) The B-BBEE status level.
 - (j) The South African National Accreditation System (SANAS) logo on the verification certificate once verification agencies have been accredited.
 - (k) The B-BBEE procurement recognition level.
 - (l) The score achieved per B-BBEE element.
 - (m) The % black shareholding.
 - (n) The % black women shareholding.
 - (o) The % black persons with disabilities shareholding
 - (p) The % black youth shareholding
 - (q) The % black people living in rural or underdeveloped areas or townships shareholding
 - (r) The % black military veterans shareholding
 - (s) The value-added status of the tenderer.
5. The Employer will not be responsible to acquire data that it needs for its own reporting systems and which may not form part of a verification agency's standard certificate format. The tenderer, at its own cost, must acquire any missing specified data listed in 4 above from its selected verification agency or registered auditor and have it recorded on the

certificate. Alternatively, such missing data must be supplied separately, but certified as correct by the same verification agency or registered auditor and also attached to this form.

SIGNED BY TENDERER:

FORM B1: SCHEDULE OF WORK EXPERIENCE**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE****Notes to tenderer:**

1. The information in this returnable form for work over the last 5 years will be utilised to calculate points for Previous Relevant Experience (as per Tender Data 5.11.1)

EMPLOYER (NAME, TEL NO & FAX NO)	CONSULTING ENGINEER (NAME, TEL NO & FAX NO)	NATURE OF WORK	VALUE OF WORK	YEAR COMPLETED

SIGNED BY TENDERER:

FORM B2: SCHEDULE OF CONTRACTOR'S EQUIPMENT**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE****Notes to tenderer:**

1. The tenderer shall provide details of the major plant and equipment required for this contract.
2. The information in this returnable form will be utilized to calculate points for Relevant Construction Equipment (as per Tender Data 5.11.1)
3. The tenderer shall state below the number of each construction plant to be used on this contract and what constructional plant will be immediately available for this contract, what constructional plant will become available by virtue of outstanding orders, and what further constructional plant will be acquired or hired for the work should the tenderer be awarded the contract. The tender to indicate: Constructional plant owned and immediately available (I); Constructional plant on order (O) (State details of arrangements made, with delivery dates); Constructional plant that will be hired (H) (State details of delivery arrangements)

PLANT AND EQUIPMENT TYPE <i>(Note to Compiler - list major plant and equipment envisaged to be used on this contract)</i>	NUMBER TO BE USED ON THIS CONTRACT	DATE OF MANUFACTURE	AVAILABILITY (State either I, O or H)

SIGNED BY TENDERER:

FORM B3: FUNCTIONALITY CRITERIA**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE****Note to tenderer:**

The tenderer shall provide the following functionality criteria in the below table. *(Note to Compiler – Align the required criteria with the Tender Data 5.11.1 functionality requirements and therefore remove eg Experience and plant if not applicable)*

FUNCTIONALITY CRITERIA	INFORMATION REQUIRED	
Locality	Tenderer address (complete address below and attach proof of address as recorded by the Companies and Intellectual Property Commission (CIPC) of the tenderer's place of business)	
CIDB Grade and class (not applicable for supplier subcontracts or work without CIDB category, where CIDB registration is not required)	Indicate Tenderer CIDB grade and class below	
Experience	Complete information in Form B1	
Plant and equipment	Complete information in Form B2	
Designated group ownership	Select the appropriate Designated Group ownership of the tenderer below as per B-BBEE certificate (mark with X):	
	≥51% ownership by black Youth	
	≥51% ownership by black Women	
	51% ownership by black Military veterans	
	≥51% ownership by black Disabled persons (Differently abled)	
	None of the above	

SIGNED BY TENDERER:

FORM C1: CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS
SUBCONTRACT NO.
FOR
UNDER CONTRACT SANRAL
FOR THE

Note to tenderer:

If the tenderer should require additional compensation for his obligations under section 1300 (over and above the total tendered for items B13.01(a), (b) and (c)) by including such additional compensation in the tendered rates and/or lump sum of items in the bill of quantities, these items and the value of such additional compensation shall also be set out in a letter attached to this form.

Should the combined, extended total tendered for Item B13.01 The contractor's general obligations:

- a) Fixed obligations
- b) Value-related obligations
- c) Time-related obligations

exceed a maximum of 15% of the tender sum, the tenderer shall clearly set out his reasons for tendering in this manner in a letter attached to this page.

The Contractor will duly consider these reasons but reserves the right to consider the tendered rates to be imbalanced and to deal with them in terms of Tender Data clause 5.9 contained in this volume.

Total tendered for Item B13.01 expressed as a percentage of the tender sum (excluding VAT)%

SIGNED BY TENDERER:

FORM D1: SCHEDULE OF TENDER COMPLIANCE**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE**

FORM NO / SBD NO	FORM DESCRIPTION	TICK IF COMPLETED
FORM A1:	CLARIFICATION BRIEFING	
FORM A2.1:	CERTIFICATE OF AUTHORITY FOR SIGNATORY	
FORM A2.2:	CERTIFICATE OF SINGLE TENDER SUBMISSION	
FORM A2.3:	CERTIFICATE OF FRONTING PRACTICES	
FORM A3.1 (SBD4):	COMPULSORY DECLARATION	
FORM A3.2 (SBD9):	CERTIFICATE OF INDEPENDENT TENDER	
FORM A3.3 (SBD8):	DECLARATION OF TENDERER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES	
FORM A3.4:	REGISTRATION ON NATIONAL TREASURY CENTRAL SUPPLIER DATABASE	
FORM A3.5 (SBD6.2)	DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS	
FORM A4:	SCHEDULE OF DEVIATIONS OR QUALIFICATIONS BY TENDERER	
FORM A5:	SCHEDULE OF ADDENDA TO TENDER DOCUMENTS	
FORM A6 (SBD2):	CERTIFICATE OF TAX COMPLIANCE	
FORM A7:	TENDERER'S REGISTERED FINANCIAL SERVICE PROVIDER LETTER AND BANK DETAILS	
FORM A8:	SCHEDULE OF CURRENT COMMITMENTS	
FORM A9:	CERTIFICATE OF COMPLIANCE WITH COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT, 1993	
FORM A10:	REGISTRATION WITH CIDB (if applicable)	
FORM A11 (SBD6.1):	PREFERENCING SCHEDULE - TENDERER'S B-BBEE VERIFICATION	
FORM B1:	SCHEDULE OF WORK EXPERIENCE	
FORM B2:	SCHEDULE OF CONTRACTOR'S EQUIPMENT	
FORM B3	FUNCTIONALITY CRITERIA	
FORM C1:	CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS	
FORM D1:	SCHEDULE OF TENDER COMPLIANCE	
C1.1.1 (SBD7):	FORM OF OFFER	
C1.1.2	FORM OF ACCEPTANCE	
C1.2.3:	CONTRACT DATA – INFORMATION PROVIDED BY THE TENDERER	
C2.2 (SBD3):	PRICING SCHEDULE (PROVIDED ON COMPACT DISC)	

SIGNED BY TENDERER:

PART C1: AGREEMENTS & CONTRACT DATA

PART C1 AGREEMENTS AND CONTRACT DATA

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C1.1 FORMS OF OFFER AND ACCEPTANCE**C1.1.1 FORM OF OFFER**

Contractor
PO Box 415
PRETORIA
0001

Dear Sir,

SUBCONTRACT NO.**FOR****UNDER CONTRACT SANRAL****FOR THE**

1. I/we, by signing this form of offer acknowledge it is the equivalent of the Letter of Subcontractor's Offer as defined in clause 1.1.10 in the "Conditions of Subcontract for Construction for Building and Engineering Works designed by the Employer" (2011), published by the International Federation of Consulting Engineers (FIDIC).
2. I/we, confirm that I/we practise the principles of corporate governance that abhors corruption and fraud and that I/we have examined the documents listed in the tender data and addenda thereto as listed in the returnable schedules and am/are duly authorised to represent and commit the tenderer to the contractual obligations contained therein.
3. I/we further confirm that by submitting this offer the tenderer accepts the conditions of tender and offers to perform all of the obligations and liabilities of the contractor under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the conditions of tender and the conditions of contract identified in the contract data.

4. PRICE OFFERED

THE OFFERED TOTAL OF THE PRICES (INCLUSIVE OF VALUE ADDED TAX) BROUGHT FORWARD FROM SECTION C2.2: PRICING SCHEDULE SUMMARY IS

..... (in words)

(R in figures)

I/we confirm that if any difference between the total of the Pricing Schedule Summary and the amounts stated above exists, the total in the Pricing Schedule Summary shall apply.

5. PREFERENCE CLAIMED

I/we claim the following B-BBEE contributor status level as per Returnable Schedule Form A11: Tenderer's B-BBEE Verification Certificate subject to Tender Data 5.11.8. In the event of any difference between the above stated status level and the Verification Certificate attached to Form A11, the Verification Certificate shall apply.

6. You may accept this offer by signing and returning to the tenderer one copy of the Form of Acceptance before the end of the period of validity stated in the tender data, (or at the end of any agreed extension thereof), whereupon the tenderer becomes the party named as the contractor in the conditions of contract identified in the contract data.
7. Notwithstanding anything contained in a covering letter to this tender, I/we declare this offer is submitted entirely without deviations or qualifications other than those stipulated in Form A4: Schedule of Deviations or Qualifications by the tenderer and that it is made free from any fraud, corruption and misrepresentation.

Yours faithfully

SIGNATURE: DATE:.....

NAME (IN CAPITALS):

CAPACITY:

NAME AND ADDRESS OF ORGANISATION:

.....

NAME AND SIGNATURE OF WITNESSES:

WITNESS 1:

SIGNATURE:

NAME (IN CAPITALS):

WITNESS 2:

SIGNATURE:

NAME (IN CAPITALS):

C1.1.2 FORM OF ACCEPTANCE

(Note to Compiler: Form to be printed on Contractor letterhead)

To *(Name of successful Subcontractor)*

Dear Sir,

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

1. It is our pleasure to inform you that the Contractor accepts your ***select if applicable corrected/corrected alternative/alternative*** offer in the amount of R..... (i.e. including VAT but excluding CPA, and any contingent sum not in the priced schedule) for a contract period of months and with a Base date of***(28 days prior to the closing date of subcontract tender)***
2. The amount due may not be the accepted price but payment shall be made in accordance with the conditions of contract identified in the contract data.
3. This Form of Acceptance is the equivalent of the Contractors Letter of Acceptance as defined in clause 1.1.6 of the "Conditions of Subcontract for Construction for Building and Engineering Works designed by the Employer" (2011), published by the International Federation of Consulting Engineers (FIDIC).
4. Acceptance shall form an agreement between us according to the terms and conditions contained in this form and in the contract that is comprised of:

Part C1: Agreements and Contract Data (including this form of acceptance),
 Part C2: Pricing Data,
 Part C3: Scope of the Work,
 Part C4: Site Information, and
 Part C5: Annexures

together with issued drawings and other documents, or parts thereof, which may be incorporated by reference into the Parts listed above.
5. Deviations and/or qualifications included in your offer as well as any changes to the terms of the offer agreed by us during the process of offer and acceptance shall not be valid unless contained in the appended schedule of deviations. In the event that an alternative offer is accepted, it is a fundamental condition of acceptance that all responsibilities and concomitant liabilities arising from the alternative design pass from us to you. ***(Note to Compiler: If no deviation/alternative tender then replace the above part of this paragraph with "There are no alternatives, deviations, qualifications or changes to the documents")***. Addenda issued during the tender period are deemed not to be deviations to the tender documents and schedules.
6. ***(Note to Compiler: Delete this paragraph if not applicable – eg. For off-site suppliers)***
 Notwithstanding the need to agree the mandate required by Section 37 of the Occupational Health and Safety Act (Act 85 of 1993), a proforma of which is attached for your reference, we hereby appoint you as the Subcontractor in terms of Regulation 7(1)(v).
7. Within 14 calendar days of the date of this Form of Acceptance (including the schedule of deviations if any) you shall deliver to us:
 - i. Fully completed and signed Form C1.1.3 Appendix to Form of Acceptance
 - ii. Fully completed and signed Form C1.1.4 Tax compliance
 - iii. Fully completed and signed Form C 1.1.5 Agreement in terms of the OHS Act and Regulations.

C1.6

- iv. Proof that you are registered and in good standing with the compensation fund or with a licensed compensation insurer.
- v. A completed and signed Form C1.1.6 Form of Banking Details

Failure to fulfil any of the above obligations shall constitute a repudiation of this agreement and we may at our discretion apply any rights of remedy including barring you from tendering on any of our future tenders for a period to be determined by us, but not less than six (6) months, from the date of tender closure. *Note to Compiler: To agree with Engineer and Sanral prior to this sanction be contemplated)*

- 8. The effective date of the Subcontract shall be the date of this Form of Acceptance unless you, within four (4) calendar days of the effective date, notify us in writing of any justification why you cannot accept the contents of this agreement.
- 9. The Subcontract Commencement Date is *(Note to Compiler: insert relevant day & date not less than 14 days after the date of this Form of Acceptance)*
- 10. Notwithstanding that a full, original-signed copy of the Subcontract document containing all contract data and schedules (including that of accepted deviations) will be delivered to you, this Form of Acceptance constitutes the binding Subcontract between us.
- 11. Please contact at to make arrangements for the signing of the Subcontract documents.

SIGNATURE: DATE:.....

NAME (IN CAPITALS):

CAPACITY: Managing Director *(Note to Compiler: Insert relevant information)*

SUBCONTRACTOR'S NAME AND ADDRESS: *(Note to Compiler: insert relevant physical address)*

NAME & SIGNATURE OF WITNESSES:

WITNESS 1:

SIGNATURE:

NAME (IN CAPITALS):

WITNESS 2:

SIGNATURE:

NAME (IN CAPITALS):

C1.1.3 APPENDIX TO FORM OF ACCEPTANCE**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE***Notes to Compiler (delete notes for Subcontract document):*

1. *The extent of deviations from the tender documents issued by the Contractor before the tender closing date is limited to those permitted in terms of the conditions of tender.*
2. *A tenderer's covering letter shall not be included in the final Subcontract document. Should any such letter, which constitutes a deviation as aforesaid, become the subject of agreements reached during the process of offer and acceptance, the outcome of such agreement shall be recorded here.*
3. *Any other matter arising from the process of offer and acceptance, either as a confirmation, clarification or change to the tender documents and which it is agreed by the parties, becomes an obligation of the Subcontract, shall also be recorded here.*
4. *Any change or addition to the tender documents arising from the above agreements and recorded here, shall also be incorporated into the final Subcontract.*

Schedule of deviations

The deviations listed below constitute agreed variations/amendments to the tender data and schedules negotiated between the Subcontractor and the Contractor based on information provided in Form A4: Schedule of Variations or Deviations by Subcontractor, or imposed or agreed conditions of award. Addenda issued during the tender period are deemed not to be variations to the tender.

- | | |
|----|----------------|
| 1. | Subject: |
| | Details: |
| 2. | Subject: |
| | Details: |
| 3. | Subject: |
| | Details: |
| 4. | Subject: |
| | Details: |

By the duly authorised representatives signing this agreement, the Contractor and the tenderer agree to and accept the schedule of deviations as the only deviations from and amendments to the documents listed in the tender data and addenda thereto as listed in the returnable schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the tenderer and the Employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this agreement shall have any meaning or effect in the Subcontract between the parties arising from this agreement.

SIGNATURE: DATE:

NAME (IN CAPITALS):

CAPACITY:

NAME AND ADDRESS OF CONTRACTOR:

.....

C1.1.4 TAX COMPLIANCE**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE****Note:**

In terms of National Treasury Instruction No 3 of 2014/2015 with reference to the Public Finance Management Act, 1999 (Act No 1 of 1999) and Regulations, the contractor and subcontractors are required to provide the Employer with written confirmation to access the SARS Electronic Tax Compliance Status (TCS) System to verify and continuously track the tax compliance status of all persons conducting business with the State.

The Subcontractor shall complete the declaration below.

I, (name)
 the undersigned in my capacity as (position)
 on behalf of
 (name of company)
 herewith grant consent that SARS may disclose to

(Note to Compiler: insert Contractor description) our tax compliance status on an ongoing basis for the Subcontract term.

For this purpose, our unique security personal identification number (PIN) is ,
 our tax reference number is and our tax clearance certificate number is

In addition, the Subcontractor shall obtain written consent from each of its subcontractors, undisclosed principals and partners involved in this Subcontract confirming that SARS may, on an ongoing basis during the Subcontract term, disclose the subcontractors' tax compliance status to the Employer. For this purpose the Contractor shall provide the Employer with the unique security personal identification number (PIN), tax reference number and tax clearance certificate for each of its subcontractors, undisclosed principals and partners involved in this Subcontract.

SIGNATURE:

DATE:

C1.1.5 AGREEMENT IN TERMS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT 1993 (ACT NO. 85 OF 1993) AND CONSTRUCTION REGULATIONS, 2014

This AGREEMENT made at.....
on this the day of in the year between
..... (*Note to Compiler: insert name of Contractor*) (hereinafter called "the Contractor") on
the one part, herein represented by
in his capacity as
and (hereinafter called "the Mandatory")
of the other part, herein represented by
in his capacity as

WHEREAS the Contractor is desirous that certain Works be constructed, namely

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

and has accepted a tender by the Mandatory for the construction, completion & maintenance of such works and whereas the Contractor and the Mandatory have agreed to certain arrangements and procedures to be followed in order to ensure compliance by the Mandatory with the provisions of the Occupational Health and Safety Act 1993 (Act 85 of 1993);

NOW THEREFORE THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. The Mandatory shall execute the work in accordance with the contract documents pertaining to this Subcontract.
2. This Agreement shall hold good from its commencement date, to either:
 - (a) the date of the Performance Certificate issued in terms of sub-clause 11.3 of the FIDIC Conditions of Subcontract for Construction for building and engineering works designed by the Employer, 2011 (hereinafter referred to as "the GCC"), as contained in Volume 1 of the contract documents pertaining to this Subcontract, or
 - (b) the date of termination of the Subcontract in terms of clauses 15, 16 or 19 of the GCC.
3. The Mandatory declares himself to be conversant with the following:
 - (a) All the requirements, regulations and standards of the Occupational Health and Safety Act (Act 85 of 1993), hereinafter referred to as "The Act", together with its amendments and with special reference to the following Sections of The Act.
 - (i) Section 8: General duties of Contractors to their employees.
 - (ii) Section 9: General duties of Contractors and self-employed persons to persons other than employees.
 - (iii) Section 37: Acts or omissions by employees or mandatories and
 - (iv) Sub-section 37(2) relating to the purpose and meaning of this Agreement.
 - (b) The procedures and safety rules of the Contractor as pertaining to the Mandatory and to all his Service Providers.
4. In addition to the requirements of sub-clause 2.2 the GCC and all relevant requirements of Volume 3 of the contract documents pertaining to this Subcontract, the Mandatory agrees to execute all the works forming part of this Subcontract and to operate and utilize all machinery, plant and equipment in accordance with The Act.

5. The Mandatory is responsible for the compliance with the Act by all his Subcontractors, whether or not nominated and/or approved by the Contractor.
6. The Mandatory warrants that all his and his Subcontractors' workmen are covered in terms of the Compensation for Occupational Injuries and Diseases Act 1993 which cover shall remain in force whilst any such workmen are present on site. A letter of good standing from the Compensation Commissioner to this effect must be produced to the Contractor upon signature of the agreement.
7. The Mandatory undertakes to ensure that he and/or his Subcontractors and/or their respective employees will at all times comply with the following conditions:
 - (a) The Mandatory shall assume the responsibility in terms of Section 16.1 of The Act. The Mandatory shall not delegate any duty in terms of Section 16.2 of The Act without the prior written approval of the Contractor. If the Mandatory obtains such approval and delegates any duty in terms of section 16.2 a copy of such written delegation shall immediately be forwarded to the Contractor.
 - (b) All incidents referred to in The Act shall be reported by the Mandatory to the Department of Labour as well as to the Contractor. The Contractor will further be provided with copies of all written documentation relating to any incident.
 - (c) The Contractor hereby obtains an interest in the issue of any formal enquiry conducted in terms of section 32 of The Act into any incident involving the Mandatory and/or his employees and/or its Subcontractors.

In witness thereof the parties hereto have set their signatures hereon in the presence of the subscribing witnesses:

SIGNED FOR AND ON BEHALF OF THE CONTRACTOR

WITNESS:

NAME (IN CAPITALS):

SIGNED FOR AND ON BEHALF OF THE MANDATARY:

WITNESS:

NAME (IN CAPITALS):

C1.1.6 FORM OF BANKING DETAILS**Notes to Subcontractor:**

1. The Contractor applies an Electronic Funds Transfer system for all payments.
-

To:
 The Subcontractor
(Note to Compiler: insert contractor address)

Dear Sir

SUBCONTRACT NO.
FOR
UNDER CONTRACT SANRAL
FOR THE
BANKING DETAILS

By signing this document, we accept the following:

- The banking details submitted are those of *(Note to Compiler: insert name of successful subcontractor)* and we take full responsibility for their correctness.
- We indemnify the Contractor from any and all outcomes if an electronic transfer is made into an incorrect bank account using the banking details submitted.

Account Name:

Bank:

Branch Name:

Branch Code:

Account Number:

Yours faithfully

.....
 Authorised Signatory for *(Note to Compiler: Insert name of successful subcontractor)*

DATE:

C1.1.7 APPOINTMENT IN TERMS OF SECTION 4 OF THE MINE HEALTH AND SAFETY ACT
(Note to Compiler: Delete if not applicable)

SUBCONTRACT NO.

FOR

UNDER CONTRACT SANRAL

FOR THE

APPOINTMENT IN TERMS OF SECTION 4 OF THE MINE HEALTH AND SAFETY ACT (ACT NO 29 OF 1996) AS AMENDED BY THE MINE HEALTH AND SAFETY AMENDMENT ACT (ACT NO 72 OF 1997)

I,

In my capacity as
of the Contractor,

who has contracted with the Employer to undertake the above-named Main Contract, to perform all functions entrusted to the Employer by sections 2 and 3 of the Act, as amended, who is the owner of the Mines(s) *state name (s) or state "to be worked under the requirements of the abovementioned contract"*

hereby appoint
of the Subcontractor,

who has contracted with the Contractor to undertake the above-named Subcontract, to perform all functions entrusted to the Contractor by sections 2 and 3 of the Act, as amended.

Signed:

Date:

Witnesses: 1. 2.

Name (print) Name (print)

I hereby accept the above appointment

Signed:

Date:

Witnesses: 1. 2.

Name (print) Name (print)

C1.2 CONTRACT DATA**C1.2.1 CONDITIONS OF SUBCONTRACT****Note to tenderer**

1. The Conditions of Subcontract comprise the “General Conditions of Subcontract”, which form part of the “FIDIC Conditions of Subcontract for Construction”, First Edition 2011, published by the International Federation of Consulting Engineers (FIDIC), and the following “Particular Conditions of Subcontract”, which include amendments and additions to these General Conditions of Subcontract. as prescribed by the Contractor.

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PART A: CONDITIONS OF SUBCONTRACT FOR CONSTRUCTION - FIDIC AMENDMENTS

Up to ... *(Note to Compiler: insert current date)* the following amendments have been issued by FIDIC.

PART B: PARTICULAR CONDITIONS OF SUBCONTRACT

The following additional amendments to the FIDIC Conditions of Subcontract for Construction, 2011 apply to this contract.

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PARTICULAR CONDITIONS AMENDING THE GENERAL CONDITIONS OF SUBCONTRACT FOR CONSTRUCTION (FIDIC)

1.1 Subcontract Definitions

Replace 1.1.3 with:

“ **Appendix to the Subcontractor’s Offer**” means the completed sections entitled C1.2.2 Appendix to Tender: Contract Data – Information provided by the Contractor and C1.2.3 Appendix to Tender: Contract Data – Information provided by the Tenderer.”

Replace 1.1.6 with:

“ **Contractor’s Letter of Acceptance**” means the Form of Acceptance as contained in part C1.1.2 of the Subcontract including any appended memoranda comprising agreements between and signed by both Parties to the Subcontract.”

Replace 1.1.10 with:

“ **Letter of Subcontractor’s Offer**” means the Form of Offer as contained in part C1.1.1 of the Subcontract.”

1.1.18 Add the following:

“**Subcontract Bill of Quantities** shall also mean the Pricing Schedule as contained in Part C2 of the Subcontract .”

Replace 1.1.29 with:

“ **Subcontract Specification**” means that document entitled Scope of Works, as included in the Subcontract, and any additions and modifications to the Scope of Works in accordance with the Main Contract. Such document specifies the Works.”

Add the following:

1.1.40 “Cost” as stated under Main Contract Sub-Clause 1.1.4.3.

1.1.41 “Target Area” means the geographic area defined in the Main Contract’s Contract Data for Targeted Labour and which typically are:

- a. one or more Provinces;
- b. one or more Metropolitan or District Municipalities;
- c. one or more Local Municipalities;
- d. one or more Wards that are predominantly located within an area and within a predefined radius of the construction activity;
- e. one or more of the areas listed in the definition of Designated Groups.

1.1.42 Targeted Enterprise” is is an entity to which the Contractor subcontracts a percentage of the contract value as a condition of contract and which is:

- j. an EME or QSE which is at least 51% owned by black people;
- k. an EME or QSE which is at least 51% owned by black people who are youth;
- l. an EME or QSE which is at least 51% owned by black people who are women;
- m. an EME or QSE which is at least 51% owned by black people with disabilities;
- n. an EME or QSE which is 51% owned by black people living in rural or underdeveloped areas or townships;
- o. a cooperative which is at least 51% owned by black people;
- p. an EME or QSE which is at least 51% owned by black people who are military veterans; or
- q. more than one of the categories referred to in paragraphs a to g; and
- r. which is tax and COID compliant.

1.1.43 “Targeted Labour” means Persons:.

- a. who are employed by the Contractor or a subcontractor in the performance of the Main Contract; and

- b. whose monthly earnings are derived from hours worked for a fixed hourly rate which is adjusted from time to time by legislation (as a statutory minimum) and the Contractor's or subcontractor's employment policies; and
- c. permanently reside in the Target Area(s) or who are recognized as being residents of the Target Area(s) based on identification and association with, and recognition by, the residents of the Target Area(s); and
- d. who are defined as a Target Group in the Main Contract's Contract Data.

1.1.44 "Subcontract's Base Date" means the date 28 days prior to the latest date for submission of the subcontract tender.

1.1.45A "day" means a calendar day, except for any extension of time that is granted under Sub-Clause 8.4 [*Extension of Subcontract Time for Completion*], in which case a "day" means a working day. A "**year**" means 365 calendar days.

1.1.46A "working day" means a day that is not listed as a Special non-working day.

1.5 Priority of Subcontract Documents

Insert the following at the end of the 1st paragraph before the colon:

"... unless specifically stated otherwise in the Subcontract"

Replace sub-paragraph items (1) to (9) with:

- "(1) the Forms of Offer and Acceptance;
- (2) the Appendix to the Subcontractor's Offer;
- (3) the Particular Conditions of Subcontract and Annexes, except any part of any Annex that is referred to elsewhere in this listed priority of Subcontract documents;
- (4) the General Conditions of Subcontract;
- (5) the Subcontract Specification;
- (6) the Subcontract Drawings,
- (7) the Standard Specifications,
- (8) the Subcontract Bill of Quantities; and
- (9) the Schedules and any other documents forming part of the Subcontract."

1.6 Notices, Consents, Approvals, Certificates, Confirmations, Decisions, and Determinations

Add the following paragraph at the end of this clause:

"However, such notice, instruction, consent or request is not deemed to have been delivered by virtue of its appearance in the minutes of meetings."

