



THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

**APPOINTMENT OF A SERVICE PROVIDER
FOR THE COMMUNITY DEVELOPMENT
PROJECT
FOR THE IMPROVEMENT OF PEDESTRIAN
FACILITIES ON NATIONAL ROUTE 5
SECTION 3 FROM KM 34.0 TO PAUL ROUX
(KM 37.0)**

PROJECT DOCUMENT

**BASE DATE: JUNE 2025
TENDER DOCUMENT**

**VOLUME 3
BOOK 3 OF 3**

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

NAME OF TENDERER:

.....

Set sequential number



THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM 37.0)

THIS DOCUMENT COMPILED BY:

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

ProcurementHO04@sanral.co.za

LIST OF CONTRACT DOCUMENTS

The following documents form part of this contract:

- VOLUME 1: Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer (1999), published by the Fédération Internationale des Ingénieurs-Conseils (FIDIC)
- 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: 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 contained in Annexure C of the CIDB Standard for Uniformity in Construction Procurement as per Government Notice No. 423 published in Government Gazette No. 42622 of 8 August 2019 and as amended from time to time. (see www.cidb.org.za).

<https://www.cidb.org.za/download/100/procurement-documents-templates-and-guidelines/6157/standard-for-uniformity-august-2019.pdf>

- VOLUME 4: Contract Drawings
- VOLUME 5: Tender Clarification Information Booklet

Notes to Tenderers:

1. VOLUME 1

This Volume 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

This Volume is obtainable from SANRAL and can be downloaded free of charge from the SANRAL's website www.nra.co.za.

3. VOLUME 3

This Volume is issued at tender stage in electronic format and can be downloaded from the SANRAL's website www.nra.co.za.

The website contains the following files:

- a) The full Project Document in pdf format (excluding the Standard Conditions of Tender).
- b) The Returnable Forms in MS Word format.
- c) The Pricing Data in MS Excel format.

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

<http://www.cidb.org.za/News/Documents/Standard%20for%20Uniformity%20August%202019.pdf>

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

- a) Returnable schedules relevant to the project.
- b) Agreements and Contract Data.
- c) Pricing Data.
- d) Scope of Work.
- e) Project Information.

4. Submission of Tender

Of the contract documents, only the following parts of VOLUME 3 needs to be submitted in (1) a printed and bound hard copy and (2) electronically on a flash drive marked "Main Tender", followed by the Tenderer's name, in a sealed envelope, in the following order:

- a) Form of Offer (signed in hard copy and scanned as .pdf)
- b) Returnable Schedules, attachments and certificates (hard copy and scanned as .pdf)
- c) Pricing Schedule (completed in hard copy, scanned as .pdf and MS Excel copy).

5. Alternative Offers

For alternative offers the Tenderer shall submit the following additional documentation, in (1) a printed and bound hard copy and (2) electronically on a separate flash drive marked "Alternative", followed by the Tenderer name, in a sealed envelope in the following order:

- a) Form of Offer (signed in hard copy and scanned as .pdf and state "Alternative Form of Offer")
- b) Returnable Schedules, attachments and certificates (hard copy and scanned as .pdf)
- c) Alternative Pricing Schedule (completed in hard copy, scanned as .pdf and MS Excel copy).

Information provided by a Tenderer over and above the above parts of Volume 3 shall be treated as information only and will only be bound into the Contract if the Tenderer notes on Form A4: Schedule of Variations or Deviations, that the information has a bearing on the tender price.

TABLE OF CONTENTS	PAGE
VOLUME 3 BOOK 1 OF 3	
PART T1: TENDERING PROCEDURES	T-6
PART T2: RETURNABLE SCHEDULES	T-26
VOLUME 3 BOOK 2 OF 3	
PART C1: AGREEMENTS AND CONTRACT DATA	C-1
VOLUME 3 BOOK 3 OF 3	
PART C2: PRICING DATA	C-48
PART C3: SCOPE OF WORK	C-56
PART C4: SITE INFORMATION	C-376
PART C5: ANNEXURE	C-384

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT
OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

PART C2: PRICING DATA

TABLE OF CONTENTS	PAGE
C2.1: PRICING INSTRUCTIONS.....	C-50
C2.2: PRICING SCHEDULE (INCORPORATING SBD3).....	C-54
C2.3: SUMMARY OF PRICING SCHEDULE.....	C-55

C2.1 PRICING INSTRUCTIONS

C2.1.1 Measurement and payment shall be in accordance with:

- a) the relevant provisions of the Standard Specifications as amended in the Scope of Works; and
- b) the relevant provisions of the COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (Draft Standard October 2020 edition), as amended in the Scope of Works,

whichever is relevant to the particular section.

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 purposes of this Pricing Schedule, 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 Scope of Works.
Quantity:	The number of units of work for each item as provided by the Employer or as tendered by the Service Provider.
Rate:	The payment per unit of work for which a rate has been provided by the Employer or for which the Service Provider 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 Pricing Schedule, the Scope of Work or elsewhere, but of which the quantity of work is not measured in units.

Provisional Sum:

An amount allowed for in the Pricing Schedule, for which the quantity of work is not known.

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 cost for which a rate or a lump sum is offered at tender stage to cover all the tenderer's handling, supervision and liability costs in providing the item or services.

Trainee Credit:

Is the product of the number of Trainees to be trained and the number of Unit Standard credits required for a Trainee to complete a SAQA accredited qualification on a specified NQF level.

C2.1.4 The quantities provided by the Employer in the Pricing Schedule are only approximate quantities. The quantities of work finally accepted and certified for payment, and not the quantities given in the Pricing Schedule, will be used to determine payments to the Service Provider.

The validity of the Contract shall in no way be affected by differences between the quantities in the Pricing Schedule and the quantities finally certified for payment. Work is valued at the rates or lump sums tendered.

C2.1.5 Rates and lump sums shall include full compensation for overheads, profits, incidentals, tax (other than VAT), etc., and for the completed items of work as specified in the Scope of Works and Contract Data and for all the risks, obligations and responsibilities specified in the General Conditions of Contract, Particular or Special Conditions of Contract, except in so far as the quantities given in the Pricing Schedule are only approximate.

C2.1.6 The tenderer shall fill in a quantity or a rate or a lump sum for each item where provision is made. Items against which no rate or lump sum has been entered in the tender will not be paid for when the work is executed, as payment for such work will be regarded as being covered by other rates or lump sums in the pricing schedule.

The tenderer shall fill in a rate against all items where the words "rate only" appears in the amount column. Although no work is foreseen under such item and no quantities are consequently given in the quantity column, the tendered rate shall apply should work under this item actually be required. Tenders should note the provisions of clause C2.1.10 of this preamble.

The tendered lump sums and rates shall be valid irrespective of any change in the quantities during the execution of the contract.

C2.1.7 The short descriptions of the payment items in the Pricing Schedule are only given to identify the items and to provide specific details. Reference shall, *inter alia*, be made to the Contract Data, General Conditions of Contract and Particular/Special Conditions of Contract and Scope of Works for more detailed information regarding the extent of work entailed under each item.

C2.1.8 Where so indicated under measurement and payment, prices or rates will be subject to adjustment for escalation as provided for below:

a) The prices or rates shall be fixed for the first 12-month period determined from the tender base date and no change during this period will be allowed for escalation.

- b) On the 12-month anniversary date of the Contract base date the rates or sums shall be adjusted by the 12-month year on year CPI index (as published in the monthly bulletin PO141. of Statistics South Africa under table B) and fixed at this value for the following 12-month period. Subsequent 12-month periods shall be dealt with on the same basis.
- c) Adjustment of lump sum prices for escalation shall only be applicable to that portion of the relevant Service which is incomplete at the end of the 12-month anniversary date and shall not be applicable to any progress payments already claimed.

Adjustment for escalation shall only be applicable for services or portions thereof, that are still within the prescribed programme and any approved extensions of time.

C2.1.9 Interim payments for lump sum payment items may be permitted. Such interim payments shall however be limited to proven progress achieved for that service deliverable. The sum of any progress payments made under a lump sum payment item shall be deducted prior to calculating any adjustments for escalation as described in clause C2.1.6 above.

C2.1.10 Provisional and Prime Cost Sums: Each Sum shall only be used, in whole or in part, in accordance with the Employer's instructions and the Contract Price shall be adjusted accordingly. The total sum paid to the Service Provider shall include only such amounts, for the work, supplies or services to which the Sum relates, as the Employer shall have instructed.

For each Sum, the Employer may instruct plant, materials or services to be procured by the Service Provider in accordance with the Employer's policies, and for which there shall be included in the Contract Price:

- a) The actual amounts paid (or due to be paid) by the Service Provider under the Sum, and
- b) An item for compilation and printing of procurement documentation, quotation/tender process and evaluation, and all overhead charges and profit, tendered in the Pricing Schedule. Provided that for Prime Cost Sums only, where a percentage mark-up or lump sum mark-up is tendered, which shall exclude profit.

The Service Provider shall produce all quotations, invoices, vouchers and accounts or receipts in substantiation of any claim under a Sum.

Any percentage adjustment or lump sum mark-up against the Sum for handling fee, profits, etc. shall not be negative.

C2.1.11 Subject to the conditions stated in Clause C2.1.12 below, the rates and lump sums filled in by the tenderer in the pricing schedule shall be final and binding when submitting the tender and may not be adjusted should there be any mistakes in the extensions thereof and in the total sums appearing in the tender. Should there be any discrepancies between the tender sum and the correctly extended and totalled pricing schedule, the rates and the lump sums will be regarded as being correct, and the Employer shall have the right to adjust the tender sum to reconcile the tender sum with the total of the pricing schedule. In such an event, the tenderer will be consulted but, failing agreement between the parties, the decision of the Employer shall be final and binding. Adjustment of the tender sum will take place prior to the signing of the contract. In their own interest tenderers must make doubly sure of the correctness of their tendered rates and lump sums, the extensions and the tender sum.

C2.1.12 A tender shall be deemed non-responsive if the unit rates or lump sums for some of the items in the Pricing Schedule are, in the opinion of the Employer, unreasonable or out of proportion, and if the tenderer fails, within a period of seven (7) days of having been notified in writing by the Employer to adjust the unit rates or lump sums for such items, to make such adjustments.

C2.1.13 All rates and sums of money quoted in the Pricing Schedule shall be in South African Rand and whole cents

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

- C2.1.14 The item numbers appearing in the Pricing Schedule refer to the corresponding item numbers in the Scope of Work.

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

C2.2 PRICING SCHEDULE (Incorporating SBD3)

SCHEDULE A

GENERAL REQUIREMENTS AND TRAINING AND SKILLS DEVELOPMENT PROGRAMME

SCHEDULE B

CONSTRUCTION OF THE WORKS (COTO) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS FOR SOUTH AFRICAN ROAD AUTHORITIES (DRAFT STANDARD OCTOBER 2020 EDITION).

SCHEDULE C

STAKEHOLDER AND COMMUNITY LIAISON, AND TARGETED LABOUR AND TARGETED ENTERPRISES SELECTION AND UTILISATION.

C2.3 SUMMARY OF PRICING SCHEDULE

SCHEDULE A:	TRAINING AND CONSTRUCTION MANAGEMENT	
	.....	R
	(from page)	
SCHEDULE B:	CONSTRUCTION OF THE WORKS	
	.....	R
	(from page)	
SCHEDULE C:	STAKEHOLDER AND COMMUNITY ENGAGEMENT	
	.....	R
	(from page)	
SUBTOTAL	.....	R
VALUE ADDED TAX:		
15% of Subtotal	.....	R
<hr/>		
TOTAL CARRIED TO C.1.1.1: FORM OF OFFER		R
<hr/>		

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

PART C3: SCOPE OF WORK

TABLE OF CONTENTS	PAGE
A1001: SCOPE OF WORK	C-58
A1002: DEFINITIONS	C-58
A1003: GENERAL REQUIREMENTS.....	C-62
A1004: TRAINING AND SKILLS DEVELOPMENT PROGRAMME	C-73
A1005: METHOD STATEMENTS FOR TRAINING STAGES	C-80
A1006: THEORETICAL TRAINING	C-82
A1007: PRACTICAL TRAINING	C-85
A1008: CONTRACTOR'S RESPONSIBILITIES TOWARDS TRAINEES	C-87
A1009: CONSTRUCTION SIMULATION.....	C-89
A1010: CONSTRUCTION MANAGEMENT AND CONSTRUCTION OF THE WORKS	C-90
A1011: MEASUREMENT AND PAYMENT	C-92

SECTION A: GENERAL REQUIREMENTS AND TRAINING AND SKILLS DEVELOPMENT PROGRAMME

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, whom 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) Business Coaching

Business coaching establishes an atmosphere of mutual trust, respect, responsibility and accountability to motivate the 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.

c) 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.

d) 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.

e) 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.

f) 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.

g) 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.

h) 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.

i) Local Community

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

j) Mentoring

Mentoring is a professional relationship in which an experienced business person 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.

k) Mobilisation Period

The period from the Commencement Date until the physical commencement of the Works, as defined in the Conditions of Contract.

l) 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.

m) 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.

n) 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.

o) Project Area

The area:

- i) through which the infrastructure under construction traverse; or
- ii) within which the infrastructure under construction falls; or
- iii) which is adjacent to and/or in proximity to project operations.

Based on resources and skills audits, and a market analysis, the Contractor, in liaison with the PLC, shall identify and agree the Project Area where preference will be given to the subcontracting of Trainee Targeted Enterprises, other Targeted Enterprises and Targeted Labour.

Because Community Development Projects are earmarked for an identified Community, the Project Area is very localised and typically comprise of:

- a. a local municipality; and/or
- b. town(s) within a local municipality; and/or
- c. ward(s) within a local municipality; and/or even
- d. villages within a rural area.

p) Project Liaison Committee (PLC)

The Committee that represents the project's Stakeholders and the Communities affected by the project.

Note:

- i) Elected and/or nominated political office bearers shall not be members of the PLC.

- ii) The Employer, Engineer and Contractor also become parties to this Committee at the relevant project stages and as far as it is within the scope of their respective roles and responsibilities.

q) 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.

r) 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.

s) Specific Outcomes

The knowledge, skills and values (demonstrated in context) which support one or more critical outcomes of a Unit Standard.

t) Targeted Enterprise

A Targeted Enterprise is an entity to which the Contractor subcontracts 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;
- ii) an EME or QSE which is at least 51% owned by black people who are youth;
- iii) an EME or QSE which is at least 51% owned by black people who are women;
- iv) an EME or QSE which is at least 51% owned by black people with disabilities;
- v) an EME or QSE which is 51% owned by black people living in rural or underdeveloped areas or townships;
- vi) a cooperative which is at least 51% owned by black people;
- vii) an EME or QSE which is at least 51% owned by black people who are military veterans; or
- viii) more than one of the categories referred to in paragraphs i) to vii); and
- ix) which is tax and COID compliant.

u) Targeted Labour

Persons:

- i) who are employed by the Contractor or a Subcontractor 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 Subcontractor's employment policies; and
- iii) permanently reside in the Project Area(s) or who are recognized as being residents of the Project Area(s) based on identification and association with, and recognition by, the residents of the Project Area(s); and
- iv) who are defined as a Target Group in the Contract Data.

v) 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.

w) 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.

x) 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 Location of The Project

The proposed project is located at Paul Roux which is within the jurisdiction of the Dihlabeng local Municipality in the Free State Province. It is on National Road 5, Section 3 from km 34.0 to Paul Roux (km 37.0). A locality plan is included in Part C4: Appendix A of this document.

The project route traverses one section of the N5 which is as follows:

- Starts at km 34,0 (± 100 m north of the intersection (S224) to Motlomo) and
- Ends at km 37,0 (± 400 m east of the intersection towards Rosendal).

The total length of the project route is 3 km.

A1003.02 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 purpose of this project is thus for a Training and Construction Manager to improve the pedestrian facilities on National Route 5, section 3 from km 34.0 to Paul Roux (km37.0).

The construction related works are further described hereunder in Sub-section A1003.02(f).

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 Employer's preliminary Training and Skills Development Programme, attached to Part C5, Annexure X, and 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.

This infrastructure component entails the repair and resurfacing of approximately 3km of internal access roads in Paul Roux as part of the implementation of the Access Management Plans for the upgrade of National Road 5 Section 3 from km 34.0 to Paul Roux (km 37.0).

The construction Works consists, amongst others, of the following:

- i) Repairing and re-surfacing of the existing roads to low traffic volume standards.
- ii) Improvement of road surface stormwater drainage where possible / required.
- iii) Provision of new road signs and markings where required.
- iv) Construction of pedestrian facilities where feasible / required.

The Works shall be constructed using the COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (Draft Standard October 2020 edition), together with the:

- a. Standard Amendments issued by COTO;
- b. Project Specification Amendments to the COTO Standard Specifications; and
- c. CIDB Labour-based Methods and Technologies for Employment Intensive Construction Works – A CIDB Guide to Best Practice

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.

A1003.03 Time for Completion and Project Programme

a) Time for Completion

The Time for Completion of all phases of the project shall be 20 months (including 4 months mobilisation period) from the Commencement Date.

b) 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 A1003.03(a)** below:

Table A1003.03(a): Indicative Programme

	Project Stage	Completion Date
A	Submission of Tenders	25 July 2025
B	Appointment of Training and Construction Manager	26 January 2026
C	Project Hand-over meeting	9 February 2026 <i>(14 days from award.)</i>
	Mobilisation Period commences	9 February 2026
D	First Progress Meeting	10 March 2026
E	Resources and Skills Audit and Market Analysis Report	10 March 2026
F	Training and Skills Development Programme Approval	10 March 2026
G	Selection of Beneficiaries of the Project Complete	12 May 2026
	Mobilisation Period ends	9 June 2025
H	Theoretical (Classroom) Training Complete	14 August 2026
I	Practical (Workplace) Training Complete	14 October 2026

	Project Stage	Completion Date
J	Simulation Construction Complete	25 January 2027
K	Construction of the Works Complete	26 September 2027
L	Project Close-out	26 November 2027

The Contractor shall submit his draft programme, based on the indicative programme, for the Engineer's perusal at the project hand-over meeting.

The Contractor shall submit his final programme for the Engineer's approval at the first progress meeting.

A1003.04 Penalties and Delays

Penalties shall be applied for each calendar day by which the Contractor fails to meet the milestone dates as per the Contractor's approved Programme. The quantum of the penalty shall be as listed in the Contract Data, Clause 8.7.

The penalties and delay damages that are applicable on work undertaken by subcontractors that qualify in terms of the definition, and which has been sublet according to the specifications for the tender process, shall be the full responsibility of the Contractor.

A1003.05 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.

A1003.06 Contractor's Staff

The names of the Contractor's Key Persons are shown in Form C1.2.3 Contract Data: Information Provided by the Tenderer.

The Contractor's two leading Key Persons are the Training Provider and the Construction Manager. The roles of both these persons are described below and in the respective sections of Part C3.

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 also 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 whom 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 A1003.06(a)** below:

Table A1003.06(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.

Provision for the Contractor's Training Staff has been made in Pricing Schedule A, under pay item A1000.01(a).

Provision for the establishment of the Contractor's Training Staff has been made in Pricing Schedule A, under pay item A1000.02(b).

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 A1003.06(b)** below, according to the CIDB contractor grading designation determined for the contract.

Table A1003.06(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	PrEng or PrTech with ECSA ² or PrCM with SACPCMP ³	None specified
Contract Manager	SACPCMP as PrCM or ECSA as Pr. Tech Eng. or Pr. Techni	5	SACPCMP as PrCM or ECSA as Pr. Eng. or Pr. Tech Eng.	5
Construction Manager	SACPCMP as PrCM or ECSA as Pr. Eng. or Pr. Tech Eng. or Pr. Techni	5	SACPCMP as PrCM or ECSA as Pr. Eng. or Pr. Tech Eng. or Pr. Techni	8

			SACPCMP as PrCM or ECSA as Pr. Eng. or Pr. Tech Eng.	5
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.

Provision for the Contractor's Construction Management Staff has been made in Pricing Schedule A, under pay item A1000.01(b).

Provision for the establishment of the Contractor's Construction Management Staff during the training phases of the project has been made in Pricing Schedule A, under pay item A1000.02(c).

Provision for the Contractor's Construction Management Staff during the construction of the Works phase has been made in Pricing Schedule B, Section C1.4.

A1003.07 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.

A1003.08 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.

Provision for the Contractor's Training Facility has been made in Pricing Schedule A, under pay item A1000.02(a).

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.

Provision for the Contractor's Camp Site and the Engineer's Site has been made in Pricing Schedule B, Section 1300 – Contractor's Establishment on Site and General Obligations, and Section 1400 – Housing, Offices and Laboratories for the Engineer's Site Personnel, respectively.

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.

A1003.09 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.

Contracts that are in construction or scheduled to be implemented during the Time for Completion of this contract are listed in **Table A1003.09(a)** below:

Table A1003.09(a): Programme of Contracts

Section	Works Description	Period	
		From	To
None scheduled at this stage.			

The contact details of the relevant service providers for the listed contracts and/or contracts unknown at the time of tender, shall be provided to the Contractor at award or as soon as it becomes available.

A1003.10 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 C for the subcontracting of Targeted Enterprises other than the Trainee Targeted Enterprises.

A1003.11 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.

A1003.12 Legal Requirements

The following Acts and associated Regulations and Codes, as amended from time to time, are predominant amongst those which apply to the construction industry, and shall apply to the contract. They are listed here for reference purposes only:

- a) Constitution of the Republic of South Africa (Act No. 108 of 1996);
- b) Public Finance Management Act (Act No. 1 of 1999);
- c) Preferential Procurement Policy Framework Act (Act No. 5 of 2000);
- d) Broad-Based Black Economic Empowerment Act (Act No. 53 of 2003);

- e) Construction Industry Development Board Act (Act No. 38 of 2000) and its Regulations;
- f) Occupational Health and Safety Act (Act No. 85 of 1993) and its Regulations;
- g) Compensation for Occupational Injuries and Diseases Act (Act No. 130 of 1993);
- h) Rates for wages and conditions of labour agreed by the Bargaining Council for the Civil Engineering Industry in terms of the Labour Relations Act (Act No. 66 of 1995);
- i) National Water Act (Act No. 36 of 1998);
- j) National Veld and Forest Fire Act (Act No. 101 of 1998);
- k) National Environmental Management: Biodiversity Act (Act No. 10 of 2004);
- l) National Environmental Management: Waste Act (Act No. 59 of 2008);
- m) National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008);
- n) National Environmental Management Act (Act No. 107 of 1998);
- o) Conservation Of Agricultural Resources Act (Act No. 43 of 1983); and
- p) National Environmental Management: Air Quality Act (Act No 39 of 2004).
- q) Skills Development Act (Act No 97 of 1998).

In addition to the above, in terms of National Treasury Instruction No. 3 of 2014/2015 with reference to the Public Finance Management Act (Act No 1 of 1999), and its 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.

A1003.13 Environmental Management

The Contractor shall be responsible for construction according to an Environmental Management Plan in terms of Part C3, Section C of the Scope of Work.

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 Part C3, Section C of the Scope of Work. Where the Contractor fails to adhere to these requirements, the specifications in Part C3, Section C, provide the methodology of the remedy.

Provision for the Contractor's Environmental Management obligations has been made in Pricing Schedule B.

A1003.14 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. Part C3, Section E of the Scope of Work contains the specification that regulates the Contractor's construction methods to ensure health and safety of his employees, subcontractors and the public.

Provision for the Contractor's Occupational Health and Safety obligations has been made in Pricing Schedule B.

A1003.15 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.

Systems and management of the contract per the ITIS will form an integral part of the Contractor's responsibilities.

Reporting of training, empowerment, capacity building, small contractor development, labour and staff employment and any such aspects shall be extracted from the Employer's Integrated Transportation Information System (ITIS), as required in terms of Conditions of Contract.

The Contractor shall update the ITIS system with the required information and documentation as required by the ITIS system.

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 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 has several ITIS modules running on any of the above ITIS platforms which affect the Contractor, who will need to use some of these modules to perform certain procedures and to provide required information. The current module applicable to this contract and its description is as follows:

- Project Information Module – uploading of employment and training data;

Users are to register as a service provider utilising the following link:

<https://itis.nra.co.za/Portal/>

Manuals for the various functions can be downloaded utilising the following links:

Project Information User Manual –

<https://itis.nra.co.za/Portal/Modules/ProductLicensing/MVC/Manuals/ITIS%20Desktop%20Project%20Information%20Module%20-%20User%20Manual.pdf>

Desktop Installation Manual –

<https://itis.nra.co.za/Portal/Modules/ProductLicensing/MVC/Manuals/ITIS%20Desktop%20-%20Installation%20Manual.pdf>

Support Manual –

<https://itis.nra.co.za/Portal/Modules/ProductLicensing/MVC/Manuals/ITIS%20Support%20Service%20Desk%20User%20Manual.pdf>

A1003.16 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. Forms A25 (SBD6.2) and A26 of the Scope of Work contains the requirements for local production and content. Further elaboration of the specifications is also included under Part C3. B.

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 at the first Progress Meeting for the Engineer's approval.

Developing and executing the Training and Skills Development Programme shall consist of the following phases:

- a) Conduct Resources and Skills Audits and a Market Analysis.
- b) Identify Project Area and Designated Groups who shall benefit from the Programme.
- c) Finalise and approve the Training and Skills Development Programme.
- d) Select Trainees and Trainee Targeted Enterprises to participate in the Programme.
- e) Conduct theoretical (classroom) training.
- f) Conduct practical (workplace) Training.
- g) Construction Simulation phase.
- h) 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.

Provision for the Resources Audit Chapter has been made in Pricing Schedule A, under pay item A1000.03(a).

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.

Provision for the Skills Audit Chapter has been made in Pricing Schedule A, under pay item A1000.03(b).

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.

Provision for the Market Analysis has been made in Pricing Schedule A, under pay item A1000.03(c).

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 to ensure that all beneficiary types, as listed below, are provided with training and skills development opportunities. The Programme shall, amongst others, make provision for:

- i) Trainee Targeted Enterprises (CIDB grades 1 to 4);
- ii) Targeted Enterprise Suppliers, Service Providers and Subcontractors;
- iii) Targeted Labour;
- iv) Interns (Students) completing their national diplomas;
- v) Graduates (Candidates) towards registration in a professional category; and
- vi) Community members and/or groups.