1.7 Joint and Several Liability under the Subcontract

Replace 1.7(b) with:

- "(b) No later than 14 days after the date of the Contractor's Letter of Acceptance these persons shall notify the other Party of their leader who shall have authority to bind that other Party and each of these persons; and"

1.9 Subcontract Agreement

Replace the 1st two sentences with the following:

"The Parties shall enter into a Subcontract Agreement when the Contractor issues to the Subcontractor the Contractor's Letter of Acceptance (see Particular Condition Sub-Clause 1.1.6). The Subcontract Agreement shall be in the form prescribed in the tender documents."

Add the following at the end of the sub-clause:

"If under the Main Contract, the Engineer does not consent to the Subcontract, upon notice from the Contractor of such non-consent:

- (a) The Parties shall be discharged from further performance of the Subcontract, without prejudice to the rights of either Party in respect of any previous breach of the Subcontract;
- (b) The Contractor shall immediately return the Subcontract Performance Guarantee (if applicable) to the Subcontractor; and
- (c) Payment by the Contractor of the amounts and/or Costs as described in (a) to (d) of Sub-Clause 15.3 [*Payment after Termination of the Main Contract*] shall be due 28 days after the Parties' discharge from the Subcontract."

2.1 Subcontractor's Knowledge of Main Contract

In the 8th line of the 1st paragraph after the word "Contract", add "as amended".

Add the following paragraph at the end of the last paragraph:

"The Subcontractor shall treat the details of the Subcontract as private and confidential, except to the extent necessary to carry out obligations under it or to comply with applicable Laws. The Subcontractor shall not publish, permit to be published, or disclose any particulars of the Subcontract Works or the Main Works in any trade or technical paper or elsewhere without the previous agreement of the Contractor."

3.2 Access to the Site

Delete the 2nd paragraph and substitute the following:

"Right of access to and possession of the Site shall be on Subcontract Commencement Date except if otherwise detailed in the Subcontract Specification. The Contractor shall not be bound to make any part of the Site available exclusively to the Subcontractor except those parts of the Site for those periods as expressly detailed in the Subcontract Specification."

6.4 Subcontractor's Representative

Add the following paragraph at the end of this clause:

"The Contractor may require the Subcontractor's Representative to attend progress and/or contractual meetings with the Employer and/or the Engineer. If the Subcontractor's Representative attends any of these meetings, he shall be permitted to review the record of the meeting and, if he has not objected to this record within 7 days of its receipt, those minutes shall be deemed to be accurate and to be accepted by the Subcontractor's Representative."

Add the following new sub-clauses:

"6.5 Recruitment of Labour, Rates of Wages and Conditions of Labour

The Subcontractor shall utilise Labour and Targeted Labour from the Target Area(s) as stated in the Main Contract, utilising the Labour Database of Targeted Labour as stated in the Main Contract.

The Subcontractor shall pay rates of wages, and observe conditions of labour, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Subcontractor shall pay rates of wages observe conditions which are not lower than the general level of wages and conditions observed locally by the employers whose trade or industry is similar to that of the Contractor. The conditions as stated in the Appendix to the Subcontractor's Offer as well as shall also apply.

6.6 Working Hours

No work shall be carried out on Site on any special non-working day or within non-working hours of any day as stated in the Appendix to the Subcontractor's Offer unless:

- (a) Otherwise stated in the Subcontract or Main Contract
- (b) The Contractor gives consent; or
- (c) The work is unavoidable or necessary for the protection of life or property or for the safety of the Works, in which case the Subcontractor shall immediately advise the Contractor.

6.7 Health and Safety

The Subcontractor shall be in good standing in terms of the Compensation for Occupational Injuries and Disease Act (COIDA) and have a letter as proof.

The Subcontractor shall be made conversant and comply with the Contractor's project specific Health and Safety plan, at all times.

The Subcontractor shall comply with all legal requirements pertaining to an employer, which include the responsibility to provide as far as reasonably practicable a safe and healthy working environment for his employees, as per Section 8 of the OHS Act.

6.8 Subcontractor's Personnel

The Subcontractors' personnel shall be appropriately skilled and experienced in their respective trades or occupations. The Contractor may require the Subcontractor to remove (or cause to be removed) any person employed on the site or works, including the Subcontractors' representative, if applicable, who:

- (a) Persists in any misconduct and lack of care
- (b) Carries out duties incompetently or negligently
- (c) Fails to conform with any provision of the Subcontract
- (d) Persists in any conduct which is prejudicial to safety, health or protection of the environment
- (e) is found, based on reasonable evidence, to have engaged in corrupt, fraudulent, collusive or coercive practice; or
- (f) has been recruited from the Contractor's Personnel or the Employer's Personnel in breach of Sub-Clause 6.2 [*Persons in the Service of Others*].

The Subcontractor and/or his personnel will be provided with opportunities to receive training as contemplated in the Main Contract. The Subcontractor shall co-operate and ensure participation in all training provided.

6.9 Records of Subcontractor's Personnel and Equipment

The Subcontractor shall submit, to the Contractor, details showing the number of each class of Subcontractor's Personnel and of each type of Subcontractor's Equipment on the Site. Details shall be submitted each calendar month, in a form approved by the Contractor, until the Subcontractor has completed all the Subcontract Works."

8.1 Commencement of Subcontract Works

In the 2nd line of the 2nd paragraph, after the words "Commencement Date", insert "but within the period stated in the Appendix to the Subcontractor's Offer"

8.6 Suspension of Subcontract Works by the Contractor

Add the following to the end of the 1st paragraph:

"If Main Contract Sub-Clause 8.9 [*Consequences of suspension*] applies, then the Cost payable shall be the Suspension cost calculated in pay item B13.01 of the Subcontract Bill of Quantities (if applicable and as appropriate having regard to any other compensation which may already have been granted in respect of the circumstances concerned), else Cost payable shall be all expenditure reasonably incurred (or to be incurred) by the Subcontractor, whether on or off the Site, including overhead and similar charges, but does not include profit."

8.7 Subcontract Damages for Delay

Replace the last sentence of the 1st paragraph with the following:

'These delay damages shall be as calculated from the rate stated in the Appendix to the Subcontractor's Offer, for every day between the relevant Subcontract Time for Completion and the date upon which completion of the Subcontract Works or Subcontract Section was achieved in accordance with Sub-Clause 10.1 [*Completion of Subcontract Works*]. However, the total amount due under this sub-clause shall be as determined between the Contractor, Engineer and Employer and shall not exceed the maximum amount of delay damages (if any) stated in the Appendix to the Subcontractor's Offer."

10.2 Taking-Over Subcontract Works

Add the following paragraph:

"The Employer may make use of any part of the permanent works prior to issue of a taking-over certificate for the Subcontract Works."

11.2 Subcontract Defects Notification Period

Add the following paragraph after the 1st paragraph:

"If the Subcontract Works is taken-over by the Contractor before taking-over of the Main Works by the Employer in terms of Sub-Clause 10.3 [*Taking-Over by the Contractor*], then the Subcontract Defects Notification Period shall be from the date on which the whole of the Subcontract Works have been taken-over under Clause 10 [*Completion of and Taking-Over the Subcontract Works*] until expiry of the period as stated in the Appendix to the Subcontractor's Offer."

Replace Sub-Clause 11.3 [Performance Certificate], with the following new subclause 11.3 [Subcontract Performance Certificate]:

"11.3 Subcontract Performance Certificate

Performance of the Subcontractor's obligations shall not be considered to have been completed until the Contractor has issued the Subcontract Performance Certificate to the Subcontractor, stating the date on which the Subcontractor has completed his obligations under the Subcontract. The Contractor shall issue the Subcontract Performance Certificate within 7 days of the expiry of the Subcontract Defects Notification Period, or as soon thereafter as the Subcontractor has supplied all the Subcontractor's Documents and completed and tested all the Subcontract Works, including remedying any defects.

After the Subcontract Performance Certificate has been issued, the provisions of the Main Contract Clauses 11.10 [*Unfulfilled Obligations*] and 11.11 [*Clearance of Site*] shall apply equally to the Subcontract."

14.1 The Subcontract Price

Add the following new paragraphs:

"Any quantities which may be set out in the Subcontract Bill of Quantities or other Schedule are estimated quantities and are not to be taken as the actual and correct quantities:

- (a) of the Subcontract Works which the Subcontractor is required to execute, or
- (b) for the purposes of Clause 12 [*Measurement and Evaluation*]

The Subcontractor shall submit to the Contractor within 14 days of receiving a written request, a full breakdown of all rates. The Contractor may take account of the breakdown when evaluating claims and making decisions."

14.6 Interim Subcontract Payments

In the 1st line of the 1st paragraph, delete "70 days" and replace with "14 days (if the Subcontractor is a Targeted Enterprise) or 30 days (if the Subcontractor is not a Targeted Enterprise)".

Delete all the paragraphs except for, the 1st paragraph (ending with the words "... Appendix to the Subcontractor's Offer.") and the last paragraph (commencing with the words "If the Subcontractor is under ..."), and replace with the following paragraph:

"Provided that the Contractor shall be entitled to withhold or defer payment of all or part of any sums otherwise due in respect of a Subcontractor's monthly statement if a dispute arises or has arisen between the Subcontractor and the Contractor involving any question of measurement or quantities or any other matter included in the Subcontractor's monthly statement. Any payment so withheld or deferred shall be limited to the extent that the amounts in the Subcontractor's monthly statement are the subject of a dispute. If the Contractor withholds or defers payment of any amount in a Subcontractor's monthly statement, then he shall notify the Subcontractor of his reasons for doing so as soon as is reasonably practicable but not later than the date when this payment would otherwise have become

due. The Contractor's withholding or deferring payment of any amount in a Subcontractor's monthly statement shall not preclude the Subcontractor from including that amount in following Subcontractor's monthly statements."

Add the following as a new pen-ultimate paragraph:

"The Contractor shall pay the Subcontractor the full value as certified by the Engineer as being due to the Subcontractor in each Interim Payment Certificate, without any deduction for plant, equipment, materials or fuel supplied by the Contractor."

14.7 Payment of Retention Money under the Subcontract

Delete all the paragraphs and replace with the following paragraphs:

"If the whole of the Subcontract Works have been taken-over under Sub-Clause 10.2 [*Taking-Over the Subcontract Works*] or Sub-Clause 10.3 [*Taking-Over by the Contractor*], the Contractor shall pay the Subcontractor the first half of the retention money under the Subcontract no later than 14 days after the whole of the Subcontract Works have been taken-over and all minor outstanding work have been completed. If a part of the Subcontract Works has been taken-over under Sub-Clause 10.2 [*Taking-Over the Subcontract Works*] or Sub-Clause 10.3 [*Taking-Over by the Contractor*], the Contractor shall pay the Subcontractor a proportion of the retention money under the Subcontract no later than 14 days after that part has been taken-over by the Contractor. This proportion shall be 50% of the proportion calculated by dividing the estimated subcontract value of the part by the estimated final Subcontract Price.

No later than 7 days after expiry of the Subcontract Defects Notification Period, the Contractor shall pay the Subcontractor the remaining portion of the retention money under the Subcontract. However, if any work remains to be executed under Clause 11 [*Defects Liability*], the Contractor shall be entitled to withhold payment of the estimated cost of this work until it has been executed and the Subcontract Performance Certificate issued."

14.8 Final Subcontract Payment

Delete the last paragraph and replace with the following:

"Within 7 days after the Subcontractor has finally performed his obligations under the Subcontract, provided that 35 days have expired since submission by the Subcontractor of the Subcontractor's Final Statement, the Contractor shall pay to the Subcontractor the balance of the Subcontract Price finally due."

15.3 Payment after Termination of the Main Contract

Delete the 2nd and 3rd paragraphs (beginning with "If the Main Contract has been terminated ..." and ending with "... the Subcontractor shall place the same at the Employer's disposal.") and replace with the following:

"Payment by the Contractor of any of these amounts or Costs shall be due as soon as practicable after termination of the Subcontract.

If Main Contract Clause 19.7 [*Release from Performance under the Law*] applies to the Main Contract or the Main Contract has been terminated under Main Contract Sub-Clause 16.2 [*Termination by Contractor*] or Main Contract Sub-Clause 19.6 [*Optional Termination, Payment and Release*], and the Contractor receives payment from the Employer for any Subcontract Plant and/or materials, then the Subcontract Plant and/or materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Subcontractor shall place the same at the Employer's disposal."

15.5 Notice to Correct under the Subcontract

Add the following at the end of the 1st paragraph:

"The Notice shall:

- (a) describe the Subcontractor's failure;
- (b) state the sub-clause and/or provisions of the Contract under which the Subcontractor has the obligation; and

- (c) specify the time within which the Subcontractor shall remedy the failure, which shall be reasonable, taking due regard of the nature of the failure and the work and/or other action required to remedy it.

The time specified in the Notice to Correct shall not imply any extension of Time for Completion."

17.3 Subcontract Limitation of Liability

Add the following additional clause references to the last sentence of the 1st paragraph, before the words "under Clause 15 [Termination of the Main Contract and Termination of the Subcontract by the Contractor]" :

" as specifically provided for in Sub-Clause 8.7 [Subcontract Damages for Delay]; Sub-Clause 17.4 [Intellectual and Industrial Property Rights]; and under"

Add the following new sub-clause:

"17.4 Intellectual and Industrial Property Rights

The provisions of Main Contract Sub-Clause 17.5 [Intellectual and Industrial Property Rights] shall apply to the Subcontract."

20.4 Subcontract Disputes

Add the following after the 1st paragraph:

"The Notice of Dispute shall be given as soon as practicable, and not later than 21 days after the Party became aware, or should have become aware, of the event or circumstance giving rise to the Dispute. The Notice of Dispute shall refer to the relevant clause(s) in the subcontract agreement. If the Party fails to give notice, he shall have no further right to dispute the event or circumstance, or the part thereof not disputed in the said notice.

Prior to referral of any dispute to the Subcontract DAB in terms of this Sub-Clause, the dispute shall first be referred to the Engineer in writing for its decision, with a copy to the other Party. The Engineer's decision shall be binding on both Parties unless and until it shall be revised by a Subcontract DAB decision in accordance with Sub-clause 20.6 [Obtaining Subcontract DAB's Decision]. Either Party shall have the right to refer a dispute to the Subcontract DAB after receipt of the Engineer's decision on the dispute. Provided that, unless either Party shall, within 21 days after his receipt of a decision by the Engineer, refer the dispute to the Subcontract DAB for a decision, he shall have no further right to dispute that decision or the part thereof not disputed in the said notice. "

Add the following paragraphs before the last paragraph:

"Where the subject of the Subcontractor dispute is referred to the Main Contract DAB, the Contractor shall use all reasonable endeavours to pursue the dispute on the Contractor's and the Subcontractor's behalf and for both the Contractor's and the Subcontractor's benefit, and shall regularly keep the Subcontractor informed of the progress of these endeavours. The Contractor shall as soon as practicable but not later than 7 days of its receipt of the Main Contract DAB decision, notify the Subcontractor of this decision. Unless the Subcontractor notifies the Contractor of his dissatisfaction with the Main Contract DAB's decision within 7 days of his receipt of the Contractor's notice, this decision shall be deemed to be accepted by the Subcontractor. This decision shall be binding on both Parties to the Subcontract unless and until it shall be revised in an amicable settlement as described in Sub-Clause 20.6 [Obtaining Subcontract DAB's Decision], or an arbitral award in accordance with Sub-Clause 20.7 [Subcontract Arbitration]."

20.5 Appointment of the Subcontract DAB

Add the following prior to the 1st paragraph:

"Where the subject of the Subcontract dispute is not referred to the Main Contract DAB, and the decision by the Engineer on a dispute made under Sub-clause 20.4 [Subcontract Disputes], is referred to the Subcontract DAB, the dispute between the Contractor and the Subcontractor shall be decided by a Subcontract DAB.

Where a Main Contract DAB is appointed under the Main Contract, the Subcontract DAB shall comprise of the members of the Main Contract DAB.”

Add the following as the 1st part of the 1st sentence of the 1st paragraph:

“Where a Main Contract DAB is not appointed under the Main Contract...”

In the 10th line of the 1st paragraph, replace “FIDIC” with “SAICE”.

In the last sentence of the last paragraph delete the full stop and add the following:

“and the provisions relating to payment shall not apply hence the Party that referred the dispute to the Subcontract DAB shall be responsible for paying the remuneration of the Subcontract DAB.”

20.6 Obtaining Subcontract DAB’s Decision

Add the following after the 1st paragraph:

“The appointed Subcontractor’s DAB shall have the freedom to first mediate between the parties in an effort to settle the dispute by mutual agreement before adjudicating the matter as is provided for in these conditions and give a decision in the dispute that has been referred.”

20.7 Subcontract Arbitration

Delete the paragraph and replace with the following paragraph:

“Unless settled amicably, any Subcontractor dispute in respect of which the Main Contract DAB’s decision or Subcontract DAB’s decision (if any) has not become final and binding shall be finally settled by means of Arbitration. The Arbitration shall be conducted under the provision of the South African law as it applies to Arbitration (Act 42 of 1965).”

ANNEX A: PARTICULARS OF THE MAIN CONTRACT

PART A (Subcontract Sub-Clause 2.1)		
1.	PARTIES	
	Name and address of Employer:	The South African National Roads Agency SOC Limited (SANRAL) 48 Tambotie Avenue Val De Grace Pretoria, 0184
	Legal form of Employer:	Company
	Name and address of Engineer:	<i>Compiler to insert</i>
	Legal form of Engineer:	<i>Compiler to insert: Company, Partnership, Individual, Proprietorship</i>
	Name and address of Contractor:	<i>Compiler to insert</i>
	Legal form of Contractor:	<i>Compiler to insert: Company, Partnership, Individual, Proprietorship</i>
2.	MAIN CONTRACT COMMENCEMENT DATE	
	Main Contract Commencement Date:	<i>Compiler to insert</i>
3.	TIME FOR COMPLETION	
	Times for Completion under the Main Contract	
	(a) Section Times for Completion:	<i>Compiler to insert description and the Times for Completion of any Section of the Main Works pursuant to the Main Contract Sub-Clause 8.2 [Time for Completion]</i>
	(b) Time for Completion:	<i>Compiler to insert Time for Completion of the Main Works pursuant to the Main Contract Sub-Clause 8.2 [Time for Completion] as well as approved Extension of Time of the Main Contract.</i>
	(c) Programme	<i>Compiler to attach the latest programme and indicate a reference to the programme here</i>
4.	DESCRIPTION OF WORKS UNDER THE MAIN CONTRACT	
	(a) The Site is Located:	<i>Compiler to insert description of location of the Site</i>
	(b) The Main Works Comprise:	<i>Compiler to insert description of the Main Works</i>
5.	CONDITIONS OF THE MAIN CONTRACT	
	The Conditions of the Main Contract consist of the FIDIC Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer, First Edition 1999, published by the International Federation of Consulting Engineers (FIDIC) together with the Particular Conditions of the Main Contract.	

	The Appendix to Tender of the Main Contract and the Particular Conditions of the Main Contract is attached to this Annex A <i>(Note to Compiler: The Appendix to Tender of the Main Contract and the Particular Conditions of the Main Contract <u>MUST</u> be attached to the Annex A of the successful Subcontractor's Subcontract. See sub-clause 2.1 of FIDIC Conditions of Subcontract, 2011).</i>		
6.	CONFIDENTIAL PARTS OF THE MAIN CONTRACT		
	The following parts of the Main Contract will be confidential between the Employer and the Contractor, and shall not be made available for inspection to the Subcontractor	C2.2	Pricing Schedule (Incorporating SBD3)
		C2.3	Summary of Pricing Schedule
		<i>(Note to Compiler: Add to this list as required)</i>	
PART B (Subcontract Sub-Clause 2.2)			
	Exclusions	<i>(Note to Compiler: List as required)</i>	

ANNEX B: SCOPE OF SUBCONTRACT WORKS AND SCHEDULES OF SUBCONTRACT DOCUMENTS

1.	Scope of Subcontract Works	
	The Scope of Subcontract Works is contained in (or referred to in):	Part C3: Scope of Works Part C4: Site Information
2.	Schedule of Technical documents for the Subcontract Works	
	The Technical documents for the Subcontract Works are contained in (or referred to in):	Part C3: Scope of Works Part C4: Site Information

ANNEX C: TAKING-OVER BY THE CONTRACTOR AND SUBCONTRACT BILL OF QUANTITIES

1.	Taking-Over by the Contractor (Sub-Clause 10.3)
	<p>Provided completion of the Subcontract Works has been achieved in accordance with sub-clause 10.1 [<i>Completion of Subcontract Works</i>], the Subcontractor may apply by notice to the Contractor for the Contractor to take-over the Subcontract Works. The Contractor shall, within 7 days after receiving the Subcontractor's application:</p> <ul style="list-style-type: none"> (i) Issue a certificate to the Subcontractor verifying the taking-over of the Subcontract Works, and stating the date of such taking-over, or (ii) Reject the application, giving reasons and specifying the work required to be done by the Subcontractor to enable a taking-over certificate to be issued. The Subcontractor shall then complete this work before issuing a further notice under this sub-clause. <p>If the Contractor fails to either issue a taking-over certificate or to reject the Subcontractor's application within the period of 7 days, and if the Subcontract Works have been completed in accordance with the Subcontract, these works shall be deemed to have been taken-over on the last day of the period of 7 days.</p>
2.	Subcontract Bill of Quantities and/or schedule of prices (if any) (Sub-Clause 1.1.18)
	The subcontract Bill of quantities is contained in Part C2 Pricing Data

ANNEX D: EQUIPMENT, TEMPORARY WORKS, FACILITIES, AND FREE-ISSUE MATERIALS TO BE PROVIDED BY THE CONTRACTOR (Sub-Clauses 4.1, 7.1 & 7.2)

1. Equipment, Temporary Works, Facilities, and Free-issue Materials	
The Equipment, Temporary Works, Facilities and Free-Issue Materials listed shall be provided by the Contractor to the Subcontractor	<i>(Note to Compiler: List as applicable)</i>
2. Common Use of Facilities	
Access to the work areas within the Site	<i>(Note to Compiler: Indicate details and arrangements, and terms and conditions, of the Subcontractor's access to the work areas, shared work areas, and requirement for allowance of other contractors within the work areas and use of each facility, where applicable)</i>
Transport of local labour to work areas within the Site	<i>(Note to Compiler: Indicate details and arrangements, and terms and conditions, for the transport of local labour to work areas within the site. Also indicate arrangement (if any) for transport of local labour to site)</i>
Common camp facilities, including messing, medical, security, safety, recreation, laundry, house-keeping, electricity, water, sewage, waste disposal, and other general camp services	<i>(Note to Compiler: Indicate details and arrangements, and terms and conditions, of the Subcontractor's use of each facility, where applicable)</i>
3. Use of Temporary Works, Equipment and Facilities by Subcontractor at no charge	
Temporary Works (including Traffic Accommodation)	<i>(Note to Compiler: Indicate details and arrangements, and terms and conditions, of the Subcontractor's use of each item. If any item is to be provided for the exclusive use of the Subcontractor, this should be expressly stated)</i>
Contractor's Equipment and vehicles	<i>(Note to Compiler: Indicate details and arrangements, and terms and conditions, of the Subcontractor's use of each item. If any item is to be provided for the exclusive use of the Subcontractor, this should be expressly stated)</i>
Facilities	<i>(Note to Compiler: Indicate details and arrangements, and terms and conditions, of the Subcontractor's use of each item. If any item is to be provided for the exclusive use of the Subcontractor, this should be expressly stated)</i>
4. Use of Temporary Works, Equipment and Facilities by Subcontractor to be charged	
Temporary Works (including Traffic Accommodation)	<i>(Note to Compiler: Indicate details and arrangements, and terms and conditions, of the Subcontractor's use of each item. If any item is to be provided for the exclusive use of the Subcontractor, this should be expressly stated)</i>
Contractor's Equipment and vehicles	<i>(Note to Compiler: Indicate details and arrangements, and terms and conditions, of the Subcontractor's use of each item. If any item is to be provided for the exclusive use of the Subcontractor, this should be expressly stated)</i>
Facilities	<i>(Note to Compiler: Indicate details and arrangements, and terms and conditions, of the Subcontractor's use of each item. If any item is to be provided for the</i>

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		<i>exclusive use of the Subcontractor, this should be expressly stated)</i>

5.	Free-Issue Materials	
	Material 1	<i>(Note to Compiler: Indicate details and arrangements, the place(s) for delivery, and terms and conditions, of the supply of each item of material)</i>
	Material 2	
	Material 3	

ANNEX E: INSURANCES (Sub-Clauses 18.1 & 18.2)

1.	Insurances to be effected and maintained by the Subcontractor	
	The Insurances listed shall be effected and maintained by the Subcontractor	The Subcontractor is to provide his own insurance for his personnel, public liability and relevant plant and equipment. The subcontractor will be covered under the main contract for the Subcontract Works. The subcontractor will also be liable for payment of applicable excess and any additional cost arising from each claim <i>(Note to Compiler: Indicate details of any other required insurances to be effected and maintained by the Subcontractor)</i>
2.	Insurances to be effected and maintained by the Contractor under the Main Contract that relate to the Subcontract Works	
	The Insurances listed shall be effected and maintained by the Contractor	The Contractor is to provide insurance for the Works. <i>(Note to Compiler: Indicate details of any other insurances to be effected and maintained by the Contractor)</i>
3.	Insurances to be effected and maintained by the Employer under the Main Contract that relate to the Subcontract Works	
	The Insurances listed shall be effected and maintained by the Employer	The Employer will not effect or maintain any insurance that relate to the Subcontract Works.

ANNEX F: SUBCONTRACT PROGRAMME (Sub-Clause 8.3)

A.	Initial Subcontract Programme
	<p>Form and detail of the programme</p> <p>The form and detail of the programme for the execution of the Subcontract Works shall fully comply with the programming and reporting requirements of the Main Contract and, in any case, shall: <i>(Note to Compiler: Amend list if required to Indicate additional requirements or list the minimum requirements of the programme)</i></p> <ol style="list-style-type: none"> a. be prepared in sufficient detail to ensure the adequate planning, execution and monitoring of the Subcontract Works; b. use the programming software specified in the Main Contract; c. take due account of the Subcontract Time for Completion; d. identify all relevant activities including those that relate to design, manufacture, procurement, and on Site works; e. show earliest and latest start and finish dates for each work activity; f. identify when and what information, drawings, materials, equipment, facilities, and/or temporary works are required from the Contractor, the Engineer and/or the Employer; g. identify when and what approvals, consents, and/or certificates are required from the Contractor, the Engineer and/or the Employer; h. identify the date(s) and location(s) within the Site that access is required to execute (parts of) the Subcontract Works; i. identify holiday periods; j. identify key delivery dates of Subcontract Plant and materials' k. identify dates by which work will be ready for inspection and/or testing; l. logically link all activities; m. identify where the critical path(s) lie(s); n. identify all float; o. include sufficient flexibility in order to make adequate adjustments to allow for interfacing the Subcontractor's activities with the Contractor and other contractors working on the Site; p. allow for weather conditions which are at the Subcontractor's risk (if any), and other Subcontractor's time risks; and q. be supported by a schedule giving sufficient details of the Subcontractor's resource requirements in terms of manpower, work rates, items of plant, equipment and materials for each work activity to justify the activity duration shown in the programme.
	<p>Acceptance</p> <p>The Contractor shall within 14 days of receiving the initial programme respond by either stating that this initial programme complies with the Subcontract, in which case it shall become the Subcontract Programme; or rejecting this initial programme, giving sufficiently detailed and cogent reasons to enable the Subcontractor to revise the initial programme in a timely manner. If the Subcontractor receives no response from the Contractor within 14 days of submitting the initial programme, it shall become the Subcontract Programme.</p> <p>If the Contractor responds stating that the initial programme fails (to the extent stated) to comply with the Subcontract, the Subcontractor shall submit a revised initial programme within 7 days of receipt of the Contractor's response, taking due account of the reasons given by the Contractor. The Contractor shall within 7 days of receiving this revised initial programme, respond by either stating that it complies with the Subcontract in which case it shall become the Subcontract Programme; or stating that the initial programme fails (to the extent stated) to comply with the Subcontract, giving sufficiently detailed and</p>

		cogent reasons to enable the Subcontractor to further revise the initial programme in a timely manner.
B.	Updating the Subcontract Programme	
	Updating	<p>The Subcontract programme shall be updated and submitted to the Contractor no later than 28 days from the date that the Subcontractor's initial programme became the Subcontract Programme and, in any case, within 7 days of the occurrence of any of the following:</p> <p><i>(Note to Compiler: Amend List if required to list instances when an updated programme is required)</i></p> <ol style="list-style-type: none"> The Subcontractor changing his method(s) and/or sequencing of work and/or duration of activities and/or allocation of resources; Any delay event experienced by the Subcontractor in his execution of the Subcontract Works of whatsoever cause which impacts the critical path or, if there is more than one critical path, any of the critical paths; Notification from the Contractor of any delay event which has occurred, or specific probable future events or circumstances, which may adversely affect the Subcontractor's work, increase the Subcontract Price or delay the execution of the Subcontract Works; The grant by the Contractor of an extension of the Subcontract Time for Completion; Receipt of a Contractor's Instruction regarding the programming and/or sequencing of the Subcontract Works; and Receipt of notification from the Contractor that the actual progress of the Subcontract Works is too slow to complete within the Subcontract Time for Completion and/or does not conform to the Subcontract Programme. <p>The updated programme shall show modifications to the Subcontract Programme necessary to ensure completion of the Subcontract Works within the Subcontract Time for Completion.</p>
	Acceptance	<p>The Contractor shall within 7 days of receiving the updated programme respond by either stating that it complies with the Subcontract, in which case it shall become the Subcontract Programme; or stating that it fails (to the extent stated) to comply with the Subcontract, giving sufficiently detailed and cogent reasons to enable the Subcontractor to revise it in a timely manner. If the Subcontractor receives no response from the Contractor within 7 days of submitting the updated programme, it shall become the Subcontract Programme.</p> <p>If the Contractor responds stating that the updated programme fails (to the extent stated) to comply with the Subcontract, the Subcontractor shall submit a revised updated programme within 7 days of receipt of the Contractor's response, taking due account of the reasons given by the Contractor. The Contractor shall within 7 days of receiving this revised updated programme, respond by either stating that it complies with the Subcontract, in which case it shall become the Subcontract Programme; or stating that it fails (to the extent stated) to comply with the Subcontract, giving sufficiently detailed and cogent reasons to enable the Subcontractor to further revise the updated programme in a timely manner.</p>
	Subcontract duration	<p>Thereafter, for the duration of the Subcontract Works, the Subcontractor shall update the programme and each updated programme shall be subject to the requirements of this Annex. The Subcontractor shall not delay any work whilst awaiting a response from the Contractor in respect of any updated or revised updated Subcontract programme.</p>

		<p>Provided that any response by the Contractor in respect of any programme submitted by the Subcontractor that relates to the Subcontract Works shall not be taken as:</p> <ul style="list-style-type: none">i) Conferring any right on the Subcontractor other than those set out in the Subcontract, orii) Any waiver of the Contractor's rights or the Subcontractor's obligations under the Subcontract.
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C1.2.2 APPENDIX TO TENDER: CONTRACT DATA - INFORMATION PROVIDED BY THE CONTRACTOR

1. This form is the equivalent of the Appendix to the Subcontractor's Offer as defined in Sub-Clause 1.1.3 of the FIDIC Conditions of Subcontract, 2011.
2. Subcontract clause numbers (SCI No.) refer to the FIDIC Conditions of Subcontract, 2011. The prefix PCC refers to an amendment or addition in the Particular Conditions of Contract.

SCI No	Item	Data
1.1.4	Contractor	means <i>Compiler to insert name of the Contractor's firm</i> Physical address: <i>Compiler to insert</i> Tel: Cell: Email:
1.1.7	Contractor's Subcontract Representative (<i>Compiler to insert details of the Contracts Manager or his delegated representative, the approved Construction Manager (Contractor's Representative)</i>)
(<i>Note to Compiler: complete the following if there are Subcontract Sections</i>) 1.1.28	Subcontract section: Subcontract section: Subcontract section:	Time for Completion Time for Completion Time for Completion
1.1.31	Subcontract Time for Completion months from the Commencement Date (<i>Compiler to insert number of days or months</i>)
1.4	Subcontract Communications	Communications between the parties shall be from the Subcontractor through to the Contractor. The addresses for communication with the Contractor shall be: Contractor: Physical address: (<i>Note to Compiler: Insert relevant physical address</i>) Postal address: (<i>Note to Compiler: Insert relevant postal address</i>) Tel: Cell: Email:
4.2	Subcontract Performance Security	Not applicable for Targeted Enterprise Subcontractors

PCC 6.5	Rates of Wages and Conditions of Labour	<p>The Subcontractor shall be registered with the Bargaining Council for the Civil Engineering Industry (Government Notice R.490 – Part III 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 Subcontractor except where a specific industry publishes its own Wage Rates and Conditions of Labour.</p> <p><i>(Note to Compiler: In cases where the works package falls under a specific industry (e.g. Forestry) that publishes its own wage rates and Conditions of Labour, then delete the previous sentence and insert the specific industry wage rates and Conditions of Labour)</i></p>
PCC 6.6	Working Hours	<p>Special non-working days are:</p> <ul style="list-style-type: none"> a) All designated public holidays (including all foreseeable statutory declared election days) (b) The annual shut-down period between December and January (c) Day before Easter Weekend (d) Day of State school term closure and day prior to State school term start (e) Other non-working days and restricted working hours specified in section B1200 in the Main Contract as follows: <ul style="list-style-type: none"> i) <i>(Note to Compiler: Add the restrictions from B1200 of the Main Contract)</i> (f) Sundays (g) Between sunset and sunrise <p><i>(Note to Compiler: amend the above to correspond with A6.5 of the Main Contract)</i></p>
PCC 8.1	Subcontract Commencement Date	As stated in Clause C1.1.2 Form of Acceptance.
PCC 8.1	Period in which the Subcontract Work is to commence	Within 14 days of the Subcontract Commencement Date
PCC 8.7	Delay Damages	<p>R..... /day</p> <p><i>(Note to Compiler: Insert an amount per day that can not exceed either the Main Contract Daily Delay Damage amount or the Subcontract Maximum amount of Delay Damages)</i></p>
PCC 8.7	Maximum amount of Delay Damages	Up to 10% of the Accepted Subcontract Price
PCC 11.2	Subcontract Defects Notification Period	<p><i>(Note to Compiler: Insert an appropriate period for the type of work and risk of defects over time but not exceeding 12 months, utilising the following guide:</i></p> <p><i>12 months – For High risk and high value subcontracts</i></p> <p><i>6 months – As a general norm</i></p> <p><i>3 months – For CE1, 2 and 3s)</i></p> <p><i>_____ months.</i></p>
13.5	Subcontract Adjustments for Changes in Cost	Statistical Releases published by Statistics South Africa

TABLE OF ADJUSTMENT DATA				
Coefficient	Resource	Definition	Publication	Table
x = 0,15	Fixed			
a =	Labour (L)	"Labour Index" shall be the price index for "Consumer Price Index" for the <i>(Note to Compiler: Insert Province)</i> Province	P0141	A
b =	Equipment (E)	"Equipment Index" shall be the price index for "Plant and Equipment"	P0151.1	4
c =	Material (M)	"Materials Index" shall be the price index for the "Civil Engineering Material" product, <i>(Note to Compiler: Insert most appropriate product, for type of work i.e.: "Roads, General (excl. Bitumen)" for projects that are both road and structures intensive, "Roads, Refurbishment (Excl. Bitumen)" for projects that are road intensive, "Structures (Excl. Bitumen)" for all structures intensive projects)</i>	P0151.1	6
d =	Fuel (F)	"Fuel Index" and shall be the price index for "Coal and Petroleum Products", for "Diesel"	P0142.1	1
<p>"Ln", "En", "Mn" and "Fn" are the current cost indices for period "n", each of which is applicable to the relevant tabulated cost element on a date 49 days prior to the last day of the period to which the interim Subcontract Payment or final Subcontract Payment relates</p> <p>"Lo", "Eo", "Mo" and "Fo" are the base cost indices, each of which is applicable to the relevant tabulated cost element on the Subcontract Base Date (the date 28 days prior to the latest date for submission of the Subcontractor's Offer).</p> <p><i>(Note to Compiler: The coefficients a, b, c, and d is to be the same as the coefficients of the Main Contract – any proposed changes to be confirmed with the Employer)</i></p>				
14.2	Total Subcontract Advance Payment% of Accepted Subcontract Price <i>(Note to Compiler: Indicate percentage if applicable else indicate 0%)</i>		
14.2	Number, Timing and proportions of instalments of advance payment	<i>(Note to Compiler: Indicate details of advance payment installments if applicable else indicate Not Applicable)</i>		
PCC 14.6	Percentage of Retention	5% of the Value of Completed Work		
PCC 14.6	Limit of Retention Money	5% of the Subcontract Price		
14.11	Subcontract Currencies of Payment	South African Rand (ZAR)		
PCC 20.5	Appointment of the Subcontract DAB	Where a Main Contract DAB is appointed under the Main Contract, the Subcontract DAB shall		

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		<p>comprise of the same members of the Main Contract DAB.</p> <p>Where a Main Contract DAB is not appointed under the Main Contract, the Subcontract DAB shall comprise of 1 (one) member only.</p>
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C1.2.3 APPENDIX TO TENDER: CONTRACT DATA – INFORMATION PROVIDED BY THE TENDERER

Note to Tenderer:

This form is the equivalent of the Appendix to the Subcontractor's Offer as defined in Sub-Clause 1.1.3 of the FIDIC Conditions of Subcontract, 2011

1. FIDIC CONDITIONS OF SUBCONTRACT

1.a Clause 1.1.34: Subcontractor

The subcontractor is:

1.b Clause 1.4: Subcontract Communications

Communications to the Subcontractor shall be delivered, sent or transmitted to the following:

Physical address:

.....

.....

Telephone:

Facsimile:

E-mail:

1.c Clause 1.1.39: Subcontractor's Representatives

The authorized and designated representative of the Subcontractor is:

Name:

SIGNED BY TENDERER:

PART C2: PRICING DATA

PART C2 PRICING DATA

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C2.1 PRICING INSTRUCTIONS

- C2.1.1 Measurement and payment shall be in accordance with the relevant provisions of the Standard Specifications as amended in the Scope of Works.
- C2.1.2 The units of measurement described in the Bill of Quantities are metric units. Abbreviations used in the Bill of Quantities are detailed in the Standard Specifications.
- C2.1.3 For the purposes of the Bill of Quantities, the following words shall have the meanings hereby assigned to them.
- | | |
|------------------|---|
| Unit: | The unit of measurement for each item of work as defined in the Standard Specifications or the Scope of Works. |
| Quantity: | The number of units of work for each item. |
| Rate: | The payment per unit of work for which the Subcontractor tenders to do the work. |
| Amount: | The product of the quantity and the rate tendered for an item. |
| Lump Sum: | An amount tendered for an item, the extent of which is described in the Bill of Quantities, the Scope of Work or elsewhere, but of which the quantity of work is not measured in units. |
| Prime cost: | Is a specific type of Provisional Sum where payment is made on the production of invoices showing the cost price of the implementation or installation of the service required. Services rendered in this manner carry a mark-up for which a rate is offered at tender stage to cover all the Subcontractor's handling, supervision and liability costs in providing the item or services. Any percentage adjustment or lump sum mark-up against the Prime cost for handling fee, profits, etc. shall not be negative . |
| Provisional Sum: | A sum (if any) which is specified in the contract as a provisional sum, for the execution of any part of the works or the supply of plant, materials or services under Sub-Clause 13.5 (<i>Provisional sums</i>) of the Main Contract. Any percentage adjustment or lump sum mark-up against the Provisional Sum for handling fee, profits, etc. shall not be negative |
- C2.1.4 Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.
- C2.1.5 It will be assumed that prices included in the Bill of Quantities are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.stanza.org.za or www.iso.org for information standards).
- C2.1.6 The prices and rates in the Bill of Quantities are fully inclusive prices for the work described under the items, and include all duties, taxes (except Value Added Tax) and other levies payable by the Contractor. 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, 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.
- C2.1.7 Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered such items.

C2.4

- C2.1.8 An item against which no price is entered will be considered to be covered by the other prices or rates in the Pricing Schedule. A single lump sum will apply should a number of items be grouped together for pricing purposes.
- C2.1.9 The quantities set out in the Bill of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in the Bill of Quantities.
- C2.1.10 Reasonable compensation will be received where no pay item appears in the Bill of Quantities in respect of work required in terms of the Contract and which is not covered in any other pay item.
- C2.1.11 The short descriptions of the items of payment given in the Bill of Quantities are only for the purposes of identifying the items. More details regarding the extent of the work entailed under each item appear in the Scope of Work.
- C2.1.12 The item numbers appearing in the Bill of Quantities refer to the corresponding item numbers in the Standard Specifications.
- C2.1.13 If the pricing schedule is provided electronically in excel format and in hard copy or pdf **(Note to Compiler: Remove as applicable)**, in the event of any discrepancy between the signed printed hard copy or pdf copy, and the electronically submitted copy in excel, the tender rates in the signed hard copy or pdf copy will govern **(Note to Compiler: Remove as applicable)**. The item numbers and description of the hard copy or pdf document will govern. For all addenda issued relating to the pricing schedule, the item numbers, description and quantities of the issued document will govern.

C2.2 PRICING SCHEDULE (INCORPORATING SBD3) (PROVIDED ON COMPACT DISC)

(Note to Compiler: Insert the relevant Schedule of Quantities for the type of Work Package that is to be sub-let according to the Main contract.

Use the Main Contract Pricing Schedule as a Master list to compile the Pricing Schedule, with individual line items listed in the subcontract to be reflected in the Main contract pricing schedule) (Note to Compiler: Consult with the relevant Engineer)

C2.3 SUMMARY OF PRICING SCHEDULE**SUBCONTRACT NO.****FOR****UNDER CONTRACT SANRAL****FOR THE***(Note to Compiler: Remove or add as applicable)*

	R
SCHEDULE A: ROADWORKS (from page)
	R
SCHEDULE B: STRUCTURES (from page)
	R
SUBTOTAL
	R
VALUE ADDED TAX @ 15% of Subtotal
<hr/>	
TOTAL CARRIED TO C.1.1.1: FORM OF OFFER	R

PART C3: SCOPE OF WORKS

PART C3 SCOPE OF WORKS

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PART C3: SCOPE OF WORKS

(Note to Compiler: The below is the minimum requirements to be contained in the document. The contractor to Insert the relevant information to describe the Scope of work for the type of Work Package that is to be sub-let)

C3.1 GENERAL SPECIFICATION

C3.1.1 SCOPE

This section provides the description of the project and the general requirements for executing the subcontract work. The work required is the *(Note to Compiler: refer only to work applicable to the subcontract)* of the national road *(number)* Section *(number)* *(from km to km)*. The total distance is approximately *(length)* km. *(Note to Compiler: refer only to the portion of the site applicable to the subcontract)*

It is a requirement of the Main Contract for the Contractor to facilitate the Subcontractor development of targeted enterprises as a contract participation goal by means of subcontracting some of the scheduled work section(s) to targeted enterprises as subcontractors.

C3.1.2 DESCRIPTION OF THE WORKS

C3.1.2.1 Description of site

- (a) Location of site *(Note to Compiler: refer only to the portion of the site applicable to the subcontract)*

The general locality of the site is indicated on the locality plan bound in the back of this volume.

The term "Site" as defined in the Main Contract in terms of Clause 1.1.6.7 of the FIDIC Conditions of Contract for Construction, 1999 and is bound by the limits of construction as shown in the drawings or the title of the project and extends to also include the following:

- Areas outside the construction zone areas where accommodation of traffic is placed.
- All borrowpits defined in the applications approved by the relevant Department of Minerals and Energy.
- All haul roads constructed by the Contractor for purposes of access.
- Any non-adjacent sites specified in the contract documentation.
- The Contractor's and his subcontractors' camp sites

The portion of the site applicable to this subcontract will comprise:

- The section of National Route *(number)* Section *(number)* *(from km to km)*. The total distance is approximately *(length)* km. *(Note to Compiler: add additional descriptions for relevant subcontract e.g. on-ramps and off-ramps forming part of an interchange, as well as overpasses and underpasses within the national road reserve up to the limits of the SANRAL's responsibility whether or not it has direct access off the national road. Excluded are provincial, municipal and private cross roads, which are not accessible from the road reserve of the national road, but the overpass and underpass structures are part of the "Site", The "Site" will also include all road signs within 500 metres of an intersection or interchange, which form part of the road signs layout for the national road. The "Site" will also include land not provided by the SANRAL, where equipment and/or materials for use in the permanent works of the contract can be stored and/or stockpiled with the provision that the land selected for this purpose be approved by the Engineer. The Contractor must make their own arrangements for the use of such land and must obtain written approval from the owner(s) concerned)*

C3.4

(b) Access to the site

Vehicular Access to the site shall be from established interchanges, intersections and approved accesses.

(Note to Compiler: In the event that the Contractor will make any part of the site available exclusively to the Subcontractor, then those parts of the site and the periods of exclusive access to be detailed here as per amended Conditions of Contract 3.2)

C3.1.2.2 Nature of Subcontract work

The description of the project contained in this section is merely an outline of the Subcontract works and shall not limit the work to be carried out by the Subcontractor under this Subcontract. Approximate quantities of each type of work to be carried out in accordance with the Subcontract documents are listed in the Bill of Quantities bound in this volume.

The nature of work to be carried out under this Subcontract includes: *(Note to Compiler: Add/ Remove as is relevant for the Work Package)*

- Erection and maintenance of the subcontractor's camp site
- Clearing and grubbing.
- Removal of trees
- Provision of traffic control facilities
- Management of traffic control facilities and traffic safety as part of the accommodation of traffic
- Construction and clearing of drains.
- Installation of prefabricated culverts including inlet and outlet structures.
- Concrete channelling and concrete linings for open drains.
- Construction of concrete paving, kerbs and channels
- Construction of small concrete and other structures.
- Construction of concrete walkways
- Pitching, stonework and protection against erosion.
- Construction of gabions.
- Patching and repairing edge breaks
- Erection of guardrails.
- Landscaping.
- Fencing
- Road signs
- Road markings
- Finishing the road and road reserve.
- Site Security Services.
- Haulage of Materials
- Supply of plant
- Supply of fuel
- Construction of concrete pavements
- Laying of asphalt using asphalt pavers
- Structural concrete such as culvert and bridges
- Crushing of materials
- Precast manufacture
- Batch plant erection and operations
- Earthworks, Layerworks construction
- Structural steel fabrication, erection

C3.1.3 DRAWINGS

The drawings issued in electronic format on a CD as part of the tender documents, shall be used for tender purposes only.

The Subcontractor will be issued with the contract drawings in electronic format on a CD. Any prints which the Subcontractor may require shall be at own cost.

Any information in the possession of the Subcontractor, which the Engineer requires to record as-built information, shall be supplied to the Engineer via the Contractor, before a Taking-Over Certificate will be issued.

Only figured dimensions shall be used and drawings shall not be scaled unless so instructed by the Engineer. The Engineer will supply all figured dimensions omitted from the drawings.

C3.1.4 CONSTRUCTION IN CONFINED AREAS

It may be necessary for the Subcontractor to work within confined areas. Except where provided for in the specifications, no additional payment will be made for work done in such confined areas. In certain instances, the width of the work to be undertaken may decrease to zero and the working space may be confined. The work method in such confined areas will be determined by the Subcontractor's constructional equipment. The Contractor will provide assistance as required.

However, the Subcontractor must note that measurement and payment will only be made in accordance with the authorised dimensions, irrespective of the method used for achieving these dimensions and that the tendered rates and amounts shall include full compensation for all special equipment and construction methods and for all difficulties encountered when working in confined areas and narrow widths, and at or around obstructions, and that no extra payment will be made nor will any claim for additional payment be considered in such cases.

C3.1.5 SUBCONTRACTOR'S CAMP SITE

The Subcontractor shall provide a suitable site for his camp. However, the Contractor will provide shared facilities as detailed in Annex D of the Contract Data of the Conditions of Subcontract.

C3.1.6 ADDITIONAL REQUIREMENTS FOR CONSTRUCTION ACTIVITIES

In addition to the requirements specified in the Standard Specifications, the Subcontractor shall adhere to the following requirements.

(Note to Compiler: Only add/remove items listed as is relevant to the Work Package)

C3.1.6.1 Accommodation of traffic

The Contractor will provide Traffic Accommodation as detailed in Annex D of the Contract Data of the Conditions of Subcontract .

C3.1.6.2 Environmental requirements

Trees and shrubs established in landscaped areas of interchanges and in the road reserve may under no circumstances be disturbed without specific instruction from the Contractor for their removal. Trees and shrubs inadvertently destroyed by the Subcontractor shall be replaced with the equivalent at the Subcontractor's own cost.

Disposal of any bituminous-based material shall only be at an approved location and by means of an approved method, arranged beforehand with the Contractor. Bituminous binders shall not be disposed of on the Site but shall be returned to the supplier for disposal.

C3.1.6.3 Dayworks

Sub-clause 13.6 of the FIDIC Conditions of Subcontract for Construction, 2011, refers.

The Subcontractor shall tender the rates applicable to daywork, as provided for in the Bill of Quantities. These rates will be taken into account in the adjudication of tenders.

C3.6

The tendered rates shall be considered to include full compensation for the work to be performed, including supervision of labour, all plant operators and other operating costs, overheads and profit. Hourly rates for transport and equipment shall apply to the actual number of hours for which the vehicles or equipment are required for a specific item of work, including travelling time if applicable.

The Contractor on behalf of his Subcontractors, shall maintain a hard cover duplicate book on site for the purposes of recording daywork. The Contractor shall record the total time claimed under each relevant item of the Bill of Quantities and the applicable instruction of the Engineer and shall ensure that the total times claimed are agreed and signed daily by the Engineer's representative on site.

The Subcontractor shall not claim daywork for any work for which an applicable rate has been tendered or agreed to in writing by the Engineer.

The cost of materials used and paid for by the Contractor or his Subcontractors, as authorised by the Engineer, shall be reimbursed at net cost, exclusive of Value Added Tax, plus the percentage as tendered for the Contractor's overhead charges and profit.

In the event where no allowance has been made for a specific item in the Bill of Quantities, the Engineer may order daywork according to sub-clause 13.6 of the FIDIC Conditions of Subcontract for Construction, 2011.

C3.1.7 ALLOWANCE FOR OTHER CONTRACTORS AND ACCOMMODATION OF OTHER CONTRACTS

Access to work areas and requirement for allowance of other contractors within the work areas is detailed in Annex D of the contract Data of the Conditions of Subcontract.

C3.1.8 PROGRAMME, RESTRICTION AND COMPLETION OF ACTIVITIES

This clause covers matters relating to the programme of work, restriction on certain activities, completion and responding time of specified activities, and compliance with the specifications.

C3.1.8.1 Programme

The Time for Completion of the Works is specified in the Appendix to the Subcontractor's Offer.

The requirements of the Subcontract programme are specified in Annex F of the Contract Data of the Conditions of Subcontract.

The Contractor will determine the extent and frequency of the work to be executed in terms of the subcontract, as certain activities are dependent upon the climatic conditions encountered during the period of the subcontract and on progress of the Contractor or other subcontractors.

The frequency and commencement period of some of the key activities, as instructed by the Contractor are scheduled in Table C3.1.8/1.

(Note to Compiler: Only add/remove items listed as is relevant to the Work Package)

TABLE C3.1.8/1: FREQUENCY AND COMMENCEMENT PERIOD OF ACTIVITIES		
Activity	Frequency	Start period
Linemarking	<i>(state days and frequency)</i>	

C3.1.8.2 Restriction on activities

Work activities will be restricted on days or hours indicated in clause 6.6 of the Contract Data of the Conditions of Subcontract and the Subcontractor must allow for these restrictions in his programme and no extension of time or claims in this regard will be considered.

C3.1.8.3 Completion time of specified activities

(Note to Compiler: Amend as appropriate for type of subcontract e.g. Fix time or multiple establishments as is relevant to the Work Package)

Generally, the activities covered by this subcontract will be on a continuous basis. However, certain specified activities are considered to be of a non-continuous nature and multiple establishments will be required as instructed by the Contractor. *(Note to Compiler: These establishments and the number thereof should be reflected in the pricing schedule)*

C3.1.9 OCCUPATIONAL HEALTH AND SAFETY

In terms of the Construction Regulation 5(1)(b) of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993), the South African National Roads Agency SOC Limited, as the Employer, is required to compile a specification on health and safety for the project. The Contractor will furnish the Subcontractor with the applicable specification and his Health and Safety plan.

The Method Statement shall be provided by the Contractor / The Method Statement for each activity shall be developed by the Subcontractor. *(Note to Compiler: Amend as appropriate)*

C3.1.10 INTEGRATED TRANSPORTATION INFORMATION SYSTEM (FOR INFORMATION PURPOSES)

The Employer has developed a comprehensive information management tool called ITIS (Integrated Transportation Information System) to address all facets of its strategic and tactical planning, design, construction and maintenance of the entire road network. This provides support for the management tasks of the Employer and to allow the personnel to make technical decisions more quickly and efficiently.

ITIS is an integrated approach to the sharing and inter-relating of technical performance information for the Employer and relies on people following procedures to populate system with data. ITIS currently consist of the following platforms:

- ITIS Web – Web enabled portal providing online access to various functions, workflows and reports.
- ITIS Desktop – Offline data capture tool enabling the capture of information offline, validation and then synchronisation of data with the ITIS database.
- ITIS Mobile – Application (Android 4.3 or later and IOS 6 or later) that allows the in-field capture of information using a smart phone or tablet (must have camera and GPS), validation and then synchronisation of data with the ITIS database.

The Employer then has several ITIS modules running on any of the above ITIS platforms which affect the Contractor, who will need to use these modules to perform certain procedures and to provide required information. The current modules applicable and their description are as follows:

- (i) Project Information Module – employment and training data.

The Subcontractor will be required to supply relevant information to the Contractor to enable compliance with his obligations.

C3.1.12 CONTRACTOR SUPPORT OF TARGETED ENTERPRISES

The Contractor shall appoint a dedicated Targeted Enterprise Construction Manager (TE Construction Manager) whose sole responsibility shall be to assist with the execution of its responsibilities towards Targeted Enterprises and Target Groups. Amongst others, the TE

Construction Manager shall facilitate the training, mentoring, development and support of Targeted Enterprises.

The TE Construction Manager shall have on his team one (1) TE Site Supervisor for every six (6) Targeted Enterprises which are in their respective construction phases and one (1) Senior TE Supervisor for every six (6) TE Site Supervisors.

The TE Construction Manager shall develop and establish a Targeted Enterprise Training, Development and Support Programme, which shall be approved by the Employer and Engineer and acknowledged by the Project Liaison committee (PLC) prior to implementation, and which shall adhere to Government's and the Employer's Transformation and Supply Chain Management Policies and principles.

a) General Obligations

The Contractor shall, with the assistance of the TE Construction Manager, comply with the following obligations:

- (i) Assist the Targeted Enterprises in instituting a quality assurance system;
- (ii) Provide adequate training, coaching, guidance, mentoring and any other identified and approved assistance to Targeted Enterprises;
- (iii) Provide support and any other identified and approved assistance to ensure that the Targeted Enterprises meet their obligations and commitments with respect to their subcontracts, and
- (iv) Ensure that the Contract Participation Goals (CPG) objectives are achieved.

b) Subcontract Agreements

The Contractor, in liaison with the Employer and the Engineer, shall conclude the subcontract agreements and provide the necessary management support to the Targeted Enterprises. The subcontract agreements shall be in accordance with the provisions of amended sub-clause 4.4 of the Conditions of Contract and shall be consistent with the terms and conditions of the Main Contract.