All theoretical training provided, and its practical components, shall be SAQA accredited and shall be a combination of:

- b. technical,
- c. entrepreneurial and
- d. 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.

Provision for the training to be provided to Trainee Targeted Enterprises has been made in Pricing Schedule A, under pay item A1000.04(a)(i) to (iv).

c) Training for Targeted Enterprise Suppliers, Service Providers and Subcontractors

Targeted Enterprise Suppliers, Service Providers and Sub-contractors that has been appointed in terms of the Contract Participation Goal (CPG) as a percentage of the value of Pricing Schedules A (Training and Construction Management) and C (Stakeholder and Community Liaison) shall also be provided with training based on the Resources and Skills Audit and Market Analysis.

Although the CIDB Standard for Developing Skills through infrastructure Contracts, Government Gazette No. 36760 of August 2013, is not applicable to this Contract type, the Employer requires the Contractor to follow the principles of these Standards for the training of Targeted Enterprise Suppliers, Service Providers and Subcontractors.

The training to be provided shall thus 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 type of training to be provided may include relevant construction methods and technical skills, but to provide for Suppliers and Service Providers, it may also include training and skills development which are supportive to the Construction Industry, such as:

- a. Safety and Security training for Site Safety Service Provider;
- b. Road and Traffic Safety training for Site Traffic Service Provider.
- c. Pre-cast Concrete training for pre-cast material Supplier, and many more.

The following conditions shall apply in terms of training limitations and eligibility for Targeted Enterprise Suppliers, Service Providers and Subcontractors:

- i. No single method shall contribute to more than 75 percent (%) of the Provisional Sum provided for the training of Targeted Enterprises Suppliers, Service Providers and Subcontractors.
- ii. Permanently employed Trainees may not account for more than 33 percent (%) of the Provisional Sum provided for the training of Targeted Enterprises Suppliers, Service Providers and Subcontractors.
- iii. Not more than one method may be applied to any individual Trainee concurrently.
- iv. The Contractor may source Trainees from a Skills Development Agency recognised by the CIDB.
- v. All Trainees shall be registered with a construction Skills Development Agency recognised by the CIDB.

Provision for the training to be provided to Targeted Enterprise Suppliers, Service Providers and Subcontractors, other than Trainee Targeted Enterprises, has been made in Pricing Schedule A, under pay item A1000.04(b).

d) Training for Targeted Labour

It is anticipated that the Trainee Targeted Enterprises, Targeted Enterprise Suppliers, Service Providers and Subcontractors, as well as the Contractor, 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 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.

The same conditions (limitations and eligibility) shall apply to Targeted Labour training as listed for Targeted Enterprises in paragraph A1004.03(b) above.

Provision for the training to be provided to Targeted Labour has been made in Pricing Schedule A, under pay item A1000.04(c).

e) Interns (Students) Completing their National Diplomas

The Employer requires of the Training and Skills Development Programme to include for the holistic development of skills in the Construction Industry.

Thus, in addition to Targeted Enterprises and Targeted Labour, the Contractor shall provide work integrated learning opportunities for University of Technology or Comprehensive University students towards completing their National Diplomas.

This learning opportunity shall apply to P1 and P2 Trainees, or Trainees with a 240 credits qualification. Both permanently employed and temporary employed Trainees shall be considered for this learning opportunity.

Provision for the integrated learning opportunities to be provided to Interns completing their National Diplomas has been made in Pricing Schedule A, under pay item A1000.04(d).

f) Graduates (Candidates) towards Registration in a Professional Category

In alliance with the Employer's requirement for the holistic development of skills in the Construction Industry, the Contractor shall also provide structured workplace learning opportunities for Graduates towards registration in a professional category by a statutory council as listed in Table 1 of the CIDB Standard for Developing Skills through Infrastructure Contracts.

This learning opportunity shall apply to Graduates with a 480 credits qualification. Both permanently employed and temporary employed Trainees shall be considered for this learning opportunity.

Provision for the structured workplace learning opportunities to be provided to Graduates towards registration in a professional category has been made in Pricing Schedule A, under pay item A1000.04(e).

g) Community Members and/or Groups

Based on the Resources and Skills Audits and the Market Analysis, and in consultation with the PLC, the Contractor shall provide structured, SAQA accredited, training to Community Members and/or Groups within the Project Area.

Although training and skills development in support of the Construction Industry is encourage, it is not compulsory that the training and skills development opportunities provided to Community Members and/or Groups are construction related.

The aim is to provide training and develop the skills of the Community to enhance the employability of Community members and to enhance the sustainability of the Community as a whole. Examples of training possibilities are given below:

- i) Local emerging businesses can be identified for entrepreneurial training, e.g. the local stationary supplier or catering cooperate.
- ii) Local emerging businesses can be identified for technical training, e.g. the local mechanical services provider or sewing cooperate.
- iii) Groups within the Community can be identified for general training, e.g. computer skills for unemployed matriculants, HIV/Aids prevention training for local social workers, road safety training for school groups, and many more.

Provision for structured, SAQA accredited training to be provided to Community Members and/or Groups has been made in Pricing Schedule A, under pay item A1000.04(f).

h) 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.saq.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.

i) Learning Material

Learning material is required for each Unit Standard. This learning material is the equivalent of prescribed text books 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:

- d) A time schedule of the different training offerings;
- e) A time schedule of the phases of the different training offerings;
- f) Details of the training logistics, e.g. venue, transport, etc.
- g) Identification and selection of Trainees;
- h) Registration of Trainees;
- i) Induction of Trainees;
- j) Details of the theoretical training execution;
- k) Details of the practical training execution;
- l) Trainee workbooks and logbooks;
- m) 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.

Since the selection of Trainees forms part of the Stakeholder and Community engagement processes, described in Part C, Section D of the Scope of the Work, provision for payment has been made in Pricing Schedule C, pay item D10.06.

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.

Provision for the Registration of Trainee Targeted Enterprises has been made in Pricing Schedule A, under pay item A1000.05(a).

The Registration of beneficiaries, other than the Trainee Targeted Enterprises shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay item A1000.04(b) to (f).

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 (work place) 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.

Provision for the induction of Trainee Targeted Enterprises has been made in Pricing Schedule A, under pay item A1000.05(b).

The induction of beneficiaries, other than the Trainee Targeted Enterprises shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay item A1000.04(b) to (f).

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 15 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.	15 (one person per Trainee Targeted Enterprise).
Full Traineeships for Trainee Targeted Enterprises	NQF level 4.	15 (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 A, under pay item A1000.04(a)(i).

Provision to provide full Traineeships to Trainee Targeted Enterprises on NQF level 3 has been made in Pricing Schedule A, under pay item A1000.04(a)(ii).

Provision to provide full Traineeships to Trainee Targeted Enterprises on NQF level 4 has been made in Pricing Schedule A, under pay item A1000.04(a)(iii).

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 A, under pay item A1000.04(a)(iv).

Theoretical, NQF levels 2 to 5 training to be provided to beneficiaries, other than the Trainee Targeted Enterprises shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay item A1000.04(b) to (f).

A1006.02 Trainees' Learning Aids, Training Material and Workplace Documentation

a) Stationary 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.

Provision for the Stationary and Learning Aids of the Trainee Targeted Enterprises has been made in Pricing Schedule A, under pay item A1000.05(c).

Stationary and Learning Aids to be provided to beneficiaries, other than the Trainee Targeted Enterprises shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay items A1000.04(b) to (f).

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.

Provision for the Learning Material, Workbooks and Logbooks of the Trainee Targeted Enterprises has been made in Pricing Schedule A, under pay item A1000.05(d).

Learning Material, Workbooks and Logbooks to be provided to beneficiaries, other than the Trainee Targeted Enterprises shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay item A1000.04(b) to (f).

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);
- ii) COTO Standard Specifications for Road and Bridge Works for State Road Authorities;
- iii) CIDB best practice documents as appropriate to this project; and
- iv) Guidelines for the implementation of Labour-Intensive Infrastructure Projects under the Expanded Public Works Programme (EPWP) (Second Edition – July 2005).

Provision for Contract and Specification Documents for Trainee Targeted Enterprises has been made in Pricing Schedule A, under pay item A1000.05(e).

Contract and Specification Documents to be provided to beneficiaries, other than the Trainee Targeted Enterprises shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay item A1000.04(b) to (f).

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 work day.

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.

All the Contractors' construction expenses and profit during the Practical Training and Training Test Section phases have been quantified and provided for in Pricing Schedule A. This includes Preliminary and General costs, site camp, plant, material, labour, PPE and any other costs that would be incurred by a Contractor and his sub-contractors to construct the Works.

Other than the Contractor's construction expenses and profit, quantified and provided for in Pricing Schedule B, provision has been made in Pricing Schedule A, under pay item A1000.06 for the Contractor to execute all his responsibilities towards Trainee Targeted Enterprises during the Practical Training phase as described in this Part C, Section A1007 of the Scope of the Work.

Amongst others, these 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.

No additional provision has been made for the Contractor's responsibilities towards other Targeted Enterprises and Labour during the Practical Training phase and it must be included in the Contractor's rates tendered in Pricing Schedule B.

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 and assessor to rate the Trainee's competency acquired in the workplace environment.

Provision for the Logbooks of the Trainee Targeted Enterprises has already been made in Pricing Schedule A, under pay item A1000.05(d).

Provision for the Logbooks to be provided to beneficiaries, other than the Trainee Targeted Enterprises shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay item A1000.04(b) to (f).

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.

Training Test Sections must not be confused with Trial Sections as specified in COTO. The objective of the Training Test Section is to perfect and embed the method described in the relevant NQF Unit Standard to guarantee the product specification as per COTO.

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 be at Trainees' disposal at all times.

All sustenance shall be procured from local Targeted Enterprise Suppliers and Service Providers.

Provision for the Sustenance of Trainee Targeted Enterprises has been made in Pricing Schedule A, under pay item A1000.07(a).

Provision for the Sustenance of beneficiaries, other than the Trainee Targeted Enterprises shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay item A1000.04(b) to (f).

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.

Provision for the Stipends of Trainee Targeted Enterprises has been made in Pricing Schedule A, under pay item A1000.07(b).

Provision for the Stipends of beneficiaries, other than the Trainee Targeted Enterprises shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay item A1000.04(b) to (f).

A1009 CONSTRUCTION SIMULATION

All the Contractor's construction expenses and profit during the Construction Simulation phase have been quantified and provided for in Pricing Schedule B. This includes Preliminary and General costs, site camp, plant, material, labour, PPE and any other costs that would be incurred by a Contractor and his Subcontractors to construct the Works.

Other than the Contractor's construction expenses and profit, quantified and provided for in Pricing Schedule B, provision has been made in Pricing Schedule A, under pay item A1000.08 for the Contractor to execute all his responsibilities towards Trainee Targeted Enterprises as described in this Part C, Section A1009 of the Scope of the Work.

Amongst others, these 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.

No additional provision has been made for the Contractor's responsibilities towards other Targeted Enterprises and Labour during the Construction Simulation phase and it must be included in the Contractor's rates tendered in Pricing Schedule B.

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 work day shall commence with a site meeting to discuss, amongst others, the following:

- a. Progress made the previous work day;
- b. Productivity outputs obtained during the previous work day.
- 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

All the Contractors construction expenses and profit during the Construction of the Works phase have been quantified and provided for in Pricing Schedule B. This includes Preliminary and General costs, site camp, plant, material, labour, PPE and any other costs that would be incurred by a Contractor to construct the Works.

Other than the Contractor's construction expenses and profit, quantified and provided for in Pricing Schedule B, provision has been made in Pricing Schedule A, under pay item A1000.09 for the Contractor to execute all his responsibilities towards Trainee Targeted Enterprises as described in this Part C, Section A1010 of the Scope of the Work.

Amongst others, these 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.

No additional provision has been made for the Contractor's responsibilities towards other Targeted Enterprises and Labour during the Construction Simulation phase and it must be included in the Contractor's rates tendered in Pricing Schedule B.

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 for Road and Bridge Works for State Road Authorities.

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.

A1011 MEASUREMENT AND PAYMENT

The Contractor shall submit monthly payment certificates with supporting documentation to the Engineer on the date and in the format as required by the Employer. Supporting documents shall, amongst others, include the payment certificates and invoices of Trainee Targeted Enterprises and progress reports. Once the Engineer has agreed and certified the payment certificate, it shall be submitted to the Employer with his accompanying invoice for payment.

Item	Description		Unit
A1000.01	Contractor's Personnel		
	(a)	Contractor's Training Staff	
		(i) Training Provider	Lump Sum (LS)
		(ii) Practitioners	Lump Sum (LS)
		(iii) Assessors	Lump Sum (LS)
		(iv) Moderators	Lump Sum (LS)
	(b)	Contractor's Construction Management Staff	
		(i) Construction Manager	Lump Sum (LS)
		(ii) Construction Mentors	Lump Sum (LS)
		(iii) Construction Supervisors	Lump Sum (LS)
		(iv) Clerks of Works	Lump Sum (LS)

The unit of measurement for pay item A1000.01(a)(i) shall be the Lump Sum. The Lump Sum tendered shall include full compensation for the Training Provider's cost for the full duration of the project, including procurement cost (if necessary), salary cost (including all taxes, leave conditions, bonuses, UIF, provident fund, medical aid, group life benefits, etc.), subsistence, travel, accommodation, meeting attendance and all other costs associated with the duties and services to be delivered by the Training Provider.

The total duration and intervals that the Training Provider spend on the project shall be determined by the Contractor. It shall be based on the requirements of the Scope of the Work and shall correspond to the Contractor's approved Training and Skills Development Programme. The Lump Sum shall not be adjusted due to amendments required by the Employer and/or the Engineer of the Contractor's draft Training and Skills Development Programme.

The unit of measurement for pay items A1000.01(a)(ii) to (iv) shall be the Lump Sum. The Lump Sum tendered shall include full compensation for the Practitioners, Assessors and Moderators' cost for the full duration of the project, including procurement cost (if necessary), salary cost (including all taxes, leave conditions, bonuses, UIF, provident fund, medical aid, group life benefits, etc.), subsistence, travel, accommodation, meeting attendance and all other costs associated with the duties and services to be delivered by Practitioners, Assessors and Moderators.

The number of Practitioners, Assessors and Moderators, the total duration that they spend on the project and the intervals at which they participate in the project shall be determined by the Contractor. It shall be based on the requirements of the Scope of the Work and shall correspond to the Contractor's approved Training and Skills Development Programme. The Lump Sum shall not be adjusted due to amendments required by the

Employer and/or the Engineer of the Contractor's draft Training and Skills Development Programme.

The unit of measurement for pay item A1000.01(b)(i) shall be the Lump Sum. The Lump Sum tendered shall include full compensation for the Construction Manager's cost for the full duration of the project, including procurement cost (if necessary), salary cost (including all taxes, leave conditions, bonuses, UIF, provident fund, medical aid, group life benefits, etc.), subsistence, travel, accommodation, meeting attendance and all other costs associated with the duties and services to be delivered by the Construction Manager.

The total duration and intervals that the Construction Manager spend on the project shall be determined by the Contractor, but the Contractor shall take cognisance of the requirement that the Construction Manager shall maintain a full-time presence on site during the practical training and construction of the Works phases of the project. The total duration and intervals that the Construction Manager spend on the project shall correspond to the Contractor's approved Training and Skills Development Programme and the Lump Sum shall not be adjusted due to amendments required by the Employer and/or the Engineer of the Contractor's draft Training and Skills Development Programme.

The unit of measurement for pay items A1000.01(b)(ii) to (iv) shall be the Lump Sum. The Lump Sum tendered shall include full compensation for the Construction Mentors, Supervisors and Clerks of Works' cost for the full duration of the project, including procurement cost (if necessary), salary cost (including all taxes, leave conditions, bonuses, UIF, provident fund, medical aid, group life benefits, etc.), subsistence, travel, accommodation, meeting attendance and all other costs associated with the duties and services to be delivered by Construction Mentors, Supervisors and Clerks of Works.

An estimated ratio between Construction Mentors, Supervisors and Clerks of Works and the number of Trainee Targeted Enterprises subcontracted are provided in the Scope of Work. However, the number of staff and the time and intervals that they spend on the project shall be determined by the Contractor. The Contractor shall take cognisance of the requirement that full-time mentoring and supervision of Trainee Targeted Enterprises shall be available during the practical training and construction of the Works phases of the project.

The number of staff and the total duration and intervals that Construction Mentors, Supervisors and Clerks of Works spend on the project shall correspond to the Contractor's approved Training and Skills Development Programme and the Lump Sum shall not be adjusted due to amendments required by the Employer and/or the Engineer of the Contractor's draft Training and Skills Development Programme.

Establishment of the Contractor's Training and Construction Management staff during the training phases of the project is provided for in Pricing Schedule A, under pay items A1000.02(b) and (c).

Establishment of the Contractor's Construction Management staff during the construction of the Work phase of the project is provided for in Pricing Schedule B, Section 1300.

Contract price adjustment shall be applicable to pay items A1000.01(a) and (b) and its subitems in accordance with Clause C2.1.8.

Interim payments shall be applicable to pay items A1000.1(a) and (b) and its subitems in accordance with Clause C2.1.9

Item	Description		Unit
A1000.02	Contractor's Training Facility and Establishment of Staff		
	(a)	Providing a Training Facility	Lump Sum (LS)

	(b)	Establishment of the Contractor's Training Staff for all project phases, including PPE.	Lump Sum (LS)
	(c)	Establishment of the Contractor's Construction Management Staff during the Training phases of the project, including PPE.	Lump Sum (LS)

The unit of measurement for pay items A1000.02(a) to (c) shall be the Lump Sum.

The Lump Sum tendered shall include full compensation for all costs associated with establishing the Contractor's Training Facility and his staff for the relevant phases of the project as described in the Scope of the Work and as required by the Contractor's approved Training and Skills Development Programme. This includes full compensation for the supply of electricity and all other utility services.

The Lump Sum shall also include full compensation for the Contractor's stationary (including paper, cartridges, files, etc.), computers, laptops, software, printers, projectors, appliances, connections, office and classroom furniture (including storage cupboards, shelves, bookcases, notice boards, etc.) and any other training aids required by his staff to perform their duties as per the Scope of Work.

Personal Protective Equipment (PPE) is deemed to include all the necessary protective clothing, eyewear, masks, gloves, and any other items required in compliance with the OHS Act.

Contract price adjustment shall be applicable to pay items A1000.02(a) to (c) and its subitems in accordance with Clause C2.1.8.

Interim payments shall be applicable to pay items A1000.02(a) to (c) in accordance with Clause C2.1.9

Item	Description		Unit
A1000.03	Training and Skills Development Programme		
	(a)	Resources Audit Chapter	Lump Sum (LS)
	(b)	Skills Audit Chapter	Lump Sum (LS)
	(c)	Market Analysis Chapter	Lump Sum (LS)
	(d)	Approved Training and Skills Development Programme	Lump Sum (LS)

The unit of measurement for pay items A1000.03(a) to (d) shall be the Lump Sum.

The Lump Sum tendered shall include full compensation for all costs associated with conducting Resources and Skills Audits, a Market Analysis and producing an approved Training and Skills Development Programme.

The Lump Sum shall, amongst others, include for all staff and their associated costs, conducting research, stakeholder engagement and consulting, compiling reports and documents, printing and all administration required to present the deliverables.

Interim reports of the Resources and Skills Audits and Market Analysis shall be submitted to the Employer and the Engineer for perusal, which reports shall become chapters of the Training and Skills Development Programme.

Contract price adjustment shall not be applicable to pay items A1000.03(a) to (d).

Interim payments shall not be applicable to pay items A1000.3(a) to (d), but shall be claimable on approval of the Training and Skills Development Programme.

Item	Description		Unit
A1000.04	Training Provisions		
	(a)	Training for Trainee Targeted Enterprises	
	(i)	NQF level 2 training.	Trainee Credit
	(ii)	NQF level 3 training.	Trainee Credit
	(iii)	NQF level 4 training.	Trainee Credit
	(iv)	NQF level 5 training.	Trainee Credit
	(b)	(i) Targeted Enterprise Suppliers, Service Providers and Subcontractors	Provisional (Prov.) Sum
		(ii) Handling cost and profit i.r.o. item A1000.04(b)(i)	Percentage (%)
	(c)	(i) Targeted Labour	Provisional (Prov.) Sum
		(ii) Handling cost and profit i.r.o. item A1000.04(c)(i)	Percentage (%)
	(d)	(i) Interns (Students) Completing their National Diplomas	Provisional (Prov.) Sum
		(ii) Handling cost and profit i.r.o. item A1000.04(d)(i)	Percentage (%)
	(e)	(i) Graduates (Candidates) towards Registration in a Professional Category	Provisional (Prov.) Sum
		(ii) Handling cost and profit i.r.o. item A1000.04(e)(i)	Percentage (%)
	(f)	(i) Community Members and/or Groups	Provisional (Prov.) Sum
		(ii) Handling cost and profit i.r.o. item A1000.04(f)(i)	Percentage (%)

The unit of measurement for pay items A1000.04(a)(i) to (iv) shall be the Trainee Credit. The Trainee Credit is the product of the number of Trainees to be trained and the number of Unit Standard credits required for a Trainee to complete a SAQA accredited qualification on a specified NQF level. It shall provide for all the Contractor's costs to provide SAQA accredited NQF level 2 to 5 training that has not been provided for under pay items:

- A1000.01 Contractor's Staff and
- A1000.02 Contractor's Training Facility and Establishment of Staff
- A1000.05 Theoretical (Classroom) Training

This includes full compensation for all costs associated with the Contractor's Training Staff to compile learning material and the accompanying assessors' guides, to provide

demonstration tools and equipment and to conduct the theoretical and practical training as per the approved Training and Skills Development Plan.

The Trainee Credit tendered shall also include full compensation for all costs associated with keeping Trainees' portfolios of evidence updated and safe, the assessment and moderating of the Trainees' competencies, conduct retraining of Trainees found not yet competent as is allowed for in the Scope of the Work, as well as for updating Trainees' competencies on the national database on Traineeship training.

Payment shall only be made once a Trainee has been assessed for a specific Unit Standard and found competent.

Contract price adjustment shall be applicable to pay items A1000.04(a)(i) to (iv) in accordance with Clause C2.1.8.

The unit of measurement for pay items A1000.04(b)(i), (c)(i), (d)(i), (e)(i) to (f)(i) shall be the Provisional Sum. The Provisional Sum shall provide for all the Contractor's costs to provide SAQA accredited NQF level 2 to 5 technical, entrepreneurial and generic training to Targeted Enterprise Suppliers, Service Providers and Subcontractors, Targeted Labour, Interns, Graduates and Community members and groups.

The Provisional Sum shall provide for full compensation for the Contractor's costs pertaining to Trainees' stipends, wages and/or salaries during the training period, including subsistence, travel and accommodation.

The Provisional Sum shall also provide for the registration and induction of Trainees, their learning material, workbooks and logbooks, and any contract and specification documents, required for the training.

To utilise the Provisional Sum, a detailed breakdown of the above costs shall be provided by the Contractor for approval by the Engineer and the Employer by means of a Works Authorisation prior to commencement of the training.

The unit of measurement for pay items A1000.04(b)(ii), (c)(ii), (d)(ii), (e)(ii) to (f)(ii) shall be the Percentage (%). The Percentage shall provide for all the Contractor's costs and profit associated with the training of Targeted Enterprise Suppliers, Service Providers and Subcontractors, Targeted Labour, Interns, Graduates and Community members and groups.

Amongst others, the Percentage shall provide for full compensation for the Contractor's costs pertaining to staff's remuneration, including their travel and accommodation. It shall also provide for the Contractor's additional Training Facility, stationary, computers, laptops, software, printers, projectors, appliances, connections, classroom furniture and any other training aids, including PPE, required for the training.

Contract price adjustment shall not be applicable to pay items A1000.04(b) to (f) and its subitems.

Pro-rata payment of Provisional Sums, per Trainee, and its associated handling cost and profit mark-ups, i.e. Percentages, shall only be made once a Trainee has been assessed for a specific Unit Standard and found competent. The Provisional Sums shall be paid in accordance with Clause C2.1.10.

Item	Description		Unit
A1000.05	Theoretical (Classroom) Training		
	(a)	Registration of Trainees	Lump Sum (LS)
	(b)	Induction of Trainees	Lump Sum (LS)
	(c)	Stationary and Learning Aids	Lump Sum (LS)
	(d)	Learning Material, Workbooks and Logbooks	Lump Sum (LS)
	(e)	Contract and Specification Documents	Lump Sum (LS)

The unit of measurement for pay item A1000.05(a) shall be the Lump Sum (LS). The Lump Sum tendered shall provide for all the Contractor's costs to Register Trainee Targeted Enterprises on the National Database for Traineeship Training, including capturing Trainees' personal detail and banking details for the payment of stipends and the signing of a Traineeship agreement between the Contractor and the Trainee.

The Registration of Trainees and associated requirements for beneficiaries, other than the Trainee Targeted Enterprises, shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay items A1000.04(b) to (f). The Lump Sum tendered for pay item A1000.05(a) shall serve as a bench mark rate for the utilisation of the Provisional Sum.

The unit of measurement for pay item A1000.05(b) shall be the Lump Sum (LS). The Lump Sum tendered shall provide for all the Contractor's costs for the induction of Trainee Targeted Enterprises into the Training Programme.

The induction of Trainees, other than the Trainee Targeted Enterprises, into the Training Programme shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay items A1000.04(b) to (f). The Lump Sum tendered for pay item A1000.05(b) shall serve as a bench mark rate for the utilisation of the Provisional Sum

The unit of measurement for pay item A1000.05(c) shall be the Lump Sum (LS). The Lump Sum tendered shall provide for all the Contractor's costs to provide Trainee Targeted Enterprises with the Stationary and Learning Aids that they require to complete SAQA accredited training, on the relevant NQF levels, successfully.

Stationary and Learning Aids to be provided to beneficiaries, other than the Trainee Targeted Enterprises, shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay items A1000.04(b) to (f). The Lump Sum tendered for pay item A1000.05(c) shall serve as a bench mark rate for the utilisation of the Provisional Sum

The unit of measurement for pay item A1000.05(d) shall be the Lump Sum (LS). The Lump Sum tendered shall provide for all the Contractor's costs to provide Trainee Targeted Enterprises with the Learning Material, Workbooks and Logbooks that they require to complete SAQA accredited training, on the relevant NQF levels, successfully.