A copy of each subcontract agreement shall be filed with the Engineer after confirming that it is in accordance with the provisions of the Main Contract and after it has been acknowledged by the PLC.

Note:

To protect Targeted Enterprises' competitive advantage and/or tender strategy, only the main subcontract agreement shall be available to the PLC for acknowledgement and not the pricing structure and/or Schedule of Quantities.

c) Quality of Work and Performance of Targeted Enterprises

The Contractor shall closely monitor and supervise all Targeted Enterprises and shall train, coach, guide, mentor and assist each Targeted Enterprise in all aspects of management, execution and completion of its subcontract. This shall typically include assistance with planning of the Works, sourcing and ordering of materials, labour relations, monthly measurements and invoicing procedures. The extent and level of such training, coaching, guidance, mentoring, and assistance to be provided by the Contractor shall commensurate with the level of subcontract applicable and shall be directed at enabling the Targeted Enterprise to achieve the successful execution and completion of its subcontract.

The Contractor shall give reasonable warning to the Targeted Enterprise when any contravention of the terms and conditions of the subcontract has occurred or appears likely to occur. The Contractor shall, whenever feasible, give the Targeted Enterprise reasonable opportunity to make good any such contravention, or to avoid such contravention, and shall render all reasonable assistance to the Targeted Enterprise in this regard.

d) Dispute Avoidance and Resolution Procedures

When any disputes arise as provided for in the subcontract, the Contractor shall explain fully to the Targeted Enterprise that such actions are provided for in the subcontract. If such action is contemplated it shall be discussed with the Employer and the Engineer before any action is taken and communicated with the PLC as soon as action has been taken.

If the Targeted Enterprise, in the opinion of the Engineer, fails to comply with any of the criteria listed below, the Engineer shall issue a written warning to the Contractor, stating all the areas of non-compliance. A copy of the letter of warning shall be forwarded to the Employer. The criteria are as follows:

- (i) Acceptable standard of work as set out in the specifications;
- (ii) Progress in accordance with the time constraints in the subcontract and the subcontract programme;
- (iii) Punctual and full payment of the workforce and suppliers;
- (iv) Site safety; and
- (v) Accommodation of traffic.

The Targeted Enterprise shall have 21 days from the date of receipt of the letter of warning by the Contractor to address and rectify the issues raised by the Engineer, except for sub-clauses (iv) and (v) above, for which the reaction time shall be in accordance with the relevant specifications for those aspects of the Works, but which shall not be longer than 24 hours. Failure by the Targeted Enterprise to comply with a deadline, will be sufficient grounds for the Contractor to apply a penalty or terminate the subcontract provided that the Employer and the Engineer is satisfied that the Contractor has made every effort to correct the performance of the Targeted Enterprise.

C3.1.13 TRAINING, COACHING, GUIDANCE, MENTORING AND ASSISTANCE

(a) Purpose of the Training and Skills Development Programme(s)

Skills development forms an integral part of the Employer's Transformation and Community Development Policies and hence, it is important to the Employer that Targeted Labour and Targeted Enterprises be equipped with skills that can be used to gain meaningful future employment and secure subcontracting opportunities.

It is, therefore, a requirement that the Contractor provide Training, Coaching, Guidance, Mentoring and assistance to the Targeted Labour and Targeted Enterprises, to ensure skills development within the Construction Industry.

The Contractor shall, in collaboration with the Employer and the Engineer, develop a Training and Skills Development Programme(s) which shall be managed by the Contractor's TE Construction Manager.

(b) Skills Audit and Analysis

Prior to developing the Training and Skills Development Programme(s), the Contractor shall conduct a Skills Audit and Analysis of the Subcontractor's employees to determine their levels of education, existing qualifications, and skills sets. The outcome of the Skills Audit and Analysis shall be used to develop a Training and Skills Development Programme(s) that will benefit both the employee and the Construction Industry at large.

Included in the Skills Audit and Analysis shall be a separate section, analysing the education, qualifications and skills sets of the Subcontractor by the Contractor to develop a Training and Skills Development Programme(s) that will develop and improve the ability of small business owners and their supervisory staff to better manage their enterprises.

(c) Developing the Training and Skills Development Programme(s)

The Employer shall be involved in the decision making and quality control pertaining to the development and implementation of the Training and Skills Development Programme(s).

The Employer has no service agreement or memorandum of understanding with any education and training quality assurance body and, therefore, does not function as the "Employer" as defined under any three-party-agreement between the Trainee, the Training Provider and the Employer.

However, the Employer requires similar outcomes to that of formal learnership programmes and the Contractor shall structure a Training and Skills Development Programme(s) in a manner that permits continued access to further learning and qualifications within a defined programme.

The complete Training and Skills Development Programme shall be approved by the Employer and Engineer and acknowledged by the PLC before any training commence.

(d) The Training Service Provider

While the Contractor's TE Construction Manager will manage the Training, Development and Support Programme(s) and mentor subcontractors from a practical point of view, the Contractor shall subcontract a Training Service Provider to implement the theoretical training components of the Programme(s).

The Training Service Provider entity shall be accredited, and have in its employ Practitioners, Assessors and Moderators whom are registered, with the Construction Education Training Authority (CETA). Proof of accreditation and registration shall be current, valid and list the NQF levels and Unit Standards for which the entity and its staff are accredited.

(e) Training Programme: General Requirements

The Training and Skills Development Programme(s) shall consist of Learnerships that include multiple, but related Unit Standards which are (1) relevant to the Works to be constructed, (2) aimed at achieving the skills development objectives of the Programme, and (3) lead towards a formal qualification in the Construction Industry.

Learnerships shall include both the theoretical and practical components of each Unit Standard and shall be in accordance with the various laws and regulations contained in the South African Qualification Authority (SAQA) statutes.

(i) Training Programme: Requirements and Considerations

The Skills Audit and Analysis shall inform the Contractor of every employee's Recognised Prior Learning (RPL) skills and competencies, which shall be taken into consideration in the development of the Training and Skills Development Programme(s) so that the RPL skills and competencies, together with the Training Programme Unit Standards offerings, will lead to a full Learnership outcome and hence a formal qualification.

It is recognised that the Training and Skills Development Programme(s) may consist of several Unit Standards but totalling insufficient credits for a full Learnership qualification. Nevertheless, the competencies and credits achieved in the Programme(s) shall contribute to a full Learnership by a later acquisition of the outstanding Unit Standards required for the full Learnership.

The Training and Skills Development Programme(s) shall be structured in a manner to prioritise those Unit Standards that will equip Trainees with the minimum skills required to become economically involved in the execution of the Works as soon as possible.

The Training Service Provider shall apply the SAQA Learnership criteria of which the basic elements are listed below to demonstrate the Employer's requirements:

- a. Minimum credits for qualification;
- b. Fundamental Unit Standards and credit values;

- c. Core Unit Standards and credit values;
- d. Elective Units Standards and credit values;
- e. Assumption that NQF Level 3 literacy, numeracy, and computer competencies exist;
- f. RPL processes;
- g. Exit level outcomes;

The above criteria are not exhaustive, and the Training Service Provider shall apply the systems and processes required by the relevant SAQA and other related legislation pertinent to training.

While structuring the Learnership offerings, the Training Service Provider shall distinguish between the levels of learning required. The bulk of the training shall focus on NQF Levels 4 and 3. NQF Level 5 training is not anticipated but may be suitable for qualifying staff of established small contractors. The qualification titles for the respective NQF Levels are:

- a. NQF Level 3 National Certificate: Construction Roadworks.
- b. NQF Level 4 National Certificate: Supervision of Construction Processes
- c. NQF Level 4 National Certificate: Business Management
- d. NQF Level 5 National Diploma: Management of Civil Engineering Construction Processes

It may be necessary to include additional Core Unit Standards, e.g. "Tendering" or "Entrepreneurship" as an additional Unit Standard for NQF Level 4, to achieve the Contract's development objectives. The identification of any additional Unit Standards shall be discussed with the Engineer and shall not be implemented without prior approval.

Before qualifying, Trainees will be expected to demonstrate competence in a practical situation that integrates the assessment of all specific outcomes, for all Unit Standards in the Learnership Programme.

All training shall take place within normal working hours, or as agreed with the trainees.

(ii) Selection of Trainees

To complete a Learnership successfully requires minimum literacy and numeracy competencies as defined by SAQA. The Training Service Provider shall utilise the Skills Audit and Analysis and conduct additional skills analysis to benchmark the literacy and numeracy levels of employees and subcontractors. This information shall guide the Training Service Provider in formulating the Learner selection methodology(ies) and process(es). The Training Service Provider shall make provision for (1) baseline assessments, e.g. conducting RPL enquiries and tests, and (2) a gap skills programme consisting of Fundamental Unit Standards, to facilitate the selection process.

Trainees identified as having already acquired some tertiary training, particularly in the field of Civil Engineering, may be suitable for a specialised Trainee programme or a higher NQF Level programme. The Training and Skills Development Programme(s) shall, therefore, make provision for Trainees with a variety of competency levels and shall make provision for different levels of training.

Note:

Where this section refers to the selection and training of Trainees, any person, employed by any national, provincial or local authority, being it full time or part time, is expressly excluded from being considered for this training.

C3.2 STANDARD SPECIFICATIONS

The Standard Specifications for Road and Bridge Works for State Road Authorities (1998 edition) prepared by the Committee of Land Transport Officials, (COLTO), as amended, shall apply to this subcontract.

C3.3. PROJECT SPECIFICATION AMENDING THE STANDARD SPECIFICATIONS

In certain clauses the Standard Specifications allow a choice to be specified in the project specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternatives or additional requirements applicable to this subcontract are contained in this part of the project specifications. It also contains some additional specifications required for the subcontract.

The number of each clause and each payment item in this part of the project specifications consists of the prefix B followed by a number corresponding to the number of the relevant clause or payment item in the Standard Specifications. The number of a new series, new clause or a new payment item which does not form part of a series, clause or a payment item in the Standard Specifications and which is included here, is also prefixed by B followed by a new number. The new numbers follow on the last clause or item number used in the relevant section of the Standard Specifications.

The following sections contain the relevant project specific changes to the Standard Specifications.

(Note to Compiler: Add relevant project specification from main contract as applicable to the package as Section 1000, 2000, 3000 etc as relevant in the next pages. The compiler to obtain the Engineer's approval if Main Contract project specifications or Standard Specifications are amended in this specification.)

C3.3.1 COLTO SERIES 1000: GENERAL
SECTION B1100: DEFINITIONS AND TERMS

.....etc.

PART C4: SITE INFORMATION

PART C4 SITE INFORMATION

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Information Only

All data and descriptions contained in this section of the Subcontract documents are given for information purposes only and cannot be interpreted as prescriptive or as an instruction despite the fact that the text may give the opposite perspective. If any conflict arises between the content of this section and other sections of the Subcontract documents, the latter take precedence.

(Note to Compiler – extract relevant information from the Main Contract Part C4 and include below to Provide as much scope of work info as possible for subcontractor to clearly understand the project when pricing. The below typical headings are given as example)

C4.1 DESCRIPTION OF THE WORKS

C4.2 DRAWINGS

C4.3 CAMP ESTABLISHMENT, POWER SUPPLY AND OTHER SERVICES

C4.4 CONSTRUCTION IN CONFINED AREAS

C4.5 MANAGEMENT OF THE ENVIRONMENT

C4.6 TRAFFIC

C4.7 SMALL CONTRACTOR DEVELOPMENT, TRAINING AND COMMUNITY LIAISON

C4.8 CLIMATE

C4.9 REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS 2014

C4.10 SAFETY PROCEDURES

C4.11 OTHER INFORMATION

C4.12 APPENDICES

Appendix 1: Locality Plan

APPENDIX 1: LOCALITY PLAN

Locality Plan of the Site: *(Note to Compiler: Insert Locality Plan of the Site)*

SUBCONTRACT NO.
FOR
UNDER CONTRACT SANRAL
FOR THE

PART C5: ANNEXURES

PART C5: ANNEXURES

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Note to tenderer:

The Annexure will include completed returnable schedules and correspondence which form part of the subcontract.

Note to Compiler:

When preparing the contract document, include relevant correspondence and omit the “Note to Compiler”

ANNEXURE 1: COPIES OF ALL ADDENDA ISSUED

ANNEXURE 2: FORM A3.1 (SBD4) - COMPULSORY DECLARATION

ANNEXURE 3: FORM A3.2 (SBD9) – CERTIFICATE OF INDEPENDENT TENDER

**ANNEXURE 4: FORM A3.3 (SBD8) – DECLARATION OF TENDERER'S PAST SUPPLY CHAIN
MANAGEMENT PRACTICES**

**ANNEXURE 5: FORM A3.4 – REGISTRATION ON NATIONAL TREASURY CENTRAL SUPPLIER
DATABASE**

**ANNEXURE 6: FORM A3.5 (SBD6.2) – DECLARATION CERTIFICATE FOR LOCAL
PRODUCTION AND CONTENT FOR DESIGNATED SECTORS**

**ANNEXURE 7: FORM A3.6 – LOCAL CONTENT DECLARATION: SUMMARY SCHEDULE
(ANNEXURE C)**

ANNEXURE 8: FORM A6 (SBD2) – CERTIFICATE OF TAX COMPLIANCE

ANNEXURE 9: FORM A10 – REGISTRATION WITH CIDB

ANNEXURE 10: FORM A11 (SBD6.1) – TENDERER'S B-BBEE VERIFICATION CERTIFICATE

ANNEXURE 11: CORRESPONDENCE RELATING TO PRICING DURING TENDER PERIOD

ANNEXURE 12: LETTER OF ACKNOWLEDGEMENT BY SUBCONTRACTOR

ANNEXURE 13: LETTER OF ACCEPTANCE BY CONTRACTOR

ANNEXURE 14: SUBCONTRACTOR PERFORMANCE REPORT

Note to Compiler: Attach the latest version of the Subcontractor Performance Report (EDMS DOC #4841504)

APPENDIX 12: GENERAL REQUIREMENTS FOR COMMUNITY DEVELOPMENT PROJECTS

A1001 SCOPE OF WORK

The Contractor's Scope of Work primarily entails the training and skills development of members of an identified Community, as well as Trainee Targeted Enterprises selected from this Community, who will become his Targeted Enterprise subcontractors and whom he shall manage and mentor during the construction phase.

The construction phase entails overseeing the construction of infrastructure, by Trainee Targeted Enterprises, that promotes the access, mobility and road safety of the identified Community, in relation to the National Road Network. The Contractor thus have primarily a training and construction management role.

To enhance the utilisation and development of Targeted Labour from the identified Community, care has been taken during the design of the Works to ensure that it can be constructed by means of labour enhanced construction methods (LECM) and the Contractor shall apply such labour enhanced methods.

A1002 DEFINITIONS

Unless inconsistent with the context, in these specifications, the following terms, words or expressions shall have the meanings hereby assigned to them:

a) Accreditation

The certification, for a set period, of a person, a body or an institution to have the capacity to fulfil a particular function within the quality assurance system set up by the SAQA.

b) Construction Education and Training Authority (CETA)

The Construction Education and Training Authority (CETA) was established in terms of the Skills Development Act, Act 97 of 1998. It provides skills development services to the construction sector, to implement the objectives of the National Skills Development Strategy and to ensure that people obtain the critical or scarce skills that are needed to build the capacity of the construction sector to become economically sustainable and globally competitive.

c) Contractor's Construction Management Staff

i) Construction Manager

The Contractor's full-time staff member who manages the practical training and construction of the Works. He also develops and supports Trainees through mentoring, providing guidance and coaching Trainee Targeted Enterprises and other Targeted Enterprises.

ii) Construction Mentor

The person who mentors and oversees Trainees during practical training and construction of the Works.

iii) Construction Supervisor

The person who directly supervises Trainees and who is the coordinator between the Construction Manager and the Trainees during the construction of the Works.

d) Contractor's Training Staff

i) Assessor

A person registered with the relevant ETQA body to measure the achievement of specified NQF standards or qualifications.

- ii) Moderator
A member of a body registered with the CETA to ensure that assessment of the outcomes described in the NQF standards and qualifications are fair, reliable and valid
- iii) Practitioner
A person registered with the CETA to practice as a trainer or instructor of specific NQF Unit Standards.
- iv) Training Provider
The person who coordinates and manages the training and skills development programme developed, or to be developed, for the project.

e) Education and Training Quality Assurance (ETQA) Body

The Education and Training Quality Assurance (ETQA) Body is the quality assurance body within the CETA whose purpose is to monitor and audit achievements in terms of standards or qualifications registered on the NQF.

f) Labour Enhanced Construction Methods (LECM)

Labour Enhanced Construction Methods (LECM) involve the use of an appropriate mix of labour and machines, with a preference for labour where technically and economically feasible, without compromising the quality of the product.

g) Mentoring

Mentoring is a professional relationship in which an experienced businessperson assists another by giving advice and imparting their knowledge and wisdom in developing special skills and knowledge that will enhance the less experienced person's professional and personal growth. The objective is to equip the business owner and his team to improve their decision-making skills, being focussed and make positive progress quickly.

h) National Qualifications Framework (NQF)

The National Qualifications Framework (NQF) is a comprehensive system for the classification, registration, publication and articulation of quality-assured national qualifications. It is the set of principles and guidelines by which records of learner achievement are registered to enable national recognition of acquired skills and knowledge, thereby ensuring an integrated system that encourages life-long learning.

i) Notional (or Learning) Hours of Training

The learning time that it is conceived it would take an average Trainee to meet the defined outcomes and includes concepts such as contact time, time spent in structured learning in the workplace and individual learning.

j) Portfolio of Evidence

A collection of written confirmation contained in a book or file that provides proof of a Trainee's progress towards achieving competency in a Traineeship or skills programme or part thereof, to be kept safe by the Training Provider for a period of at least 5 (five) years after completion of the Traineeship or skills programme or part thereof.

k) Recognition of Prior Learning (RPL)

The comparison of the previous learning and experience of a Trainee, howsoever obtained, against the learning outcomes required for a specific qualification, and the acceptance for purposes of qualification of that which meets the requirements.

l) South African Qualifications Authority (SAQA)

The South African Qualifications Authority (SAQA) is a juristic person that is an entity given a legal personality by the law and that was established in terms of the South African Qualifications Authority Act, Act No. 58 of 1995. The SAQA must develop and implement policy and criteria for the development, registration and publication of qualifications and part-qualifications.

m) Specific Outcomes

The knowledge, skills and values (demonstrated in context) which support one or more critical outcomes of a Unit Standard.

n) Trainee Targeted Enterprise

A Targeted Enterprise as defined in t) above, but who participates in the project, and who is subcontracted to the Contractor, as a Trainee in the Contractor's Training and Skills Development Programme.

o) Traineeship (also Learnership)

A work-based training and learning programme which leads to a qualification registered on the NQF. Where reference is made to Traineeship it shall also mean Learnership.

p) Unit Standard

The registered statement of desired education and training outcomes and its associated assessment criteria, together with administrative and other information as specified in the regulations.

i) Unit Standard – Core

The compulsory learning required in a situation contextually relevant to a qualification.

ii) Unit Standard – Elective

A selection of additional credits at the level of the NQF specified from which a choice may be made to ensure that the purpose of the qualification and the minimum required number of credits for the qualification is achieved.

iii) Unit Standard – Fundamental

The learning which forms the foundation or basis needed to undertake the education, training or further learning required to obtain a qualification.

A1003 GENERAL REQUIREMENTS

A1003.01 Description of the Project

Training and skills development forms an integral part of the Employer's Transformation Policy and Community Development Strategy and hence, it is important to the Employer that Communities and small, medium and micro enterprise (SMME) Contractors within local Communities are trained and equipped with skills that can be used to gain meaningful employment and secure contracting or subcontracting opportunities.

The Training and Skills Development Programme shall comprise of, amongst others, structured theoretical (classroom) training with an extensive practical (workplace) and developmental construction component.

The services required from the Contractor comprise the following components and phases, of which some will overlap in its execution.

a) Conduct Resources and Skills Audits, and Market Analysis

the Contractor shall conduct Resources and Skills Audits to determine the Targeted Enterprise capacity in the Project Area and the Community's levels of education, existing qualifications, and skills sets. It shall be followed by a Market Analysis of the area in which these Targeted Enterprises typically, or potentially could, operate.

b) Develop a Training and Skills Development Programme

Based on the Contractor's Resources and Skills Audits and Market Analysis, the Contractor shall develop a Training and Skills Development Programme as a basis for the project.

c) Select Beneficiaries of the Project

Beneficiaries of the project shall comprise Designated Groups and/or Targeted Enterprises from the Community, as identified via the Employer's Stakeholder and Community Liaison processes described in Part C3, Section D and shall include:

- i) Trainee Targeted Enterprise Subcontractors (CIDB grades 1 to 4);
- ii) Targeted Enterprise Suppliers, Service Providers and Subcontractors;
- iii) Targeted Labour; and
- iv) Community members or groups.

d) Conduct Theoretical (Classroom) Training

The theoretical training shall be SAQA accredited programmes that include multiple, but related, Unit Standards which are relevant to the practical implementation component, i.e. the Works to be constructed. The theoretical, together with the practical, component of the project is aimed at achieving the training and skills development objectives of the Employer to lead towards Trainees obtaining a formal qualification in the Construction Industry and for Targeted Enterprises to improve their CIDB grading levels.

e) Conduct Practical (Workplace) Training

During the practical training phase of the project, the Construction Manager shall expose Trainees to the practical aspects of construction work under his direction. The Construction Manager shall supervise and closely monitor Trainees and shall train, coach, guide, mentor and assist Trainees in all aspects of the execution and management of a typical construction project. Amongst others, Trainees shall be developed in the planning of the Works, sourcing and ordering of materials, labour relations, monthly measurements and invoicing procedures.

f) Construction of the Works

An infrastructure construction component has been identified for the Community Development Project to facilitate the Training and Skills Development Programme.

The Works shall be constructed using the COTO Standard Specifications.

Care has been taken during the design of the Works to ensure that it can be constructed by means of labour enhanced construction methods and the Contractor shall apply such labour enhanced methods within the perimeters of the Specifications.

A1003.02 Time for Completion and Project Programme

The Contractor shall programme his duties in such a manner to complete the various phases of the project within the indicative milestone dates specified below. The Employer's indicative programme for this project is depicted in **Table A1003.02(a)** below:

Table A1003.02(a): Indicative Programme

	Project Stage	Completion Date
--	---------------	-----------------

A	Submission of Tenders	X (<i>insert date</i>)
B	Appointment of Training and Construction Manager	X + 24 weeks
C	Project Hand-over meeting	X + 26 weeks (<i>14 days from award.</i>)
	Mobilisation Period commences	X + 26 weeks
D	First Progress Meeting	X + 30 weeks
E	Resources and Skills Audit and Market Analysis Report	X + 30 weeks
F	Training and Skills Development Programme Approval	X + 30 weeks
G	Selection of Beneficiaries of the Project Complete	X + 38 weeks
	Mobilisation Period ends	X + 38 weeks
H	Theoretical (Classroom) Training Complete	X + 52 weeks
I	Practical (Workplace) Training Complete	X + 66 weeks
J	Simulation Construction Complete	X + 80 weeks
K	Construction of the Works Complete	X + 98 weeks
L	Project Close-out	X + 106 weeks

The Contractor shall submit his draft programme, based on the indicative programme, for the Engineer's perusal at the project hand-over meeting.

A1003.03 Drawings

The drawings issued in electronic format on a Compact Disc as part of the tender documents, shall be used for tender purposes only.

The Contractor will be issued with the contract drawings in electronic format on a Compact Disc. Any prints which the Contractor may require shall be at his own cost.

Any information in the possession of the Contractor, which the Engineer requires to record as-built information, shall be supplied to the Engineer before the Taking-Over Certificate will be issued.

Only figured dimensions shall be used and drawings shall not be scaled unless so instructed by the Engineer. The Engineer will supply all figured dimensions omitted from the drawings.

A1003.04 Contractor's Staff

The Contractor's two leading Key Persons are the Training Provider and the Construction Manager. The roles of both these persons are described below.

a) Contractor's Training Staff

i) The Training Provider

The Contractor's Training Provider shall predominantly coordinate and manage the Training and Skills Development Programme of the project. If the Contractor is not an accredited Training Service Provider, he shall subcontract an accredited Training Service Provider by applying the Employer's Supply Chain Management Policy for second tier procurement.

ii) Practitioners, Assessors and Moderators

The Training Provider shall have under his management, or in his employ, Practitioners, Assessors and Moderators who are registered with the CETA. Proof of accreditation and registration shall be current, valid and list the NQF levels and Unit Standards for which the Training Provider and his staff are accredited.

The training and competency levels required of the Training Provider and his staff are provided in **Table A1003.04(a)** below:

Table A1003.04(a): Qualifications and Experience Requirements for Training Staff

Designation	Qualification or Unit Standard No.	NQF Level	Credit	Minimum Relevant Experience (years)
Training Provider	Civil Engineering Qualification	5	N/A	10
Practitioner	Train the trainer; No 7384	4	16	None Specified
Assessor	Conduct outcome base assessment; No 115753	5	15	5
Moderator	Conduct moderation of outcome-based assessment; No 115759	6	10	5

In addition to the above qualifications, and in keeping with current CETA practical experience requirements for registration as a Practitioner, NQF Level 4 Unit Standards shall only be presented by Practitioners with NQF Level 5 (one level up) credentials.

Elective Unit Standards are typically more vocational orientated and may require specialist input. It is thus not a requirement that individual Practitioners and Assessors shall have all the necessary skills for all the different categories of Unit Standards. The Training Provider may and shall therefore, when necessary, appoint Practitioners and Assessors on an ad hoc basis with the levels of experience which are required for the Unit Standards to be presented.

The Employer further requires that Assessors and Moderators shall have at least 5 (five) years' experience as a Site Agent, managing construction processes in the fields of roads maintenance, new roads construction, roads rehabilitation, structures, etc.

b) Contractor's Construction Management Staff

i) The Construction Manager

The Construction Manager and his staff shall predominantly manage the practical training, construction of the Works and mentoring, development and support of the Trainees and Targeted Enterprises.

The Construction Manager is also the Contractor's Representative and shall maintain a full-time presence on site during the practical training and construction of the Works phases of the project.

ii) The Construction Mentor

The Construction Mentor is not listed as a Key Person for eligibility and functionality purposes but is an extension of the Construction Manager and it is recommended that 1 (one) Construction Mentor be provided for every 4 (four) Targeted Enterprises. The Construction Mentor shall maintain a full-time presence on site during the practical training and construction of the Works phases of the project.

iii) The Construction Supervisor

The Construction Supervisor is not listed as a Key Person for eligibility and functionality purposes but is an extension of the Construction Manager and Mentors. The Construction Supervisor does not only directly supervise Targeted Enterprises but is also the coordinator between the Targeted Enterprises and the Construction Manager. It is recommended that 1 (one) Construction Supervisor be provided for every 3 (three) Targeted Enterprises. The Construction Supervisor shall maintain a full-time presence on site during the construction of the Works phases of the project.

The Clerk of Works is not listed as a Key Person for eligibility and functionality purposes, but the Contractor shall have in his employ the number of Clerks of Works that is required to assist the Construction Manager with the Project Management and Administration of the Works. It is recommended that 1 (one) Clerk of Works be provided for every 12 (twelve) Targeted Enterprises. The Clerk of Works shall maintain a full-time presence on site during the practical training and construction of the Works phases of the project.

The minimum requirements with regards to qualification, registration and experience in the civil engineering or road construction field, for the Contractor's Construction Management staff shall be as stated in **Table A1003.04(b)** below, according to the CIDB contractor grading designation determined for the contract.

Table A1003.04(b): Qualifications and Experience Requirements for Construction Management Staff

Key Person	Contracts up to 6CE		Contracts 7CE or Higher	
	Minimum Technical Qualification or Registration	Minimum Relevant Experience (years) ¹	Minimum Technical Qualification or Registration	Minimum Relevant Experience (years) ¹
Professional Registered Person	None specified	None specified	Pr.Eng or Pr.Tech with ECSA ² or Pr.CM with SACPCMP ³	None specified
Contract Manager	None specified	10	None specified	10
Construction Manager	None specified	10	None specified	10
	National Diploma Civil Engineering	5	National Diploma Civil Engineering	7
	NQF 6 in Civil Engineering	5	NQF 6 in Civil Engineering	7
Construction Health and Safety Officer	CHSO with SACPCMP	As required by SACPCMP	CHSO with SACPCMP	As required by SACPCMP
Construction Mentor	None specified	8	None specified	8
	National Diploma Civil Engineering	3	National Diploma Civil Engineering	5
	NQF 5 in Civil Engineering	3	NQF 5 in Civil Engineering	5
Construction Supervisor	None specified	5	None specified	5
	National Diploma Civil Engineering	2	National Diploma Civil Engineering	3
	NQF 4 in Civil Engineering	2	NQF 4 in Civil Engineering	3
Clerk of Works	National Diploma Civil Engineering	2	National Diploma Civil Engineering	3

¹ Relevant experience is the actual number of years, measured from the date of acquiring the base qualification, working in the civil engineering or road construction field.

- ² Registered with the Engineering Council of South Africa (ECSA) or any other international body recognised by the Employer. Foreigners with permanent South African residence longer than 5 (five) years shall be ECSA registered.
- ³ South African Council for Project and Construction Management Professions.

For any proposed change in Key Personnel during the contract, the Contractor shall submit to the Engineer for consent the name and details of the Key Person the Contractor proposes to appoint. The Contractor shall not, without the prior consent of the Engineer, revoke the appointment of the Contractor's Key Personnel or appoint a replacement.

A1003.05 Meetings with the Engineer and the Employer

The Contractor shall conduct monthly project progress meetings with the Employer and the Engineer. These meetings shall take place on site, at the Contractor's Training Facility and later at his Camp Site. The progress of all aspects of the project shall be discussed, as well as any contractual and technical issues that may have arisen since the previous project progress meeting.

Any matter that may impact on the project's budget and/or may lead to a Contractor's Claim shall be dealt with immediately and ad hoc meetings shall be arranged to resolve such matters.

A1003.06 Contractor's Training Facility and Camp Site

When selecting and/or establishing his Training Facility and Camp Site, the Contractor shall consider the advantages that will remain with the Community for permanent structures to be left standing.

The Contractor's Training Facilities and Camp Site may be the same building(s) and/or on the same site, or it may be separate buildings and/or on different sites, which-ever is most suitable to project circumstances.

a) Training Facility

The Contractor shall be responsible for providing everything necessary to offer the various theoretical and practical training, including:

- i) a suitable venue with sufficient furniture, lighting and power for lectures,
- ii) suitable ablution facilities with separate cubicles for both genders; and
- iii) all necessary stationery, consumables and learning aids and material.

b) Camp Site

For both the practical training and construction of the Works phases of the project, the Contractor shall provide a suitable Camp Site to accommodate the Engineer and his staff, the Contractor's staff and the Contractor's subcontractors and labourers.

c) Electricity Supply and other Utility Services

The Contractor shall make his own arrangements for the supply of electricity and all other utility services. No direct payment will be made for the provision of these services. The cost thereof shall be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required.

A1003.07 Allowance for Other Contractors and Contracts

In addition to the requirements of Clause 4.6 of the FIDIC Conditions of Contract for Construction, 1999, the Contractor must take note of the presence of other Contractors on the site and make allowances for them on the site. This may involve adapting the Contractor's Programme to accommodate the work of other Contractors and ensuring access to their sites.

Although details of such contracts may not be known at the time of tender of this contract, it may include, *inter alia*, periodic maintenance, special maintenance, rehabilitation and upgrade contracts.

A1003.08 Targeted Procurement

The Employer is committed to the implementation of Government's policies and in turn expects the same from its Contractors. Thus, in addition to the Trainee Targeted Enterprises benefitting from this Community Development Project, to comply with the Employer's objectives of its preferential procurement policy, the Contractor shall utilise the Employer's targeted procurement procedure, which is the process used to create a demand for the services and supplies of, or to secure the participation of, Targeted Enterprises in contracts.

Accordingly, it is a requirement of this project that the Contractor is familiar with the specifications that relate to the transformation of the construction industry through the following:

- a) adherence to the policies and initiatives of the Government;
- b) employment of Targeted Enterprises as per the Contract Participation Goals stated in the Contract Data;
- c) provision of mentoring, guidance and assistance to subcontracted Targeted Enterprises;
- d) arrangement of engineering skills, entrepreneurial skills and generic skills training programmes for subcontracted Targeted Enterprises; and
- e) liaison with government institutions and community-based structures.

Part C3, Section D, describes the Employer's requirements for the subcontracting of Targeted Enterprises in detail and provision is made in Pricing Schedule D for the subcontracting of Targeted Enterprises other than the Trainee Targeted Enterprises.

A1003.09 Changes to Scope of Work

It is a condition of this contract that the Employer reserves the right to limit the total expenditure on the Works due to possible budget constraints. Should the tender sum exceed the budgeted amount, the scope of the works may be reduced at any time before or during the contract period to ensure that the final contract amount does not exceed the budgeted amount.

A1003.10 Environmental Management

The Contractor shall be responsible for construction according to an Environmental Management Plan. The Contractor must take the utmost care to minimise the impact of his establishment and other construction activities on the environment and must adhere to the requirements of the Environmental Management Plan.

A1003.11 Occupational Health and Safety

In terms of the Construction Regulation 2014, 5(1)(b) of the Occupational Health and Safety Act (Act No 85 of 1993), the South African National Roads Agency SOC Limited, as the Employer, is required to compile a specification on health and safety for the project.

A1003.12 Contractor Performance and Project Reporting

a) Contractor Performance Reports

The Engineer is responsible for the completion of the contractor performance reports on behalf of the Employer. These reports will be completed monthly and on issuing the Taking-Over Certificate.

The standard for contractor performance reports provides for a uniform and consistent method of assessment of the performance of the Contractor with respect to the following project parameters regarding the Contractor meeting his contractual obligations and achievement of targets:

- i) time management;
- ii) cost management;
- iii) quality management;
- iv) health and safety management;
- v) management of site conditions; and
- vi) management of subcontractors (including payment).

Each performance report will be discussed with the Contractor, who will be given an opportunity to comment on the assessment. The Engineer must respond to any issues raised by the Contractor in writing, and the Contractor's comments and the written response by the Engineer must form part of the contractor performance report. The contractor performance report will be signed off by the Employer.

The monthly contractor performance reports and other inputs from the Engineer will be used to monitor and evaluate the Contractor's performance throughout the contract.

b) Integrated Transportation Information System

The Employer has developed a comprehensive information management tool called ITIS (Integrated Transportation Information System) to address all facets of its strategic and tactical planning, design, construction and maintenance of the entire road network. This provides support for the management tasks of the Employer and to allow its personnel to make technical decisions more quickly and efficiently.

A1003.13 Local Production and Content

The Department of Trade and Industry in consultation with National Treasury has designated the construction sector and determined the stipulated minimum threshold for steel products and component for construction for the state procurement for local production and content.

A1004 TRAINING AND SKILLS DEVELOPMENT PROGRAMME

The Contractor shall, in collaboration with the Employer, the Engineer and the Project Liaison Committee (PLC), develop the Training and Skills Development Programme and submit it for the Engineer's approval.

Developing and executing the Training and Skills Development Programme shall consist of the following phases:

1. Conduct Resources and Skills Audits and a Market Analysis.
2. Identify Project Area and Designated Groups who shall benefit from the Programme.
3. Finalise and approve the Training and Skills Development Programme.
4. Select Trainees and Trainee Targeted Enterprises to participate in the Programme.
5. Conduct theoretical (classroom) training.
6. Conduct practical (workplace) Training.
7. Construction Simulation phase.
8. Construction of the Works phase.

A1004.01 Resources and Skills Audits, and Market Analysis

Prior to developing the Training and Skills Development Programme, the Contractor shall conduct Resources and Skills Audits of the identified Community and the Targeted Enterprises residing within the Project Area.

The Resources and Skills Audits shall be followed by a Market Analysis of the construction industry within the geographical area where the Targeted Enterprises could potentially operate.

a) Resources Audit

To determine the Targeted Enterprise subcontractor capacity in the Project Area, the Contractor shall conduct a Resources Audit within the greater project area. The Contractor shall consult, as a minimum, the National Treasury's CSD (to be obtained from the Employer) and the CIDB contractor database. Other databases, e.g. the Local Municipality's Economic Development department's database, may also be considered.

This Resources Audit shall inform the Contractor what CIDB contractor grading Targeted Enterprises are available within the greater project area, which in turn will guide the Contractor, in consultation with the PLC, to establish the boundaries of the Project Area and to identify the criteria for the different beneficiary groups of the project, i.e. Trainee Targeted Enterprises, other Targeted Enterprises and Community groups and/or members.

In addition, the Contractor shall conduct a Resource Audit of Targeted Enterprise Suppliers and Service Providers available within the Project Area. Knowledge of the availability of plant, equipment, material and service providers will enable the Contractor to ensure that as much as possible of the total economic spend on the project remains within the community.

The Resources Audit shall be presented to the Employer, the Engineer and the PLC as an Interim Report and shall become a chapter of the Training and Skills Development Programme.

b) Skills Audit

Following the Resources Audit, the Contractor shall conduct a Skills Audit of these resources, as well as of the Community in general. The purpose of the audit is to determine the Targeted Enterprises' and the Community's levels of education, existing qualifications, Recognised Prior Learning and skills sets and competencies, which in turn will inform the details of the Training and Skills Development Programme.

The Skills Audit shall be presented to the Employer, the Engineer and the PLC as an Interim Report and shall become a chapter of the Training and Skills Development Programme.

c) Market Analysis

The Contractor shall conduct a Market Analysis of the construction industry within the geographical area where the identified resources typically would, or potentially could, operate.

The Market Analysis shall entail a quantitative and qualitative assessment of the market, establishing its size both in volume and in value. Amongst others, factors to consider includes:

- i) the various client and/or customer segments;
- ii) client and/or customer assignment and/or buying patterns;
- iii) supplier power and services availability;
- iv) identification of competitors;
- v) analysis of the economic environment;
- vi) economic feasibility or profitability; and

vii) regulations and barriers to entry.

The Market Analysis will assist the Contractor to identify the Targeted Enterprises that will benefit most from the Training and Skills Development Programme from a market feasibility point of view, and it will inform the content of the Training and Skills Development Programme.

The Market Analysis shall be presented to the Employer, the Engineer and the PLC as an Interim Report and shall become a chapter of the Training and Skills Development Programme.

A1004.02 Developing the Training and Skills Development Programme

The Employer shall be involved in the decision making and quality control pertaining to the development and implementation of the Training and Skills Development Programme.

The Employer has no service agreement or memorandum of understanding with any education and training quality assurance body and, therefore, does not function as the “Employer” as defined under any three-party-agreement between the Trainee, the Training Provider and the Employer.

However, the Employer requires similar outcomes to that of formal Traineeship programmes and the Contractor shall structure a Training and Skills Development Programme in a manner that permits continued access to further learning and qualifications within a defined programme.

The complete Training and Skills Development Programme shall be approved by the Employer and the Engineer and agreed by the PLC before any training commence.

Provision for the Training and Skills Development Programme has been made in Pricing Schedule A, under pay item A1000.03(d).

A1004.03 General Requirements of the Training and Skills Development Programme

a. Training Variety

The Training and Skills Development Programme shall make provision for a variety of training options and all theoretical training provided, and its practical components, shall be SAQA accredited and shall be a combination of:

- i) technical,
- ii) entrepreneurial and
- iii) generic training

as informed by the resources and skills audits and market analysis.

b) Training for Trainee Targeted Enterprises

One of the primary objectives of Community Development Projects is to offer a full Traineeship experience to Trainee Targeted Enterprises, which requires a minimum period of 18 to 24 months of theoretical and practical training combined.

The Training and Skills Development Programme shall thus consist of Traineeships that include multiple, but related Unit Standards which:

- i) are relevant to the Works to be constructed,
- ii) are aimed at achieving the skills development objectives of the Employer, and
- iii) leads towards a formal qualification in the Construction Industry.

Traineeships shall include both the theoretical and practical components of each Unit Standard taught and shall be in accordance with the various laws and regulations contained in the SAQA statutes.

In smaller Community Development Projects with a shorter duration, it is recognised that the Training and Skills Development Programme may consist of several Unit Standards but totalling insufficient credits for a full Traineeship qualification. Nevertheless, the Training Provider shall ensure that the competencies and credits

achieved in the Programme, contribute to a full Traineeship by a later acquisition of the outstanding Unit Standards required for the full Traineeship.

The details of the training to be provided to Trainee Targeted Enterprises are further described in the relevant paragraphs of Part C, Section A of the Scope of Work.

c) Training for Targeted Labour

It is anticipated that the Trainee Targeted Enterprises will have Targeted Labourers in their employ. These Labourers shall also be provided with training based on the Resources and Skills Audit and Market Analysis.

Similar to that of Trainee Targeted Enterprises, the training to be provided shall be one, or a combination of, the following learning methods:

- i) Work related theoretical and practical training from selected Unit Standards;
- ii) Structured workplace learning towards the attainment of a part or a full occupational qualification;
- iii) Structured workplace learning for apprentices or other artisan Trainees towards the attainment of a trade qualification leading to a listed trade (Government Gazette No. 35625 of 31 August 2012) subject to at least 60 percent (%) of the artisan Trainees being holders of public FET college qualifications.

The selected Unit Standard training to be provided to Targeted Labour shall equip them with the technical skills that is relevant to the tasks assigned to them. These Unit Standards are typically road construction methods on NQF level 2.

Targeted Labour shall also receive generic skills training as identified during the Contractor's Resources and Skills Audits and may, amongst others, include:

- a. First aid training;
- b. Road safety training;
- c. Environmental management training; etc.

d) Selection of Unit Standards

The Training and Skills Development Programme shall be structured in a manner to prioritise those Unit Standards that will equip Trainees with the minimum skills required to become economically involved in the execution of the Works as soon as possible.

The Contractor's Training Provider shall apply the SAQA Traineeship criteria of which the basic elements are listed below to demonstrate the Employer's requirements:

- i) Minimum number of credits for a qualification;
- ii) Fundamental Unit Standards and credit values;
- iii) Core Unit Standards and credit values;
- iv) Elective Units Standards and credit values;
- v) Assumption that NQF Level 3 literacy, numeracy, and computer competencies exist;
- vi) Recognised Prior Learning processes; and
- vii) Exit level outcomes.

The above criteria are not exhaustive, and the Training Provider shall apply the processes and procedures required by the relevant SAQA and other related legislation pertinent to training. The Training Provider shall regularly consult the SAQA website (www.saq.org.za) to ensure that the most current Unit Standards are presented. If a conflict arises, the legislated requirements shall apply.

While structuring the Traineeship offerings, the Training Provider shall distinguish between the levels of learning required. The bulk of the training shall focus on NQF Levels 3 and 4. NQF Levels 2 and 5 training is not anticipated but may be suitable in some instances. Typical qualification titles for the respective NQF Levels that may be considered for inclusion into the Training and Skills Development Programme are listed in **Table A1004.03(a)** below:

Table 1004.03(a): Typical Qualification Titles*

NQF Level	Qualification	Name	Approximate Credits
2	National Certificate	Road Construction	120
2	National Certificate	Construction: Roadworks	120
2	National Certificate	Construction Contracting	120
3	National Certificate	Building and Civil construction	150
4	National Certificate	Supervision of Construction Processes	180
5	National Diploma	Management of Civil Engineering Construction Processes	210

* The Training Provider shall regularly consult the SAQA website (www.saqa.org.za) to ensure that the most current Qualifications and Unit Standards are presented with the adequate number of minimum credits to obtain the Qualification.

It shall be necessary to include additional Core Unit Standards, e.g. "Tendering" or "Entrepreneurship" as an additional Unit Standard for NQF Level 4, to achieve the Contract's development objectives. The identification of any additional Unit Standards shall be discussed with the Employer and the Engineer and shall not be implemented without prior approval.

e) Learning Material

Learning material is required for each Unit Standard. This learning material is the equivalent of prescribed textbooks for other qualifications. Each Trainee shall receive a copy of the learning material to learn the contents and to use it as reference source after obtaining the qualification.

The SAQA Unit Standard curriculums define the contents of the learning material. The learning material shall not only comply with the SAQA and CETA guidelines but shall be technically and practically aligned to road construction and road maintenance. Any input from a subject matter expert required to ensure the appropriateness of the learning material's contents shall be included in the Contractor's costs for compiling the learning material.

The Unit Standard requirements to be addressed in learning material, as outlined by the SAQA Unit Standard curriculums, are amongst others, the following:

- i) The purpose of the Unit Standard;
- ii) The specific outcomes (typically 4 per Unit Standard);
- iii) The assessment criteria (typically 4 per specific outcome);
- iv) The range as is defined for each specific outcome;
- v) The critical cross-field outcomes for the Unit Standard;
- vi) The Unit Standard essential embedded knowledge.

A1005 METHOD STATEMENTS FOR TRAINING STAGES

The Contractor shall, before commencing with the Training and Skills Development Programme, demonstrate to the Employer and the Engineer how he intends to execute each of the respective training offerings.

A1005.01 Contents and Submission of Method Statements

The Contractor shall provide the Engineer with a method statement, describing the detail of, amongst others, the following components of the training:

- a) A time schedule of the different training offerings;
- b) A time schedule of the phases of the different training offerings;
- c) Details of the training logistics, e.g. venue, transport, etc.
- d) Identification and selection of Trainees;

- e) Registration of Trainees;
- f) Induction of Trainees;
- g) Details of the theoretical training execution;
- h) Details of the practical training execution;
- i) Trainee workbooks and logbooks;
- j) Assessment and moderating stages and arrangements, etc.

It is anticipated that the time schedule and training methodologies of individual training offerings may vary depending on the progress made by Trainees and the identification of subsequent training needs based on continuous Trainee assessments. It is thus not expected of the Contractor to submit a complete set of method statements prior to commencement of the Training and Skills Development Programme, but method statements for individual training stages shall be submitted for the Engineer's approval at least 10 (ten) calendar days prior to its commencement.

The Employer's minimum requirements for the most critical components to be outlined in the Method Statements are elaborated on in the sections below.

A1005.02 Selection of Trainees

To complete a Traineeship successfully requires minimum literacy and numeracy competencies as defined by SAQA. Once the Designated Groups to participate in the project has been identified by the Stakeholder and Community engagement processes described in Part C3, Section D of the Scope of the Work, the Contractor's Training Provider shall utilise the Skills Audit and conduct additional skills analysis to benchmark the literacy and numeracy levels of the potential Trainees. The Training Provider shall thus make provision for baseline assessments such as conducting Recognised Prior Learning enquiries and tests.

This information shall guide the Training Provider in finalising the Trainee selection methodology(ies) and process(ess), which shall be approved by the Employer and the Engineer and agreed by the PLC.

Trainees identified as having already acquired some tertiary training, particularly in the field of Civil Engineering, may be suitable for a specialised trainee programme or a higher NQF level programme. The Training and Skills Development Programme shall, therefore, make provision for Trainees with a variety of competency levels and shall make provision for different levels of training.

Note:

Where this section refers to the selection and training of Trainees, any person, employed by any national, provincial or local authority, being it full time or part time, is expressly excluded from being considered for this training.

A1005.03 Registration of Trainees

The first day of any level of training, be it a full Traineeship or a single Unit Standard, shall be allocated to registering, inducting and providing information to Trainees. The registration process shall, amongst others, include the following:

- a) Capture Trainees' personal details for populating the national database on Traineeship training.
- b) Capture Trainees' banking details for the electronic transfer of stipends and later payments for work undertaken.
 - i) All payments to Trainees shall be by electronic transfers or direct deposits into Trainees' bank accounts.
 - ii) The Contractor shall assist Trainees that do not have bank accounts, to open bank accounts.
- c) Formalise the parties' commitment to the Training Programme by signing an agreement between the Contractor and the Trainee.

A1005.04 Induction of Trainees

Induction means explaining to Trainees the purpose of the Training Programme, what is expected of them during the theoretical (classroom) training, as well as during the practical

(workplace) training. It includes agreeing codes of ethics, behaviour etc. The following items for inclusion in the induction are pointers and not the only aspects to be imparted:

- a) Stipend payments (amount per day, per full training day attended in classroom, and only if found competent).
- b) Working and training days and hours as a contractor would be working or not working.
- c) Number and duration of comfort and lunch breaks (lunch will be provided during classroom training only).
- d) Types of absenteeism and treatment thereof as a contractor would treat such absenteeism.
- e) Disciplinary code and grievance procedure (explained and a copy handed to each Trainee with a signed copy retained by Training Provider).
- f) Trainees found not competent after the first training offering shall be allowed one repeat training offering. Thereafter, Trainees that are still found not competent shall be disqualified from the Training Program.
- g) The Contractor's insurances that are in place during the theoretical and practical training phases.
- h) UIF is not applicable to any stage or phase of the Training Programme.
- i) A detailed explanation of SAQA and CETA functions and responsibilities, as well as training processes and procedures.
- j) Roles and responsibilities of Trainees and the Contractor and his Training Provider, Practitioners, Assessors and Moderators.
- k) An explanation of Unit Standards and its division into fundamental, core and elective units.
- l) An explanation and breakdown of Unit Standard credits and how it builds toward an accredited qualification.
- m) The approximate ratio between theoretical and practical training and how it overlaps.
- n) An explanation of the Unit Standard exit outcomes.

A1006 THEORETICAL TRAINING

A1006.01 Number of Trainees per Contact Session

Experience has shown that the optimal number of Trainees per contact session is 12 (twelve) Trainees per Practitioner or Assessor.

Smaller Trainee numbers tend to be not feasible to the Contractor from an economical point of view, whereas larger groups of up to a maximum of 20 (twenty) Trainees can be accommodated if during the second learning session of the day, i.e. the afternoon learning application session, the Practitioner is assisted by an Assessor. For groups of more than 20 (twenty) Trainees per Unit Standard, the group shall be divided and taught in two separate groups.

For this project, a minimum number of ... Trainee Targeted Enterprises between CIDB grades 1 to 4 shall benefit from the project and at least 2 (two) persons shall be trained from each Trainee Targeted Enterprise. The minimum number of Trainees to be trained in the respective categories are listed in Table A1006.01(a) below:

Table A1006.01(a): Minimum Number of Trainees to be Trained

Trainee Category	Level of Training	No of Persons
Full Traineeships for Trainee Targeted Enterprises.	NQF level 3.	... (one person per Trainee Targeted Enterprise).
Full Traineeships for Trainee Targeted Enterprises	NQF level 4.	... (one person per Trainee Targeted Enterprise).

A minimum number of Trainee Targeted Enterprises to be provided with NQF level 2 training is not stipulated, but provision has been made to provide NQF level 2 training on an ad hoc basis in Pricing Schedule D.

A minimum number of Trainee Targeted Enterprises to be provided with NQF level 5 training is not stipulated, but provision has been made to provide NQF level 5 training on an ad hoc basis in Pricing Schedule D.

A1006.02 Trainees' Learning Aids, Training Material and Workplace Documentation

a) Stationery and Learning Aids

Trainees shall be issued with a stationary or learning aids pack, which shall be replenished as required during both the theoretical and practical training components, to participate actively in the training experience. For up to NQF 3 training, a basic pocket calculator shall be included in the stationary pack, while NQF 4 Trainees shall receive a basic scientific calculator.

In addition to the stationary pack, Trainees shall also be provided with other learning and workplace aids as required by the Unit Standard. Examples of such learning and workplace aids are scale rulers, GPS devices, computing equipment, etc.

b) Learning Material, Workbooks and Logbooks

Before the training of a Unit Standard commence, the following learning material needs to be available and/or issued to Trainees:

- i) Unit Standard learning material;
- ii) Unit Standard Trainees' Workbook;
- iii) Unit Standard Trainees' Logbook;
- iv) Unit Standard Practitioner's visual training aids and/or demonstration tools;
and
- v) Unit Standard Assessor's guide.

The requirements for and/or utilisation of the listed learning material are discussed in detail in the relevant sections of the Scope of Work.

c) Contract and Specification Documents

During theoretical (classroom) training and practical (workplace) training, Trainees will be referred to contract documentation and quality specifications. Trainees enrolled in the NQF 4, full Traineeships shall be issued with one set of this documentation, which as a minimum, shall include the following:

- i) FIDIC Short Form of Contract (green book); and
- ii) COTO Standard Specifications for;

A1006.03 Theoretical Training Programme

Theoretical (classroom) training shall be conducted according to the programme explained to Trainees during the induction. This programme shall be displayed on a notice board in the training room and shall be tracked weekly and updated if necessary.

The training programme shall be in a bar chart format (MS Projects or similar) taking cognisance of the construction industry's typical non-working days. The basis of the programme shall be to conduct training in the classroom at an average of 3 (three) credits per workday.

A1006.04 Scheduling of Training Sessions

Each Unit Standard training has a theory content (lecturing) and a learning application element (examples and exercises). Experience has shown that Trainees perform best if the theory content is lectured during the morning contact session, while the practical element is conducted during the afternoon contact session.

During the afternoon practical sessions, the Trainee will display his competence in the Trainee's Workbook by recording actions, methods, calculations, etc. for compiling his Portfolio of Evidence.

The Contractor is advised to complete the training of a Unit Standard uninterrupted. Training is proved to be less effective if a part of the training is done and then interrupted to only continue a week or weeks later.

A1006.05 Trainees' Portfolio of Evidence and Workbooks

Each Trainee must compile a Portfolio of Evidence. The Portfolio of Evidence serves as proof of the Trainees' competence and will be assessed and moderated by an Assessor and/or Moderator. The Contractor shall keep record of the Portfolio of Evidence for a period of at least 5 (five) years after the training has been completed or partially completed.

The Trainees' Workbook is a tool to record that the work has been done and that the Trainee is competent in doing the work. The Workbook forms an integral part of the Trainees' Portfolio of Evidence. For each Unit Standard, Trainees will keep a Workbook for the theoretical (classroom) component and the practical (workplace) component.

Over and above the Trainees' Workbook, any other documentary proof relevant to the Unit Standard and assisting in illustrating the competence of the Trainee, must be filed in the Portfolio of Evidence.

A1006.06 Assessing Trainees' Progress

The Assessor, whether permanently on the training project or not, shall assess Trainees' competence in a Unit Standard within 3 (three) working days after completion of the Unit Standard's training. The Assessor shall advise the Training Provider and the affected Trainees of the need for repeat training as soon as possible and the Training Provider shall schedule repeat training as soon as possible.

The Assessor shall maintain his portfolio of assessment of Trainees and keep it updated and available for Moderating.

No additional pay item has been provided for repeat training and it must be included in the Contractor's tenderer training rates.

A1007 PRACTICAL TRAINING

Once a Trainee has been found competent for the theoretical component, he must be declared competent for the practical component before he can be declared competent for the Unit Standard.

Hence, Trainees will be expected to demonstrate their competence in a practical situation that integrates the assessment of all specific outcomes, for all Unit Standards in the Traineeship Programme.

Amongst others, the Contractor's responsibilities include ensuring that Trainees keep a Logbook and update their Portfolio of Evidence continuously, training Trainees in the use of construction tools and practical construction techniques, ensure adequate plant, material and labour for the practical training experience and conduct assessments of the Trainees' learning progress. Provision shall be made for repeat training when necessary.

A1007.01 Workplace Experience Requirements

Trainees shall spend at least 10 (ten) times the Unit Standard credit value in notional hours in a workplace environment, e.g. if a Unit Standard consists of 3 (three) credits, the Trainee shall spend 3 x 10 (30) notional hours in a workplace environment to qualify for an assessment of his competence in the Unit Standard.