Learning Material, Workbooks and Logbooks to be provided to beneficiaries, other than the Trainee Targeted Enterprises, shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay items A1000.04(b) to (f). The Lump Sum tendered for pay item A1000.05(d) shall serve as a bench mark rate for the utilisation of the Provisional Sum

The unit of measurement for pay item A1000.05(e) shall be the Lump Sum (LS). The Lump Sum tendered shall provide for all the Contractor's costs to provide Trainee Targeted Enterprises with the Contract and Specification Documents that they require to complete SAQA accredited training, on the relevant NQF levels, successfully.

Contract and Specification Documents to be provided to beneficiaries, other than the Trainee Targeted Enterprises, shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay items A1000.04(b) to (f). The Lump Sum tendered for pay item A1000.05(e) shall serve as a bench mark rate for the utilisation of the Provisional Sum.

Contract price adjustment shall be applicable to pay items A1000.04(a) to (e) in accordance with Clause C2.1.8.

A1000.06	Practical (Workplace) Training	Lump Sum (LS)
-----------------	---------------------------------------	----------------------

The unit of measurement for pay item A1000.06 shall be the Lump Sum (LS). The Lump Sum tendered shall provide for all the Contractor's costs, other than construction expenses and profit, to provide Trainee Targeted Enterprises with the Practical Training that they require to complete SAQA accredited training, on the relevant NQF levels, successfully and the assessment thereof.

Amongst others, the Lump Sum shall include for 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.

Contract price adjustment shall be applicable to pay item A1000.06 in accordance with Clause C2.1.8.

Interim payments shall be applicable to pay item A1000.06 in accordance with Clause C2.1.9

A1000.07	Contractor's Responsibilities Towards Trainees		
	(a)	(i) Trainee Sustenance	Prime Cost (PC) Sum
		(ii) Handling cost and profit i.r.o. item A1000.07(a)(i)	Percentage (%)
	(b)	(i) Trainee Stipends	Prime Cost (PC) Sum
		(ii) Handling cost and profit i.r.o. item A1000.07(b)(i)	Percentage (%)

The unit of measurement for pay item A1000.07(a)(i) shall be the Prime Cost (PC). The Prime Cost Sum shall provide for all the Contractor's costs to provide Trainee Targeted Enterprises with sustenance during the theoretical training phase of the project.

The unit of measurement for pay items A1000.07(a)(ii) shall be the Percentage (%). The Percentage shall provide for all the Contractor's costs and profit associated with providing Trainee Targeted Enterprises with sustenance during the theoretical training phase, including the cost of the procurement processes required to procure sustenance from local Suppliers.

Sustenance to be provided to beneficiaries, other than the Trainee Targeted Enterprises, shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay items A1000.04(b) to (f). The Prime Cost Sums utilised under pay item A1000.07(a)(i) shall serve as a bench mark rate for the utilisation of the Provisional Sum

The unit of measurement for pay item A1000.07(b)(i) shall be the Prime Cost (PC). The Prime Cost Sum shall provide for all the Contractor's costs to pay stipends to Trainee

Targeted Enterprises during the theoretical and practical training phases of the project in accordance with the Basic conditions of Employment Act (Act no. 75 of 1997).

The unit of measurement for pay items A1000.07(b)(ii) shall be the Percentage (%).

The Percentage shall provide for all the Contractor's costs and profit associated with paying stipends to Trainee Targeted Enterprises during the theoretical and practical training phases of the project, including the cost of electronic funds transfers and/or bank cash deposits and all administration related to the payment of stipends.

Stipends to be paid to beneficiaries, other than the Trainee Targeted Enterprises, shall be paid from the Provisional Sum provided in Pricing Schedule A, under pay items A1000.04(b) to (f).

Stipends shall be paid in accordance with the legislated daily stipends stated in the Basic Conditions of Employment Act (Act No. 75 of 1997), as amended and as per its most recent learnership allowances table.

Contract price adjustment shall not be applicable to pay items A1000.07(a) and (b), and its subitems.

The Prime Cost Sum shall be paid in accordance with Clause C2.1.10.

A1000.08	Construction Simulation Phase	Lump Sum (LS)
-----------------	--------------------------------------	----------------------

The unit of measurement for pay item A1000.08 shall be the Lump Sum (LS). The Lump Sum tendered shall provide for all the Contractor's costs, other than construction expenses and profit, to provide Trainee Targeted Enterprises with the Construction Simulation experience that they require to complete SAQA accredited training, on the relevant NQF levels, successfully.

Amongst others, the Lump Sum shall include for 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.

Contract price adjustment shall be applicable to pay item A1000.08 in accordance with Clause C2.1.8.

Interim payments shall be applicable to pay item A1000.08 in accordance with Clause C2.1.9

A1000.09	Construction Management Phase	Lump Sum (LS)
-----------------	--------------------------------------	----------------------

The unit of measurement for pay item A1000.09 shall be the Lump Sum (LS). The Lump Sum tendered shall provide for all the Contractor's costs, other than construction expenses and profit, to manage the construction of the Works by Trainee Targeted Enterprises.

Amongst others, the Lump Sum shall include for Trainee Target Enterprises' competency reviews, 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.

Contract price adjustment shall be applicable to pay item A1000.09 in accordance with Clause C2.1.8.

Interim payments shall be applicable to pay item A1000.09 in accordance with Clause C2.1.9.

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

SECTION B1: 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 B1, together with additional amendments as set out in Section B2 and Project specific Specification Data as set out in Section B3.

As at 18 November 2024 no amendments have been issued by COTO.

SECTION B2: PROJECT SPECIFICATION AMENDMENTS TO THE COTO STANDARD SPECIFICATIONS

Notes to tenderer:

1. This Section B2 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 B2. Details of such alternatives or additional requirements applicable to this contract are contained in Section B2: Specification Data. Section B2 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.

SECTION B2: PROJECT SPECIFICATION

TABLE OF CONTENTS	PAGE
COTO CHAPTER 1: GENERAL	C-104
COTO CHAPTER 2: SERVICES	C-109
COTO CHAPTER 3: DRAINAGE	C-110
COTO CHAPTER 4: EARTHWORKS AND PAVEMENT LAYERS: MATERIALS	C-111
COTO CHAPTER 5: EARTHWORKS AND PAVEMENT LAYERS: CONSTRUCTION.....	C-112
COTO CHAPTER 6: CONCRETE LAYERS	C-113
COTO CHAPTER 8: PRETREATMENT AND REPAIR OF EXISTING LAYERS.....	C-114
COTO CHAPTER 9: ASPHALT LAYERS	C-115
COTO CHAPTER 11: ANCILLARY ROAD WORKS	C-116
COTO CHAPTER 20: QUALITY ASSURANCE.....	C-117

COTO CHAPTER 1: GENERAL

SECTION 1.1: GENERAL PREAMBLE

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 includes 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:

- a) **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.

- b) **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.

- c) **Where the supplier is not selected by the contractor and actual cost is reimbursable and 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.

- d) **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.

- e) **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.

- f) **Where the particulars of the work is not scheduled and the estimated cost of the work is more than R500,000.00 (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 8, SBD 9, 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.

- g) **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.

- h) **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 backfilling for patching shall be done as required under pay item C1.2.3 details of patch backfilling, is to be provided if applicable.

Add the following new subclause:

"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 because 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 Manuals/TRH or 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 Manual/TRH publication or 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

Add the following new pay item:

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

C1.2.10 Dispute Adjudication Board (DAB)

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

SECTION 1.3: CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS

PART C: MEASUREMENT AND PAYMENT

Item	Unit
C1.3.1 The Contractor's general obligations	
<i>Delete subitem C1.3.1.3 and replace with the following:</i>	
"C1.3.1.3 Time related obligations:	
(i) Mobilisation period	month
(ii) Execution of the works	month"
<i>Add the following pay subitems:</i>	
"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, hire costs or cost of ownership or minimum hourly charges (standing time costs) 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 as per amended Condition of Contract clause 8.9.

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."

SECTION 1.4: FACILITIES FOR THE ENGINEER

PART A: SPECIFICATIONS

A1.4.3 GENERAL

In the last sentence of the 7th paragraph delete: “not later than six weeks after the Contract commencement date” and replace with: “not later than the end of the Mobilisation period as defined in sub-clause 8.1 of the FIDIC Conditions of Contract”

Include:

PC1.4.6.1	Secretary / receptionist	Provisional Sum	R400 000.00
-----------	--------------------------	-----------------	-------------

PC1.4.6.2	Technical assistant	Provisional Sum	R400 000.00
-----------	---------------------	-----------------	-------------

COTO CHAPTER 2: SERVICES

SECTION 2.1: GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

PART A: SPECIFICATION

A2.1.3 GENERAL

A2.1.3.2 Location, identification, protection and relocation of existing services

b) Location of existing services

Services affected by the construction of the four (4) circles at identified positions are as indicated on the applicable drawings.

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

COTO CHAPTER 3: DRAINAGE

There are no amendments to this Chapter

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

COTO CHAPTER 4: EARTHWORKS AND PAVEMENT LAYERS: MATERIALS

There are no amendments to this Chapter

COTO CHAPTER 5: EARTHWORKS AND PAVEMENT LAYERS: CONSTRUCTION

PART A: SPECIFICATION

A5.3.8 WORKMANSHIP

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".

COTO CHAPTER 6: CONCRETE LAYERS

SECTION 6.1: PAVEMENT LAID CONCRETE LAYERS

PART A: SPECIFICATION

A6.1.5 MATERIALS

A6.1.5.1 Cementitious materials

In the 2nd paragraph insert:

“the quantity of supplementary cementitious materials be limited to”, *after* “... may be used subject to”.

A6.1.6 CONSTRUCTION EQUIPMENT

A6.1.6.2 Concrete batching plant

In the 1st sentence of the 2nd paragraph delete the following:

“Where concrete is supplied by a commercial source outside the direct control of the Engineer”.

A6.1.8 WORKMANSHIP

c) Construction tolerances

(vii) Surface regularity

Add the following new paragraph:

“Any adjustment in the payment for the concrete layer will be made by multiplying the full payment value for each 100 m section, (for all the relevant payment items for this work) by the payment adjustment factor derived from Table A9.1.8-3. The payment adjustment shall apply to the total concrete layer width placed over the 100 m sections in question.”

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.”

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

COTO CHAPTER 9: ASPHALT LAYERS

There are no amendments to this Chapter

COTO CHAPTER 11: ANCILLARY ROAD WORKS

SECTION 11.4: ROAD RESTRAINT SYSTEMS

PART C: MEASUREMENT AND PAYMENT

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

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.

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

A20.1.4.7 Testing of bituminous binders

Replace: “SABITA PG1 –Series on modified binders “ with:
“SABITA TG1 –Series on modified binders “.

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 laboratory

Replace reference to: "Independent laboratory" with: "Independent site laboratory".

Add the following new pay item:

"Item	Unit
C20.1.6 Payment of independent site laboratory	
C20.1.6.1 Direct payment by contractor prime cost (PC) sum	
a) Handling cost and profit in respect of item C20.1.6.1 percentage	
(%)	

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."

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

SECTION B3: 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.**

COTO CHAPTER 1: GENERAL

C H	S E C	C L	SUB-CLAUSE	SPECIFICATION DATA
1			GENERAL	
	A 1 . 1		GENERAL PREAMBLE	
		A 1 . 1 . 2	DEFINITION S	
			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 are provided in Clause A1003.1 of Part C3, Section A.
	C 1 . 1		GENERAL PREAMBLE	
	A 1 . 2		GENERAL REQUIREME NTS AND PROVISIONS	
		A 1 . 2 . 3	GENERAL	
			A1.2.3.3 Environment al 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 consequenti al delays)	Method 3 (Critical path method without consequential delays) is specified. The value of "N" is 24 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-	The conditions for handing-over of the Site of the Works are as follows:

			<p>over of the Site of the Works</p> <p>a) Sequence The entire project route section will be handed over to the successful bidder at once.</p> <p>b) Temporary deviations Temporary deviations shall not be applicable to this contract</p> <p>c) Half or partial width sections One closure allowed for construction of circles at km 34.1 and 34.43. Upon completion a further closure allowed for construction of circles at km 35.05 and km 35.40. A further secondary closure is allowed along the project section for patching / repair works with proper cognisance of unrestricted sections from the circle closure.</p> <p>d) Unrestricted sections Due to the nature of the project (limited length), no unrestricted sections shall apply although due care shall be exercised in order to optimise traffic flow through the project.</p> <p>e) Routine Maintenance The Contractor shall take over the maintenance responsibility on the date of Access to site but may liaise with the routine maintenance contractor by arranging a transition period immediately after the Access to site to allow sufficient time to muster his resources required for routine maintenance of the road. However, the transition period may not extend beyond the end of the Mobilisation Period defined in sub-clause 8.1 of the FIDIC Conditions of Contract and C1.2.2 Contract Data.</p> <p>f) Other Only such lengths as required by the contractor to successfully complete planned daily works shall be closed to traffic and not the entire project length or larger portions thereof which are not required for the creation of work areas., with cognisance of sub-item (c) above.</p>
			<p>A1.2.3.9 Monthly reports</p> <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) Aerial progress video footage shall be recorded on a monthly basis. The Contractor shall prepare a photo presentation from aerial footage of the entire project route section consisting of at least 50 photos to demonstrate the progress of the current works. Complete monthly aerial video footage shall be stored in a suitable format and handed to the Engineer upon final completion. Such footage shall be taken from similar fixed points / paths in order to clearly demonstrate project progress. Separate payment has been allowed for in the Schedule under payment item PC 1.3.1.5.</p>

			<p>c) Reporting of training, empowerment, capacity building, small contractor development, labour and staff employment and any such aspects shall be extracted from the Employer's Integrated Transportation Information System (ITIS), as required in terms of Conditions of Contract Clause 4.21.</p> <p>The Contractor shall update the ITIS system with the required information and documentation as required by the ITIS system.</p> <p>ITIS currently consist of the following platforms:</p> <ul style="list-style-type: none"> • 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 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. <p>The Employer has several ITIS modules running on any of the above ITIS platforms which affect the Contractor, who will need to use some of these modules to perform certain procedures and to provide required information. The current module applicable to this contract and its description is as follows:</p> <p>Project Information Module – uploading of employment and training data;</p> <p>Users are to register as a service provider utilising the following link:</p> <p>https://itis.nra.co.za/Portal/</p> <p>Manuals for the various functions can be downloaded utilising the following links:</p> <p>Project Information User Manual –</p> <p>https://itis.nra.co.za/Portal/Modules/ProductLicensing/MVC/Manuals/ITIS%20Desktop%20Project%20Information%20Module%20-%20User%20Manual.pdf</p> <p>Desktop Installation Manual –</p> <p>https://itis.nra.co.za/Portal/Modules/ProductLicensing/MVC/Manuals/ITIS%20DeskTop%20-%20Installation%20Manual.pdf</p>
--	--	--	--

			Support Manual – https://itis.nra.co.za/Portal/Modules/ProductLicensing/MVC/Manuals/ITIS%20Support%20Service%20Desk%20User%20Manual.pdf												
		A1.2.3.10 Notices, signs and advertisements	Details of the contract sign board will be provided.												
		A1.2.3.12 Ownership of assets and disposal of non-usable assets	Pay item C1.2.9.1 is not applicable for the project. As per paragraph 3 under this clause a provisional sum has been allowed for disposal of non-useable assets (payment item C1.2.9.2) along with handling cost / profit under payment item C1.2.9.3.												
		A1.2.3.13 Prevention of damage to nearby properties and services	Structures that could be affected by excessive ground vibrations is listed in the following table: <table border="1"><thead><tr><th>Structure</th><th>Type</th><th>Location</th></tr></thead><tbody><tr><td>Old or low quality houses within 20m from the work zone</td><td>Brick type structures</td><td>Two dwellings and three outhouses (with plumbing) at km 34.2 (Circle 1) position – South eastern quadrant.</td></tr><tr><td>Well built houses</td><td>Brick type structures</td><td>House and boundary wall at km 34.43 (Circle 2) – south eastern quadrant.</td></tr><tr><td colspan="3">No structures within 20m for Circles 3 and 4</td></tr></tbody></table>	Structure	Type	Location	Old or low quality houses within 20m from the work zone	Brick type structures	Two dwellings and three outhouses (with plumbing) at km 34.2 (Circle 1) position – South eastern quadrant.	Well built houses	Brick type structures	House and boundary wall at km 34.43 (Circle 2) – south eastern quadrant.	No structures within 20m for Circles 3 and 4		
Structure	Type	Location													
Old or low quality houses within 20m from the work zone	Brick type structures	Two dwellings and three outhouses (with plumbing) at km 34.2 (Circle 1) position – South eastern quadrant.													
Well built houses	Brick type structures	House and boundary wall at km 34.43 (Circle 2) – south eastern quadrant.													
No structures within 20m for Circles 3 and 4															
		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. No formal agreements have been made with the relevant stakeholders.												
		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/A greements and Permits	The Contractor shall be responsible for applying for the following wayleaves: Any / all services encountered within the roads reserve if / where applicable.												
	A 1 . 2	EXECUTION OF THE WORKS													

		7		
			A1.2.7.1 Programme of work	
			a) General	A scheme 2 programme shall apply.
			b) Scheme 2	<p>The contractor shall provide a licensed copy of his software to the Engineer for the duration of the project.</p> <p>Additional schedules, other than required in terms of Conditions of Contract Clause 8.3, to be provided are:</p> <p>Not Applicable</p>
			A1.2.7.4 Work on, over, under or adjacent to utilities	<p>The Contractor shall adhere to the specifications relating to work under / near overhead power lines as contained in:</p> <p>ESKOM: Distribution Guide – Part 19: BUILDING LINE RESTRICTIONS, SERVITUDE WIDTHS, LINE SEPARATIONS AND CLEARANCES FROM POWER LINES.</p>
	A 1 . 3		CONTRACT OR'S SITE ESTABLISH MENT AND GENERAL OBLIGATION S	
		A 1 . 3 . 3	GENERAL	
			A1.3.3.1 Construction camps	<p>No specific areas for construction camps have been identified.</p> <p>No SANRAL owned land is available.</p>
	A 1 . 4		FACILITIES FOR THE ENGINEER	
		A 1 . 4 . 3	GENERAL	The Contractor shall supply offices and laboratory buildings similar to the typical layout of offices and laboratory buildings.
		A 1 . 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.

			b) Offices	The details of fittings, furniture and equipment shall be as specified in the standard specifications and indicated in the Schedule of Quantities.
			c) Laboratories	Three types of laboratories are required on site: 1. Soils laboratory 2. Bituminous materials laboratory 3. Concrete testing laboratory
			f) Ablution unit	Separate shower and change rooms are to be provided at the living quarters.
			A1.4.7.2 Housing	
			a) Prefabricated houses	Not Applicable.
			A1.4.7.3 Services	
			b) Water, electricity and gas	A three-phase generator shall be provided on site capable of delivering constant regulated electricity suitable for operating sensitive electronic equipment.
			A1.4.7.5 Office staff	An office secretary/receptionist is required by the Engineer.
A	1	5	ACCOMMODATION OF TRAFFIC	
		A	GENERAL	
		1		
		5		
		3		
		A	CONSTRUCTION EQUIPMENT	
		1		
		5		
		6		
			A1.5.6.1 Traffic control facilities	
			A1.5.6.2 Illuminated traffic signs and safety devices	
			d) Sign mounted flashing lights	Sign mounted flashing lights shall be operated during the night and day.
		A	EXECUTION OF THE WORKS	
		1		
		5		

		.		
		7		
			A1.5.7.3 Accom- modation of traffic where the road is constructed in half or partial widths	<p>STOP / GO one-way traffic sections as shown on drawing TP1801-IC-R-18-AT-001 shall be in operation only during daytime from 06:00 to 18:00. No night closures will be allowed.</p> <p>The maximum allowable closure length which includes the transition area, buffer zone and termination area is 1.0km. The allowable waiting time for each closure should not be more than 10 minutes.</p> <p>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 1.0km.</p> <p>The maximum allowable closures on site at any given time is two (2).</p>
	A 1 . 7		LOADING AND HAULING	
		A 1 . 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	The installation of new services has not been allowed for under the project. Existing services shall be moved / relocated where necessary.
			A2.1.1.2 Location, identification, protection and relocation of existing services	<p>Existing, known services are indicated on - drawing TP1802-1C-R-16-LA-002 for each of the four traffic circles.</p> <p>At the position of traffic circle 1, there are three street lights (SL) that need to be relocated.</p> <ul style="list-style-type: none"> • SL 1-1 should be relocated approximately 3. m to the south behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. • SL 1-2 should be relocated approximately 0.75 m to the north behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. • SL 1-3 should be relocated approximately 1.5 m to the north behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. <p>At the position of traffic circle 1, there are two telephone poles (TP) that need to be relocated.</p> <ul style="list-style-type: none"> • TP 1-1 should be relocated approximately 6 m to the north on the proposed cadastral boundary. • TP 1-2 should be relocated approximately 11.75 m to the north on the new cadastral boundary. <p>At the position of traffic circle 1, there is one water man hole (MH) that needs to be relocated.</p> <ul style="list-style-type: none"> • MH 1-1 should be removed and reconstructed approximately 7.50m to the south within the new road reserve.

				<p>At the position of traffic circle 1, there is one water pipeline (WPL) that needs to be rerouted.</p> <ul style="list-style-type: none"> WPL 1-1 should be rerouted from the new MH 1-1 at the cadastral boundary to the existing manholes on the western and southern ends of Motlomo. <p>At the position of traffic circle 2, there are seven street lights (SL) that need to be relocated.</p> <ul style="list-style-type: none"> SL 2-1 should be relocated approximately 4.5 m to the south behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. SL 2-2 should be relocated approximately 4.5 m to the south behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. SL 2-3 should be relocated approximately 2.5 m to the south behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. SL 2-4 should be relocated approximately 0.75 m to the south behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. SL 2-5 should be relocated approximately 2.5 m to the north behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. SL 2-6 should be relocated approximately 11. m to the north behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. SL 2-7 should be relocated approximately 0.5 m to the north behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. <p>At the position of traffic circle 2, there are two telephone poles (TP) that need to be relocated.</p> <ul style="list-style-type: none"> TP 2-1 should be relocated approximately 6 m to the north on the proposed cadastral boundary.
--	--	--	--	---

				<ul style="list-style-type: none"> TP 2-2 should be relocated approximately 9.5 m to the north on the new cadastral boundary. <p>At the position of traffic circle 2, there is one man hole (MH) that needs to be relocated.</p> <ul style="list-style-type: none"> MH 2-1 should be removed and reconstructed approximately 3.00m to the south within the new road reserve. <p>At the position of traffic circle 3, there are seven street lights (SL) that need to be relocated.</p> <ul style="list-style-type: none"> SL 3-1 should be relocated approximately 3.00 m to the south behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. SL 3-2 should be relocated approximately 1.50 m to the south behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. SL 3-3 should be relocated approximately 2.20 m to the south behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. SL 3-4 should be relocated approximately 0.75 m to the south behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. SL 3-5 should be relocated approximately 1.50 m to the north behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. SL 3-6 should be relocated approximately 4.20 m to the south behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. SL 3-7 should be relocated approximately 11.00 m to the north behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. <p>At the position of traffic circle 3, there are five telephone poles (TP) that need to be relocated.</p> <ul style="list-style-type: none"> TP 3-1 should be relocated approximately 16.00 m to the west on the proposed cadastral boundary.
--	--	--	--	---

				<ul style="list-style-type: none"> • TP 3-2 should be relocated approximately 4.50 m to the north on the proposed cadastral boundary. • TP 3-3 should be relocated approximately 15.50 m to the north on the proposed cadastral boundary. • TP 3-4 should be relocated approximately 16.00 m to the north on the proposed cadastral boundary. • TP 3-5 should be relocated approximately 6.00 m to the north on the new cadastral boundary. <p>At the position of traffic circle 4, there are three street lights (SL) that need to be relocated.</p> <ul style="list-style-type: none"> • SL 4-1 should be relocated approximately 4.50 m to the west behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. • SL 4-2 should be relocated approximately 0.75 m to the north behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. • SL 4-3 should be relocated approximately 2.20 m to the north behind the guardrail on the walkway to provide lighting to the traffic circle and the walkway. <p>At the position of traffic circle 4, there are two telephone poles (TP) that need to be relocated.</p> <ul style="list-style-type: none"> • TP 4-1 should be relocated approximately 30.00 m to the west on the proposed cadastral boundary. • TP 4-2 should be relocated approximately 11.00 m to the north on the proposed cadastral boundary.
		A2.1.2	DEFINITIONS	
		A2.1.3	GENERAL	
			A2.1.3.1 Installation of new services	The installation of new services has not been allowed for under the project. Existing services shall be moved / relocated where necessary and as indicated above.
			A2.1.3.2 Location, identification, protection and relocation of existing services	

			a) Existing as-built records	Existing, known services are indicated on drawing TP1801-IC-R-16-LAS-002 for each of the four traffic circles.
			b) Location of existing services	Existing, known services are indicated on drawing TP1801-IC-R-16-LAS-002 for each of the four traffic circles. An amount is allowed in the schedule of quantities for detection and relocation. Ground penetration radar equipment may be used to confirm the location of services if required.
			d) Protection of services	
			<i>(i) Service owners</i>	The Contractor shall timeously notify each of the relevant service owners of the envisaged construction work to allow the service owner to lay and/or relay any particular service if required.
			<i>(ii) Protection</i>	In accordance with the Engineer's instruction.
			<i>(iv) Relocation</i>	No negotiations have transpired with existing services owner's with regards to possible relocation of such services. The Contractor shall, during the mobilization period identify services and make timeous arrangements for the relocation and / or protection of such services as / where required.
			A2.1.3.3 Safety, Method Statements, safeguarding the works and accommodation of traffic	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			a) Safety and Method Statements	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			c) Accommodation of traffic	The Contractor shall ensure that the pedestrians and other non-motorized traffic are safeguarded and shall be able to cross the working area without being endangered. The pedestrians should not be able to enter areas where works are taking place. In addition, all trenches shall be suitably barricaded by PVC safety netting.
			A2.1.3.5 Programming for services	
			a) Trenching and installation sequence	Should service ducts be installed it shall be undertaken before surface treatments.