A1007.02 Keeping a Logbook and Assessment

Trainees shall be issued with a Logbook and the necessary stationary to capture his workplace experience during the practical training. Trainees shall keep a diary of their workplace experience and file any proof of their experience in their Portfolio of Evidence.

During or on completion of the practical training, the Portfolio of Evidence shall be assessed by an assessor to rate the Trainee's competency acquired in the workplace environment.

A1007.03 Training Test Sections

Trainees shall be trained in practical construction techniques by constructing Training Test Sections for each construction activity. The Construction Manager shall ensure that Trainees are knowledgeable and adequately trained in the detail of constructing the Training Test Sections.

The list below contains recommended good practice techniques that should be applied to every Training Test Section.

a) Trainees' Responsibilities

Trainees shall:

- i) execute the work during the Training Test Section phase.
- ii) rotate tasks to ensure that every Trainee gain experience in every activity.
- iii) study and interpret the requirements, specification, drawings and instructions prior to attempting the Training Test Section.
- iv) list pertinent points, i.e. tolerances and discuss their interpretation of the work with the Construction Manager.

b) Construction Manager's Responsibilities

The Construction Manager shall:

- i) issue Trainees with personal protective equipment (PPE) prior to them commencing their practical training.
- ii) timeously order or obtain plant, human resources and material for the Training Test Section.
- iii) set a date and the place for constructing the Training Test Section and invite all Trainees and relevant personnel to attend.
- iv) explain the lines of communication during the Training Test Section. Only the Construction Manager shall relay any instruction or proposal to amend the construction method during the Training Test Section.
- v) explain the purpose of the Training Test Section and the construction method to achieve the specified product in a cost-effective manner.
- vi) explain the method statement to Trainees, taking care to ensure that they fully understand what is being explained to them. If necessary, the Construction Manager shall repeat the process to be undertaken and arrange for translation into the Trainees' home language.
- vii) demonstrate to Trainees, the actual practical process and repeat it as often as is necessary until the desired result is achieved.

A1007.04 Workplace Experience Outcomes

Outcomes from the Training Test Sections shall provide Trainees with the following experiences:

- a) Familiarity with the use of all tools and small plant;
- b) Exposure to the daily servicing needed of small plant;
- c) Understanding that tasks are achievable and reasonable;
- d) Understanding the importance of materials handling and batching techniques;
- e) Knowledge of the end-product specifications and how it is checked and recorded;
- f) The impact that a change in the method has on output, including failure to achieve a task.
- g) Obtaining and understanding of the requirements needed to tender for construction activities to be used during the construction period.

A1007.05 Integrated Summative Assessment and Moderation

The last and final phase of assessment for total competence per Unit Standard and/or the full Traineeship is the integrated summative assessment and the moderation and verification by CETA.

Integrated summative assessment means the combination of results of the theoretical assessment from the classroom training plus the practical assessment from the workplace training.

This NQF training is an outcome-based qualification which means that Trainees can perform as required by the Unit Standard and are, to all intents and purposes, prospective contractors.

A1008 CONTRACTOR'S RESPONSIBILITIES TOWARDS TRAINEES

In addition to the specifications for training above, the Contractor shall also undertake the duties described under this section relating to Trainees' welfare during training.

A1008.01 Trainee Welfare

a) Travel and Accommodation

During the training phases of the project, Trainees shall be responsible for their travel and accommodation arrangements to and from the training facility and the camp site at their own cost.

During the practical training phase of the project, the Contractor shall, however, provide transportation to and from the training facility or the camp site to the place where the practical training shall take place.

The cost to transport Trainees during the practical training phase shall be included in the Contractor's rates for the relevant elements of the Works to be constructed during the practical training phase as if the Trainees are his own employees.

In choosing the training facility and camp site's location, the Contractor shall take cognisance of Trainees' travel and accommodation challenges.

b) Sustenance

Trainees shall receive the following sustenance during the theoretical training phase of the project:

- i) A choice of tea, coffee or fruit juice and a nutritious snack during the morning comfort break.
- ii) A choice of tea, coffee or fruit juice and a nutritious lunch pack during the lunch break.
- iii) A choice of tea, coffee or fruit juice only during the afternoon comfort break.
- iv) Potable or bottled water shall always be at Trainees' disposal.

All sustenance shall be procured from local Targeted Enterprise Suppliers and Service Providers.

A1008.02 Trainee Stipends

The Contractor shall pay Trainees the legislated daily stipend in accordance with the Basic Conditions of Employment Act (Act No. 75 of 1997), as amended and as per its most recent learnership allowances table. Payment of stipends shall be applicable:

- a) during both the theoretical (classroom) and practical (workplace) training phases;
- b) only if the Trainee was present for the full duration of the training on the day; and
- c) only if the Trainee was found competent on completion of the Unit Standard.

Stipends shall be payable monthly and into the Trainees' bank accounts.

It shall be clearly explained to Trainees that when Training Test Sections are carried out, they will continue to be paid a stipend, because even though permanent work may be the result, it is the practical component of the Unit Standard and it is a training experience.

Just as for the theoretical training component, Trainees will only be paid the stipend if they can demonstrate that they are competent in the practical execution of the Unit Standard.

A1009 CONSTRUCTION SIMULATION

Amongst others, the Contractor's responsibilities include mentoring, coaching and guidance of Trainees, providing each Trainee Targeted Enterprise with a Bill of Quantities for their respective work packages and assist Trainees to price the Bill of Quantities, assist the Trainee Targeted Enterprises to establish and train their construction teams, to schedule and execute the work, to procure material, plant and labour, and to measure the work and compile payment certificates.

A1009.01 Purpose and Outcomes of the Construction Simulation Phase

The purpose of the Construction Simulation phase is for the Trainee Targeted Enterprises to conduct actual construction work in a controlled setting, which simulates a real contracting environment. The following outcomes are expected:

- a) Establish a degree of independence to perform as an emerging contractor.
- b) Develop the capabilities of tendering for and completing specified construction work.
- c) Develop confidence with weekly and monthly planning.
- d) Develop confidence with the setting of group and individual tasks.
- e) Develop confidence with usage of construction material.
- f) Develop confidence in the operation and maintenance of plant.
- g) Improve capability to measure the tasks and work completed.
- h) Improve capability to incorporate measured work into a payment certificate.
- i) Improve capability to calculate daily work costing and profitability.
- j) Develop an understanding of the discipline required for maximum productivity.
- k) Develop confidence in reporting of progress in typical construction formats.

Continuing mentorship, coaching and guidance during this project phase is critical to embed the prior learning received and to develop Trainee Targeted Enterprises beyond the learning experience.

A1009.02 Execution of the Construction Simulation Phase

a) Responsibilities of the Trainee Targeted Enterprises

The Trainee Target Enterprise Owner or his Supervisor shall:

- i) price a bill of quantities for a section of construction work and/or tasks as if he is tendering competitively for the work;
- ii) establish a construction team based on his experience from the Training Test Sections on what is practical achievable and profitable.
- iii) train his construction team, consisting of Target Labour, to perform the construction tasks to the required standards.
- iv) Supervise his construction team and take responsibility for the quality and standard of the work that they produce.

b) Responsibilities of the Construction Manager

Prior to, and during the commencement of the Construction Simulation, the Construction Manager shall:

- i) discuss the priced bills of quantities with the Trainee Targeted Enterprises in a classroom setting and agree on the rates to be paid for work done during this phase. All Trainee Targeted Enterprises shall be paid the same rates for the same pay items.
- ii) assist Trainee Targeted Enterprises to schedule work activities for the sections of work assigned to them and agree on the construction methods to apply.
- iii) plan with each Trainee Targeted Enterprise what plant, material and labour he would require for constructing the work in accordance to the agreed construction methods.
- iv) plan with each Trainee Targeted Enterprise how and from where to arrange and procure his plant, material and labour.

To ensure that Trainee Targeted Enterprises receive the maximum benefit skills development experience during the Construction Simulation phase, the Construction Manager shall provide extensive administration and financial management support. Every workday shall commence with a site meeting to discuss, amongst others, the following:

- a. Progress made the previous workday;
- b. Productivity outputs obtained during the previous workday.
- c. How productivity outputs impact on cost and profitability.
- d. Planning of resources and construction for the day ahead.
- e. The most feasible construction method for the work planned for the day.

c) Payment for Work Completed

During the Construction Simulation phase, the Trainee Targeted Enterprises are expected to operate as if they are proper contractors.

Stipends will no longer be paid, and Trainee Targeted Enterprises shall be paid for the work according to tasks or quantities completed and as per the agreed rates.

With the assistance of the Construction Manager and Construction Mentors, Trainee Targeted Enterprises shall compile a Simulation Payment Certificate as if he sourced and paid plant, material and labour himself.

However, the Contractor shall procure plant, material and labour on behalf of the Trainee Targeted Enterprises and shall pay Suppliers, Service Providers and Labour directly. The Construction Manager shall pay the balance of the Simulation Payment Certificate into the bank accounts of the Trainee Targeted Enterprises on receipt of their invoices.

A1010 CONSTRUCTION MANAGEMENT AND CONSTRUCTION OF THE WORKS

Amongst others, the Contractor's responsibilities include Trainee Target Enterprises' competency review, Construction mentoring, coaching and guidance, assistance to Trainee Targeted Enterprises on any aspect of the planning and administration of the Works, ensuring that Trainee Targeted Enterprises comply with all relevant statutory requirements monthly and overall management of the construction of the Works.

A1010.01 Subcontracting Work to Trainee Targeted Enterprises

Once the Construction Simulation phase has been completed, Trainee Targeted Enterprises shall have the opportunity to tender for construction work packages and enter into formal subcontract agreements with the Construction Manager as detailed in Part C, Section D of the Scope of the Work.

The Trainee Targeted Enterprises shall, however, remain Trainees in the sense that they still must complete the notional hours required by the NQF level 3, 4 and 5 Unit Standards to be found competent in these Unit Standards. Thus, although the principles of subcontracting to Targeted Enterprises, as detailed in Part C, Section D of the Scope of Work, shall apply, every Trainee Targeted Enterprise shall be awarded at least 1 (one) subcontract package to ensure that they receive the practical exposure to complete a Full Traineeship.

a) Trainee Target Enterprises' Competency Review

During the Construction Simulation period, Trainee Targeted Enterprises demonstrated their competency to operate as contractors and taking responsibility for all aspects of planning, procuring and managing plant, material and labour.

In awarding subcontract packages to Trainee Targeted Enterprises, the Construction Manager shall review Trainees' ability to combine all learning experiences into that of a competent contractor. Following this review, the Construction Manager, in consultation with the Engineer, shall award construction packages to Trainee

Targeted Enterprises to ensure that they receive the full benefit of the practical training experience.

b) Form of Subcontract Agreement

The subcontract shall be the FIDIC Short Form of Contract (green book) as prescribed in Part C, Section D of the Scope of Work.

The Works shall be constructed in accordance with the COTO Standard Specifications.

c) Payment for Work Completed

Trainee Targeted Enterprises shall be paid for tasks or quantities completed at the agreed rates and in terms of the subcontract agreement.

The Contractor shall no longer procure plant, material or labour on behalf of the Trainee Targeted Enterprises and shall not pay Suppliers, Service Providers or Labour directly and on behalf of the Trainee Targeted Enterprises.

Trainee Targeted Enterprises shall compile their Payment Certificates, which shall include for plant, material and labour and which shall, after checking and agreeing the quantities between the parties, be paid by the Contractor on receipt of the Trainee Targeted Enterprises' invoices.

If the Contractor did procure any plant, material or labour on behalf of a Trainee Targeted Enterprise, the cost of such procurement shall not be offset against the Payment Certificate. The Contractor shall pay the full value of the Payment Certificate and then issue the Trainee Targeted Enterprise with an invoice for the Contractor's cost incurred.

A1010.02 Construction Mentoring

During the construction of the Works the Contractor shall continue his training duties, but in a mentoring capacity. Amongst others, the Construction Manager shall continue with the following activities:

- a) Coach, guide and mentor Trainee Targeted Enterprises continuously;
- b) Supervise construction activities and be responsible for the standard and quality of the Works constructed.
- c) Ensure that Trainee Targeted Enterprises are registered and comply with all relevant statutory requirements, e.g.
 - i) South African Revenue Service
 - ii) National Treasury's Central Supplier Database
 - iii) Compensation for Occupational Injuries and Deceases Act
 - iv) Rates for wages and conditions of labour agreed by the Bargaining Council for the Civil Engineering Industry.
 - v) Construction Industry Development Board
 - vi) Occupational Health and Safety Regulations
 - vii) Environmental Management Regulations
- d) If requested or required, assist Trainee Targeted Enterprises to schedule work activities and decide on construction methods to apply.
- e) If requested or required, assist Trainee Targeted Enterprises to plan and procure their plant, material and labour.
- d) Assist Trainee Targeted Enterprises to determine production rates required and obtained to optimise profitability.
- e) Assist Trainee Targeted Enterprises to measure the works and quantify it in a payment certificate for invoicing.
- f) Any other support to Trainee Targeted Enterprises to enhance the success of their business.

The Construction Manager shall conduct bi-weekly technical meetings with the Trainee Targeted Enterprises to introduce them to the industry norm of monthly cost and management meetings at which allowable versus cost issues are thoroughly explored.

A1010.03 Construction Management

The Construction Manager shall be responsible for day to day management of Trainee Targeted Enterprises and construction of the Works in a manner that is expected from a competent Contractor. He shall keep a daily site diary, receive and execute instructions from the Engineer and give and monitor instructions to the Trainee Targeted Enterprises.

Regular audits, but not less than quarterly, shall be conducted by the Employer to ensure compliance with financial and progress accounting, as well as compliance with Occupational Health and Safety and Environmental Management legislation.

APPENDIX 13: BASELINE RISK ASSESSMENT

1. Objective

The objective of this baseline risk assessment was to identify and categorise the low to high hazards associated with performing tasks during different work categories.

The evaluation of results will assist management to eliminate, minimise or control risks to workers associated with the tasks performed or exposure to the working environment.

This risk assessment was also conducted to assist management in identifying training needs in order to concentrate efforts where it is mostly needed.

- 1.1 According to the **Occupational Health and Safety Act 85 of 1993**, all companies must assess where they stand in terms of risk, identifying the major risks which they are exposed to thereby establishing their priorities and a system for future risk control. A baseline risk assessment must be comprehensive and may well lead to further, separate and more in-depth risk assessment studies.
- 1.2 The baseline risk assessment should be reviewed periodically, about every year, after every accident/incident, change of work force or change of plant/equipment to ensure that it is still relevant and accurate. Any other studies will need to be incorporated to achieve a 'complete picture'.

2. Scope of Works

The description of the works shall inter alia contain the following particulars regarding the work to be constructed and maintained under the contract.

The proposed work on National Road R101 Section 8 is situated within two Local Municipalities (Bela Bela and Modimolle Mookgophong), both of which fall under the Waterberg District Municipality in the Limpopo Province.

The project extends from Bela Bela at the intersection with Voortrekker Road (km 0.0) to Modimolle at the intersection with Road R33 (km 26.8).

The general objective of this project is to successfully and optimally complete improvement of the road section. The aim of this improvement is to:

- Relieve traffic congestion to acceptable level of service by providing suitable cross sections;
- Improve road geometry (alignment) to provide better road safety;
- Provide non-motorised transport (NMT) and pedestrian facilities;
- Provide adequate pavement capacity for a 20-year design period; and
- Widen and lift bridges and other structures where required for hydraulic and traffic capacity

Also refer to the Design Report and Scope of work as per Bill of Quantities.

3. Risk Analysis Method

The risk analysis considered all the tasks as described in the safe work procedures developed for this specific operation.

The risk analysis included

- a. Description of the task/system under analysis.
 - b. Evaluation of each risk by determining the probability of recurrence and severity of each event.
- 3.1 Evaluation of current and planned controls, barriers and safeguards.
- 3.2 A selected team of personnel were involved to conduct this on the job task analysis to determine baseline risk assessment

4. Determination of Levels of Risk

- c. Risks associated with each step in the operational process were considered.
- d. The following factors were considered and rated in accordance with the effect it would have on the items described below, should the event occur:
 - Threat to the health and safety of a worker
 - Severity of the event
 - Likelihood of the event happening
 - Event consequence

A risk level was attributed to each event in the following manner:

Low risk	=	1-6
Medium risk	=	7-15
High Risk	=	16-24

6. Risk Ranking & Calculation of risk

6.1 Risk Ranking:

Consequence:

Fatality or permanent disability	-	5
Major Injury	-	4
Average lost time injury	-	3
Minor Injury	-	2
Medical treatment only or less	-	1

Probability:

Has happened	-	A
Quite possible to happen	-	B
Could Happen	-	C
Not likely to happen	-	D

6.2 Calculation of Risk:

Consequence: Probability = Risk Ranking (see table in risk assessment)

7. Evaluation of Results

Activities listed in the high risk categories must be seen as tasks requiring immediate attention. Training will, in most instances, solve the problem satisfactorily.

An implementation plan may then be devised to address the outstanding issues. This action plan must take cognisance of the hazards that should be eliminated concurrently.

8. Abbreviations used in Risk Assessment

DSTI	-	Daily Safety Task Instruction
HIRA	-	Hazard Identification and Risk Assessment
HCA	-	Hazardous Chemical Agents
PTO	-	Planned Task Observation
PPE	-	Personal Protective Equipment
SOP	-	Safe Operating Procedure
SWP	-	Safe Work Procedure
DoEL	-	Department of Employment and Labour

9. Assessment Team

The following people were involved in establishing the relevant task groups and analysis.

• F du Toit	-	Pr. CHSA
• W Venter	-	Can CHSA / Risk Assessor
• D van der Merwe	-	Design Team Leader
• J Hodgson	-	Design Team
• Khutso Nkoana	-	Design Team

10. Task Specific-Risk Assessment

Should the baseline assessment indicate tasks in High risk a specific task risk assessment must be conducted. This assessment will then target the specific tasks and the hazards attached to it.



Pr. CHSA: F du Toit



BASELINE RISK ASSESSMENT

PROJECT NRA R.101-080-2019/1

REV 01

RISK ASSESSMENT TITLE / TASK	THE IMPROVEMENT OF NATIONAL ROAD R101 SECTION 8 FROM BELA BELA (KM 0.0) TO MODIMOLLE (KM 26.8)		
CONTRACT NUMBER	NRA R.101-080-2019/1	START DATE	To be Confirmed
RISK ASSESSMENT REFERENCE NO	SHE/BLRA/BVI/SANRAL/R101/01	END DATE	To be Confirmed
REVISION STATUS	01	REVISION DATE	1 Month after Commencement
BRIEF DESCRIPTION OF WORK/ACTIVITY	THE IMPROVEMENT OF NATIONAL ROAD R101 SECTION 8 FROM BELA BELA (KM 0.0) TO MODIMOLLE (KM 26.8)		

REQUIRED AND EXISTING CONTROL MEASURES	Available		Adequate		REMARKS
	Yes	No	Yes	No	
Scope of Work (logical steps on how task will be performed)	X		X		
Procedures: (WI / SOP / Vendor Spec)	X		X		
Training, Induction, Competency Certificates, Specific Training / Other Instructions	X		X		
Special permits required (specify)		X		X	Construction Work Permit: DoEL, Wayleaves: Eskom, Telkom, Etc.
Equipment / Tool Registers / Others (specify)	X		X		

PROBABILITY LEGEND			CONSEQUENCE / INJURY / LOSS			RANKING					
A	Has happened		5	Fatality or permanent disability or > R 1,000,000			A	B	C	D	
B	Quite possible to happen (Happen during last year)		4	Major Injury or > R 500,000 < R 1,000,000		5	24	22	19	15	
C	Could Happen (No record of recent occurrence)		3	Average Lost time Injury or > R 250,000 < R 500,000		4	21	18	14	10	
D	Not likely to happen		2	Minor Injury or < R 250,000		3	17	13	9	6	
PROB: Probability		CON: Consequence	1	Medical Treatment only or Less or No Financial loss		2	12	8	5	3	
HIGH RISK = 17-24			MEDIUM RISK = 7-15		LOW RISK = 1-6		1	7	4	2	1
BASIC PPE REQUIRED FOR TASK			<input checked="" type="checkbox"/> HARD HAT		<input checked="" type="checkbox"/> OVERALL		<input checked="" type="checkbox"/> EAR PROTECTION		<input checked="" type="checkbox"/> DUST MUSK		
			<input checked="" type="checkbox"/> SAFETY GLASSES		<input checked="" type="checkbox"/> SAFETY FOOTWEAR		<input checked="" type="checkbox"/> GLOVES		<input checked="" type="checkbox"/> SAFETY VEST		

* Risk Assessment Template

ADDITIONAL REFERENCES TO TASK	<input checked="" type="checkbox"/> METHOD STATEMENT	<input checked="" type="checkbox"/> MSDS	<input checked="" type="checkbox"/> PLANNED TASK OBSERVATION	<input checked="" type="checkbox"/> SAFE WORK PROCEDURE
	<input checked="" type="checkbox"/> WORK INSTRUCTION	<input checked="" type="checkbox"/> COVID19 CONTROLS	-	-

Step No	Activity	Task	Potential Hazards	Risks	Current Risk			Suggested Control Measures
	List activity steps	List task steps	Potential dangers that could cause harm. List the potential hazards	Potential Risks due to Hazard	PROB	CON	Ranking	If the risk is not tolerable, establish further controls to mitigate/prevent
1.1	SITE ESTABLISHMENT	ID Camp Site <ul style="list-style-type: none"> Obtain Necessary permission Application for services Determine safe access 	<ul style="list-style-type: none"> No permission obtained 	<ul style="list-style-type: none"> Project Interruption Legal liability claims Financial Loss 	C	4	14	<ul style="list-style-type: none"> Permission obtained before site is establishment. Liaising with community The application for services must be submitted to the local municipality counsel
1.2		Transporting of Machinery and Tools to site	<ul style="list-style-type: none"> Driver under the influence of illegal substance Accidents Hijacking 	<ul style="list-style-type: none"> Fatalities 3rd Party claims Financial Loss Property damage 	C	5	19	<ul style="list-style-type: none"> Induction Training Driver must be authorised, competent and medically fit Driver to ensure that all equipment is properly fastened/secured Driver must adhere to the speed limits on site Planned Task Observations Task Specific Training Installation of tracking devices
1.3		Offloading Machines, Equipment, Containers and Tools	<ul style="list-style-type: none"> Overcrowding, Poor offloading practices, Uneven surfaces Tripping and falling over equipment and articles laying around Getting hit by moving plant 	<ul style="list-style-type: none"> Multiple injuries Back injuries Sprains & strains Theft of materials Financial loss Equipment Damage 	C	4	14	<ul style="list-style-type: none"> Induction training. Task Specific training Supervision Wearing of correct PPE Laydown area identified and demarcated before offloading commences Supervision Moving plant controlled
1.4		Determine site Layout <ul style="list-style-type: none"> Entrance and Exit to campsite Determine positions for office, stores, and material 	<ul style="list-style-type: none"> Flammable store too close to offices Wrong layout can cause confusion during emergency evacuations 	<ul style="list-style-type: none"> Equipment damage Financial Loss 	C	3	9	<ul style="list-style-type: none"> Induction Wearing required PPE Hazardous Chemical Agents/Flammable Substances stored away from offices Hazardous Chemical Agents/Flammable Substances stored correctly Site lay out done to plans Position of services taken into consideration Supervision

Step No	Activity	Task	Potential Hazards	Risks	Current Risk			Suggested Control Measures
	List activity steps	List task steps	Potential dangers that could cause harm. List the potential hazards	Potential Risks due to Hazard	PROB	CON	Ranking	If the risk is not tolerable, establish further controls to mitigate/prevent
1.5	SITE ESTABLISHMENT	Excavation of post holes	<ul style="list-style-type: none"> Hand tools not safe for use Employees stepping on edge of hole Loose material on edge of hole Overcrowding Members of public/stray animals getting injured when stepping into/falling over hole 	<ul style="list-style-type: none"> Lost time injuries Back injuries Multiple injuries Financial loss Legal liability claims 3rd Party claims 	C	3	9	<ul style="list-style-type: none"> Task specific training Induction Training Registers and checklists completed Identification of underground services Supervision Appropriate PPE Delineators indicating open holes Cover plates placed on holes
1.6		Installing fence components	<ul style="list-style-type: none"> Faulty tools and equipment Manual handling Heavy components Sharp Theft 	<ul style="list-style-type: none"> Minor Injuries/cuts Back injuries – sprains Damaged components Damaged tools and equipment Stolen tools/equipment and components 	C	3	9	<ul style="list-style-type: none"> Induction training Task Specific training Supervision Correct PPE to be worn Components stored out of sight Accredited training (If required)
1.7		Installation of Diesel Tank and services	<ul style="list-style-type: none"> Faulty installation Lifting equipment failure Swinging loads Tripping and falling over equipment/obstacles 	<ul style="list-style-type: none"> Sprains & Strains Multiple injuries Back injuries Financial loss Equipment Damage Project interruption 	C	4	14	<ul style="list-style-type: none"> Diesel tank to be placed on concrete floor Do electrical connection for the tank Task Specific training Bunding area for diesel storage. Spill kits available All electrical cables to be buried 500mm deep Water connection to be established, pipes to be buried Wearing required PPE Supervision No trenches left open Storage of flammable Substances certificate to be obtained from Fire Department

Step No	Activity	Task	Potential Hazards	Risks	Current Risk			Suggested Control Measures
	List activity steps	List task steps	Potential dangers that could cause harm. List the potential hazards	Potential Risks due to Hazard	PROB	CON	Ranking	If the risk is not tolerable, establish further controls to mitigate/prevent
1.8	SITE ESTABLISHMENT	Erecting of signage and demarcation of storage areas	<ul style="list-style-type: none"> • Areas wrongfully marked off • Signage not displayed 	<ul style="list-style-type: none"> • Injury caused by misuse of equipment • Hand injuries • Injuries due to faulty equipment • Financial loss 	C	3	9	<ul style="list-style-type: none"> • Wearing required PPE • Supervision • All signage necessary, according to site layout plan to be erected • Storage area to be demarcated • Workers using HCA must undergo HCA training. • A qualified first aider must be available on site • Workers to wear gloves when erecting signs • Supervision
2.1	LOCATION OF EXISTING SERVICES	Locating of existing services	<ul style="list-style-type: none"> • Electrical cables 	<ul style="list-style-type: none"> • Electrocutation • Damage to electrical cables • Legal liability claims • Time loss 	C	5	19	<ul style="list-style-type: none"> • Layout plans obtained from client • Service provider notified • Supervision • Training • Safe Operating Procedure • Planned Task Observations • Task Specific Training • Daily Safety Task Instructions
			<ul style="list-style-type: none"> • Underground services 	<ul style="list-style-type: none"> • Damage to water pipes, telephone lines, network cables, etc. • Electrocutation • Legal liability claims • Production time loss 	C	5	19	<ul style="list-style-type: none"> • Layout plans obtained from client • Service provider notified • Supervision • Training • Safe operating procedure to be implemented • Supervision • Planned Task Observations • Task Specific Training • Daily Safety Task Instructions

Step No	Activity	Task	Potential Hazards	Risks	Current Risk			Suggested Control Measures
	List activity steps	List task steps	Potential dangers that could cause harm. List the potential hazards	Potential Risks due to Hazard	PROB	CON	Ranking	If the risk is not tolerable, establish further controls to mitigate/prevent
3.1	WORKING NEAR SERVICES	Plant operating near power lines	<ul style="list-style-type: none"> Exposure to live and static electricity Overhead power lines knocked over Overhead power lines snapped 	<ul style="list-style-type: none"> Electrocution Property damage Production time loss Legal liability claims Financial loss 	D	5	15	<ul style="list-style-type: none"> Prestart checklist Operator authorised, competent and medically fit Machinery may not exceed height of overhead power lines Supervision Banksmen/Spotter checking plant height Supervision Wearing required PPE Service provider representative to be present
3.2		Excavations/earthworks near overhead power lines	<ul style="list-style-type: none"> Ground stability compromised Striking overhead powerline structures 	<ul style="list-style-type: none"> Electrocution Property damage Production time loss Legal liability claims Financial loss 	D	5	15	<ul style="list-style-type: none"> Prestart checklist Operator authorised, competent and medically fit Machinery may not exceed height of overhead power lines Supervision Ground stability checked Wearing required PPE Service provider representative to be present

Step No	Activity	Task	Potential Hazards	Risks	Current Risk			Suggested Control Measures
	List activity steps	List task steps	Potential dangers that could cause harm. List the potential hazards	Potential Risks due to Hazard	PROB	CON	Ranking	If the risk is not tolerable, establish further controls to mitigate/prevent
4.1	SECURE/SAFE STORAGE FOR MATERIALS, PLANT AND EQUIPMENT	Stacking & Storage – materials	<ul style="list-style-type: none"> • Unauthorised access • Unstable stacking • Unsafe stacking practice • Collapsing / change in position of materials • Incorrect placement • Falling material • Manual handling • Hand & foot injury • Trip and fall 	<ul style="list-style-type: none"> • Cuts to hands • Section 24 Incidents • Property Damage • Financial Loss • Time Loss due to injuries • Production time loss • Back injuries • Sprains and strains 	C	4	14	<ul style="list-style-type: none"> • A competent & appointed person to supervise stacking & storage of all materials. • Toolbox talk to be conducted to ensure correct stacking & storage practices. • Allocated storage area to be demarcated with danger tape with poles not exceeding distance/length gaps of 3m or alternatively with snow netting. • All materials will be stacked at ground level on a firm & level base capable of withstanding the load & stacked in a manner as to avoid collapsing or change in position. • Ensure vehicles, machinery or persons moving past them do not endanger the stability of stacks. • All stacking should conform to the minimum requirements: 3 times the minimum base dimension is deemed to be the height to which articles may be stacked
4.2		Stacking & Storage – plant and equipment	<ul style="list-style-type: none"> • Moving plant • Parking area not level • Insufficient storage areas • Incorrect lifting practices • Uneven surfaces 	<ul style="list-style-type: none"> • Accidents • Damage to plant and equipment • Major injuries • Fatalities • Financial loss • Project interruption 	D	5	15	<ul style="list-style-type: none"> • Operators authorised, competent and medically fit • Wearing of required PPE • Stand Clear Policy enforced • Induction • Stop blocks • Sufficient storage areas • Storage areas demarcated • Banksman • Supervision • Task Specific training (Parking of plant)

Step No	Activity	Task	Potential Hazards	Risks	Current Risk			Suggested Control Measures
	List activity steps	List task steps	Potential dangers that could cause harm. List the potential hazards	Potential Risks due to Hazard	PROB	CON	Ranking	If the risk is not tolerable, establish further controls to mitigate/prevent
5.1	TRAFFIC ACCOMMODATION	Positioning of Flagmen and signs	<ul style="list-style-type: none"> Trips and falls Sprains and strain Sharp edges of signs Dropping of signs Not visible to other road users/plant 	<ul style="list-style-type: none"> Ergonomic related injuries Multiple injuries Financial loss Damage to signs Project interruption Struck by other road users Fatalities 	C	5	19	<ul style="list-style-type: none"> Wearing required PPE Induction training. Supervision Traffic awareness training Task specific training Planned Task Observations Supervision Accredited training
5.2		Preparation & maintenance of temporary traffic signs, Cleaning with water and rags	<ul style="list-style-type: none"> Workers being exposed to extreme temperatures Workers being exposed to incoming traffic 	<ul style="list-style-type: none"> Dehydration/ Hypothermia Accident/Incidents Financial loss Project interruption Fatalities 	C	5	19	<ul style="list-style-type: none"> Wearing required PPE Induction training. Supervision Correct placement of signs Accredited training
5.3		Loading and offloading of temporary traffic signs	<ul style="list-style-type: none"> Overcrowding Workers exposed to traffic 	<ul style="list-style-type: none"> Financial loss Project interruption Accident/Incident Fatalities 	C	5	19	<ul style="list-style-type: none"> Wearing required PPE Induction training. Supervision Task specific training Safe operating procedures Planned Task Observations Supervision Accredited training
5.4		Working in closure	<ul style="list-style-type: none"> Incoming traffic Workers being hit by traffic 	<ul style="list-style-type: none"> Accident/Incidents Multiple fatalities Financial loss Project interruption 	C	5	19	<ul style="list-style-type: none"> Wearing required PPE Induction training. Supervision Supervision Wearing required PPE Accredited training
5.5		Company vehicles and public vehicles driving through construction site	<ul style="list-style-type: none"> Poor communication between Stop & Go Incoming traffic Vehicles striking plant, equipment and workers Incorrect placement of signs 	<ul style="list-style-type: none"> Accident/incident Legal liability claims Financial loss Property damages Project interruption Fatalities Production time loss 	C	5	19	<ul style="list-style-type: none"> Wearing required PPE Flag men in position Supervision Closure set up to client spec or SARTSM Task specific training Safe operating procedures Accredited training
6.1	FIRE RISK PREVENTION	Stacking and storing of materials	<ul style="list-style-type: none"> Materials catching fire 	<ul style="list-style-type: none"> Property damages Production time loss Injury Major financial loss Project time delay 	C	3	9	<ul style="list-style-type: none"> Fire extinguishers. Fire Fighting Training. Annual services of fire equipment. Emergency procedure and drills. No flammables stored with combustibles.
6.2		Fires from outside the property.	<ul style="list-style-type: none"> Fire damaging plant, causing plant not to operate correctly, and contamination of stockpiles. 	<ul style="list-style-type: none"> Property damage Financial loss Production time loss 	C	4	14	<ul style="list-style-type: none"> Emergency plan to be put in place in case an emergency occurs

Step No	Activity	Task	Potential Hazards	Risks	Current Risk			Suggested Control Measures
	List activity steps	List task steps	Potential dangers that could cause harm. List the potential hazards	Potential Risks due to Hazard	PROB	CON	Ranking	If the risk is not tolerable, establish further controls to mitigate/prevent
6.3	FIRE RISK PREVENTION	Fire risk	<ul style="list-style-type: none"> Insurance can deny pay-out if fire extinguishers are ineffective and not registered at SANS, legal liability claims can have negative effect on company 	<ul style="list-style-type: none"> Financial loss Possible closing of the company All workers can lose their jobs 	C	4	14	<ul style="list-style-type: none"> Regular inspection and maintenance to be done on fire extinguishers Suppliers to be SANS Accredited
6.4		Smoke	<ul style="list-style-type: none"> Inhaling smoke if fire occurs 	<ul style="list-style-type: none"> Occupational illness and disease (permanent lung damage) 	C	3	9	<ul style="list-style-type: none"> Fire extinguishers. Fire Fighting Training Annual services of fire equipment. Emergency procedure and drills.
6.5		Fire occurring	<ul style="list-style-type: none"> Employees not knowing where all escape routes are Employees know knowing what to do encase a fire occurs 	<ul style="list-style-type: none"> Possibility of a fatality Serious injuries (3rd degree burns) Legal liability claims Financial loss 	C	4	14	<ul style="list-style-type: none"> Supervisors, managers, and safety officer to ensure regular fire drills are done and that there is enough fire fighters to ensure all personnel evacuate the building accordingly First aiders to be trained and available in case of an emergency
7.1	EXPOSURE TO NOISE, DUST, VIBRATION AND HAZARDOUS CHEMICAL AGENTS	Noise	<ul style="list-style-type: none"> Working close to plant, equipment and machinery Working in high noise areas 	<ul style="list-style-type: none"> Noise Induced Hearing Loss 	C	4	14	<ul style="list-style-type: none"> Noise survey done Noise zones indicated PPE requirements indicated Wearing required PPE Induction Medicals surveillance Supervision Contain high noise levels through engineering, elimination or substituting control
7.2		Dust	<ul style="list-style-type: none"> Excessive dust 	<ul style="list-style-type: none"> Respiratory and eye irritation Poor visibility Accidents Injuries 3rd Party Claims Financial loss Project interruption 	C	3	9	<ul style="list-style-type: none"> Dust suppression Wearing of required PPE Induction & task specific training Supervision Work in dusty areas kept to a minimum

Step No	Activity	Task	Potential Hazards	Risks	Current Risk			Suggested Control Measures
	List activity steps	List task steps	Potential dangers that could cause harm. List the potential hazards	Potential Risks due to Hazard	PROB	CON	Ranking	If the risk is not tolerable, establish further controls to mitigate/prevent
7.3	EXPOSURE TO NOISE, DUST, VIBRATION AND HAZARDOUS CHEMICAL AGENTS	Vibration	<ul style="list-style-type: none"> Vibrating equipment Poorly maintained equipment Absence of medical surveillance 	<ul style="list-style-type: none"> Vibration White Finger Hand Arm Vibration Syndrome Whole Body Vibration Occupational Vibration Syndrome Damage to tools, plant and equipment Financial loss Production time loss 	D	4	10	<ul style="list-style-type: none"> Registers/Checklists Anti-vibration PPE Task specific training Medical surveillance Supervision Maintenance Vibration survey to replace/substitute vibrating tools, equipment and plant
7.4		Hazardous Chemical Agents	<ul style="list-style-type: none"> Exposure to hazardous Chemical Agents 	<ul style="list-style-type: none"> Eye, skin and respiratory irritation Chemical burns Production time loss Fire hazard Property damage Financial loss Occupational illness and disease 	C	4	14	<ul style="list-style-type: none"> Registers/checklists Hazchem training Task Specific training MSDS's available Wearing required PPE Stored/Used to manufacturer's instruction Signage displayed Medical surveillance Supervision Accredited HCA training
8.1	DRIVING / OPERATING CONSTRUCTION VEHICLES AND MOBILE PLANT	Inspecting Mobile Machinery	<ul style="list-style-type: none"> Injury to body/misuse of equipment Hitting other plant Hitting workers 	<ul style="list-style-type: none"> Fatalities Major injury Financial loss Legal liability claims Production time loss 	C	3	9	<ul style="list-style-type: none"> Training. Wearing of correct PPE. Pre start checklist Operators authorised, competent and medically fit Supervision
8.2		Climb into Vehicle/Machinery	<ul style="list-style-type: none"> Injury to body 	<ul style="list-style-type: none"> Injury Production time loss 	C	2	5	<ul style="list-style-type: none"> Operators authorised, competent and medically fit Task specific training
8.3		Driving/Operating vehicles and plant	<ul style="list-style-type: none"> Being hit by other road users Hitting flagmen/pedestrians Hitting other plant or road users Excessive dust Hitting surrounding properties and services Material/Equipment falling off 	<ul style="list-style-type: none"> Poor visibility Accidents Fatalities Major injuries Damage to plant, property, services and other vehicles 3rd Party claims Financial loss Project interruption 	C	5	19	<ul style="list-style-type: none"> Drivers/Operators authorised, competent and medically fit Prestart checklist Dust suppression Vehicles and plant conforming to safety standards/legislation Supervision Traffic accommodation Speeds reduction (Rumble strips) Tracking device installation

Step No	Activity	Task	Potential Hazards	Risks	Current Risk			Suggested Control Measures
	List activity steps	List task steps	Potential dangers that could cause harm. List the potential hazards	Potential Risks due to Hazard	PROB	CON	Ranking	If the risk is not tolerable, establish further controls to mitigate/prevent
9.1	MATERIAL DELIVERY	Inspecting Mobile Machinery	<ul style="list-style-type: none"> Injury to body/misuse of equipment Hitting other plant Hitting workers 	<ul style="list-style-type: none"> Fatalities Major injury Financial loss Legal liability claims Production time loss 	C	3	9	<ul style="list-style-type: none"> Training. Wearing of correct PPE. Pre start checklist Operators authorised, competent and medically fit Supervision
9.2		Climb into Vehicle/Machinery	<ul style="list-style-type: none"> Injury to body 	<ul style="list-style-type: none"> Injury Production time loss 	C	2	5	<ul style="list-style-type: none"> Operators authorised, competent and medically fit
9.3		Transporting of Material to site	<ul style="list-style-type: none"> Warning devices on vehicles not working Overhead services Running over co-workers Accidents Hitting other plant 	<ul style="list-style-type: none"> Project interruption Financial loss Equipment Damage Fatalities Legal liability claims 	C	5	19	<ul style="list-style-type: none"> Induction Training Operator/driver authorised, competent and medically fit Supervision Driver must adhere to the speed limits on site Only authorised drivers to operate vehicle. Adherence to speeds limits tracked
10.1	LOADING AND OFFLOADING	Loading and offloading using lifting equipment	<ul style="list-style-type: none"> Unauthorised persons operating/using lifting equipment Faulty lifting equipment Lifting equipment not load tested Misuse of equipment Workers standing underneath suspended load Being hit by other road users/plant 	<ul style="list-style-type: none"> Accident/incident Injury to body Fatalities Financial loss Project interruption 	C	5	19	<ul style="list-style-type: none"> Task Specific Training Operator authorised, competent and medically fit Wearing of correct PPE Load tests for lifting equipment Supervision
10.2		Loading and offloading by hand	<ul style="list-style-type: none"> Jumping off vehicles Incorrect lifting practices Material falling off vehicles Equipment/Material not stable 	<ul style="list-style-type: none"> Equipment falling Major injury Financial loss Equipment/Material damage Project interruption 	C	4	14	<ul style="list-style-type: none"> Task Specific Training Operator authorised, competent and medically fit Wearing of correct PPE Supervision

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	List activity steps	List task steps	Potential dangers that could cause harm. List the potential hazards	Potential Risks due to Hazard	PROB	CON	Ranking	If the risk is not tolerable, establish further controls to mitigate/prevent
11.1	SURVEY AND SETTING OUT	Sharpening of pegs	<ul style="list-style-type: none"> Sharpening of pegs with panga / knife Splinters from pegs 	<ul style="list-style-type: none"> Cuts, amputations to fingers Minor injuries from splinters Pegs cur incorrectly Production interruption Financial loss 	C	3	9	<ul style="list-style-type: none"> Task specific training Inspection registers and checklists Supervision Wearing required PPE Order pre-cut pegs from supplier
11.2		Setting out according to plans	<ul style="list-style-type: none"> Poor/incorrect surveying 	<ul style="list-style-type: none"> Financial losses Project Interruption 	C	3	9	<ul style="list-style-type: none"> Traffic Control Supervision Wearing required PPE Surveying to be done by a competent surveyor Surveying to be done according to layout plans Record to be kept Spot checks to be done by engineering staff
12.1	CLEARING AND GRUBBING	Clearing and Grubbing	<ul style="list-style-type: none"> Not visible to other site users Being hit by other traffic Material not cleared and grubbed thoroughly Hitting flagmen Hitting other plant or road users Dust Hitting surrounding properties 	<ul style="list-style-type: none"> Accident/incidents Major injury Fatalities Financial loss Legal liability claims Financial loss Project Interruption Surrounding property damages 	C	4	14	<ul style="list-style-type: none"> Supervision Wearing required PPE Prestart checklist Operator authorised, competent and medically fit Workers to stand clear when Grader is levelling area Traffic Accommodation Awareness training for locals
13.1	LAYER WORKS (MASS EARTHWORKS)	Loading Material with Excavator onto Tipper Trucks	<ul style="list-style-type: none"> Incorrect loading Warning devices on truck not working Overhead services Excavator hitting tippers 	<ul style="list-style-type: none"> Project interruption Financial loss Injury Damage to plant 	C	4	14	<ul style="list-style-type: none"> Prestart checklists Plant conform to safety standards Operators authorised, competent and medically fit Operators checking loading area (surface, level, etc.) PTO's. Task Specific Training Supervision
13.2		Transporting of Material to construction area	<ul style="list-style-type: none"> Warning devices on tipper truck not working Material may fall of truck Hitting pedestrians, flag personnel and other road users 	<ul style="list-style-type: none"> Road Accidents Fatalities Financial Loss Property damage Legal liability claims Damage to other plant, road users and property 	C	5	19	<ul style="list-style-type: none"> Prestart checklists Plant conform to safety standards Induction Training Operators authorised, competent and medically fit Supervision No speeding Traffic to be controlled

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13.3	LAYER WORKS (MASS EARTHWORKS)	Tipping of Material	<ul style="list-style-type: none"> • Tipper Truck fall over because of uneven surface • Warning devices on truck not working • Overhead services (Power line at tipping area) • Incorrect tipping • Hitting running over workers • Dust 	<ul style="list-style-type: none"> • Eye and respiratory irritation • Major injury • Fatalities • Project interruption • Financial loss • Injury • Legal liability claims 	C	5	19	<ul style="list-style-type: none"> • Prestart checklists • Plant conform to safety standards • Induction training. • Operators authorised, competent and medically fit • Inform operators of overhead lines • Telly man to indicate to Tipper Truck driver if it is safe to tip
13.4		Levelling material with grader	<ul style="list-style-type: none"> • Hitting other road users • Hitting workers • Hitting survey pegs' • Dust 	<ul style="list-style-type: none"> • Eye and respiratory irritation • Major injury • Fatalities • Project interruption • Financial loss • Injury • Legal liability claims 	C	5	19	<ul style="list-style-type: none"> • Prestart checklists • Plant conform to safety standards • Induction training • Operators authorised, competent and medically fit • Supervision • Traffic controlled
13.5		Compact material with Roller	<ul style="list-style-type: none"> • Hitting others road users • Hitting other plant • Hitting workers 	<ul style="list-style-type: none"> • Major injury • Fatalities • Project interruption • Financial loss • Injury • Legal liability claims 	C	5	19	<ul style="list-style-type: none"> • Prestart checklists • Plant conform to safety standards • Induction training • Operators authorised, competent and medically fit • Supervision • Traffic controlled
14.1	STABILIZATION	Spraying of cement with cement sprayer	<ul style="list-style-type: none"> • Hitting others road users • Hitting other plant • Hitting workers • Excessive cement dust • Poor visibility 	<ul style="list-style-type: none"> • Eye and respiratory irritation • Major injury • Fatalities • Project interruption • Financial loss • Injury • Legal liability claims 	C	5	19	<ul style="list-style-type: none"> • Prestart checklists • Plant conform to safety standards • Induction training • Operators authorised, competent and medically fit • Supervision • Traffic controlled
14.2		Packing cement by hand	<ul style="list-style-type: none"> • Trips and falls • Sprains and strain • Not visible to other road users/plant • Incorrect placement of bags • Tearing of bags when offloading • Excessive cement dust 	<ul style="list-style-type: none"> • Ergonomic related injuries • Eye and respiratory irritation • Multiple injuries • Financial loss • Damage to cement bags • Project interruption • Struck by other road users • Fatalities 	C	5	19	<ul style="list-style-type: none"> • Wearing required PPE • Induction training. • Supervision • Medicals

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14.3	STABILIZATION	Spreading/mixing cement with grader or recycler	<ul style="list-style-type: none"> Sample not taken incorrectly Hitting others road users Hitting other plant Hitting workers 	<ul style="list-style-type: none"> Major injury Fatalities Project interruption Financial loss Injury Legal liability claims 	C	5	19	<ul style="list-style-type: none"> Prestart checklists Plant conform to safety standards Induction training Operators authorised, competent and medically fit Supervision Traffic controlled
14.4		Compacting and finishing off	<ul style="list-style-type: none"> Hitting others road users Hitting other plant Hitting workers 	<ul style="list-style-type: none"> Major injury Fatalities Project interruption Financial loss Injury Legal liability claims 	C	5	19	<ul style="list-style-type: none"> Prestart checklists Plant conform to safety standards Induction training Operators authorised, competent and medically fit Supervision Traffic controlled
15.1.1	SURFACING & SEALING OF ROAD (ASPHALT SURFACING, CRACK SEAL, SLURRY AND PATCHING)	<u>Asphalt Surfacing</u> Transporting asphalt mix on tipper trucks to site	<ul style="list-style-type: none"> Warning devices on vehicles not working Overhead services Hitting workers Accidents Hitting other road users/plant 	<ul style="list-style-type: none"> Project interruption Financial loss Equipment Damage Fatalities Legal liability claims 	C	5	19	<ul style="list-style-type: none"> Induction Training Operator/driver authorised, competent and medically fit Supervision Driver must adhere to the speed limits on site
15.1.2		Dumping the asphalt into paver	<ul style="list-style-type: none"> Being hit by other road users Hitting paver/tipper too hard Workers exposed to hot temperatures 	<ul style="list-style-type: none"> Accident Burns Fatalities Injuries Project interruption Liability claims Financial loss 	C	5	19	<ul style="list-style-type: none"> Operators authorised, competent and medically fit Prestart checklists Supervision Banksman in position Wearing of required PPE Flagmen in position

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15.1.3	SURFACING & SEALING OF ROAD (ASPHALT SURFACING, CRACK SEAL, SLURRY AND PATCHING)	Paving	<ul style="list-style-type: none"> Respiratory irritation Burns Being hit by other road users 	<ul style="list-style-type: none"> Accidents Burns Major injuries Fatalities Project interruption Liability claims Financial loss 	C	5	19	<ul style="list-style-type: none"> Operators authorised, competent and medically fit Prestart checklists Supervision Banksmen in position Wearing of required PPE Flagmen in position
15.1.4		Compacting asphalt mix	<ul style="list-style-type: none"> Warning devices on vehicles not working Hitting workers Accidents Hitting other road users/plant 	<ul style="list-style-type: none"> Accident Burns Fatalities Injuries Project interruption Liability claims Financial loss 	C	5	19	<ul style="list-style-type: none"> Operators authorised, competent and medically fit Prestart checklists Supervision Wearing of required PPE Flagmen in position
15.2.1		CHIP AND SPRAY Prime coat	<ul style="list-style-type: none"> Being hit by other road users Hitting flagmen/pedestrians Hitting other plant or road users Hitting surrounding properties and services 	<ul style="list-style-type: none"> Poor visibility Accidents Fatalities Major injuries Damage to plant, property, services and other vehicles 3rd Party claims Financial loss Project interruption 	C	5	19	<ul style="list-style-type: none"> Drivers/Operators authorised, competent and medically fit Prestart checklist Vehicles and plant conforming to safety standards/legislation Supervision Traffic accommodation Speeds reduction (Rumble strips)
15.2.2		Spreading of stone with chip spreader	<ul style="list-style-type: none"> Being hit by other road users Hitting flagmen/pedestrians Hitting other plant or road users Excessive dust Hitting surrounding properties and services Material/Equipment falling off 	<ul style="list-style-type: none"> Poor visibility Accidents Fatalities Major injuries Damage to plant, property, services and other vehicles 3rd Party claims Financial loss Project interruption 	C	5	19	<ul style="list-style-type: none"> Drivers/Operators authorised, competent and medically fit Prestart checklist Dust suppression Vehicles and plant conforming to safety standards/legislation Supervision Traffic accommodation Speeds reduction (Rumble strips)
15.2.3		Rolling stone with Roller and sweeping with broce broom	<ul style="list-style-type: none"> Hitting others road users Hitting other plant Hitting workers 	<ul style="list-style-type: none"> Major injury Fatalities Project interruption Financial loss 3rd Party claims 	C	5	19	<ul style="list-style-type: none"> Prestart checklists Induction Operators authorised, competent and medically fit Supervision Traffic controlled

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15.3.1	SURFACING & SEALING OF ROAD (ASPHALT SURFACING, CRACK SEAL, SLURRY AND PATCHING)	CRACK SEALING Marking out cracks to be sealed	<ul style="list-style-type: none"> Being struck by passing traffic Struck by debris from passers by 	<ul style="list-style-type: none"> Major injuries Fatalities Damage to plant and equipment Financial loss Project interruption 	C	5	19	<ul style="list-style-type: none"> Induction Wearing required PPE Training on MSDS's Supervision Traffic Accommodation Flagmen in position
15.3.2		Spraying of binder on road between cracks	<ul style="list-style-type: none"> Being hit by other road users Operator not seeing other personnel or equipment Hitting other road users Hot emulsion Emulsion fumes LP gas (heating emulsion) 	<ul style="list-style-type: none"> Major injury Burns Fatalities Explosions Project interruption Financial loss 3rd Party claims 	C	5	19	<ul style="list-style-type: none"> Induction Wearing required PPE Training on MSDS's Supervision Traffic Accommodation Flagmen in position
15.4.1		PATCHING Marking out areas to be patched	<ul style="list-style-type: none"> Being struck by passing traffic Struck by debris from passers by 	<ul style="list-style-type: none"> Major injuries Fatalities Damage to plant and equipment Financial loss Project interruption 	C	4	14	<ul style="list-style-type: none"> Induction Wearing required PPE Training on MSDS's Supervision Traffic Accommodation Flagmen in position
15.4.2		Cutting of bituminous surface with asphalt/concrete saw	<ul style="list-style-type: none"> Faulty equipment Unauthorised operators operating cutter Cutting incorrect marks 	<ul style="list-style-type: none"> Major injuries Damage to plant and equipment Financial loss Project interruption 	C	3	9	<ul style="list-style-type: none"> Induction Wearing required PPE Supervision Traffic Accommodation Flagmen in position
15.4.3		Removing bituminous material	<ul style="list-style-type: none"> Faulty equipment Misusing equipment Removing too much material 	<ul style="list-style-type: none"> Minor injuries Damage to tools/equipment Financial loss Project interruption 	C	3	9	<ul style="list-style-type: none"> Induction Wearing required PPE Supervision Traffic Accommodation Flagmen in position
15.4.4		Priming patch area	<ul style="list-style-type: none"> Faulty equipment Misusing equipment Spraying outside patch area, onto plant and other road users Emulsion spray/fumes 	<ul style="list-style-type: none"> Eye and respiratory irritation Minor injuries Damage to tools/equipment Financial loss Project interruption 	C	3	9	<ul style="list-style-type: none"> Training on MSDS's Induction Wearing required PPE Supervision Traffic Accommodation Flagmen in position
15.4.5		Filling & compacting with whacker/ride on roller	<ul style="list-style-type: none"> Faulty equipment Running over equipment Hitting workers Excessive noise 	<ul style="list-style-type: none"> Major injuries Equipment/Plant damage Project interruption Financial loss NIHL Eye and respiratory irritation 	C	4	14	<ul style="list-style-type: none"> Induction Supervision Operators authorised, competent and medically fit Registers/Checklists Wearing required PPE Dust suppression

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15.5.1	SURFACING & SEALING OF ROAD (ASPHALT SURFACING, CRACK SEAL, SLURRY AND PATCHING)	SLURRY Mixing of slurry with small mixer	<ul style="list-style-type: none"> Turning/Rotating parts not covered Excessive dust Working with bituminous products Faulty equipment Misuse of equipment 	<ul style="list-style-type: none"> Major injuries Equipment/Plant damage Project interruption Financial loss Eye and respiratory irritation 	C	4	14	<ul style="list-style-type: none"> Task Specific Training Supervision Operators authorised, competent and medically fit Registers/Checklists Wearing required PPE Dust suppression
15.5.2		Slurry transported by wheelbarrow Slurry spread with squeegees	<ul style="list-style-type: none"> Slurry coming into contact with skin Workers falling over obstacles not visible causing injury 	<ul style="list-style-type: none"> Injury to body Injury due to misuse of equipment Injury due to faulty equipment 	C	3	9	<ul style="list-style-type: none"> Wearing of correct PPE First aid to be at hand
16.1	EXCAVATION AND TRENCHING	Establish work area for excavator/TLB	<ul style="list-style-type: none"> Unstable working area Workers/Members of public struck by moving plant Setting out of pegs 	<ul style="list-style-type: none"> Multiple injuries Fatalities Financial loss Damage to plant Production time loss Legal liability claims 	C	5	19	<ul style="list-style-type: none"> Task Specific Training Operators authorized, competent and medically fit Inspection of work area Registers/Checklists Flagmen in position near edge of excavation Supervision Wearing of required PPE
16.2		Excavating with TLB/Excavator	<ul style="list-style-type: none"> Workers/Members of public struck by moving plant Faulty equipment Edges of excavations collapsing Equipment, Tools, Employees/Members of public falling into excavation 	<ul style="list-style-type: none"> Multiple injuries Damage to plant and equipment Production time loss 3rd Part claims 	C	4	14	<ul style="list-style-type: none"> Operator authorized, competent and medically fit Stable working area for plant Registers/Checklists Flagmen in position near edge of excavation Supervision Wearing of required PPE
16.3		Working in excavation, excavation by hand	<ul style="list-style-type: none"> Congestion Collapsing of excavation/trench walls Faulty equipment Hitting underground services 	<ul style="list-style-type: none"> Electric shock Multiple injuries Engulfment Damage to plant and equipment 	C	4	14	<ul style="list-style-type: none"> Supervision Registers/Checklists Wearing of required PPE Task Specific Training