			A2.1.3.6 Provision of record drawings and details	It is not a requirement that the contracts surveyor must be registered with the SAGC.
			A2.1.3.9 Limitations and restrictions	
			c) Installation under special conditions	The Contractor shall strictly adhere to the specific conditions as specified in the wayleave or any other relevant documentation.
			e) Working widths	A corridor of a suitable maximum width, as agreed by the Engineer, shall be allowed for all trenching operations, i.e. for all safety and environmental protection measures, accommodating workers and working space, as well as the safe placement of excavated material, once the setting out and pre-marking of the trench line has been completed.
		A2.1.4	DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS	
			A2.1.4.1 Temporary works	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A2.1.4.2 Alternative designs	
			b) Alternative design approvals	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A2.1.4.3 Designs	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		A2.1.5	MATERIALS	
			A2.1.5.1 Trench backfill material	A limited allowance has been made for G7 material from commercial sources as per payment item C2.1.11.1.
			A2.1.5.2 Soil cement and stabilised trench backfill material	
			a) Soil cement backfill	No allowance has been made for soil cement backfill under the project.
			b) Cement stabilised backfill	Not Applicable.
		A2.1.6	CONSTRUCTION EQUIPMENT	
			A2.1.6.1 Excavation equipment	No additional specifications other than those contained in the contract

				documentation are applicable to this sub-clause.
		A2.1.7	EXECUTION OF THE WORKS	
			A2.1.7.1 Trenching for Services	
			f) Safe placement of excavated material	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			h) Excavation	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			j) Excavation using Labour Enhanced Construction Methods	Labour enhanced construction methods shall be used as allowed for under payment item C2.1.9.
			k) Excavations outside the normal trench profile	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			l) Timbering and shoring	
			<i>(ii) Contract Specific Shoring Requirements</i>	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			m) Soil cement backfilling	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			n) Erosion protection with sandbags	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			p) Preparation of the bottom of trenches	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			r) Dealing with water	
			<i>(i) Contractor's obligations for dealing with water</i>	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A2.1.7.2 Reinstatement of existing roads and existing road furniture	

			a) General	Reinstatement shall match the existing layers where applicable or be as ordered by the Engineer in line with the pavement design drawings (new construction).
			b) Reinstatement of existing road carriageways and other paved areas	Reinstatement shall match the existing pavement layers or be as ordered by the Engineer
			d) Reinstatement of unpaved areas	Reinstatement shall match the existing surrounds or be as ordered by the Engineer.
			A2.1.7.3 Railway reserves, bridge and other special crossings	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A2.1.7.6 Ownership, removal and disposal of existing service materials	<p>Any existing service material (ducts, pipes, cables etc) recovered when existing services are removed remains the property of the Employer or owner, if confirmed in writing.</p> <p>Otherwise, 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> <p>The removal of services shall be in accordance with the specifications contained in the wayleave or as agreed to in writing by the owner thereof.</p>
		A2.1.8	WORKMANSHIP	
			A2.1.8.2 Compaction	
			a) Relative density compaction control	Relative density compaction control shall be used for ALL compaction control and acceptance tests. DCP tests shall not be accepted.
			<i>(ii) Areas subjected to vehicle traffic loads or within the road prism</i>	<p>Areas over and above any road carriageways, lined drains or any paved footways, sidewalks or walkways, layers shall be backfilled in maximum thickness lifts of 150mm (after compaction) 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> <p>Areas over and above any fill or embankment within the road prism. layers shall be backfilled in maximum thickness lifts of 150mm (after compaction) and the material shall be compacted to a minimum</p>

				of 93% of MDD or a minimum of 100% of MDD where sand is used.
			c) DCP compaction control	DCP tests shall not be accepted for any compaction acceptance control tests.
	B2.1		GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES PART B: LABOUR ENHANCEMENT	Labour enhanced construction methods shall be used
		B2.1.1	SCOPE	Labour enhanced construction methods shall be used as also allowed for in the relevant payment items.
	C2.1		GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES PART C: MEASUREMENT AND PAYMENT	
			(ii) Notes on measurement and pay items	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		C2.1.6	Trench excavation (in soft material)	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		C2.1.8	Excavations outside the normal trench profile	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		C2.1.9	Trench excavation using labour enhanced construction methods	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		C2.1.10	Excavation in tunnels exceeding 3,0 m in length in:	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		C2.1.16	Subsurface drains in trench bottoms (Contract Documentation reference or drawing number indicated)	Not Applicable.
		C2.1.17	Removal and disposal of spoil material from trench excavations:	Spoil site to be identified / provided by the Contractor per payment item C2.1.17.2.

		C2.1.18	Timbering, strutting and shoring	Not Applicable.
		C2.1.20	Specified temporary works to control water inflow (state reference in Contract Documentation or indicate drawing number etc.)	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
	A2.2		DRY SERVICES	
		A2.2.1	SCOPE	A nominal allowance has been made in the schedule for the supply, laying and proving of ducts as / where required (payment item C2.2.1).
			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	Ducts shall be ordinary pipes of unplasticized PVC with requirements as per sub-clause A2.2.5.1(a).
			A2.2.5.1 Ducts and sleeves	
			A2.2.5.2 Bedding	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A2.2.5.3 Backfill	
			a) Backfill for trenches (excluding micro or mini trenching)	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			b) Backfill for micro or mini trenching	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A2.2.5.4 Cable duct markers	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A2.2.5.5 Concrete	Concrete shall comply to a strength class C20/25-20, where required.
		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	Where more than one duct is to be installed in a trench it shall comply with the requirements as set out in Clause 4.2.1 and Figure 1 of SANS 2001-DP3.
			b) Bedding and compaction of bedding	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause Density tests by DCP shall not be allowed.
			d) Concrete bedding and encasement	
			<i>(i) Concrete bedding</i>	Concrete bedding shall extend at least one third of the pipe diameter up on either side of the duct. Concrete shall comply to a strength class C20/25-20.
			<i>(ii) Concrete encasement</i>	Concrete encasement shall extend at least one third of the pipe diameter over the duct. Concrete shall comply to a strength class C20/25-20.
			A2.2.7.4 Duct markers	
			b) Route markers	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			c) Road crossing markers	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A2.2.7.6 Duct installation by micro and mini trenching	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		A2.2.8	WORKMANSHIP	
			A2.2.8.2 Proving ducts	
			a) Standard proving requirements	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			b) Other duct integrity requirements	Other integrity requirements as specified by the service owner shall comply with the owner's specification.
	C2.2		DRY SERVICES PART C: MEASUREMENT AND PAYMENT	
		C2.2.6	Duct accessories (markers, marking, draw wires and end caps etc.)	The tendered rates shall include full compensation for the manufacture, delivery and installation of the markers, draw wires, end caps, plugs or other accessories

				complete as specified or for completing the marking on kerbs.
		C2.2.8	Covers and frames for duct handholes, manholes and access chambers	The tendered rates shall include full compensation for the manufacture, delivery and installation of the covers and frames complete as specified.
		C2.2.9	Install duct handhole, manhole and access chamber covers and frames provided by others	The tendered rates shall include full compensation for the installation of the covers and frames complete as specified.
	D2.2		DRY SERVICES PART D: GUARANTEES AND COMPLIANCE CERTIFICATES	
		D2.2.2	WARRANTIES FOR PRODUCT OR ELEMENT DESIGN AND INSTALLATION OF PROPRIETARY SYSTEMS	The design and installation of proprietary dry service systems shall require that a warranty of 15 years be supplied by the Contractor.

COTO CHAPTER 3: DRAINAGE

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
3			DRAINAGE	
	A3.1		DRAINS	
		A3.1.4	DESIGN BY CONTRACTOR / PERFORMANCE	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
	B3.1		DRAINS	
		B3.1.6	CONSTRUCTION EQUIPMENT	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
	D3.1		DRAINS	
	A3.2		CULVERTS	
		A3.2.3	GENERAL	
			A3.2.3.1 Types of culverts	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		A3.2.7	EXECUTION OF THE WORKS	
			A3.2.7.4 Unsuitable founding conditions	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
	A3.3		CONCRETE KERBING AND CHANNELING, ASPHALT BERMS, CHUTES, DOWNPIPES, AS WELL AS CONCRETE, STONE PITCHED AND GABION LININGS FOR OPEN DRAINS	
		A.3.3.4	DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		A3.3.5	MATERIALS	
			A3.3.5.2 Drainage structure materials	
			d) Joint sealant	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		A3.3.7	EXECUTION OF THE WORKS	
			A3.3.7.1 Drainage structures	

			a) Prefabricated concrete kerbing and channelling	Figure 4 kerbing to SABS 927 with 300mm wide Figure 14 concrete channel
	B3.3		CONCRETE KERBING AND CHANNELING, ASPHALT BERMS, CHUTES, DOWNPIPES, AS WELL AS CONCRETE, STONE PITCHED AND GABION LININGS FOR OPEN DRAINS	
		B3.3.4	DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
	D3.3		CONCRETE KERBING AND CHANNELING, ASPHALT BERMS, CHUTES, DOWNPIPES, AS WELL AS CONCRETE, STONE PITCHED AND GABION LININGS FOR OPEN DRAINS PART D: GUARANTEES AND COMPLIANCE CERTIFICATES	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.

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	Not Applicable.
	A4.2		CUT MATERIALS	
		A4.2.7	EXECUTION OF WORKS	
			A4.2.7.1 Excavation operations	
			a) Control at the cuttings, designated excavations and box cuts	<p>A full-time materials manager is not required for the project.</p> <p>Materials management shall be undertaken part time by the Site Agent and / or his delegated person.</p>
			b) Classes of excavation	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			h) Excavation of material in cuttings	<p>Cut slopes shall never be less (steeper) than 1:2.</p> <p>Benching into the existing road / formation shall be undertaken as indicated drawings TP1801-IC-R-04GL-001 to TP1801-IC-R-04GL-004.</p> <p>A full-time excavation controller is not required for the project.</p> <p>Excavation control shall be undertaken part time by the Site Agent and / or his delegated person.</p>
			i) Excavation of material in box cuts	<p>Benching shall always be started at the bottom of the existing cut progressing to the top of the formation in steps not exceeding 0,40m in height measured vertically.</p> <p>Existing surfacing layers adjacent to the box cut shall be mechanically sawn before the excavations start.</p>
			j) Excavation of material in designated excavations	Refer drawings in Volume 4 of the tender / contract documents.
			k) Selection and the use of the cut material	<i>Refer Part C4, Section C4.3 Appendices</i>
			n) Finishing of the side slopes of cuttings and designated excavations (para 1)	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.

	A4.3		EXISTING ROAD MATERIALS	
		A4.3.3	GENERAL	
			A4.3.3.1 Employer identified existing road materials	<i>Refer Part C4, Section C4.3 Appendices. For profiles of existing pavement structure.</i>
		A4.3.5	MATERIALS	
			A4.3.5.2 Reclaimed Asphalt Material	<p>Due to the nature of the project and expected limited quantum of Reclaimed asphalt material to be generated, no specific allowance has been made for the re-usage of such materials.</p> <p>If found suitable such materials may be used in pavement layers, backfill, shoulder repairs and / or other works to be undertaken by the Contractor. Pavement and envisaged granular layers shall not contain more than 30% modification of such surfacing materials by volume.</p>
			A4.3.5.3 Bituminous Seal surfacings	<p>Due to the nature of the project and expected limited quantum of Reclaimed bituminous surfacings to be generated, no specific allowance has been made for the re-usage of such materials.</p> <p>If found suitable such materials may be used in pavement layers, backfill, shoulder repairs and / or other works to be undertaken by the Contractor. Pavement and envisaged granular layers shall not contain more than 30% modification of such surfacing materials by volume.</p>
		A4.3.7	EXECUTION OF THE WORKS	
			A4.3.7.4 Milling	Loose local areas within a milled zone that appear loose after the milling process will be treated as a base patch as described / allowed for under Section C8.8, payment items C8.8.2, C 8.8.4 and related / relevant items under this section.
			A4.3.7.7 Excavation of crushed stone, macadam, cemented and gravel materials	A full time excavation controller is not required for the project and such duties can be undertaken part time by the Site Agent or his / her delegated agent / foreman.

			A4.3.7.9 Removal of existing pavement blocks	Not applicable.
			A4.3.7.12 Stockpiling of material	
			a) Preparation of the stockpile site	Not applicable.
	A4.4		COMMERCIAL MATERIALS	
		A4.4.3	GENERAL	
			A4.4.3.1 Employer identified commercial materials	
			a) Materials from commercial suppliers	<p>The following commercial material suppliers have provisionally been identified by the Employer:</p> <ul style="list-style-type: none"> • WG Wearer (058 303 5665) • Afrimat Harrismith (058 623 2891) • Petra Quarry (BFN) – 051 433 2964 <p>Regardless of the above information the Contractor shall ensure that suitable quality / quantity is available from the above or his identified source for the requirements of the project.</p> <p>Local suppliers shall also be identified as part of the Contractor's duties in relation to the CPG / other targets required under the contract.</p>
			b) Materials from private or non-commercial suppliers	No private or non-commercial suppliers have been identified by the Employer.
			c) Materials from the Employer's own sources	No Employer owned materials are available for use in this project.
		A4.4.5	MATERIALS	
			A4.4.5.1 Earthworks and pavement layer materials	Material sourced for use in the permanent works shall be stockpiled separately at the source. It is not a requirement that the sourced material be fenced off.
			A4.4.5.4 Non-traditional stabilising or soil treatment agents (<i>para 1</i>)	Non-traditional or soil treatment agents shall not be allowed.
	C4.4		COMMERCIAL MATERIALS PART C: MEASUREMENT AND PAYMENT	
		C4.4.5	Bituminous stabilising agents	The method of calculating the quantity of bituminous stabilising agents shall be determined in accordance with the authorized application rate.

	A4.5		ALTERNATIVE MATERIALS	
		A4.5.3	GENERAL	<p>The use of alternative materials is permitted. Proof of previous usage and satisfaction of all specifications will however be required.</p> <p>The Employer reserves the right to reject any such materials, even if specifications are met. Should the Contractor envisage the usage of alternative materials he / she will notify the Employer during the tender stage of the project and indicate the saving in cost to be realised by usage of such alternative materials.</p> <p>The Contractor shall procure other alternative materials not specified in the project documents but as defined in clause A4.5.2 of the standard specifications.</p>
		A4.5.5	MATERIALS	
			A4.5.5.3 Industrial operations material	
			a) Slag from the production of ferrous and non-ferrous materials	The acceptable expansion limit for steel slag meant for use in road pavement construction is 1.5% or less when assessed from the hot water bath expansion test.
		A4.5.8	WORKMANSHIP	Alternative materials shall comply with Table A4.1.5-6: Requirements for 10 % FACT and ACV values as well as Table A4.1.5-16: Durability requirements for all other rocks and all other requirements as stipulated in the Contract Documentation.
	D4.5		ALTERNATIVE MATERIALS PART D: GUARANTEES AND COMPLIANCE CERTIFICATES	The Employer, in consultation with the Engineer and Contractor, may request an extension of the Defects Liability Period and / or further guarantees for Alternative Materials and related products as proposed by the Contractor.

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	Slope gradients for batters shall not be steeper than 1:2
			Roller-pass (high-energy impact compactor or roller HEIC)	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		A5.1.3	GENERAL	
			A5.1.3.1 Roadbed material Investigation	<p><i>Refer Part C4, Section C4.3 Appendices, For profiles of roadbed investigation results.</i></p> <p>In line with the test results roadbed treatment shall include the following with suitable allowances made in the schedule under Section C5.1:</p> <ul style="list-style-type: none"> • Compaction of in situ material • Removal and replacement • Pioneer layer.
		A5.1.5	MATERIALS	
			A5.1.5.2 Topsoil	Topsoil shall be obtained from within the road reserve and within the construction limits and shall be stored in windrows.
			A5.1.5.3 Collapsing soil material	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause. No areas have provisionally been identified which comprise of collapsible soils.
		A5.1.6	CONSTRUCTION EQUIPMENT	High energy impact compactors (HEIC) shall be equipped with functioning continuous impact response metering and GPS if considered to be utilized.
		A5.1.7	EXECUTION OF WORKS	
			A5.1.7.1 Clearing and grubbing	Material obtained from clearing and grubbing shall be disposed of as described in clause A1.6.7.7.
			A5.1.7.2 Removal and conservation of topsoil from roadbed	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.

			A5.1.7.3 Normal roadbed treatment	
			a) Construction overview	<p>Roadbed treatment shall entail the following:</p> <ul style="list-style-type: none"> • Removal of unsuitable material if / as instructed by the Employer or his agent • Replacement of unsuitable material if required from commercial sources. • Scarification of in-situ and or imported material to a depth of 150mm • Compaction to 93% of MDD at OMC <p>Benching shall be undertaken as specified on the applicable drawings.</p>
			b) Removal of unsuitable roadbed material	Unsuitable material shall be disposed of as described in clause A1.6.7.7
			c) Percentage of Max Dry density (MDD)	<p>All compliant roadbed materials shall be scarified to an approved line and level and to a depth of at least 150mm and compacted to 93% of MDD.</p> <p>Should the material quality and related properties be such that the required density cannot be achieved and the Contractor has proven such, the Engineer may relax the compaction specification to 90% of MDD as allowed for in the Schedule (payment item C5.1.1.1).</p>
			e) Compaction of collapsible soil	
			<i>(i) General</i>	No areas have provisionally been identified which comprise of collapsible soils. No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			<i>(ii) Soil collapse construction</i>	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			<i>(iii) Non wetting-up roadbed collapse</i>	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			<i>(iv) Wetting-up roadbed collapse</i>	No additional specifications other than those contained in the contract

				documentation are applicable to this sub-clause.
			f) Hard material	<p>No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.</p> <p>Solid rock formations have not been identified during the materials investigations.</p>
			<i>(i) In situ treatment by ripping</i>	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause. No mudrock or shales were encountered during the materials investigation.
			<i>(ii) In situ treatment by drilling and rock breaking</i>	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			g) Inactive clay and normal clay	
			<i>(i) Material modification</i>	Material modification shall not be allowed.
			<i>(ii) Lime modification</i>	Lime modification shall not be allowed.
			<i>(iii) Removal of material</i>	Unsuitable inactive and normal clay material shall be removed to a depth of 450mm, or as indicated by the Engineer and replaced with pioneer layer materials.
			h) Active Clay	<p>The treatment of active clays shall be by means of Alternative 2.</p> <p>Moisture content fluctuations shall be restricted by constructing a flattened side batter, 1 (vertical):3 (horizontal).</p>
			<i>(i) Alternative 1 – roadbed construction using lime – Phase 1</i>	Lime modification shall not be allowed.
			<i>(i) Alternative 1 – roadbed construction using lime – Phase 3</i>	Lime modification shall not be allowed.
			<i>(ii) Alternative 2 – Roadbed construction by removal of active clay</i>	<p>Heaving clay in the roadbed shall be removed down to the bottom of the clay layer, or to a minimum depth of 450 mm below natural ground level.</p> <p>The removed material shall be suitably spoiled as specified and a pioneer layer shall then be</p>

				constructed in accordance with the specifications.
			i) Construction of a pioneer layer	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A5.1.7.4 Special drainage measures, dewatering	Subsoil drainage has not been allowed for under the project.
			A5.1.7.5 Dolomitic roadbed treatment	The project route is not situated in a dolomitic area. No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		A5.1.8	WORKMANSHIP	
			A5.1.8.2 Compaction requirements	All samples shall be taken in a stratified random pattern. No lot shall consist of less than 6 samples.
	C5.1		ROADBED PART C: MEASUREMENT AND PAYMENT	
		C5.1.13	Construction of a levelling layer	Measurement for payment shall be by cross-sections.
	A5.2		FILL	
		A5.2.3	GENERAL	
			A5.2.3.1 Fill Dimensions and shape	Refer to drawings TP1801-IC-R-04GL-001 to TP1801-IC-R-04GL-004.
			A5.2.3.2 Fill adjacent to existing fill	Refer to drawings TP1801-IC-R-04GL-001 to TP1801-IC-R-04GL-004.
			A5.2.3.3 Fill layer thickness	Fills shall be constructed in lifts of Compacted layer thickness of 200mm or less.
			A5.2.3.4 Fill compaction classification	
			a) MDD compaction	
			<i>(i) Sand fill</i>	Not applicable.
			<i>(ii) Normal fill and Coarse Fill</i>	The compaction density shall be 93% of MDD.
			<i>(iii) Fill widening</i>	The compaction density shall be 93% of MDD.
		A5.2.5	MATERIALS	
			A5.2.5.2 Use of fill materials	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.

				No high fills are envisaged.
		A5.2.7	EXECUTION OF THE WORKS	
			A5.2.7.3 Benching for fill construction	Refer to drawings TP1801-IC-R-04GL-001 to TP1801-IC-R-04GL-004.
			A5.2.7.4 Widening of fills	<p>Benching shall be undertaken as specified on the applicable drawings. Refer to drawings TP1801-IC-R-04GL-001 to TP1801-IC-R-04GL-004.</p> <p>The Contractor shall identify designated spoil sites. Non-Hazardous organic material may be disposed of in a suitable manner within the road reserve with the written consent of the Employer or his agent. A method statement shall be provided by the Contractor and approved by the Employer or his agent before spoil material shall be spoiled, whether in the road reserve or elsewhere as identified by the Contractor.</p> <p>Fill material shall be obtained from cut and or commercial sources.</p>
			A5.2.7.5 Rockfill embankment toe	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A5.2.7.9 Fills higher than 10m	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A5.2.7.10 Drainage blankets in fills	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A5.2.7.11 Drainage blanket layer in cuttings	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		A5.2.8	WORKMANSHIP	
			A5.2.8.2 Materials Quality and compaction requirements	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			Table A5.2.8-1	Fill widenings with normal or coarse fill material shall be constructed in layers of 200mm and less and shall be compacted to 93% of MDD.

				Each layer shall be tested and evaluated separately.
	A5.3		ROAD PAVEMENT LAYERS	
		A5.3.3	GENERAL	
			A5.3.3.3 Requirements prior to the construction of any pavement layer	The Engineer may order after inspection and / or testing that the in-situ material may be processed and constructed as per the requirements for a selected layer without any prior roadbed preparation being required.
			A5.3.3.4 Compaction of pavement layer material	<p>The length of any section of a layer being compacted shall not be more than what can be properly compacted with the available equipment in a single-operation.</p> <p>The compaction densities for the pavement layers are as follows (MDD):</p> <ul style="list-style-type: none"> • Upper selected subgrade layer : 95% • Gravel shoulder layer : 95% • C3 subbase layer: 97% • G4A base layer : 98% • G1 crushed stone base layer (with cement / emulsion) : 104%
			A5.3.3.7 Joints between pavement layers	
			a) Location of joints	<p>Due to the nature of the project with widening envisaged at circle positions, the position of the joint is predetermined / fixed.</p> <p>All other joints as may be required shall coincide with a road marking line (lane or shoulder) in so far as possible / practicable.</p>
			b) Longitudinal joints	Cutting depths shall coincide with the existing road pavement layer depths as supplied.
			c) Transverse Joints	The construction of transverse joints shall commence with a saw-cut through the existing surfacing and through each bound layer as required to match the existing pavement layer depths.
			A5.3.3.8 Pavement Layer Drainage	Subsoil drainage as required.
		A5.3.5	MATERIALS	
			A5.3.5.1 Material information	The required material properties for each individual pavement layer are as shown on drawings TP1801-IC-R-

				04GL-001 to TP1801-IC-R-04GL-004. and scheduled in the BOQ.
			A5.3.5.2 Pavement Layer thickness and compaction requirements	
			a) Pavement layer thickness requirements	The required layer thickness values for each individual pavement layer are as shown on drawings TP1801-IC-R-04GL-001 to TP1801-IC-R-04GL-004 and scheduled in the BOQ.
			b) Gravel and soil pavement layer compaction requirements (G4B to G9 material)	The required pavement layer compacted dry densities for each individual pavement layer are shown on drawings TP1801-IC-R-04GL-001 to TP1801-IC-R-04GL-004 and scheduled in the BOQ. Where layer densities are omitted from drawings / the BOQ, the compacted dry densities as specified in Table A5.3.5-1 shall prevail.
			Table A5.3.5-1	The required compacted dry density for upper selected layer shall be 95% of MDD.
			c) Crushed stone pavement layer compaction requirements (G1 to G4A and G5A material)	The compaction densities for the pavement layers are as follows (MDD): <ul style="list-style-type: none">G4A base layer : 98%G1 crushed stone base layer (with cement / emulsion) : 104%
			Table A5.3.5-2	The required compacted density for G1 crushed stone base layer treated with cement and emulsion shall be 104% of MDD. Due to working areas, widths and the like slushing and Apparent Density compaction will not be achievable.
		A5.3.7	EXECUTION OF WORKS	
			A5.3.7.1 Controlling pavement layer thickness	
			b) Minimum pavement layer thickness in transition areas	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A5.3.7.2 Combining Materials	It may be required that reclaimed materials; materials from commercial sources and/or cut be combined. The materials obtained from various sources shall be mixed uniformly at the point of use.

			A5.3.7.3 Construction of gravel pavement layers	
			a) Construction	<p>The required positioning of longitudinal joints for each individual pavement layer are shown on the applicable drawings.</p> <p>Where not specified otherwise, the longitudinal joints shall comprise a series of steps that are 150 mm wide and vertically conform to the depth of each layer.</p> <p>No longitudinal construction joint shall be directly under a wheel path / track in so far as possible / practicable.</p>
			A5.3.7.7 Initial compaction of crushed stone layer	The maximum compacted thickness of any G1 crushed-stone base layer compacted in one process shall be 150 mm.
			A5.3.7.12 Construction of trial sections	
			a) Trial Sections	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		A5.3.8	WORKMANSHIP	
			A5.3.8.4 Construction tolerances for pavement layers	<p>For all layers, the level tolerances shall be as specified in Table A5.3.8-1.</p> <p>No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.</p>
			d) Width tolerances	The required lane and shoulder widths as well as road edge lines are indicated on the drawings.
			A5.3.8.5 Surface regularity	Surface regularity, or riding quality of the base layer, shall be assessed by a rolling straight edge with requirements as specified in sub-clause (b).
			c) By using a profiler	The payment item for adjustment shall be PC5.3.2.1.
	C5.3		ROAD PAVEMENT LAYERS PART C: MEASUREMENT AND PAYMENT	
		C5.3.1	Compiling and implementing M&U	One M&U plan shall be required for each of the pavement layers.

			plans for the construction of all the pavement layers	
	A5.4		STABILISATION	
		A5.4.3	GENERAL	
			A5.4.3.2 Work in restricted areas	Treatment and stabilisation of layer work materials in restricted areas shall not be measured separately for payment.
			A5.4.3.3 Construction limitations	
			e) Traffic limitations	NO construction equipment is allowed to travel over a compacted stabilised layer unless for placing covering material which shall be placed by end-tipping, spread, and not compacted until the underlaying layer has cured for at least 7 days.
		A5.4.5	MATERIALS	
			A5.4.5.1 General	Materials to be stabilized are indicated on the applicable drawings and indicated in the BOQ.
			A5.4.5.2 Material for modification or pre-treatment	Non-compliant material shall be suitably spoiled. Suitable material shall be sourced by the Contractor from commercial sources which are compliant to the specifications.
			A5.4.5.3 Cementitious stabilising agents	The type of stabilizing agent shall be CEM II (B-V) (V-S) 32.5N or CEM V (A-V) 32.5N at a nominal content of 3% by weight for tendering purposes.
			A5.4.5.4: Bituminous stabilising agents	In recycled pavement layers the Bituminous stabilising agent shall be: Stable grade bitumen emulsion (40%) at a nominal rate of 1% nett bitumen content.
		A5.4.6	CONSTRUCTION EQUIPMENT	The specific method of protection or curing used shall be: <ul style="list-style-type: none"> Method b) Damp protective layer curing for new subbase layers. Method c) Membrane curing for G1 base layer Side spraying water tankers shall not be required.
		A5.4.7	EXECUTION OF THE WORKS	

			A5.4.7.1 Construction of a trial section	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A5.4.7.3 Chemical pre-treatment and stabilization	
			e) Applying and mixing in the cementitious agent using a recycler	Application of the cementitious stabilizing agent shall be by hand and the requirements of Clause A5.4.7.3(b) remain applicable. The outer edge lines shall be confirmed by the Engineer prior to commencement of stabilizing works.
			A5.4.7.7: Protection and curing of chemically stabilised layers	The specific method of protection or curing used shall be: <ul style="list-style-type: none"> • Method b) Damp protective layer curing for new subbase layers. • Method c) Membrane curing for recycled base layers
			c) Membrane curing	The application rate of the curing membrane shall be 0,5 liters/m ² .
			d) Prime coat curing	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
	A5.5		RECONSTRUCTION OF PAVEMENT LAYERS	Not applicable. Further refer Sections 8.5 and 8.8.

COTO CHAPTER 6: CONCRETE LAYERS

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
6			CONCRETE LAYERS	
	A6.1		PAVER LAID CONCRETE LAYERS	As labour enhanced construction is specified Section A6.1 is not applicable other than for material requirements, construction equipment, etc that does not relate to paving of the concrete using plant / machinery.
		A6.1.2	DEFINITIONS	
			Aggregate	No additional specifications or changes other than those contained in the contract documentation are applicable to this sub-clause.
		A6.1.4	DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS	
			A6.1.4.2 Design requirements	
			e) Air content	Use of an air-entraining agent is not recommended due to the strength reducing effect of increased air in concrete.
		A6.1.5	MATERIALS	
			A6.1.5.5 Reinforcing steel, tie-bars and dowels	
			a) Dimensions	The dimensions of the steel is as follows: <ul style="list-style-type: none"> Longitudinal : Y16 High tensile steel bars Transverse : Y8 High tensile steel bars Steel Mesh : Ref 617 (2kg/m²) The dimension detail is also indicated on the drawings.
			A6.1.5.7 Materials for joints	
			b) Silicone sealant	
			<i>(vii) Sealant.</i>	The joint filled with sealant detail is to meet the specifications.
			<i>(iv) Materials for cleaning, repairing and resealing of existing joints and cracks</i>	The requirements for resealing of existing joints or cracks shall comply with the requirements of Chapter 7 (section 7.1)
		A6.1.6	CONSTRUCTION EQUIPMENT	
		A6.1.7	EXECUTION OF THE WORKS	

			A6.1.7.1 Preparing the Underlying Layers	
			a) General	The underlying layers shall be constructed as indicated on drawings TP1801-IC-R-04GL-001 to TP1801-IC-R-04GL-004 and allowed for under Section C5 in the BOQ.
			A6.1.7.3 Placing, Compacting and Finishing Concrete	
			a) General requirements for both side-form and slip-form paving	
			<i>(v) Placing of tie bars</i>	The placing of tie bar detail is indicated on the drawings.
			<i>(vi) Placing of dowel bars</i>	The placing of dowel bar detail is indicated on the drawings.
			<i>(viii) Placing of steel mesh in jointed concrete pavement</i>	The placement of steel mesh detail is indicated on the drawings.
			A6.1.7.3 Placing, Compacting and Finishing Concrete	
			a) General requirements for both side-form and slip-form paving	
			<i>(x) Surface texturing</i>	The pavement surface shall be further textured by means of a grooving comb.
			A6.1.7.4 Joint forming	
			a) Construction joints	The joint detail is indicated on the drawings.
			b) Weakened-plain longitudinal hinge joints	The construction joint detail is indicated on the drawings.
			c) Weakened-plain transverse contraction joints	The depth of sawn groove detail is indicated on the drawings. The joints shall be sealed in accordance with clause A6.1.7.5 and as indicated on the drawings.
			d) Expansion joints	The expansion joint detail is indicated on the drawings.
			A6.1.7.5 Joint sealing	
			a) Silicone sealant	
			<i>(vii) Materials</i>	The dimensions and positions of the sealant and appurtenant materials is indicated on the drawings.
		A6.1.8	WORKMANSHIP	

			c) Construction tolerances	
			<i>(vii) Surface regularity</i>	The surface regularity shall be measured with either an Inertial High speed profilometer (IRI) or a Direct Contact Device (IRI). The rolling Straight Edge or 3,0m straight edge will only be used in areas inaccessible to the above instruments and for sidewalks.
	B6.1		PAVER LAID CONCRETE LAYERS PART B: LABOUR ENHANCEMENT	
		B6.1.6	CONSTRUCTION EQUIPMENT	
	A6.2		SEGMENTAL BLOCK PAVING LAYERS	
		A6.2.5	MATERIALS	
			A6.2.5.1 Paving blocks	The paving blocks shall be of class 25, Type S-A and 60mm thick.
			A6.2.5.4 Concrete beams, kerbs and channelling	Prefabricated kerbing and channelling shall comply with the requirements of Section A3.3 of Chapter 3.
		A6.2.7	EXECUTION OF THE WORKS	
			A6.2.7.1 Preparing the underlying layers.	The underlying layers shall be constructed as indicated on drawings TP1801-IC-R-04-GL-001 to TP1801-IC-R-04-GL-004 and allowed for under Section C5 in the BOQ.
			A6.2.7.4 Laying of the blocks.	The laying pattern and dimensions shall be as directed by the Engineer with further requirements under this clause deemed to be applicable.

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	
			A8.1.5.1 Bituminous material	<p>The priming material shall be one of the following as specified in Part C: Measurement and Payment:</p> <ul style="list-style-type: none"> • Quick drying bituminous prime, or; • MC-30 cutback bitumen, or; • Invert bitumen emulsion.
		A8.1.7	EXECUTION OF THE WORKS	
			A8.1.7.5 Opening to traffic	Blinding of the prime coat is not recommended but shall only be allowed for as temporary solution at intersections providing access to Route N5 where no other means of traffic accommodation is practicable.
	A8.5		STANDARD CRACK SEALING	SPECIFICATIONS
		A8.5.7	EXECUTION OF THE WORKS	
			A8.5.7.1 Preparation and execution	<p>The cracks shall be blown out with heated compressed air.</p> <p>No pre-treatment with primer is required and no rolling of cracks is required.</p> <p>The herbicide shall be Isopropylamine salt of glyphosate and shall be applied prior to sealing of the cracks.</p>
	A8.8		PATCHING AND EDGE BREAK REPAIR	
		A8.8.5	MATERIALS	
			A8.8.5.3 Backfill material	
			Table A8.8.5-2: Backfill material	Backfill material shall be hot-mix asphalt, 58V-22 stone skeletal mix.

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	<p>Mix 1: Continuously graded asphalt surfacing layer</p> <p>Sand skeletal mix continuously graded as defined A - E2 modified binder Design level III Extreme loading conditions (V) PG binder 58V-22 (PMB) NMPS = 14mm Further reference: Sabita Manual 35</p> <p>Mix 2: Continuously graded asphalt base layer</p> <p>Stone skeletal mix continuously graded as defined Design level III Extreme loading conditions (V) PG binder 58V-22 NMPS = 20mm Further reference: Sabita Manual 35</p>
			Asphalt mixes Cold mix asphalt (CA)	<p>The usage of CA is not provided for under the contract.</p> <p>No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.</p>
			Aggregate	The grading class applicable to the project shall be Grading Class 1.
		A9.1.3	GENERAL	
			A9.1.3.1 Nominal mix proportions and application rates	
			Table A9.1.3-1: Nominal Mix Proportions of Stone Skeletal Mixes for Tender Purposes Bitumen (type and grade according to Project Documentation) (%)	<p>Binder types are as indicated under item A9.1.2 above.</p> <p>The preliminary mix design base binder shall be as indicated in Table A9.1.3-1 for tendering purposes.</p>
			Table A9.1.3-1: Nominal Mix Proportions of Stone	In line with the project scope the usage of Reclaimed Asphalt is not foreseen / allowed for.

			Skeletal Mixes for Tender Purposes	
			Table A9.1.3-1 *Note 2:	Not Applicable.
			Table A9.1.3-2: Nominal Mix Proportions of Sand Skeletal Mixes for Tender Purposes Bitumen (type and grade according to Contract Documentation) (%)	
			Table A9.1.3-2: Nominal Mix Proportions of Sand Skeletal Mixes for Tender Purposes	
			Table A9.1.3-2 *Note 2:	Not Applicable.
			b) Bond coat and rolled-in chippings	The standard nominal application rates tabled shall apply for tender purposes.
		A9.1.4	DESIGN BY THE CONTRACTOR	
			A9.1.4.1 Mix Designs	The mix types shall be as indicated under sub-clause A9.1.2 above. Mix design Level III shall be applicable.
			A9.1.4.2 Mix design requirements	The asphalt mix used in all mixes shall meet the design requirements of design level III. Warm mix technology is not prescribed.
		A9.1.5	MATERIALS	
			A9.1.5.2 Bituminous binders for asphalt mixes	Binders to be used are as indicated in sub-clause A9.1.2 above. Classification requirements for testing protocols are as follows: Traffic classification: H Temperature zone: 58 Final binder PG classification for remainder : 58H-22
			A9.1.5.3 Bitumen bond coat	No change to the bond coat specification is proposed. Should polymer modified emulsions be utilized by the Contractor, such materials shall conform to AC-E1 standards. Due to tackiness and pickup a self-priming paving unit shall be required in this instance.

			A9.1.5.4 Aggregates	
			a) Aggregate Properties	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			c) Fine aggregate grading	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A9.1.5.5 Fillers	
			Table A9.1.5-7: Filler requirements	<p>The active filler shall be hydrated lime at 1% (min. also nominal) and 2% (max.) by mass and shall be tested in accordance with British Standard 812.</p> <p>At least 70% by mass of the active filler shall pass the 0.075mm sieve and the material shall have a bulk density in toluene of between 0.5 and 0.9 g/ml. The voids in the dry compacted filler shall be between 0.3% and 0.5%.</p>
			A9.1.5.8 Mix properties	The properties of the sand and stone skeletal mixes shall be relevant to design level III per Sabita Manual 35.
			A9.1.5.9 Asphalt Reinforcing	AC reinforcing not applicable for project.
		A9.1.6	CONSTRUCTION EQUIPMENT	
			A9.1.6.3 Paver	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A9.1.6.5 Rollers	No major bridge type structures are in the project route section where asphaltic surfacing is to be constructed. Therefore, no constraining parameters are specified for asphalt compaction equipment in this instance.
		A9.1.7	EXECUTION OF THE WORKS	
			A9.1.7.5 Bond coat	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A9.1.7.6 Placing the asphalt	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			A9.1.7.9 Applying rolled-in chippings	The project specific size of pre-coated chippings shall be 10mm.

				No change to the minimum specified final surface texture is proposed.
			A9.1.7.11 Surfacing of bridge decks	Not applicable.
		A9.1.8	WORKMANSHIP	
			A9.1.8.8 Sampling	
			b) Coring of completed layers	The Contractor shall provide suitable coring machines capable of cutting 100mm or 150mm diameter cores from the completed asphalt layers.

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	Geotextiles shall be non-woven needle-punched geotextiles Grade A5.
	A11.2		NON-STRUCTURAL GABIONS	
		A11.2.7	EXECUTION OF WORKS	
			A11.2.7.2 Constructing gabion boxes and mattresses	
			g) Assembly	Gabion boxes and mattress sizes and details are as follows: "0.5m wide x 2,0m long x 0,5m deep nominal dia. 2,7mm, diaphragms on 1m c/c, mesh size 80x100. 1,0m wide x 1,0m long x 1,0m deep nominal dia. 2,7mm, diaphragms on 1m c/c, mesh size 80x100.
	A11.4		ROAD RESTRAINT SYSTEMS	
		A11.4.1	SCOPE	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		A11.4.5	MATERIALS	
			A11.4.5.2 Materials	

			a) Steel guardrails for erection on timber posts	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			c) Guardrail posts	The type of preservative to be used for treatment of timber posts shall be Creosote that complies with SANS 616.
		A11.4.7	EXECUTION OF THE WORKS	
			A11.4.7.2 Construction of guardrails on timber posts	Guardrails shall be erected to the dimensions and specifications as specified on drawings TP1801-IC-R-15-TP-001 to TP1801-IC-R-15-TP-003 and allowed for in the BOQ, or upon instruction of the Engineer.
			A11.4.7.4 Construction of concrete barrier systems	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
	A11.5		FENCING	
		A11.5.5	MATERIALS	
			A11.5.5.2 Straining posts, stays, standards and droppers	The type of preservative to be used for treatment of timber posts shall be Creosote that complies with SANS 616.
		A11.5.7	EXECUTION OF THE WORKS	
			A11.5.7.7 Erecting special purpose fencing	Refer payment item C11.5.1.1(a) for wire requirements.
	A11.6		ROAD SIGNS	
		A11.6.1	SCOPE	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
		A11.6.5	MATERIALS	
			A11.6.5.2 Materials	
			a) Structural steel	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			d) Other plate material	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
			m) Alternative materials	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.

		A11.6.7	EXECUTION OF THE WORKS	
			A11.6.7.1 Classification of Materials	Overbreak in width or depth will be filled by the Contractor and shall not be measured for payment.
			A11.6.7.5 Erecting road signs	
			a) Position	Positions of road signs for each circle is indicated on drawings TP1801-IC-R-11-RS-001 to TP1801-IC-R-11-RS-004.
			b) Excavation and backfilling	No backfilling with concrete envisaged / allowed for.
			A11.6.7.7 Dismantling, storing and re-erecting existing road signs	Road signs are to be dismantled and stored for re-use. Dismantling of signs will include sign panels and ground mounted sign supports.
	C11.6		ROAD SIGNS PART C: MEASUREMENT AND PAYMENT	
			ii) Notes on measurement and pay items	Excavations will be measured from the ground surface.
			iii) Items that will not be measured separately	No additional specifications other than those contained in the contract documentation are applicable to this sub-clause.
	A11.7		ROAD MARKINGS AND ROAD STUDS	
		A11.7.5	MATERIALS	
			A11.7.5.2 Materials	
			a) Marking materials	
			(ii) Retro-reflective road marking	Water based paint will be accepted and has been allowed for retro-reflective road marking.
			(iii) Thermoplastic road marking material	Application of the permanent thermoplastic road marking shall have to be performed within the last 3 months of the 12-month defects liability period and at latest by Taking Over.
			b) Road studs	Permanent road studs compliant to SANS 1463 (RSA - 1, yellow / red, white / red, white / white) shall be used with reference to Table A11.7.5-1.

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

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: Designated Environmental Officer
	C1007	ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES	
		(h) On site plant	
		(ii) Asphalt plant	Considering the project scope it is not envisaged that an asphalt plant will be erected on site for this project.
	C1008	AREAS OF SPECIFIC IMPORTANCE	No areas of specific importance are identified.
	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	
		(p) Target Area(s)	For Targeted Labour: Dihlabeng Local Municipality.
		(u) 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 The Final Contract Value include the value of scheduled work and extra work but exclude Community Development work and any Contract Price Adjustment and adjustments for reduced payments, Rise and Fall, Retention Money, Penalties and VAT.
		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	0.5% of targeted labour value
		b. Black women;	30% of targeted labour value
		CPG for Targeted Enterprise	Minimum of (30%) of the Final Contract Value by the end of the contract to Targeted Enterprises The Final Contract Value include the value of scheduled work and extra work but exclude Community Development work and any Contract Price Adjustment and adjustments for reduced payments, Rise and Fall, Retention Money, Penalties and VAT.
		Targeted Enterprise minimum contribution by the following Target Groups:	
		i) Targeted Enterprise with ≥51% ownership by Youth	Minimum of 5% of the Final Contract Value
		ii) Targeted Enterprise with ≥51% ownership by Women	Minimum of 5% of the Final Contract Value
		iii) Targeted Enterprise with ≥51% ownership by Military veterans	Minimum of 1% of the Final Contract Value
		iv) Targeted Enterprise with ≥51% ownership by Disabled persons (Differently abled)	Minimum of 0.5% of the Final Contract Value
		v) Targeted Enterprise with CIDB 1 or 2 grading	Minimum of 5% of the Final Contract Value
		vi) Targeted Enterprise with CIDB 3 or 4 grading	Minimum of 5% of the Final Contract Value

	D1008	WORK SUITABLE FOR EXECUTION BY TARGETED ENTERPRISES	<ol style="list-style-type: none"> 1. Erection and maintenance of the Contractor's camp site 2. Clearing and grubbing. 3. Provision of traffic control facilities. 4. Management of traffic control facilities and traffic safety as part of the accommodation of traffic. 5. Construction and clearing of drains. 6. Installation of prefabricated culverts including inlet and outlet structures. 7. Concrete channelling and concrete linings for open drains. 8. Construction of concrete paving, kerbs and channels. 9. Construction of small concrete and other structures. 10. Pitching, stonework and protection against erosion. 11. Construction of gabions. 12. Patching and repairing edge breaks. 13. Erection of guardrails. 14. Fencing. 15. Road signs. 16. Road markings. 17. Finishing the road and road reserve. 18. Site Security Services. 19. Haulage of materials 20. Supply of plant. 21. Supply of fuel. 22. Specialised subcontract work such as: <ol style="list-style-type: none"> i. Laying of asphalt using asphalt pavers. ii. Batch plant erection and operations. iii. Earthworks, layer works construction. iv. Structural steel refurbishment.
SECTION E		REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS	
	E1018	PROJECT SPECIFIC CONSTRUCTION REQUIREMENTS	Refer to E1018 for project specific specifications.

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

SECTION C: ENVIRONMENTAL MANAGEMENT PLAN

SECTION C: ENVIRONMENTAL MANAGEMENT PLAN

TABLE OF CONTENTS	PAGE
C1001: SCOPE	C-171
C1002: DEFINITIONS	C-171
C1003: LEGAL REQUIREMENTS	C-173
C1004: ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS	C-176
C1005: TRAINING.....	C-178
C1006: ACTIVITIES/ASPECTS CAUSING IMPACTS.....	C-179
C1007: ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES.....	C-184
C1008: AREAS OF SPECIFIC IMPORTANCE.....	C-195
C1009: REHABILITATION	C-196
C1010: RECORD KEEPING	C-196
C1011: COMPLIANCE AND PENALTIES	C-197
C1012: PROJECT SPECIFIC CONDITIONS	C-197

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 policy has developed this Environmental Management Plan (EMPI) as a tool for continual improvement in environmental performance.

This EMPI prescribes the methods by which proper environmental controls are to be implemented by the Contractor. 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 (1999 edition) published by the Federation Internationale des Ingenieurs-Conseils (FIDIC) as the Defects Notification Period (maintenance period).

The provisions of this EMPI 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 Environmental Management Programme (EMPr). In the event that any conflict occurs between the terms of the EMPI and the project specifications or environmental authorisation, the terms herein shall be subordinate.

The EMPI 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 EMPI and/or environmental authorisation cannot occur without being submitted to SANRAL who will manage the process of amending the EMPI.

The EMPI 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 regulations. 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 the National Department of Environmental Affairs, (DEA), 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 Programme (EMPr): the embodiment of this EMPI to ensure that undue or reasonably avoidable adverse impacts of a development are prevented, and to ensure that positive impacts are enhanced. It thus addresses the how, when, who, where and what of integrating environmental mitigation and monitoring measures through identified projects.

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 relevant 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 EMPI, the site includes areas outside of, but adjacent to, the road reserve that may be affected by construction activities.

Spoil material: is material 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 is considered as waste material that 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 EMPI, 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 EMPI are legally binding in terms of this contract. In the event that any rights and obligations contained in this EMPI 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 EMPI 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 EMPI 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 EMPI, 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 EMPI shall be included.

The Contractor shall receive and implement any instruction issued by the Engineer relating to compliance with the EMPI 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 EMPI 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 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 EMPI. 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 diploma 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 EMPI the DEO shall also provide full cooperation whenever the Contractor is subjected to regular environmental audits.

(e) Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is an independent environmental specialist appointed by the Engineer to objectively and regularly monitor the Contractor's compliance with the conditions of the authorisations issued for the project and the approved EMPr (that is this EMPI 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 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; and
- (iv) The environmental benefits of improved personnel performance.

(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 commonest 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	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, no work on stream deviations or diversions shall be undertaken in accordance with the General Authorisation.

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 instruction 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 means such as water spray vehicles 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 undertake a study 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 in this study, 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 wetland 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 Agriculture, Forestry and Fisheries.

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. Should a soak-away system be used, it shall not be closer than 800 metres from any natural water course or water retention system. 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.

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. 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. 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 'waste' 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 strictly 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 the 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 considered to be 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 this EMPI. 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. 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 EMPI, 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 the 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 500m 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 relevant 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 EMPI, 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 EMPr. 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 meeting. 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 EMPI, 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.