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17.1	V-DRAINS, EDGE BEAMS AND CONCRETE WORKS	Setting out of edge beam, V-Drain and concrete works area Insert level pegs according to plan	<ul style="list-style-type: none"> Misuse of equipment Faulty equipment Tripping over pegs 	<ul style="list-style-type: none"> Injury Accident/Incident Legal liability claims Financial loss 	C	3	14	<ul style="list-style-type: none"> Supervision Task specific training Wearing required PPE Registers/Checklists
17.2		Excavation of edge beam, V-Drain and concrete works area by hand	<ul style="list-style-type: none"> Faulty equipment Obstacles/uneven surfaces Dust Rocks, gravel shooting up into the eyes 	<ul style="list-style-type: none"> Trips and fall misuse of equipment Injury due to faulty equipment 	C	3	14	<ul style="list-style-type: none"> Supervision Task specific training Wearing required PPE Registers/Checklists
17.3		Compacting of floor using pedestrian roller or compactor	<ul style="list-style-type: none"> High noise levels Excessive dust Faulty equipment Running over equipment and tools 	<ul style="list-style-type: none"> Injuries Damage to plant and equipment Noise Induced Hearing Loss Financial loss 	C	3	14	<ul style="list-style-type: none"> Supervision Task specific training Wearing required PPE Registers/Checklists
17.4		Mixing concrete using Concrete Mixer	<ul style="list-style-type: none"> Cement dust inhalation Splashing cement 	<ul style="list-style-type: none"> Injuries Eye irritation Production interruption Financial loss 				<ul style="list-style-type: none"> Supervision Task specific training Wearing required PPE Registers/Checklists
17.5		Pouring concrete for edge beam, wing wall or apron slabs	<ul style="list-style-type: none"> Splashing onto workers Faulty equipment Mixer truck being hit by other road users 	<ul style="list-style-type: none"> Injuries Eye irritation Production interruption Financial loss 	C	3	14	<ul style="list-style-type: none"> Task specific training Wearing required PPE Registers/Checklists Traffic accommodation Flagmen in position Supervision TSO to check on activities regularly
18.1	CULVERTS	Excavation of trench (TLB/Excavator)	<ul style="list-style-type: none"> TLB/Excavator hitting workers TLB/Excavator hitting other road users/plant Incorrect trenching/digging Hitting unidentified services 	<ul style="list-style-type: none"> Major injuries Fatalities Project interruption Financial loss Legal liability claims Property damage 	C	5	19	<ul style="list-style-type: none"> Task Specific Training Operator authorised, competent and medically fit Prestart checklists Supervision Wearing of required PPE Service provider notified of construction activities Working according to lay out plan

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18.2	CULVERTS	Placing/Spreading bedding and compacting	<ul style="list-style-type: none"> Faulty tools Congestion Excavation collapse (If depth is greater than 1m) High noise levels Vibration 	<ul style="list-style-type: none"> Major injuries Damage to tools/equipment Project interruption Financial loss Noise induced hearing loss White finger syndrome Hand arm vibration syndrome 	C	4	14	<ul style="list-style-type: none"> Task Specific training Supervision Wearing required PPE Checklists Working according to lay out plan
18.3		Workers along with the lifting equipment lower pre manufactured culverts into the trench	<ul style="list-style-type: none"> Slip and fall Unsafe Equipment & Tools Lifting equipment not load tested 	<ul style="list-style-type: none"> Injury due to overcrowding. Injury from faulty equipment. Hand injuries 	C	4	14	<ul style="list-style-type: none"> Task Specific training Safe work procedures Wearing required PPE, Supervision. Only authorise and competent operators to operate machinery/vehicles.
18.4		Covering the culvert in trench, with soil / soilcrete with machinery and hand tools.	<ul style="list-style-type: none"> TLB/Excavator hitting workers TLB/Excavator hitting other road users/plant Hitting unidentified services 	<ul style="list-style-type: none"> Major injuries Fatalities Project interruption Financial loss Legal liability claims Property damage 	C	5	19	<ul style="list-style-type: none"> Task Specific Training Operator authorised, competent and medically fit Prestart checklists Supervision Wearing of required PPE
19.1	MAJOR STRUCTURES (CULVERTS / BRIDGES)	Working at heights	<ul style="list-style-type: none"> Workers might fall due to incorrect use of safety equipment (safety harnesses) 	<ul style="list-style-type: none"> Fatality. Major injury Head injuries Disabling injuries 	C	4	14	<ul style="list-style-type: none"> Training on how to use PPE correctly Engineering controls in place Correct PPE supplied for task Toolbox talks First aider on site Planned Task Observations Pre-use inspections on safety equipment Supervision Daily Safety Task Instructions
19.2		Climbing onto Structures	<ul style="list-style-type: none"> Not taking safe position. Slipping and Falling from structure. Tools falling Safety harness not properly used 	<ul style="list-style-type: none"> Financial loss Workers falling from elevated position Fatality Serious injury 	C	4	14	<ul style="list-style-type: none"> Induction training Task specific training, Authorised personnel to work on structures, Correct PPE to be worn (Safety Harness important). Fall protection plan to be implemented. Supervision First aider to be on site at all times All workers working at heights to be declared medical fit Workers to undergo working at heights training

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19.3	MAJOR STRUCTURES (CULVERTS / BRIDGES)	Working on structure	<ul style="list-style-type: none"> Working on erected position with faulty harnesses Falling tools Slip and fall 	<ul style="list-style-type: none"> Serious injury Fatality Financial loss Project time interruption Property damage 	C	5	19	<ul style="list-style-type: none"> Task specific training, Authorised personnel to work on structures, Correct PPE to be worn Safety Harness important). Fall protection plan to be implemented. Medical fitness certificates of workers to be valid and in place. Working at height training Supervision Daily Safety Task Instructions Plan Task Observations
19.4		Falling Objects	<ul style="list-style-type: none"> Falling tools 	<ul style="list-style-type: none"> Serious injuries 	C	3	9	<ul style="list-style-type: none"> Task specific training Tool inspections Demarcating area Supervision DSTI's PTO's SOP's First Aider Present
19.5		Scaffolding / Temporary Works	<ul style="list-style-type: none"> Working on erected position with faulty harnesses Falling tools Slip and fall 	<ul style="list-style-type: none"> Serious injury Fatality Financial loss Project time interruption Property damage 	C	5	19	<ul style="list-style-type: none"> Task specific training, Authorised personnel to work on structures, Correct PPE to be worn Safety Harness important). Fall protection plan to be implemented. Scaffold to be erected as per SANS10085-1 and inspected by authorised person upon erection Medical fitness certificates of workers to be valid and in place. Working at height training
20.1	FENCING	Digging of holes	<ul style="list-style-type: none"> Use of damaged tools Exposure to poisonous animals 	<ul style="list-style-type: none"> Injuries Time loss 	C	3	9	<ul style="list-style-type: none"> Task specific training Tool inspections Demarcating area Supervision DSTI's PTO's SOP's

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20.2		Installation of fencing	<ul style="list-style-type: none"> Poor offloading practices, Unstable foot conditions Using of unsafe tools Substandard housekeeping 	<ul style="list-style-type: none"> Injuries Theft of materials Financial loss Equipment Damage 	C	3	9	<ul style="list-style-type: none"> Tool inspection Housekeeping Security patrol Task specific training DSTI's PTO's SOP's
			<ul style="list-style-type: none"> Working near sharp edges 	<ul style="list-style-type: none"> Injuries Time loss Legal liability claims 	C	4	14	<ul style="list-style-type: none"> Issuing of PPE Equipment inspections Task Specific Training DSTI's PTO's SOP's
21.1	HEADWALLS	Bricklaying	<ul style="list-style-type: none"> Working at heights Uneven surfaces Faulty equipment, tools and materials Scaffold/Structure collapse Excessive dust (Brick dust and cement) Noise (Equipment) Vibration (Grinder/Brick cutter) Splashing cement Manual handling 	<ul style="list-style-type: none"> Minor injuries Major Injuries Fatalities (If falling from height) Eye, skin and respiratory irritation Occupational Illnesses and Diseases Sprains and strains 	C	4	14	<ul style="list-style-type: none"> Task Specific Training Wearing required PPE Supervision Registers/Checklists
21.2		Plastering	<ul style="list-style-type: none"> Working at heights Uneven surfaces Faulty equipment, tools and materials Scaffold/Structure collapse Splashing cement Manual handling Excessive cement dust 	<ul style="list-style-type: none"> Minor injuries Major Injuries Fatalities (If falling from height) Eye, skin and respiratory irritation Occupational Illnesses and Diseases Sprains and strains 	C	4	14	<ul style="list-style-type: none"> Task Specific Training Wearing required PPE Supervision Registers/Checklists

Step No	Activity	Task	Potential Hazards	Risks	Current Risk			Suggested Control Measures
	List activity steps	List task steps	Potential dangers that could cause harm. List the potential hazards	Potential Risks due to Hazard	PROB	CON	Ranking	If the risk is not tolerable, establish further controls to mitigate/prevent
22.1	DRILLING & BLASTING	Drilling of Blast Holes	<ul style="list-style-type: none"> • Use of damage drill rig • Rotating Parts • Incompetent Operators • Incorrect Drill Method • Employment of inexperienced personnel • Use of unlawful equipment • Blast holes drilled incorrectly 	<ul style="list-style-type: none"> • Injury • Property damage • Production / Time loss • Financial loss • Noise • Dust 	C	5	19	<ul style="list-style-type: none"> • Pre inspection checklist • Task specific training • Occupational Hygiene Survey • Competent personnel / operators to be used • Supervision • Only registered, experienced blasters skilled in this type of work with current permits to be employed • Blaster to accurately set out round and check correctness on completion of drilling
22.2		Transportation of Explosives to Blasting Area / Site	<ul style="list-style-type: none"> • Fatigue • High jacking • Being hit by other road users • Hitting flagmen/pedestrians • Hitting other plant or road users • Hitting surrounding properties and services 	<ul style="list-style-type: none"> • Material loss • Financial loss • Legal Liability Claims • Criminal Charges • Accidents • Fatalities • Major injuries • Damage to plant, property, services and other vehicles • 3rd Party claims • Project interruption 	C	4	14	<ul style="list-style-type: none"> • Registered company to be use for transporting explosives • Vehicle surveillance / tracking • Task specific training • Drivers/Operators authorised, competent and medically fit • Prestart checklist • Explosives transport permit to be in place • Waybills
22.3		Storing and issuing of explosives	<ul style="list-style-type: none"> • Access to Explosives not controlled • No supervision 	<ul style="list-style-type: none"> • Theft • Criminal Prosecution • Property and equipment loss • Financial loss 	C	5	19	<ul style="list-style-type: none"> • Access to Explosives to be controlled / locked at all times • Explosives must be booked in and out as per legal requirements magazine • Only blaster or delegate is allowed to book explosives in or out

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22.4	DRILLING AND BLASTING	Charging of Blast Holes and connecting charges	<ul style="list-style-type: none"> Blast holes charged incorrectly Uneven surfaces Incorrect handling Faulty equipment Premature set off Blast holes drilled incorrectly 	<ul style="list-style-type: none"> Explosion Fatalities Major injuries Damage to plant, property, services and other vehicles 3rd Party / Legal liability claims Financial loss Project interruption 	C	4	15	<ul style="list-style-type: none"> Blaster to be authorised & competent Civil blasting certificate to be available Registers/Checklists for explosives, detonators, etc. completed Required permits to be obtained Local authorities to be notified Supervision Notification of surrounding residents, businesses and other that may be affected Emergency procedures to be in place Trained blasting professionals to be present Appropriate blasting and hazard signage to be in place and visible Access control to blasting area Use of competent and trained workers
22.5		Setting off Blast	<ul style="list-style-type: none"> Inexperienced personnel Use of unlawful equipment Blast holes charged incorrectly Blast damage to surrounding structures and services Misfires Fly rock Premature set off Charges not set off Personnel / Community members still in Blasting area 	<ul style="list-style-type: none"> Fire risk Legal liability claims Financial loss Fatalities Property damage Major injuries Damage to plant, property, services and other vehicles 3rd Party claims Project interruption 	C	5	19	<ul style="list-style-type: none"> Local authorities notified Supervision Notification of surrounding residents, businesses and other that may be affected Evacuation of surrounding area Traffic accommodation as per Traffic Management Plan Blaster to be qualified and must adhere to legal requirements Only single shot detonation to be used to limited PPV's to below 25mm/s Competent blaster Task specific training PPE Approved Blasting Procedures to be followed Road must be closed for blasting period Permit to blast Emergency procedures to be in place

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22.6		Inspection after Blast	<ul style="list-style-type: none"> Loose debris can fall on workers Unstable ground Misfires Financial loss Legal liability claims 	<ul style="list-style-type: none"> Injury to workers Financial loss Legal liability claims Slip and fall incidents 	C	5	19	<ul style="list-style-type: none"> Blasting site to be inspected by Blaster Site to be declared safe before allowing return of people First aid to be available Blasting professional to assist Blaster with access control into or out of Blast area
23.1	CRUSHING AND SCREENING OF MATERIAL	Operating Crushing & Screening Equipment	<ul style="list-style-type: none"> Exposure to moving machine parts Crushing / screening not done according to procedures 	<ul style="list-style-type: none"> Serious injuries Legal liability claims Production time loss Project interruption Major financial loss Silica Exposure Dust Noise Induced Hearing Loss 	C	4	14	<ul style="list-style-type: none"> Safe operating procedures to be in place Task specific training to be given to all workers Only competent operators to operate Crushing / Screening Plant No unauthorized access to be allowed near machinery Machinery to be inspected before every shift Wearing of Required PPE e.g. Ear Plugs, Dust Masks Occupational Hygiene Survey to be done Silica Exposure to be reported to DoEL
24.1	ELECTRICAL WORKS	Location of existing structures & services	<ul style="list-style-type: none"> No and/or outdated plan available Striking of existing services can lead to Electrocutation Unable to recognize the different services (Telkom, electrical, gas) Slip trip and falls due to trench 	<ul style="list-style-type: none"> Serious Injury Fatalities Financial Loss Time Loss Legal Liability Claims Trench over flooding due to striking of water pipes 	C	5	19	<ul style="list-style-type: none"> Enquire about a plan to help locate the existing and underground services before work commences Competent person must read and interpret plans Excavation must be performed by hand or shovel. No picks can be used Eskom and/or Local Municipality to give clearance of activities Supervision Correct PPE to be worn

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24.2		Excavation & Trenching	<ul style="list-style-type: none"> Existing services No appointed supervision No Access / Egress ladder Inadequate Shoring Inadequate Sloping Collapsing of Excavation Insufficient Barricading No Symbolic warning signs displayed 	<ul style="list-style-type: none"> Serious Injury Fatalities Financial Loss Time Loss Legal Liability Claims Suffocation Electrocution Slip, Trip & Falls 	C	5	19	<ul style="list-style-type: none"> Existing services to be inspected and located Excavation supervisor has to be appointed Access ladders must be made available for safe access by employees Shoring & sloping to be adequate if and when required No plant or excess soil must be placed on the edge of the excavation Excavation must be sufficiently barricaded Warning signs to be displayed on barricading Employee must wear appropriate PPE
24.3		Drainage of trenches and excavations	<ul style="list-style-type: none"> Hot Pipes from pump Soil contamination Slip, Trip & Falls Drowning Collapsing of excavation 	<ul style="list-style-type: none"> Illness Minor & Major Injuries Fatalities Burns Electrocution 	C	4	14	<ul style="list-style-type: none"> Supervision Drip tray to be placed under water pump Pipes to be placed to minimize slip, trip and falls Access ladders to be available for employees Water pump not to be placed close to the excavation edge
24.4	ELECTRICAL WORKS	Layering and bedding	<ul style="list-style-type: none"> Collision between plant and public traffic & persons Incompetent operator Persons riding or jumping on moving plant Compactor crushing feet Plant leaks can cause damage to the environment No PPE supplied 	<ul style="list-style-type: none"> Serious Injuries Crushing Fatalities Financial Loss Time Loss Legal Liability Claims 	C	4	14	<ul style="list-style-type: none"> Flagmen and appropriate road signage to be in place and operating at all times All plant to have reverse hooters and revolving lights Only trained operators to be used Daily inspections and checklists on all plant & equipment to be done

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24.5		Electrical Installation / Optical Fibre Installation	<ul style="list-style-type: none"> • Live Electrical Wires • Misuse of equipment • Fire • Incompetent Person • No or poor traffic accommodation • Trench collapsing • Overcrowding in trench 	<ul style="list-style-type: none"> • Serious Injuries • Electrocution • Electric Burns • Fatalities • Financial Loss • Time Loss • Legal Liability Claims • Property Damage 	C	4	14	<ul style="list-style-type: none"> • Get an accredited/registered contractor to do the work • Get certificate of compliance once installation is complete • Firefighting equipment to be close by • Ensure the correct equipment is used for the task • Traffic accommodation to be implemented if required • Supervision • Overcrowding to be prevented when laying cables in trench
24.6		Connecting of Electricity to existing system	<ul style="list-style-type: none"> • Live Electrical Wires • No lock out procedures available • No labels on cables • Fire • Incompetent Person 	<ul style="list-style-type: none"> • Serious Injuries • Electrocution • Electric Burns • Fatalities • Financial Loss • Time Loss • Legal Liability Claims • Property Damage 	C	4	14	<ul style="list-style-type: none"> • Lock out procedures available • Only a competent and registered person to carry out electrical work • Electricity stream to be checked after lockout has been done to ensure lockout was done properly and that no electricity is present • Lockout to be done by supervisor • Supervisor to ensure only he/she has access to remove lockout • Cables to be labelled with its description • Firefighting equipment to be close by
24.7		Testing of installation	<ul style="list-style-type: none"> • Live Electrical Wires • Incorrect Equipment Used • Fire • Incompetent Person • Explosion • 	<ul style="list-style-type: none"> • Serious Injuries • Electrocution • Electric Burns • Fatalities • Financial Loss • Time Loss • Legal Liability Claims • Property Damage 	C	4	14	<ul style="list-style-type: none"> • Only a competent and registered person to carry out electrical testing • Correct equipment to be used, i.e. DC voltmeter to be used on a DC system • Equipment to be calibrated • Ensure firefighting equipment is available • Correct PPE to be worn
25.1	EXPOSURE TO ENVIRONMENTAL CONDITIONS	Working in hot conditions	<ul style="list-style-type: none"> • Heat radiating from plant and equipment • Ultra Violet rays • High temperatures 	<ul style="list-style-type: none"> • Dehydration • Heat Exhaustion • Heat Stroke • Heat cramps • Heat rash • Sunburns • Fatigue 	C	4	14	<ul style="list-style-type: none"> • Subscription to weather notification service • Employee rotation policy • Longer rest periods • Water available • Shaded area • Awareness training • Fitness Certificates • Supervision

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25.2		Working in Cold conditions	<ul style="list-style-type: none"> • Cold equipment • Extreme low temperatures • Snow, sleet, rain and winds 	<ul style="list-style-type: none"> • Hypothermia • Chilblains • Immersion/Trench foot • Frostnip • Colds & Flu 	D	4	10	<ul style="list-style-type: none"> • Subscription to weather notification service • Employee rotation policy • Sheltered area • Heat retaining PPE (Freezer jackets) • Hot drinks
25.3		Working in inclement weather	<ul style="list-style-type: none"> • Lightning 	<ul style="list-style-type: none"> • Fatalities • Severe burns • Damage to plant and equipment • Power failures 	D	5	15	<ul style="list-style-type: none"> • Subscription to weather notification service • Work stopped in inclement weather
25.4		Threats from animals e.g. dogs, snakes, spiders, bees, etc.	<ul style="list-style-type: none"> • Dog Bites • Snake Bites • Spider Bites • Bee Stings 	<ul style="list-style-type: none"> • Rabies • Poisoning • Allergic Reactions • Shock • Fatalities 	D	5	15	<ul style="list-style-type: none"> • Emergency preparedness • Emergency numbers/poison information centre number available • First Aider • Training on snake handling/ awareness
25.5		Threats from local communities	<ul style="list-style-type: none"> • Burglaries • Muggings • Vandalism • Theft • Protests 	<ul style="list-style-type: none"> • Stabbing • Multiple injuries • Fatalities • Financial loss • Damage to property, plant and equipment • Project interruption 	C	5	19	<ul style="list-style-type: none"> • Liaison with community • Site security • Induction • Emergency preparedness • Additional security • Frequent communication with community

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267.1	TRANSMITTABLE DISEASES (E.G. COVID-19)	Coming into contact with other workers. Normal working activities on site	<ul style="list-style-type: none"> Workers exposed to Health Hazards namely Diseases / Bacteria / Viruses (e.g. COVID-19) 	<ul style="list-style-type: none"> Serious illnesses due to Health hazards - Contracting disease. 	C	5	20	<ul style="list-style-type: none"> Health and Safety Management Plan to include planning around transmittable diseases and the relevant regulations Compile and implement a Risk Assessment and Safe Operating Procedure pertaining to the transmittable disease Toolbox talks / other gatherings / meetings to be held in small groups (depending on the COVID-19 level and measurements) Emergency Response and Prevention Plan to be developed and implemented Employees to be trained in the content of the risk assessments revised H&S Plan, COVID-19 Risk Assessment Other informal training / communication pertaining COVID-19 Implementation and adherence to the Emergency Response and Prevention Plan submitted by the Pr. CHSA Social Distancing to be implemented. Employees to keep a fair distance of 1.5 to 2 meters from co-workers
26.2		Coming into contact with other workers. Normal working activities on site	<ul style="list-style-type: none"> Workers exposed to Health Hazards namely Diseases / Bacteria / Viruses (e.g. COVID-19) 	<ul style="list-style-type: none"> Serious illnesses due to Health hazards. Contracting disease. 	4	5	20	<ul style="list-style-type: none"> Contractor to implement a self-screening tool by means of a questionnaire. This must be kept on record for all employees. This must be done prior to employees / visitors/ contractors entering the site and bi-weekly (every second week) thereafter. It is recommended that a daily infrared temperature test is conducted on all employees / visitors / contractors at the site entrance.
27.1	PORTABLE ELECTRICAL EQUIPMENT	Inspection of Portable Electrical Equipment	<ul style="list-style-type: none"> Failure to inspect Inspection not done properly 	<ul style="list-style-type: none"> Serious injury Damage to equipment Production Interruption 	C	3	9	<ul style="list-style-type: none"> Daily inspection Inspector appointed Lockout Repair findings

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27.2		Working with Grinders, Drills etc.	<ul style="list-style-type: none"> Misuse of equipment Faulty equipment Not using the right disk/drill bit Failure to follow lockout procedure Shooting/Fractured parts Guards not used/absent Operating near flammables Workers not wearing PPE Earth not connected 	<ul style="list-style-type: none"> Amputations Serious injury Blindness Electrical shock Financial loss Production interruption 	C	3	9	<ul style="list-style-type: none"> Wearing of correct PPE Supervision Registers/Checklists All equipment being used to be guarded properly Workers to ensure that all surfaces are clean and free from flammable articles before starting grinding operations
28.1	HAND TOOLS	Working with hand tools	<ul style="list-style-type: none"> Misuse of equipment Faulty equipment 	<ul style="list-style-type: none"> Injuries (cuts, bruises, etc.) Equipment damage Production Interruption 	C	3	9	<ul style="list-style-type: none"> Registers/Checklists Wearing of required PPE Supervision Task Specific Training
29.1	ROAD SIGNS	Surveyor to set out sign positions (Also refer to survey and setting out)	<ul style="list-style-type: none"> Workers being hit by other road users Faulty equipment/tools 	<ul style="list-style-type: none"> Accidents Major injuries Fatalities Project interruption 	C	3	9	<ul style="list-style-type: none"> Supervision Traffic awareness training Wearing of correct PPE. Stop/Go controls Flagmen
29.2		Excavate post holes by hand with pick and spade	<ul style="list-style-type: none"> Workers being hit by other road users Faulty equipment/tools 	<ul style="list-style-type: none"> Accidents Major injuries Fatalities Project interruption 	C	3	9	<ul style="list-style-type: none"> Supervision Traffic awareness training Wearing of correct PPE. Stop/Go controls Flagmen
29.3		Erecting/Handling signs	<ul style="list-style-type: none"> Fixing/Moving signs Faulty equipment Workers being hit by other road users 	<ul style="list-style-type: none"> Major injuries Fatalities Cuts Damage to signs Financial loss 	C	4	14	<ul style="list-style-type: none"> Supervision Traffic awareness training Wearing of correct PPE. Stop/Go controls Flagmen
30.1	ROAD MARKING	Pre marking/Painting with traffic	<ul style="list-style-type: none"> Worker hit by other road users Spray truck hit by other road users Spray truck hitting workers 	<ul style="list-style-type: none"> Fatalities Major accidents Liability claims Financial loss Project interruption 	C	5	19	<ul style="list-style-type: none"> Traffic accommodation Flagmen in position Traffic awareness training Supervision Wearing required PPE PTO's Task Specific Training

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30.2	ROAD MARKING	Placing road studs	<ul style="list-style-type: none"> Worker hit by other road users Spray truck hit by other road users Spray truck hitting workers 	<ul style="list-style-type: none"> Fatalities Major accidents Liability claims Financial loss Project interruption 	C	5	19	<ul style="list-style-type: none"> Traffic accommodation Flagmen in position Traffic awareness training Supervision Wearing required PPE PTO's Task Specific Training
31.1	SITE DESTABLISHMENT (DEMobilIZATION)	Loading Mobile Machinery, EQUIPMENT and tools onto LDV 's and Trucks	<ul style="list-style-type: none"> Overcrowding, Poor offloading practices, Uneven surfaces Using of unsafe offloading practices Tripping and falling over equipment and articles laying around Hit by moving plant 	<ul style="list-style-type: none"> Multiple injuries Back injuries Sprains & strains Theft of materials Financial loss Equipment Damage 	C	4	14	<ul style="list-style-type: none"> Task specific training Wearing required PEE 25kg per person weight ratio to be adhered to. Heavy & odd shaped objects to be handled by two or more workers. Correct stacking practices Supervision Supervision. Lifting equipment load tested Operators authorised, competent and medically fit Prestart checklists
31.2		Transporting of Machinery and Tools from site	<ul style="list-style-type: none"> Warning devices on vehicles not working Overhead services Running over co-workers (Supervisor etc.) Accidents Hitting other plant 	<ul style="list-style-type: none"> Project interruption Financial loss Equipment Damage Fatalities Legal liability claims 	C	5	19	<ul style="list-style-type: none"> Operator/driver authorised, competent and medically fit Supervision Driver must adhere to the speed limits on site
31.3		Offloading Machine, Equipment, Containers, Offices and Tools	<ul style="list-style-type: none"> Overcrowding, Poor offloading practices, Uneven surfaces Using of unsafe offloading practices Tripping and falling over equipment and articles laying around Hit by moving plant 	<ul style="list-style-type: none"> Multiple injuries Back injuries Sprains & strains Theft of materials Financial loss Equipment Damage 	C	4	14	<ul style="list-style-type: none"> Task specific training Wearing required PEE 25kg per person weight ratio to be adhered to. Heavy & odd shaped objects to be handled by two or more workers. Correct stacking practices Induction training. Supervision

PART C5: ANNEXURES