C1012 PROJECT SPECIFIC CONDITIONS

TABLE 7/1: MECHANISMS THAT CAUSE ENVIRONMENTAL IMPACTS DURING CONSTRUCTION ACTIVITIES

Section	Contents	<i>Environmental Impacts</i>				
		<i>Pollution Type</i>	<i>Deformation of Landscape</i>	<i>Soil erosion</i>	<i>Alien Vegetation</i>	<i>Sensitive Areas</i>
C1.3	Camp Establishment	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	-Rivers and streams -Wetlands -Restricted areas i.e. private land owners -Grasslands -Inhabited areas -Heritage sites -Agricultural areas -Habitat fragmentation
C1.4	Housing, Offices and laboratories	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	-Rivers and streams -Wetlands -Restricted areas i.e. private land owners -Grasslands -Inhabited areas -Heritage sites -Agricultural areas -Habitat fragmentation
C1.5	Accommodation of Traffic	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas Maintenance of windrows	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	-Rivers and streams -Wetlands -Restricted areas i.e. private land owners -Grasslands -Inhabited areas -Heritage sites -Agricultural areas -Habitat fragmentation
C1.6	Clearing and grubbing	Waste treatment Hazardous waste Water supply	Selection of site Preserve indigenous vegetation	Selection of site Preserve indigenous vegetation Preserve topsoil	Protection of indigenous vegetation Preserve topsoil	-Rivers and streams -Wetlands -Restricted areas i.e. private land owners -Grasslands

Section	Contents	Environmental Impacts				
		Pollution Type	Deformation of Landscape	Soil erosion	Alien Vegetation	Sensitive Areas
		Noise /lights Dust control	Preserve topsoil			-Inhabited areas -Heritage sites -Agricultural areas -Habitat fragmentation
C1.7	Overhaul	Spillage Storage Noise/lights Dust control Exhaust fumes Washing waste	Turning circles Parking areas	Restrict access to sensitive areas	Protection of indigenous vegetation Preserve topsoil	-Rivers and streams -Wetlands -Restricted areas i.e. private land owners -Grasslands -Inhabited areas -Heritage sites -Agricultural areas -Habitat fragmentation
C3.1 -3.3	Drainage	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	-Rivers and streams -Wetlands -Restricted areas i.e. private land owners -Grasslands -Inhabited areas -Heritage sites -Agricultural areas -Habitat fragmentation
C5	Mass Earthworks	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	-Rivers and streams -Wetlands -Restricted areas i.e. private land owners -Grasslands -Inhabited areas -Heritage sites -Agricultural areas -Habitat fragmentation
C5.3	Pavement layers	Waste treatment Hazardous waste	Selection of site	Selection of site Preserve indigenous vegetation	Preserve indigenous vegetation Preserve topsoil Management of weeds	-Rivers and streams -Wetlands -Restricted areas i.e. private land owners

Section	Contents	Environmental Impacts				
		Pollution Type	Deformation of Landscape	Soil erosion	Alien Vegetation	Sensitive Areas
		Water supply Spillage Storage Noise / lights Dust control	Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas Maintenance of windrows	Preserve topsoil		-Grasslands -Inhabited areas -Heritage sites -Agricultural areas -Habitat fragmentation
C6.1	Concrete pavements etc.	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	-Rivers and streams -Wetlands -Restricted areas i.e. private land owners -Grasslands -Inhabited areas -Heritage sites -Agricultural areas -Habitat fragmentation
C9.1	Asphalt works	Waste treatment Hazardous waste Water supply Spillage Storage Noise / lights Dust control Smoke control Storage of materials	Selection of site Preserve indigenous vegetation Preserve topsoil Turning circles Parking areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil	-Rivers and streams -Wetlands -Restricted areas i.e. private land owners -Grasslands -Inhabited areas -Heritage sites -Agricultural areas -Habitat fragmentation
C11.1 – 11.9	Ancillary roadworks	Waste treatment Hazardous waste	Selection of site	Selection of site Preserve indigenous vegetation	Preserve indigenous vegetation Preserve topsoil Management of weeds	-Rivers and streams -Wetlands -Restricted areas i.e. private land owners

Section	Contents	Environmental Impacts				
		Pollution Type	Deformation of Landscape	Soil erosion	Alien Vegetation	Sensitive Areas
		Water supply Spillage Storage	Preserve indigenous vegetation Preserve topsoil	Preserve topsoil		-Grasslands -Inhabited areas -Heritage sites -Agricultural areas -Habitat fragmentation

SECTION D: STAKEHOLDER AND COMMUNITY LIAISON AND TARGETED LABOUR AND TARGETED ENTERPRISES UTILIZATION AND DEVELOPMENT

TABLE OF CONTENTS	PAGE
D1001: SCOPE	C-203
D1002: DEFINITIONS AND APPLICABLE LEGISLATION	C-204
D1003: TARGET GROUP PARTICIPATION	C-210
D1004: STAKEHOLDER AND COMMUNITY LIAISON AND SOCIAL FACILITATION	C-215
D1005: MOBILISATION PERIOD	C-223
D1006: THE ROLE OF THE ENGINEER	C-226
D1007: TENDER PROCESS FOR TARGETED ENTERPRISES	C-227
D1008: GENERAL RESPONSIBILITIES OF THE CONTRACTOR TOWARDS TARGETED ENTERPRISES	C-238
D1009: WORK SUITABLE FOR EXECUTION BY TARGETED ENTERPRISES	C-244
D1010: TRAINING, COACHING, GUIDANCE, MENTORING AND ASSISTANCE	C-245
D1011: LABOUR ENHANCED CONSTRUCTION	C-253
D1012: COMMUNITY DEVELOPMENT	C-253
D1013: MEASUREMENT AND PAYMENT	C-254

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, Targeted Enterprise Subcontracting, and Targeted 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 Principles for Project Liaison, Targeted Enterprise subcontracting, and Targeted 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 the Contractor's subcontracting with Targeted Enterprises and the employment of Targeted Labour. It may also include the supply of material and goods, procurement of services, and participation with MOU partners to facilitate successful works execution.*
2. *Communication will be streamlined through the PLC and used to manage the expectations of local business and communities.*
3. *SANRAL will chair PLC meetings and provide secretarial support through the Consulting Engineer or its Agent. Representation on the PLC will comprise SANRAL, the Contractor, the Consulting Engineer (SANRAL's Agent), and other relevant entities such as business representatives, traditional authority representatives, provincial, district, and local municipal representatives (not political office bearers), community representatives, and any other critical local Stakeholder that may be deemed necessary by SANRAL. While serving on the PLC, members must declare any conflict of interest and recuse themselves if requested by the PLC Chairperson.*
4. *The selection process of a Project Liaison Officer (PLO), who will be employed by the Consulting Engineer, must be fair and transparent, and the individual appointed must be supported by the PLC.*
5. *The definition of a Target Area (sometimes referred to as a local area or Project Area) may be varied by SANRAL with the input of the PLC prior to the construction tender being let.*
6. *The setup of databases for Targeted Labour in the Target Area will be done with the input of the PLC. The Targeted Labour database will be disseminated to the PLC for comment and input.*
7. *A system of Targeted Labour selection from the database must be established at a PLC meeting. The Targeted Labour database will be used by the Contractor to recruit Targeted Labour.*
8. *The PLC may give input in identifying areas of the Scope of the Works that are deliverable by Targeted Enterprises, and areas where capabilities are not available locally. All Scope of the Works areas where capabilities are not available locally will be imported from outside of the local area and local service providers will be given an opportunity to learn through one of the structured training options provided in the Contract.*
9. *Capability assessments of Targeted Enterprises will be done with the input of the PLC, prior to the subcontract tender stage commencing, to identify any deficiencies in skills and experience. For Targeted Labour, skills assessments will be done at recruitment stage.*
10. *Targeted Enterprise development support and training must be coordinated and conducted, prior to the sub-contract tender stage commencing, with the input of the PLC.*
11. *The setup of databases for Targeted Enterprises will be conducted with the input of the PLC. The database will be disseminated to the PLC for comment and input. A database will only become final on the date of sub-contract tender closure.*
12. *The Targeted Enterprises on the database must be assisted by the Consulting Engineer and the Contractor to be compliant with the relevant legislation to execute work for a SANRAL project. Targeted Enterprises on the database must be registered on the National Treasury Central Supplier Database (CSD). The*

databases for Targeted Enterprise subcontracting will be used by the Contractor for open tender processes. Tender processes for Targeted Enterprise subcontracting must be conducted by the Contractor using government principles (e.g., public opening of received bids, announcement of bidders and prices). The successful tenderers will be tabled, by the Contractor, in the PLC meeting for information purposes.

13. *Appeals to the tender process, which cannot be resolved by the PLC, must be escalated to SANRAL for an independent review which will be facilitated by the Transformation Unit.*
14. *The Consulting Engineer must ensure that formal contracting arrangements between the Contractor and the Targeted Enterprise Subcontractors are in place in all projects.*

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 utilisation and development.

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) Community

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

c) Contract Participation

Contract Participation is the process by which the Employer implements Government's objectives by setting Specific Goals to enhance Targeted Labour and Targeted Enterprises' utilisation and development, which the Contractor must achieve as a minimum.

d) Contract Participation Goal (CPG)¹

¹ 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 10845-8:2015 SANS 10845, Suite for Construction Procurement, 2015.

The CPG is the monetary value of the participation goals set by the Employer for Targeted Labour and Targeted Enterprises expressed as a percentage of the Final Contract Value (excluding provision for Contract Price Adjustment (CPA, also referred to as escalation), contingencies for unforeseen additional expenditure, and Value Added Tax (VAT)).

e) Contract Participation Goal Plan (CPG Plan)

The CPG Plan outlines how the Contractor intends to achieve the various Specific Goals w.r.t. the CPG as set in the Specification Data. The CPG Plan includes the detail of the Targeted Enterprise work programme, as well as the contents and value of the work packages. See Annexure X1 for the CPG Plan template.

f) Contract Participation Performance (CPP)

The CPP is the measure of the Contractor's progress in achieving the CPG and the formula for calculating its value is described in Section D1003.05.

g) Contract Skills Development Goals (CSDG)²

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) Domestic Subcontractors

A Domestic Subcontractor 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 Contract. The appointment of the Subcontractor is treated as something entirely for the benefit of the Contractor and is a purely "domestic matter".

i) Final Contract Value

The Final Contract Value also means the Contract Price as defined in FIDIC, sub-clause 1.1.4.2. To calculate the CPG as per Section D1003.04, Contract Participation Goal (CPG), of the Specifications, the Final Contract Value shall exclude CPA, contingencies, and VAT).

j) 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.

k) Labour

Persons:

- i) who are employed by the Contractor or a Subcontractor in the performance of the Contract, and

² CIDB Standard for Developing Skills through Infrastructure Contracts, 23 August 2013.

- 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 Subcontractor's employment policies, but
- iii) 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.

l) 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.

m) Mobilisation Period

The Mobilisation Period is the period between the Commencement Date and the date of Access to Site, which period (duration) is stated in the Contract Data. Section D1005 of the Specifications describes the purpose and requirements of the Mobilisation Period.

n) Project Area

The Project Area is 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 subcontracting opportunities.

o) Project Liaison Committee (PLC)

The PLC is 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 may not be members of the PLC, and
- ii) the Engineer and Contractor become members of the PLC on their appointment and participate in the Committee within the scope of their respective roles and responsibilities.

p) Project Liaison Officer (PLO)

The PLO is 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.

q) Specific Goals

Specific Goals may include contracting with persons, or categories of persons, historically disadvantaged by unfair discrimination based on race, gender and disability.

The Employer's Specific Goals are set in the Specification Data, and unless otherwise permissible by the Preferential Procurement Policy Framework Act (Act 5 of 2000) and its Regulations, Specific Goals may be set by the Employer for

the Contractor to subcontract with Targeted Enterprises in terms of their ownership and/or control, and employ Targeted Labour as follows:

- i) Emes and/or qses which are at least 51% owned by black people as listed below.
- ii) Black people who:
 - a. are citizens of the Republic of south Africa by birth or descent; or
 - b. became citizens of the Republic of South Africa by naturalisation:
 - i. before 27 April 1994; or
 - ii. on or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalisation prior to that date.
- iii) Women who are South African citizens.
- iv) Youth as defined in the National Youth Commission Act (Act 19 of 1996).
- v) People with disabilities as defined in the Code of Good Practice on employment of people with disabilities issued under the Employment Equity Act (Act 55 of 1998).
- vi) Black military veterans who qualify to be called a military veteran in terms of the Military Veterans Act (Act 18 of 2011).
- vii) Unemployed persons that are black people as listed in iii) to vi) above.
- viii) Unemployed persons not attending and not required by law to attend an educational institution and not awaiting admission to an educational institution.

r) Stakeholders

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 leadership representation.
- iv) Organised forums representing community interest groups.
- v) Organised forums representing the youth, women, and disabled people.
- vi) Other structured community groups such as religion, education, farming, etc.
- vii) Organised forums representing the transport sector.
- viii) Organised forums representing the business sector.
- ix) Organised forums representing road users and road safety interest groups.
- x) Organised forums representing environmental interest groups.
- xi) Any other relevant stakeholder forum or organisation recognised by the Employer and the local municipality.

s) Subcontractor

An entity appointed by the Contractor to execute a portion of the Scope of the Works as defined in the Conditions of Contract under FIDIC subclause 1.1.2.8. This includes both Domestic Subcontractors 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, or
- iv) one or more Wards that are predominantly located within the Project Area.

u) Targeted Enterprise

A Targeted Enterprise is an entity to which the Contractor subcontracts a percentage of the contract value as set in the Specification Data, acting in the capacity of a Subcontractor or JV partner, and

- i) the Contractor does not have any equity holding in the enterprise, either directly or through a flow through calculation in accordance with the amended Construction Sector Code of Good Practice published in Notice 931 of 2017 in Government Gazette No. 41287 of 2017 in terms of the Broad Based Black Economic Empowerment Act (Act 53 of 2003); and
- ii) is registered in terms of the Company's Act (Act No. 71 of 2008) or Close Corporation Act (Act No. 69 of 1984); and
- iii) its ownership adheres to the Specific Goals as set in the Specification Data; and
- iv) is registered with National Treasury's Central Supplier Database; and
- v) is tax compliant prior to award of a subcontract; and
- vi) is CIDB registered where applicable; and
- vii) is COIDA compliant prior to award of a subcontract where applicable.

A Targeted Enterprise may be a:

- a. subcontractor subcontracted to execute a portion of the Scope of the Works,
- b. manufacturer that operates or maintains a factory or establishment that produces materials or goods,
- c. supplier that owns, operates or maintains a store, warehouse or other establishment in which goods are kept in stock, which was bought in its own name, and regularly sold to other parties in the usual course of its business,
- d. service provider who provides professional, technical, or managerial services, including those required for the acquisition of personnel, facilities, equipment, and goods.

Targeted Enterprises are also Subcontractors 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.

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 Subcontractors.

y) Target Group

It is a group of entities and/or persons set as the Employer's Specific Goals in the Specification Data for the Contractor to subcontract with Targeted Enterprises and employ Targeted Labour.

z) Targeted Labour

Persons:

- i) who are unemployed, and
- ii) who are then employed by the Contractor or a Subcontractor (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 Subcontractor'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 Contractor's suppliers and service providers are not defined as "Targeted Labour" for the purposes of this Contract.

aa) 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.

bb) Training and Skills Development Programme (TSDP)

The TSDP outlines how the Contractor intends to achieve the CSDG targets, by applying the various training methods described in Section D1010 of the Specifications.

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) Constitution of the Republic of South Africa Act, Act No. 108 of 1996.
- b) Public Finance Management Act, Act No. 1 of 1999.
- c) Preferential Procurement Policy Framework Act, Act No. 5 of 2000, and its latest regulations.
- d) The South African National Roads Agency Limited and National Roads Act, Act No. 7 of 1998.
- e) Construction Industry Development Board Act, Act No. 38 of 2000.
- f) Broad-Based Black Economic Empowerment Act, Act No. 53 of 2003, as amended.
- g) Amended Construction Sector Codes, Government Gazette Notice 931 of 2017.
- h) The Skills Development Act, Act No. 97 of 1998.
- i) *The Skills Development Levies Act, Act no. 9 of 1999.*
- j) The National Small Enterprises Act, 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) CIDB Standard for Indirect Targeting for Enterprise Development through Construction works Contracts, 29 January 2013 (Government Gazette No. 36190, 25 February 2013).

- ii) CIDB Standard for Developing Skills through Infrastructure Contracts, 08 August 2013 (Government Gazette No. 36760, 23 August 2013), amended by version 2, June 2020 (Government Gazette No. 43495, 03 July 2020).
- iii) CIDB Standard for Minimum Requirements for Engaging Contractors and Subcontractors on Construction Works Contracts, 25 October 2015 (Government Gazette No. 42021, 09 November 2015).
- iv) CIDB Standard for Contract Participation Goals for Targeted Enterprises and Labour through Construction Works Contracts, 31 October 2017 (Government Gazette No. 41237, 10 November 2017).
- v) SANS 10845: 2015, Parts 5, 7 and 8.

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 subcontracting.

It also describes the measurement of penalties 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) subcontract 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 established at a PLC meeting 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 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 Target Groups and Target Area(s). 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 inputs of the PLC, compile a Targeted Enterprise Database from which Targeted Enterprises shall be subcontracted 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 for consideration to ensure Target Group participation as intended by the Employer.

d) Targeted Enterprise Database

Once the Preliminary Targeted Enterprise Database has been disseminated to the PLC for information purposes, 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.

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 subcontract tender or group of similar subcontract 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 goals set by the Employer for Targeted Labour and Targeted Enterprises expressed as a percentage of the Final Contract Value (excluding CPA, Contingencies, and VAT). The participation goals comprise of the following:

a) Targeted Labour

In the case of Targeted Labour, the CPG is:

- i) the sum of the wages and allowances, for which the Contractor, Subcontractors, and Targeted Enterprises contract to engage Targeted Labour in the performance of the Contract, expressed as a percentage of the Final Contract Value (excluding CPA, contingencies, and VAT) associated with the Specific Goals that are set in the Specification Data; or
- ii) the amount equal to the person days worked for which the Contractor, Subcontractors, and Targeted Enterprises contract to engage Targeted Labour expressed as a percentage of the total person days worked associated with the Specific Goals that are set in the Specification Data.

$$\% \text{ Targeted Labour (TL}_{\text{Total}}\%) = \text{the sum of the \% Targeted Labour employed by the Contractor, Subcontractors, and Targeted Enterprises.}$$

b) Targeted Enterprises

In the case of Targeted Enterprises, including manufacturers, suppliers, and service providers, the CPG is:

- i) the amount equal to the value of goods, services and works for which the Contractor contracts to engage Targeted Enterprises in the performance of the Contract, expressed as a percentage of the Final Contract Value (excluding CPA, contingencies, and VAT) associated with the Specific Goals that are set in the Specification Data, and calculated as follows:

$$\% \text{ Targeted Enterprises (TE}_{\text{Total}}\%) = \frac{\text{TE}_{\text{Subcontractor}}}{\text{TE}_{\text{Manufacturer}} + \text{TE}_{\text{Supplier}} + \text{TE}_{\text{ServiceProvider}} + \text{TE}_{\text{JointVenture}}} + \dots$$

Where:

$$\begin{aligned} \text{TE}_{\text{Subcontractor}} &= 1.0 \times \% \text{ Targeted Enterprise subcontractors, including the \% Targeted Labour employed by Targeted Enterprise subcontractors.} \\ \text{TE}_{\text{Supplier}} &= 0.5 \times \% \text{ Targeted Enterprise suppliers.} \\ \text{TE}_{\text{Manufacturer}} &= 1.0 \times \% \text{ Targeted Enterprise manufacturers.} \end{aligned}$$

$$TE_{ServiceProvider} = 1.0 \times \% \text{ Targeted Enterprise service providers (excluding cost of goods if service provider is not also the supplier or manufacturer of goods, e.g., a transport service).}$$

$$TE_{JointVenture} = 1.0 \times \% \text{ Targeted Enterprise joint venture participation parameter.}$$

While the individual participation goals, 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:

$$CPG_{Total} \text{ Labour} = \text{Final Contract Value} \times [TL_{Total\%} + (TE_{Total\%} - \text{Targeted employed by the Targeted Enterprises})]$$

Where:

$$\text{Final Contract Value} = \text{The total value of the Contractor's final certified work measured at the date of issue of the Taking-Over Certificate. The Final Contract Value includes the value of scheduled work and extra work but excludes any CPA, contingencies, and VAT.}$$

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

Both the Targeted Labour and Targeted Enterprise participation goals may consist of sub-goals which are stipulated in the Specification Data. The Contractor is required to achieve these individual sub-goals. If the Contractor fails to achieve any one of the individual sub-goals 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 goal set by the Employer for Targeted Enterprises. It is the Contractor's responsibility to assess the work required to meet the goals and, if necessary, to engage additional Targeted Enterprises to execute work on the Contract as well to ensure that the minimum goals 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:

$$CPP = CPG_{Actual}$$

$$= \text{total monetary value (excluding VAT) of Targeted Labour employed by the Contractor plus the total monetary value (excluding VAT) of Targeted Enterprises contribution, including Targeted Labour employed by the Targeted Enterprises.}$$

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.

a) CPP Penalties

Failure to reach either the CPG or any individual Target Group goals 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 goal or sub-goals 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:

$$\text{Penalty Targeted Labour} = (TL - TG) + \text{Sum } (TL_n - TG_n) - 1.2 \times L_{dp}$$

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 (excluding CPA, contingencies, and VAT).
- TG = Cumulative monetary value of Targeted Labour employed on the contract by the Contractor and all Subcontractors.
- L_{dp} = Cumulative monetary value of black Disabled Persons employed on the Contract by the Contractor and all Subcontractors.
- $(TL_n - TG_n)$ = The monetary values calculated unless if any calculated value is negative, then it shall be a zero value.

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

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 (excluding VAT).
- 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 (0) 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 subcontractors, as well as its associated risks, shall remain the sole responsibility of the Contractor.

The Employers CPG requirements, and the compulsory utilisation of project specific Targeted Labour and Targeted Enterprise 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, which include the Contractor, 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, providing 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 subcontracting, 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 Annexure. 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/or 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.

Stakeholder representation on the PLC is project and Project Area specific and may, amongst others, include:

- i) Relevant Provincial departments.
- ii) Relevant District and Local Municipal departments.
- iii) Traditional leadership representation.
- iv) Organised forums representing community interest groups.
- v) Organised forums representing the youth, woman, and people with disabilities.
- vi) Other structured community groups such as religion, education, farming, etc.
- vii) Organised forums representing the business sector.
- viii) Organised forums representing the transport sector.
- ix) Organised forums representing road users and road safety interest groups.
- x) Organised forums representing environmental interest groups.
- xi) Any other relevant stakeholder forum or organisation recognised by the Employer and the district and/or local municipality.

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 political office bearers 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.

The Employer's timeous establishment of the PLC and/or the level of functionality of the PLC shall not prevent the Contractor from continuing with his responsibilities during the Mobilisation Period and the subsequent commencement of construction of the Works.

b) Reimbursement of PLC Members

PLC membership is voluntary and PLC members shall not be remunerated for any time spent in PLC meetings or work done outside of PLC meetings, which are associated with representing their constituencies 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 reimburse PLC members for actual costs incurred in executing their PLC duties (other than time spent in PLC meetings or work done outside of PLC meetings). The Contractor will determine and table to the PLC a realistic, monthly, reimbursable amount which will be substantiated by an outline of the anticipated actual costs envisaged to be incurred by PLC members.

In establishing a reimbursement amount for PLC members, the factors listed below, as well as the Project Classification Table may be considered, but is not mandatory or conclusive:

- i) Transportation costs.
- ii) Sustenance (if not provided during meetings).
- iii) Type, size, and complexity of the project.
- iv) Facilitation of performance milestones.

Table D1004.03(a): Project Classification (Type, Size, Complexity)

Project Classification	Project Value (Rm)	Indicative PLC Reimbursement
Maintenance (M) (OPEX)	< R 100	R 585
	> R 100	R 585
Development (D) (CAPEX)	< R 100	R 585
	R 100 – R 300	R 705
	R 300 – R 500	R 820
	> R 500	R 935

PLC members will be reimbursed monthly, and the reimbursable amount may be revised bi-annually should the actual costs incurred by PLC members change during the project.

The PLC reimbursement amount shall be increased annually, or twelve (12) months after the last bi-annual adjustment, based on the CPI figure contained in Table B2 of Statistical Release P0141 by StatsSA (base date March 2023).

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 Principles for Project Liaison.
- 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, and
 - 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 PLC through the Mayor's Office and the PLC Chairperson (the Employer).
- c. If required, and in consultation with the Employer, a Political Steering Committee (PSC) may be established to address political matters.

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 the constituency whom they represented will be requested to nominate a replacement member.

iii) Targeted Enterprises and Targeted Labour

PLC members shall:

- a. ensure that they, or companies in which they hold equity, do not tender for any work or on any subcontract that are issued for this Contract. Should a PLC member, or a company in which he/she holds equity, tender for such work or subcontract, it will be treated as a conflict of interest and:
 - i. the person shall cease to be a PLC member for this Contract, and
 - ii. the tender proposal submitted will not be evaluated.
- b. not have private or business interests in any of the subcontract tenders tabled to the PLC or considered in this Contract.
- c. shall recuse themselves from discussions that deal with a subcontract 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 subcontract to a tenderer known to the member.
- d. 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).

- e. 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 manufacturer/supplier/subcontractor/service provider procurement or involvement in the Contract.

iv) Confidentiality

- a. PLC members shall accept that all information, documentation, and discussions regarding any matter serving before the PLC are confidential and undertake not to communicate this information outside of the PLC meeting.
- b. Decisions of PLC meetings may not be disseminated to any party other than the constituency whom they are representing.
- c. Information for public dissemination shall be clearly documented in the minutes of the meeting of the PLC to ensure that sensitive information is 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 provide input to the project's design stage matters which are of interest or concern to the parties to the PLC.
- b. Peruse the PLC 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's Project Manager of any training that PLC members require to execute their duties.
- e. Provide input to the Engineer in sourcing suitable candidates, based on the Employer's qualifying criteria, for the position of PLO.

- f. Observe that the qualifying criteria and procedures applied by the Engineer to select and employ the PLO are executed in a fair and transparent manner and are within the prescripts of the relevant labour legislation and regulations.
- g. Provide input to the Engineer in identifying the project's Target and Project Area(s) from which Targeted Labour and Targeted Enterprises could be employed and subcontracted, respectively.
- h. Provide input to the Engineer in identifying the project's Target Groups for inclusion in the Tender Documents.

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. Provide input to the Contractor in establishing the selection criteria and process to employ Targeted Labour
- c. Provide input to the Contractor in identifying the eligibility, functionality, preference, and compliance criteria to select and subcontract Targeted Enterprises.
- d. Provide input to the Databases compiled by the PLO and the Contractor from which Targeted Labour will be selected and employed and Targeted Enterprises will be subcontracted, respectively.
- e. Observe that the criteria and methodologies applied by the Contractor to select and employ Targeted Labour and subcontract Targeted Enterprises are executed in a fair and transparent manner and are within Government legislation and regulations and the Employer's Policies.
- f. Observe that the conditions of employment and the conditions of subcontracting, in the employment of Targeted Labour and subcontracting of Targeted Enterprises are applied in a fair and transparent manner and according to the Employer's employment and subcontracting requirements.
- g. Provide input to the Contractor on the training needs, eligibility criteria and selection criteria for the provision of training to Targeted Labour, Targeted Enterprises, Target Groups, project Stakeholders and the affected Communities.
- h. Observe that training and skills development programmes, which the Contractor committed to, are implemented, and executed as approved and intended.
- i. Inform the constituency whom they represent of any project matters which the respective parties to the PLC wishes to communicate with each other.
- j. Inform the constituencies 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 Employer's Project Manager, Engineer, and Contractor of any road safety concerns within the Project Area(s) and provide input on possible mitigating measures and/or road safety programs that will be most suitable for acceptance by the affected Communities to promote road safety.
- l. 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.
- m. Assist parties to the PLC to liaise with their respective constituencies 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 parties to the PLC based on the urgency of project matters.
- ii) Notice of Meetings
 - a. Notice of PLC meetings shall be given at least seven (7) calendar days prior to meeting dates.
 - 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 been absent from a meeting, he/she bears the onus of acquiring 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' 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 PLC members at the commencement of meetings, or the minutes of the previous meeting will serve as the agenda of 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. The Chairperson shall:
 - i. chair all meetings of the PLC,
 - ii. co-ordinate all the activities of the PLC with the assistance of the PLO,
 - iii. monitor that PLC members are fulfilling their tasks as assigned by the PLC,
 - iv. see to the execution of decisions taken by the PLC,
 - v. ensure, with the assistance of the Engineer, the validity of members' claims for reimbursement,
 - vi. monitor that all activities of the PLC comply with current laws, regulations, and SANRAL policies, 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% plus one (+1) ratio excluding co-opted members.
- viii) Apologies and Non-attendance
 - a. Apologies shall be in writing. In an emergency where a PLC member could not apologise in advance, a written apology must be submitted as soon as possible.

- b. Apologies may be sent through any media agreed to by the PLC, e.g., through SMS or WhatsApp messaging or a similar application.
 - c. The constituency, represented by a PLC member who fails to attend three (3) consecutive meetings without an apology, will be informed in writing and requested to nominate a replacement member.
- ix) Language
 - a. PLC meetings will be conducted in English to enable all participants to understand the discussions of the meeting.
 - b. However, care and consideration must be given to provide non-English speakers an opportunity to participate and hence, if agreed by all PLC members any of the 11 official languages may be spoken and translated during the meeting. Even if a language other than English is used, the minutes of the meeting will be recorded in English.
- x) Other
 - a. Sustenance shall be provided at PLC meetings as per government policy.

D1004.04 Project Liaison Officer

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 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 Communities 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 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 subcontracting opportunities,
 - d. the project programme as it pertains to the employment of Targeted Labour and subcontracting 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 they pertain 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) Monitor that the Contractor compiles the Targeted Labour databases based on the eligibility and selection criteria and that it is updated 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) Confirm that each Targeted Labourer enters an employment contract which adheres to current and relevant Labour legislation.
- xiv) Confirm 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 observe 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 Subcontractor), requirements, disputes, unrest, strikes, etc., and bring it to the attention of the PLC.
- xviii) Play a facilitating role to resolve any disputes between the parties to the PLC, which may occur due to the project.
- xix) Other than keeping the records already mentioned in this section, keep a 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, Stakeholder and affected Communities' matters 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 subcontracts 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 been submitted and/or completed by the Contractor:

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

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 Annexures or 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 w.r.t. the Mobilisation Period have been executed to the satisfaction of, the Engineer after consultation with the Employer's Project Manager.

The Employer's Project Manager 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 Programme

The Contractor shall compile an acceptable Training and Skills Development Programme, which sets out how he intends to achieve the various 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 www.cidb.org.za).

The Training and Skills Development Programme 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 Programme has been accepted by, and all the duties w.r.t. the Mobilisation Period have been executed to the satisfaction of, the Engineer after consultation with the Employer's Project Manager.

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

c) Subcontracting to Targeted Enterprises

During the Mobilisation Period the Contractor shall execute the following duties w.r.t. subcontracting work to Targeted Enterprises:

- i) Liaise with the Employer's Project Manager, the Engineer and the PLC to structure and finalise the work packages to be subcontracted to Targeted Enterprises.
- ii) Liaise with the Employer's Project Manager, the Engineer, and the PLC to determine the Targeted Enterprise Database criteria for the subcontracting of Targeted Enterprises.
- iii) Compile the Targeted Enterprise Database(s) for input 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 with the input of 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 subcontract 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 with the input of 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.

All training provided by the Contractor shall be aligned with the training requirements as described in Section D1010 of the Specifications.

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 subcontracting.

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 and Targeted Labour in the Project Area. The purpose of the audit was to:

- a) obtain an understanding of the Community's skills, both educational and occupational,
- b) obtain an understanding of the resources available within the Community, i.e., Targeted Enterprise availability and capabilities, and Targeted Labour skills levels.
- c) establish the CPG targets for Targeted Enterprises and Targeted Labour for inclusion in 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 Subcontracting

- i) Make recommendations to the Contractor in identifying, structuring, and scheduling the work packages to be subcontracted to Targeted Enterprises.
- ii) Approve the scope and extent of the work packages and, in consultation with the Employer, accept the CPG Plan.
- iii) Verify that the Targeted Enterprise Database(s) has been updated prior to the letting of every new set of subcontracts.
- iv) Approve tender procedures, tender documents, tender submission requirements and adjudication processes for the subcontracting of Targeted Enterprises.

- v) Review all tender adjudication reports and monitor that the criteria and procedures applied by the Contractor to subcontract to Targeted Enterprises are executed in a fair and transparent manner and are within the Employer's and Government's Supply Chain Management Policies.
- vi) Verify that subcontract agreements and the conditions of subcontracting to Targeted Enterprises are fair and transparent and within the prescripts of the Contract requirements.
- vii) Monitor the management of Targeted Enterprise subcontracts 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 subcontract 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.
- ii) Approve the proposed Training and Skills Development Programme, in consultation with the Employer.
- iii) Monitor that the Training and Skills Development Programme and any Targeted Enterprise support programmes, which the Contractor committed to, are implemented, and executed as intended.

D1007 TENDER PROCESS FOR TARGETED ENTERPRISES

While the Contractor may utilise manufacturers, suppliers, service providers, and subcontractors of its choice and selected via its own internal processes, for the subcontracting 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 subcontracting 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 subcontract a dedicated TE Procurement Coordinator, whose sole responsibility will be the management of Targeted Enterprise procurement and subcontracting matters.

The TE Procurement Coordinator shall be well acquainted with, and has experience in:

- a) the management of road construction and ancillary works,
- b) road construction and ancillary works suitable for SMMEs,
- c) National Treasury's Supply Chain Management Legislation and Regulations,
- d) the Employer's Supply Chain Management and Procurement Policies,
- e) the Employer's Transformation Policy,
- f) the Employer's proforma document for Targeted Enterprise Subcontracting,
- g) claims, amicable settlement, and dispute resolution facilitation, and
- h) Stakeholder and Community relations management.

The TE Procurement Coordinator shall conduct the tender processes and procedures for Targeted Enterprise subcontracting as prescribed in this Section D of the Specifications and shall adhere to Government's Supply Chain Management legislation and regulations and the Employer's policies.

The TE Procurement Coordinator shall provide the PLC with the necessary pre- and post-tender information for them to be able to observe that the criteria and methodologies applied by the Contractor to subcontract Targeted Enterprises are executed in a fair and transparent manner and are within Government's legislation and regulations and the Employer's policies.

D1007.02 Procedures for Targeted Enterprises Subcontracting

The Contractor shall utilise the Employer's proforma tender and contract document for Targeted Enterprise Subcontracting. The proforma subcontract document is attached as Annexure 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 subcontracting include, amongst others, the following activities, and sub-activities:

Activity 1 Tender Preparation

- 1.1 Compile preliminary list of subcontracting work packages.
- 1.2 Conduct a market analysis and resources and skills audit.
- 1.3 Call for an expression of interest.
- 1.4 Establish a Targeted Enterprise Helpdesk.
- 1.5 Compile Preliminary Targeted Enterprise Database.
- 1.6 Identify Targeted Enterprises, Target Groups and Project Area.
- 1.7 Finalise the Contract Participation Goal (CPG) Plan.
- 1.8 Acceptance of the CPG Plan.
- 1.9 Compile tender documents.

Activity 2 Tender Process

- 2.1 Advertise the subcontract packages.
- 2.2 Conduct a tender briefing and tender training session.
- 2.3 List of minimum tender submission documents.
- 2.4 Tender closure and opening of tenders.
- 2.5 Finalise Targeted Enterprise Database.

Activity 3 Tender Evaluation

- 3.1 Stage 1 – Eligibility
- 3.2 Stage 2 – Functionality
- 3.3 Stage 3 – Price and Preference
- 3.4 Stage 4 – Compliance Check

Activity 4 Appoint Successful Targeted Enterprises

- 4.1 Submitting a Tender Report.
- 4.2 Negotiating tender sum and/or rates with Targeted Enterprises.
- 4.3 Low tender sums submitted by Targeted Enterprises.
- 4.4 Payment to the Contractor.
- 4.5 Entering the Subcontract Agreement.

The summarised list of activities above, are further elaborated on in the paragraphs below:

a) Tender Preparation

Although the Contractor is required to implement the Targeted Enterprise work opportunities equally and continuously over the duration of the Contract, most of the Tender Preparation activities must be concluded during the Mobilisation Period.

i) Compile a preliminary list of subcontracting 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 subcontracted to Targeted Enterprises.

The Contractor shall refer to the construction activities that has been identified as being suitable for construction by Targeted Enterprises as listed in Section D1009 of the 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 manufacturers, suppliers, and non-construction service providers).
- 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 advised 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, functionality, and preference,
- b. compliance requirements such as CSD and CIDB registration, tax clearance and COID compliance, and
- c. the anticipated scope of the works to be undertaken by Targeted Enterprises.

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, functionality, and preference criteria, as well as of compliance requirements.

The Contractor shall enhance the readiness of Targeted Enterprises to participate in the subcontracting opportunities by establishing a Targeted Enterprise 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 the paragraphs 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 stage.

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. Target 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) Finalise the Contract Participation Goal (CPG) Plan.

The Contractor shall utilise all the information gathered from the activities described in the paragraphs above to finalise the 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 Target 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 Subcontracting (see Annexure)

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 subcontract work packages, its evaluation and selection criteria, and the Tender Advertisement shall be acknowledged by the PLC and accepted by the Employer, prior to advertising the tender (see Annexure. The draft subcontract tender documents shall be approved by the Engineer before letting the tender.

b) Tender Process

i) Advertise the sub-contract 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 advised by the PLC. The Contractor shall keep printed proof of all advertisements and the platforms where the subcontract packages were advertised.

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 session 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 by the Project Manager on award.

Notes of the tender briefing 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, manufacturing, supply, or services):

- a. A valid B-BBEE certificate or Sworn Affidavit with 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 (if applicable).
- 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 the stipulated time and date as advertised in the subcontract Tender Advertisement and Tender Data. Tenders shall be submitted to the Contractor in the format and at the address prescribed by the Contractor in the subcontract Tender Advertisement and Tender Data.

The tender opening shall be conducted by the Contractor who shall publicly announce and record the names of all Tenderers and their tender prices.

v) Finalise Targeted Enterprise Database

The purposes of the preliminary Targeted Enterprise Database are described in 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, through the Project Manager, 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 the relevant subcontract tender and shall be made available to the PLC if requested.

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 sub-contract 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. A valid B-BBEE certificate or a Sworn Affidavit with the Tenderer's B-BBEE contributor level.
- e. Proof that the Tenderer is an EME or a QSE.
Proof that the Tenderer falls within one or more of the Target 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 sub-contract 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 (Annexure) 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 sub-contract, 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. 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.

c. Project Specific Target Groups, e.g., woman, youth, etc.

In addition to the eligibility criteria for preferential procurement functionality points may also be allocated for the following Target 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 Target Groups shall not be more than 15% of the total evaluation points.

One, two or three of the Target Groups listed above may be selected to count towards the score for Target Groups.

If any one of the Target 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 Target 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 %

Preference will be scored as follows:

Table D1007.02(a): Allocation of Preference Score

Specific Goals	Criteria	10 Points		20 Points	
		Points	Max Points	Points	Max Points
TE's B-BBEE Level	1	10	10	20	20
	2	9		18	
	3	6		14	
	4	5		12	
	5	4		8	
	6	3		6	
	7	2		4	
	8	1		2	
	Non-compliant	0		0	

The highest scoring tenderer for each sub-contract package shall be checked for compliance.

The Contractor shall state in the tender advertisement and in the tender documents that only one sub-contract 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 sub-contract 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 sub-contract 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 CE 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**

a) Submitting a Tender Report.

The Contractor shall present the Tender Report for each sub-contract package to the Employer's Project Manager and the Engineer and thereafter table the winning tenderers to the PLC prior to award of the sub-contract.

b) 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 sub-contract 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 to the PLC prior to negotiation.); or
- ii. accept the highest points scoring tenderer's higher rates and total sum and remunerate the Subcontractor, at the Subcontractor'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 Subcontractors.

b. Provisional Sum

If the Employer has provided a Provisional Sum for the work items in the sub-contract package, the Contractor shall report on the feasibility of the highest point scoring compliant tenderer's tender rates and tender sum to the Employer's Project Manager 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 tenderers rates and total sum and remunerate the Subcontractor from the Lump Sum which the Contractor has tendered for the fluctuation between the Contractor's rates and that of the Targeted Enterprise Subcontractors. 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's Project Manager 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 five percent (5%) 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 mark-ups. If all prices submitted are deemed exceptionally low by the Engineer, the sub-contract 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 sub-contract packages.

iv) Payment to the Contractor.

- i. 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.
 - ii. 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 Subcontractors.
- v) Entering the Sub-contract Agreement.

The Contractor's TE Procurement Coordinator shall assist successful Targeted Enterprises to enter into a sub-contract 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 sub-contracted in terms of the CPG as stated in the Specification Data.

1. 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.

2. 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, guidance, coaching, development, and support of Targeted Enterprises as per the Contractors 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

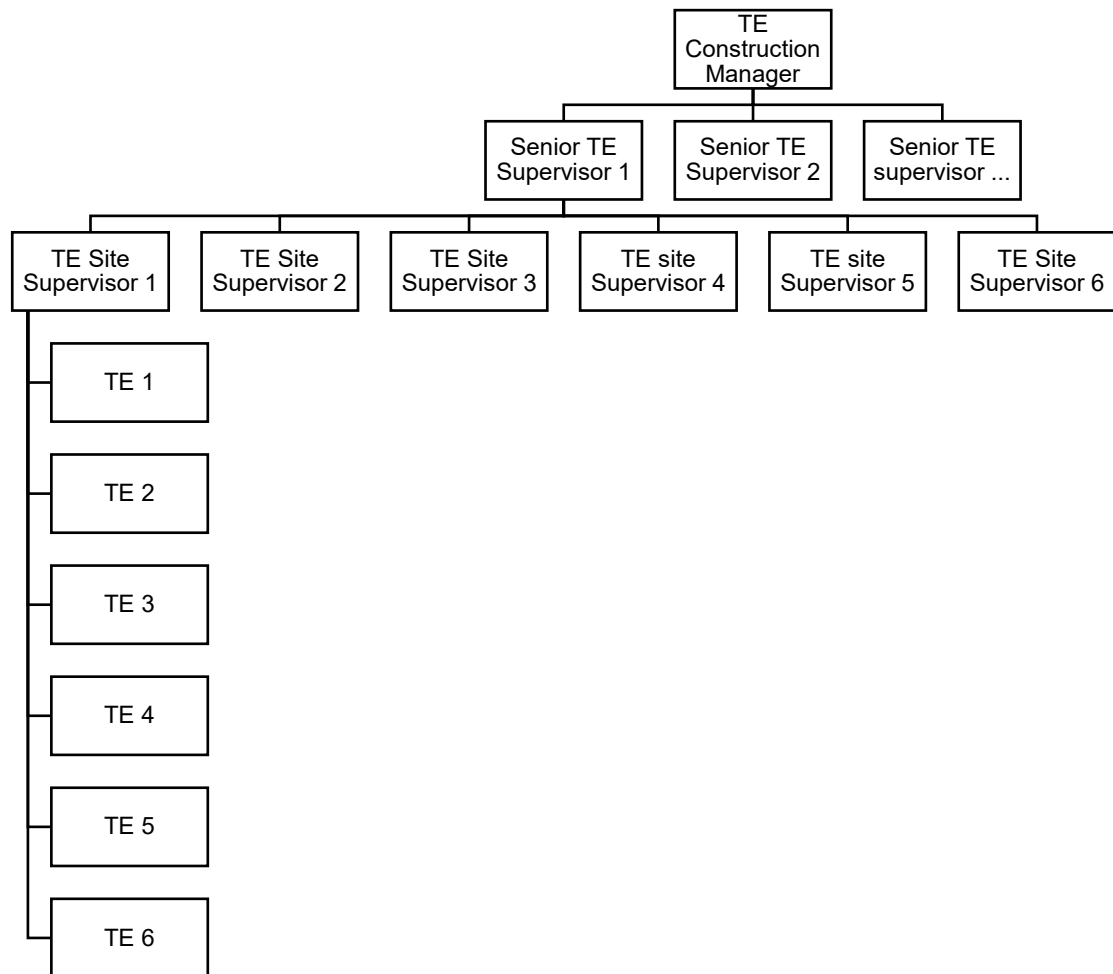
The TE Construction Manager shall have as a minimum a National Diploma: Management of Civil Engineering Construction Processes (NQF Level 5) or an equivalent qualification.

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) Ensure that the CPG objectives are achieved.

D1008.03 Sub-contract Agreements

The Contractor shall conclude sub-contract agreements with each sub-contracted Targeted Enterprise and shall utilise the Employer's proforma document for Targeted Enterprise subcontracting (see Annexure), 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**

Amongst others, the sub-contract agreement includes the following Particular Conditions of Contract:

- i) The Targeted Enterprise's entitlement to receive the training contemplated in the main Contract (sub-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 the main Contract (sub-contract Part C1, C1.2.1, Part B, clause 6.8).
- iii) The allowable sources from which Labour may be drawn in terms of the main Contract (sub-contract Part C1, C1.2.1, Part B, clause 6.5).
- iv) The terms and conditions relating to the recruitment, employment and remuneration of Labour engaged on the main Contract (sub-contract Part C1, C1.2.1, Part B, clause 6.5).
- v) The training to be provided to the Targeted Enterprise's workforce (sub-contract Part C1, C1.2.1, Part B, clause 6.8).
- vi) The terms and conditions related to payment of the Targeted Enterprise (sub-contract 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 sub-contract agreement (sub-contract Part C1, C1.2.1, Part B, clauses 14.6 and 20.4 to 20.7).
- viii) Dispute avoidance and resolution procedures (sub-contract 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 sub-contract agreement once approved by the Employer and the Engineer.

b) Monitoring of Sub-contract Agreements

The proforma sub-contract 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 sub-contract agreements were entered into with the sub-contracted Targeted Enterprises. The PLC may request insight into the Conditions of Subcontract and Sub-contract Data.

To protect Targeted Enterprises' competitive advantage and/or tender strategy, only the sub-contract agreement shall be available to the PLC for perusal and not the pricing structure and/or Schedule of Quantities.

A copy of each sub-contract 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 sub-contract 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 sub-contract work items.

Where the Contractor's sub-contract 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 PC1.3.1 of the COTO specification payment items, i.e.:

C1.3.1.1 paid in 3 instalments of 50%, 35% and 15%.

C1.3.1.2 paid as a percentage of the total value progressively per certificate.

C1.3.1.3 paid monthly for the Subcontractor'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 subcontracting 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 sub-contract. 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 sub-contract applicable and shall be directed at enabling the Targeted Enterprise to achieve the successful execution and completion of its sub-contract.

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 sub-contract 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 (sub-contract Part C3, clause 3.1.12), give reasonable warning to the Targeted Enterprise when any contravention of the terms and conditions of the sub-contract 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 sub-contract agreement provided that the Employer's Project Manager 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 the 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 (TSDP) which shall be managed by the Contractor's TE Construction Manager.

The CIDB Standard for Developing Skills through Infrastructure Contracts, 08 August 2013 (Government Gazette No. 36760, 23 August 2013), as amended by version 2, June 2020 (Government Gazette No. 43495, 03 July 2020) shall apply to projects with a Works Construction Period of 12 months or more, as set out under this Section D1010.

D1010.01 Purpose of the Training and Skills Development Programme (TSDP)

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.

The TSDP shall provide the learning detail for Targeted Labour, Targeted Enterprises and other Learner categories, including course and/or module contents and timeframes. See Annexure for the TSDP format.

D1010.02 Developing the TSDP

The Employer shall, through its Project Manager, be involved in the decision making and quality control pertaining to the development and implementation of the TSDP facilitated through this Contract.

The complete TSDP shall be developed during the Mobilisation Period, accepted by the Engineer after consultation with the Employer's Project Manager, and tabled to the PLC for their information before any training commence.

i. 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 in relation to the provision of different types of workplace opportunities linked to work associated with a Contract which culminate in or lead 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 final contract value multiplied by the percentage (%) for Civil Engineering work (CE) as set in the Specification Data.

To attain the CSDG, it is estimated that the following number of Learners must be trained on the Contract in the stated categories:

TABLE D1010/1: Number of Learners per Category

Learning Category		Number of Learners
Method 1	Occupational qualification.	10
Method 2	TVET College graduates, or	1
	Apprenticeships.	1
Method 3	P1 and P2 learners, or	1
	240 credits qualification.	1
Method 4	Candidates, 360 credits qualification.	1
	Candidates, 480 or more credits qualification.	1
Generic Skills	Occupational qualification.	10
Community Training	Occupational qualification.	10

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 Learners (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 50 percent (%) of the CSDG. The Contractor's permanently employed Trainees may not account for more than 25 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.

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 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 is 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.

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 (Penalty)

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. $\text{Penalty} = \{[\text{LoAs} + \text{LoLs} + \text{LoUSs} + \text{LoCs}]\}$

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).

b. Delay the issuing of the Performance Certificate until all the required records described in clause 5 of the Standards are received.

D1010.03 TSDP 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) Sourcing of Trainees

The Employer may provide the Contractor with its list of Trainees or source from which Trainees may be selected.

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

If the Employer does not provide the Contractor with a list or source of Trainees, the Contractor may source beneficiaries of the CSDG from the CIDB Skills Development Agency (SDA) or an SDA recognised by the CIDB such as the Construction Education and Training Authority (CETA) or a relevant Sector Education and Training Authority (SETA).

All beneficiaries shall be registered with a Skills Development Agency (SDA) recognised by the CIDB.

b) 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 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.

c) 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(ess). 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.

d) 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.

e) Learning Material

Learning material is required for each Unit Standard. This learning material is the equivalent of prescribed textbooks for other qualifications. Each Trainees 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/or road maintenance. Any input from a subject matter expert required to ensure the appropriateness of a 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.

f) Generic Skills Training

Generic skills training, which is not construction (technical) specific, but which are beneficial to the skills development of Targeted Enterprises and Targeted Labour, shall be taught in learning areas where the need has been identified and approved by the Employer's Project Manager and the Engineer.

The Contractor shall make representation to the Employer's Project Manager 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 examples of generic skills training programmes are:

- i) National Certificate: Vocational, levels 1, 2, and 3 in various fields.
- ii) National Certificate: Road Safety Development.
- iii) National Certificate: Occupational Hygiene and Safety.

Generic skills training shall add towards the Contractor's CSDG credits and shall be structured learning as per the CSDG Method 1 requirements. Training shall be accredited by the relevant Sector Education and Training Authority (SETA) and shall be provided by SETA accredited entities and individuals.

g) Community Training

Community training shall be taught in learning areas 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 sub-clause (d). Priority shall be given to training that will equip Community members with skills that will enhance their employability.

Typical examples of community training programmes are:

- i) General Education and Training Certificate: Hygiene and Cleaning
- ii) General Education and Training Certificate: ABET
- iii) National Certificate: Vocational, levels 1, 2, and 3 in various fields.
- iv) National Certificate: Travel and Community Tourism
- v) Further Education and Training Certificate: Community Development
- vi) Further Education and Training Certificate: Public Awareness HIV/AIDS

Community skills training shall add towards the Contractor's CSDG credits and shall be structured learning as per the CSDG Method 1 requirements. Training shall be accredited by the relevant Sector Education and Training Authority (SETA) and shall be provided by accredited entities and individuals.

D1010.04 The Training Service Provider

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.

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 sub-contract 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.

c) 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 monthly, 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 Projects

Community Development (CD) Projects are primarily training and skills development programmes to benefit an identified Community and Trainee Targeted Enterprises selected from the Community.

The owners and supervisors of Trainee Targeted Enterprises receive SAQA accredited training towards an accredited NQF qualification which consists of theoretical and practical components.

The theoretical training, as well as the practical training (which is the construction of the CD Works) is undertaken by the Trainee Targeted Enterprises under the mentorship and supervision of a Training and 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.

D1013 MEASUREMENT AND PAYMENT

Item **Unit**

D10.01 Target Group Participation

(a)	N/A.	
-----	------	--

Item
Unit

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

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 suppliers.	Number (No)
(b)	Targeted Enterprise Procurement Coordinator		Month

The unit of measurement for item D10.03(a) shall be the number of individual sub-contract agreements concluded with Targeted Enterprise Subcontractors 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(a) 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 sub-contract 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 sub-contract agreements and the management of all the Targeted Enterprise sub-contracts, 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 Subcontractors of CIDB 1 and 2 contractor grading designation appointed in terms of Section D of the Specifications.	Prime Cost (PC) Sum
(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 Subcontractors.	Lump Sum (LS)
(d)	Preliminary and General Obligations of Targeted Enterprise Subcontractors 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 Prime Cost 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 Prime Cost Sum amount stated in the Pricing Schedule. Construction works by Targeted Enterprise Subcontractors of CIDB 1 and 2 contractor grading designation, exceeding the Prime Cost 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 Subcontractors, which are not provided for in other pay-items.

The Lump Sum tendered under item D10.05(c) is for fluctuation of the Targeted Enterprise Subcontractor 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 pro rata basis to provide compensation for the fluctuation between the tendered rates of the Main Contractor and that of the Targeted Enterprise Subcontractors until the Lump Sum is depleted. Any costs incurred due to fluctuation in tendered rates more than that tendered for under item D10.05(c) will be for the Contractor's account. Item D10.05(c) is applicable where the Target Enterprise Subcontractor's tender amount is higher than the Main Contractor's tender amount. The Lump Sum will cover the fluctuation for all the tendered rates of the Subcontractors.

The Lump Sum tendered under item D10.05(d) is for the Preliminary and General Obligations of Targeted Enterprise Subcontractors (excluding CIDB 1 and 2 contractor grading designation). Payment of the Lump Sum shall be on a pro-rata basis to provide compensation for the P&Gs of Targeted Enterprise Subcontractors until the Lump Sum is depleted. Any costs incurred for the P&Gs of Targeted Enterprise Subcontractors 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)	Accredited occupational qualification training.		
	(i)	Stipend/wages for unemployed learners.	Prime Cost (PC) Sum
	(ii)	Handling costs and profit in respect of payment associated with sub-item D10.06(a)(i).	Percentage (%)
	(iii)	Mentorship and other costs.	Person Month
(b)	TVET college graduates and apprenticeships.		
	(i)	Stipend/wages for unemployed learners.	Prime Cost (PC) Sum
	(ii)	Handling costs and profit in respect of payment associated with sub-item D10.06(b)(i).	Percentage (%)
	(iii)	Mentorship and other costs.	Person Month
(c)	P1 and P2 learners and learners with a 240 credits qualification.		
	(i)	Stipend/wages for unemployed learners.	Prime Cost (PC) Sum
	(ii)	Handling costs and profit in respect of payment associated with sub-item D10.06(c)(i).	Percentage (%)
	(iii)	Mentorship and other costs.	Person Month
	(iv)	Travel and Accommodation	Prime Cost (PC) Sum
	(v)	Handling costs and profit in respect of payment associated with sub-item D10.06(c)(iv).	Percentage (%)
(d)	Candidates with 360 credits or more qualification.		
	(i)	Stipend/wages for unemployed learners.	Prime Cost (PC) Sum
	(ii)	Handling costs and profit in respect of payment associated with sub-item D10.06(d)(i).	Percentage (%)
	(iii)	Mentorship and other costs.	Person Month
	(iv)	Travel and Accommodation	Prime Cost (PC) Sum
	(v)	Handling costs and profit in respect of payment associated with sub-item D10.06(c)(iv).	Percentage (%)
(e)	Generic skills training		
	(i)	Stipend/wages for unemployed learners.	Prime Cost (PC) Sum
	(ii)	Handling costs and profit in respect of payment associated with sub-item D10.06(e)(i).	Percentage (%)
	(iii)	Mentorship and other costs.	Person Month
(f)	Community training		
	(i)	Stipend/wages for unemployed learners.	Prime Cost (PC) Sum
	(ii)	Handling costs and profit in respect of payment associated with sub-item D10.06(f)(i).	Percentage (%)
	(iii)	Mentorship and other costs.	Person Month

The Prime Cost Sums under sub-items D10.06(a)(i), (b)(i), (c)(i), (d)(i), (e)(i), and (f)(i) shall be paid in accordance with the provisions of sub-clause 13.5 of the FIDIC Conditions of Contract. The Prime Cost Sums shall cover the monthly stipends and/or wages as prescribed by the Employer to be paid to the relevant categories of unemployed Trainees receiving training and/or workplace training. No provision is made for stipends or wages of employed Trainees and the Contractor must make provision for loss of production for his own employees which are included in the TSDP.

The Percentage tendered for sub-items D10.06(a)(ii), (b)(ii), (c)(ii), (d)(ii), (e)(ii), and (f)(ii) is the percentage of the stipends and wages paid under sub-item D10.06(a)(i), (b)(i), (c)(i), (d)(i), (e)(i), and (f)(i) and shall include full compensation for the Contractor's handling costs, and any other costs associated with the pay-out of stipends and wages, which are not provided for in other pay-items.

The Person Month under sub-items D10.06(a)(ii), (b)(ii), (c)(ii), (d)(ii), (e)(ii), and (f)(ii) shall be paid in accordance with the provisions of sub-clause 13.5 of the FIDIC Conditions of Contract. The Person Month shall cover the monthly cost to mentor and/or train a Trainee and shall include all charges for the provision and delivery of the service including an accredited Training Service Provider (if required), learning material, stationery, information technology hardware and software, connection or licence costs, Trainee sustenance, fully furnished and equipped training venue(s), travel and accommodation (if/where required) and any other requirement as described in Section D1010 of the Specifications, and shall include the Contractor's loss of production, handling cost, profit, record keeping, reporting to the Employer and any other body or organisation as required in terms of the mentoring or training category, and all other administrative and overhead costs associated with mentoring and training. No mark-up is payable to the Contractor under this item.

No payment, nor pro rata payment, shall be made for trainees that, once selected, do not attend or only partially complete structured training modules. The Contractor's own staff may attend the training modules provided. However, training of the Contractor's staff shall be considered for measurement and payment purposes within the limits set in Section D1010.02 and if they also qualify as Targeted Labour.

The Prime Cost Sums under sub-items D10.06(c)(iv) and (d)(iv) shall be paid in accordance with the provisions of sub-clause 13.5 of the FIDIC Conditions of Contract. The Prime Cost Sums shall cover the travel and accommodation of Trainees in the relevant learning categories and in line with the Employer's Travel, Accommodation and Disbursement Policy. No provision is made for travel and accommodation of Trainees in other learning categories and the Contractor must make provision for travel and accommodation (if required) for these categories in other relevant pay-items.

The Percentage tendered for sub-items D10.06(c)(v) and (d)(v) is the percentage of the travel and accommodation paid under sub-item D10.06(c)(iv) and (d)(iv) and shall include full compensation for the Contractor's handling costs, and any other costs associated with the travel and accommodation, which are not provided for in other pay-items.

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

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*.

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

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

TABLE OF CONTENTS	PAGE
E1001: SCOPE	C-262
E1002: DEFINITIONS AND ABBREVIATIONS	C-263
E1003: HEALTH AND SAFETY POLICY	C-266
E1004: ROLES AND RESPONSIBILITIES	C-267
E1005: HSE TRAINING AND COMPETENCE	C-267
E1006: APPLICATION FOR CONSTRUCTION WORK PERMIT	C-269
E1007: DUTIES	C-269
E1008: MANAGEMENT AND SUPERVISION	C-269
E1009: RISK MANAGEMENT	C-270
E1010: LEGAL COMPLIANCE AND DOCUMENT CONTROL	C-272
E1011: OPERATIONAL INTEGRITY	C-275
E1012: OCCUPATIONAL HEALTH AND HYGIENE	C-276
E1013: WASTE MANAGEMENT	C-278
E1014: HAZARDOUS SUBSTANCE MANAGEMENT	C-278
E1015: CONTRACTORS	C-279
E1016: DESIGNING FOR HEALTH, SAFETY AND THE ENVIRONMENT	C-284
E1017: INCIDENT MANAGEMENT	C-284
E1018: PROJECT SPECIFIC CONSTRUCTION REQUIREMENTS	C-286

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, 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 provision must be made to review the policy regularly 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)

Appointment	Legal Reference
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.Cl 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.

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 Mandatory 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 C.004-029-2018/1, 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>	<u>Risk Rating</u> <u>High</u> <u>Medium</u> <u>Low</u>
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;	M

		Employees under / close to suspended loads.	
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
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	H

		bypass stop & go – fatality / serious injuries / vehicle accidents.	
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 Loads striking personnel, vehicles or equipment. People working underneath High voltage power lines may arch onto crane boom.	H
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;	H

		Serious injuries	
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. Drivers not slowing down to indicated speed limit. Drivers losing control of their vehicles.	H
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;	Public persons accessing construction area,	H

	Stockpiles; Incomplete structures.	stockpiles and incomplete structures. Fatality / Serious injury to public persons	
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 operators 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.

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT
OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

SECTION G: LOCAL PRODUCTION AND CONTENT

G1000 LOCAL PRODUCTION AND CONTENT

G1001 SCOPE

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.

This section provides the requirements for local production and content for the contract.

G1002 PRODUCT DESIGNATION

The products and components for local content and production for construction are as follows:

G1002.01 Steel

Only locally produced or locally manufactured steel products and components for construction with a minimum threshold for local content and production as stipulated below will be considered.

Table 1a: Minimum local content for Steel Value-added Products

Steel Construction Materials	Components	Local Content Threshold
Fabricated Structural Steel	Latticed steelwork, reinforcement steel, columns, beams, plate girders, rafters, bracing, cladding supports, stair stringers & treads, ladders, steel flooring, floor grating, hand railing and balustrading, scaffolding, ducting, gutters, launders, downpipes and trusses	100%
Joining/Connecting Components	Gussets, cleats, stiffeners, splices, cranks, kinks, doglegs, spacers, tabs and brackets	100%
Frames	Doors and windows	100%
Roof and Cladding	Bare steel cladding, galvanised steel cladding and colour coated cladding	100%
Fasteners	Bolts, nuts, rivets and nails	100%
Wire Products	All fencing products, all barbed wire and mesh fencing, fabric/mesh reinforcing, gabions, wire rope/strand and chains, welding electrodes, nails/tacks, springs and screws	100%
Ducting and Structural Pipework	Non-conveyance tubing fabricated from steel sheeting and plate with structural supports	100%
Gutters, downpipes & launders	Fabricated materials made from sheeting associated with roof drainage systems	100%

Table 1b: Minimum local content for Primary Steel Products

Steel Construction Materials	Local Content Threshold
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%
Wire Rod and Drawn Wire	100%
Sections (Channels, Angles, I-Beams and H-Beams)	100%
Reinforcing bars	100%

In the designation, imported inputs raw materials (i.e. zinc and additives in the surface preparation and protection process (cleaning and coating/galvanising)) used in the production of steel products and components for the construction are deemed as locally manufactured input materials.

The imported input raw material, as specified above, used in the manufacture and production of steel products and components for construction will be deemed to have been sourced locally for the purposes of calculating local content.

G1002.02 Electrical and telecommunication cables

Only locally produced or locally manufactured electrical and telecommunication cables for construction with a minimum threshold for local content and production as stipulated below will be considered.

Electrical Cables: cables used for power transmission	
Cable Products	Stipulated minimum threshold
Low Voltage	90%
Low Cost Reticulation	90%
Medium & High Voltage	90%
ACR	90%

Telecom Cables: cables used for telecommunications	
Cable Products	Stipulated minimum threshold
Optical Fibre Cables	90%
Copper Telecom Cables	90%

Excluded in the designation are mainly primary steel, copper, aluminum, polyvinyl chloride (PVC), cross-linked polyethylene (XLPE), aramid yarn, and optical fibre used for fabrication of cable products. This is to encourage local manufactures to seek the best global competitive prices for primary materials hence the competitive imported materials used in the manufacture of cables will be deemed to have been sourced locally for the purposes of calculating local content.

G1002.03 Yellow metal equipment

Only locally produced or locally manufactured Yellow metal equipment for construction with a minimum threshold (based on the cost of the locally produced portion of the equipment relative to the cost of the equipment) for local content and production as stipulated below will be considered.

Yellow Metal Equipment

Equipment type	Stipulated minimum threshold
Articulated dump truck (ADT)	60%
Tractor loader backhoe (TLB)	60%
Front end loader (FEL)	60%

G1003 COMPLIANCE

Contractors may not subcontract any work in such a manner that the local production and content of the designated products does not meet the specified thresholds.

The completed Form A3.5 (SBD6.2): Declaration Certificate for Local Production and Content for Designated Sectors and Form A3.6: Local Content Declaration: Summary Schedule (Annexure C), submitted by the Contractor are included as part of the contract in Part C5 Annexure.

The Department of Trade and Industry will undertake compliance audits with a view to monitor the implementation of the industrial development strategies.

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

G1004 MEASUREMENT AND PAYMENT

The Contractor shall not be separately reimbursed or compensated in respect of compliance with the provisions of this clause C3.6. All costs incurred in this regard shall be considered to be included in the rates tendered for the various items of work listed in the Pricing Schedule.

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

**SECTION H: PROJECT SPECIFICATION AMENDMENTS TO THE STANDARD
SPECIFICATIONS FOR ELECTRICAL AND LIGHTING WORKS**

TABLE OF CONTENTS

DESCRIPTION	PAGE
SECTION H1: GENERAL	C3-309
SECTION H2: SCOPE OF WORK AND TECHNICAL SPECIFICATIONS	C3-311
SECTION H3: QUALITY ASSURANCE SPECIFICATION	C3-362
SECTION H4: MEASUREMENT AND PAYMENT OF ELECTRICAL DISTRIBUTION AND EARTHING INFRASTRUCTURE	C3-369
SECTION H5: LUMINAIRES – (SECTION GH.10).....	C3-374

SECTION G1: GENERAL

TABLE OF CONTENTS

ITEM	DESCRIPTION	PAGE
1.8	REGULATIONS AND STANDARDS	C3-309
1.9	NOTICES AND FEES	C3-309
1.10	QUALITY OF MATERIALS	C3-309
1.11	WORKMANSHIP AND STAFF	C3-310
1.12	MAINTENANCE OF INSTALLATIONS	C3-310
1.13	CERTIFICATE OF COMPLIANCE	C3-310

SECTION H1: GENERAL

1.8 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 Electricity Act 1984 (Act 41 of 1984) as amended,
- o) 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 Employer in writing for his ruling in writing.

1.9 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.

1.10 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, specifications, or to British 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.

1.11 WORKMANSHIP AND STAFF

Except in the case of electrical installations supplied by a single-phase electricity supply at the point of supply, 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.

1.12 MAINTENANCE OF INSTALLATIONS

With effect from the date of the Taking-Over Certificate the contractor shall at his own expense undertake the regular servicing of the installation during the Defects Liability Period and shall make all adjustments necessary for the correct operation thereof.

If during the said 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 such stoppages however be so frequent as to become troublesome, or should the installation otherwise prove unsatisfactory during the said 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.

1.13 CERTIFICATE OF COMPLIANCE

On completion of the service, a certificate of compliance shall be issued to the Employer in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

SECTION H2: SCOPE OF WORK AND TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

ITEM	DESCRIPTION	PAGE
<u>2.1</u>	<u>PURPOSE</u>	C3-312
<u>2.2</u>	<u>NOTICES</u>	C3-314
<u>2.3</u>	<u>CABLES</u>	C3-314
<u>2.4</u>	<u>SUPPLY AUTHORITY APPLICATION FOR CONNECTION AND</u> <u>METERING KIOSK</u>	C3-321
<u>2.5</u>	<u>CABLE SLEEVES</u>	C3-321
<u>2.6</u>	<u>ELECTRICAL KIOSKS AND MINIATURE SUBSTATIONS</u>	C3-321
<u>2.7</u>	<u>EARTHING AND LIGHTNING PROTECTION</u>	C3-331
<u>2.8</u>	<u>MINISUB, KIOSK, MAST / POLE, MANHOLE, SLEEVE AND CABLE</u> <u>SECURITY MEASURES</u>	C3-334
<u>2.9</u>	<u>LIGHTING MASTS AND POLES</u>	C3-340
<u>2.10</u>	<u>LUMINAIRES</u>	C3-345
<u>2.11</u>	<u>LIGHTING MANAGEMENT SYSTEM</u>	C3-353
<u>2.12</u>	<u>MAINTENANCE</u>	C3-359
<u>2.13</u>	<u>SCHEDULE OF DRAWINGS</u>	C3-359

SECTION H2: SCOPE OF WORK AND TECHNICAL SPECIFICATIONS

This section defines the Scope of Work and Technical Specifications for the electrical and lighting works forming part of **CONTRACT SANRAL C004-029-2018/1F IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5, SECTION 3 FROM KM 34,0 TO PAUL ROUX (KM37,0)**

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 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 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.

The Electrical Contractor shall be appointed in terms of the Conditions of Contract or Sub contracts, as applicable, that are contained in THE CONDITIONS OF CONTRACT.

This Contract covers the supply, delivery, off-loading, storage, installation, testing, commissioning, aiming of luminaires and handing over in proper working order of the complete services installation as specified in the Project Specification and in all the constituent parts of this set of documents.

All equipment shall be new. In addition, full maintenance of the installation shall be provided during the 12-month defects liability period.

(a) Scope of Work

The specifications are based on a design with energy efficient, high performance LED street lighting luminaires, ready to be managed by a lighting management system and protected by an electronic security system.

For all offered solutions, photometric calculations shall be submitted as detailed in paragraph 2.10 and luminaire IES files and documentation shall be submitted as detailed in paragraph 2.10.

The luminaire specifications are detailed in paragraph 2.10. In particular the luminaires shall bear the SANS 475 mark (Luminaire performance requirements) and the SANS 60598-2-5 safety mark or International equivalent.

(i) Masts, poles and luminaires

The project consists of the installation of the following masts, poles and luminaires.

N5 Freeway Mainline

- 11.8 m poles (10m mounting height (m-h)) poles with 500 mm single spigot configuration for installation of 1 x LED street lighting luminaire,

Traffic Circles along N5

- 11.8 m poles (10m mounting height (m-h)) poles with 500 mm three way spigot configuration for installation of 3 x LED flood lighting luminaires,

(i) Electrical works

In addition the electrical work shall include the following:

- Supply, install, test and commission 420V 3 phase low voltage distribution kiosks with associated control and protection gear.
- Arrange, co-ordinate and install the points of supply in accordance to the correspondence with and standards of the local supply authority and the electrical design drawings.
- Supply, install, test and commission security cages around the minisubs and low voltage distribution kiosks in accordance to the drawings and the Employer Specifications.
- Supply, install, test and commission low voltage reticulation consisting of PVC SWA PVC Al and Cu cable and earth conductor (including trenching and concrete encasement) and sleeves where not installed by the main contractor.
- Supply, install, test and commission the lighting scheme consisting of, 10m mounting height lighting poles and luminaires. The termination panels within the masts and poles shall accommodate 35mm² 4 core AL PVC SWA PVC Cable terminations and earth.
- Supply, install, test and commission of luminaires on high masts, mid-hinge masts and poles.
- The electrical reticulation, where direct buried, is to be installed and encased in 20MPa concrete (800mm x 300mm) that is 700mm minimum below final ground level relative to the top of the encasement.
- Testing and cleaning of all service sleeves shall be done before services are to be drawn through the sleeves after the Engineers approval.
- Earthing and lightning protection, including earthing of the light masts and poles.
- Relocation of existing services where necessary including 11kV cables, LV cables and lighting poles.
- Commissioning, aiming of luminaires and testing of system to the satisfaction of the Engineer shall form part of this contract.
- Supply, install, test and commission an electronic security monitoring system for transformers, cabling, kiosks, poles and masts.
- Service tools and accessories.
- As-built drawings, documentation and training.

(ii) Lighting Management System (LMS)

Supply, install all equipment on lighting poles to enable a lighting management system ready for:

- Future Central Control System which includes computer hardware and software
- Future Communications networks including data costs
- Future Segment controllers (if required for the LMS)
- Future Luminaire controllers

The electronic security monitoring system and LMS shall be compatible with and integrated with the SANRAL Electronic Central Management System (SAN-ECMS). The SANRAL ECMS is an IoT based system supplied by Intelligent IoT Solutions. (email: projects@intelligent-iot-solutions.com)

~~(iii) Pilot Installation~~

~~The contractor shall construct, test and commission a pilot installation with a total length of approximately 1 km.~~

~~The pilot section shall be used by the contractor to demonstrate (test & trial) and obtain Engineers approval of the following:~~

- ~~1. The Lighting installation for compliance to the performance specification (lighting levels and uniformities achieved etc)~~
- ~~2. LMS system implementation and functionality~~
- ~~3. Security system (sensors, power monitoring, etc) implementation and functionality~~
- ~~4. Integration of LMS and security system~~
- ~~5. Integration of security system with SANRAL ECMS (Electronic Central & Management System)~~

~~The materials and labour for the pilot installation shall be covered by the pay items related to the equipment and activities for this section of the route.~~

~~A separate pay item is provided for the testing, commissioning and demonstration of the pilot installation.~~

2.2 NOTICES

The contractor shall issue all notices and make the necessary arrangements with the Employer, Dihlabeng Local Municipality, ESKOM and other necessary authorities as may be required with respect to the installation.

2.3 CABLES

(a) Cable Lengths

All scheduled cable lengths are for tendering purposes only and the Contractor shall measure 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 rates tendered The Contractor shall take the height of the mast/pole cable access hatch into account when ordering cable.

(b) Trenching and Burial of cables

For typical trenching details refer to SANRAL typical drawing Nos TD-E-P-3000-1- (LV Cable Trench), TD-E-P-3001-1-V1 MV Cable Trench and TD-E-P-3002-1-V1 Sleeve Installation.

Trenching shall be programmed in advance and the approved program shall not be departed from except with the consent of the Engineer.

Electrical cables (MV and LV) shall be installed and encased in **20MPa** concrete (minimum 500mm wide x 150mm thick concrete bedding + 150mm thick concrete cover) so that the top of the finished concrete encasement is 900mm minimum below final ground level. Vibration sensors, linked to the SANRAL ECMS, shall be installed in strategic areas along the route of the cable.

Where fibre optic miniduct is to be installed with the electrical cables, another bedding of 100mm 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 times likely to injure cables, the following precautions shall be taken:

- Before laying the cables all injurious items shall be removed from the bottom of the trench.
- The floor of the trench shall be evenly covered with a layer of sifted backfill, or sandy loam to a level which is 150mm above the highest unevenness of the trench.

The backfill used for this purpose shall have passed through a screen having a 6mm 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 150mm concrete bedding and inspected and approved by the Engineer they shall be covered with an additional 150mm 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 stamped down after the addition of every 150mm 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. Vibration sensors, linked to the SANRAL ECMS, shall be installed at all crossings along the route of the cable.

Where two MV cables are run in the same trench they shall be separated by at least 200mm. Where two lighting cables are laid in the same trench they shall be separated by at least 25mm. Where a lighting cable is laid in the same trench as a MV cable they shall be separated by at least 75mm 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 150mm shall be provided for cables of the same voltage and of 300mm for cables of differing voltage.

(a) Cables in sleeves across bridge structures

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.

(b) Cable Routing

The electrical contractor shall peg out the cable routes after which the Engineer or his representative shall be called to approve the routing. MV cables shall run parallel with and 1m from the road reserve boundaries.

Freeway lighting cables may share the same trench with the MV cable for certain sections, but the majority of the freeway lighting cabling shall be installed in the centre of the median or along the alignment of the poles at on and off ramps.

(c) Electrical Cables

Low voltage distribution and lighting cables shall be 4-core aluminium or stranded copper polyvinyl chloride (PVC) insulated PVC bedded galvanised steel wired armoured (SWA) PVC sheathed 600V/1000V cables with ECC earth conductor manufactured to SANS 1507-3.

MV distribution cables shall be 11kV cross-linked polyethylene (XLPE) complying with SANS 1339. All cables shall be 3-core stranded aluminium or copper and steel wired armoured.

(d) 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 an **hexagonal** die.

Lead sheets, or other approved material, approximately 75mm wide, shall be clamped around the high voltage cables at every cable end box and cable joint box and underneath every cable marker.

The following information shall be engraved on the sheets if the manufacturer has not already printed in on the cable sheath:

- (a) Voltage, e.g.: 11kV
- (b) Sizes, e.g.: 185mm² Cu.
- (c) Designation, e.g.: Substation 1, Substation 2

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 off the expense of the contractor.

(e) 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 70mm² 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.

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:

Red phase to terminal A
White phase to terminal B
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.

All cable ends within minisubs shall be made with heat-shrinkable high voltage termination systems suitable for 5 – 69kV as manufactured by Raychem Corporation. The material shall be non-tracking, erosion resistant and shall comply with the Manufacturer's appropriate Quality Assurance Schedules No's RK 1700 and 1720. The material shall not be subject to deterioration due to ultra-violet exposure. Heat shrink sheds shall be used to increase the creepage length. The shed closest to the crotch of the cable shall incorporate all three tails of the cable.

At all minisub terminations as minimum of 3m slack shall be provided adjacent to the termination point.

Where no intermediate connection is available, the cable tails shall be supported by means of pin insulators every 1.5m to avoid vibration in the crotch of the cable. Where a cold tail is joined to the cable tail, this shall be done by means of a barrier ferrule. The heat-shrink material shall cover the barrier ferrule.

Where the cable tail itself is connected to the lug or stud of an item of equipment, a sealed end lug shall be crimped onto the tail and the lug connected to the equipment. The heat-shrink material shall cover all but the spade of the lug to prevent the ingress of moisture.

Tenderers are to make due allowance for the length of tails in each particular case, since no claim for additional cost for extra-long tails will be considered.

Freeway lighting cables shall be made off using adjustable mechanical glands of the correct size, prescribed by the manufacturers. The armouring shall be clamped between substantial tapered bushes secured by lock nuts and properly earthed.

Neoprene waterproofing shrouds are to be fitted over all glands.

(f) Labelling and Marking of Cables

All cables shall be labelled with 3mm 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.

All MV cables shall also be labelled to state from where the supply is taken. The labels shall be so installed that they are easily readable.

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 50m 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.

(g) 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 (SANS10142) 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.

(h) Cable Testing

On completed sections of laid, jointed and terminated MV cables, a high voltage DC test of 15 minutes duration shall be carried out by persons qualified to make such tests.

Where such tests include sections of cable which have already been in service, the test voltages and duration are to be reduced in accordance with the Engineer's instructions.

Cable tests shall be in accordance with the following:

XLPE cables: 5000V megger test between cores and to earth unless additional tests are ordered by the Engineer. Method: SANS 0198 - Part XIII

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.

This schedules of cables may not be used for ordering purposes. The cable lengths given in the schedules are provided for tender purposes only.

The contractor shall do all measuring on site himself in respect of lengths of cable, earth wires and trenches required. The lengths given in the schedules are only allowed for tender purposes. Payments will only be made for the lengths of cable actually installed and at the tendered tariffs. In their tenders, Tenderers shall allow for cut-off lengths of cables and bends in their rates.

Labelling of transformers, kiosks, masts and poles shall adhere to the SANRAL labelling format which incorporates road section/chainage at which the equipment is located.

2.4 SUPPLY AUTHORITY APPLICATION FOR CONNECTION AND METERING KIOSK

The electrical contractor shall be responsible for the submission and payment of an application for two new 3-phase 400V 25kVA supplies from Dihlabeng Local Municipality. The positions of the new connection shall be determined on site.

The lighting distribution voltage shall be 400V 3-phase.

2.5 CABLE SLEEVES

Where cables pass under roadways they shall be laid in 110mm diameter PVC sleeve 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 110mm ribbed PVC sleeves shall be installed. The sleeves shall be heavy duty class 34 uPVC sleeving with a wall thickness of not less than 1,5mm 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 B22.23.

2.6 ELECTRICAL KIOSKS AND MINIATURE SUBSTATIONS

(a) Electrical Kiosks

The provisional number of kiosks to be supplied and installed is given in the Pricing Schedules.

All electrical distribution kiosks shall be of the vandal proof/anti-vandal type.

The material of construction of the kiosks shall be 3CR12.

The colour of the electrical kiosks shall be Moss Green. The contractor shall submit a sample for approval prior to manufacture.

The kiosks shall be tested to Ingress Protection rating IP44.

EK's shall be equipped with white powder coated, galvanised steel mounting plates, and removable galvanised steel gland plates. The kiosks shall be fitted with a 6.3 x 50 x 200mm Cu earth bar, predrilled with holes of 6mm diameter. Electrical equipment to be installed shall include but not be limited to:

K-RL1 & K RL2:

- Incoming Isolator 1 x 63A 3ph + N 10kA Curve C
- 1 x 63A 3ph + N 10kA Curve C
- 1 x contactor 3 phase 63A
- 1 x 6A 1ph - Bypass
- Photocell switch
- Termination blocks for photocell
- 5 x 3 phase + N circuit breaker 20A, 10kA Curve C

- 1 x 40A, 1ph circuit breaker 6kA Curve C
- 1 x 63A, 2P earth leakage, 30 mA
- 3 x 20A single phase 6kA Curve C
- 1 x 16A Three Pin socket outlet
- Security and alarm system as specified in 2.8.3

Access shall be via a hinged lid and slide out front and rear access panels. The hinged lid shall be fitted with concealed hinges and a vandal proof locking mechanism.

The terminals for the incoming main distribution cables shall be sized to accommodate cables up to 70mm². The terminals for consumer cables shall be sized to accommodate cables up to 50mm².

The lid and mounting plate of each electrical kiosk shall be bonded to the enclosure by flat Cu straps at a minimum of 2 points.

All components and circuits shall be labelled.

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 electrical kiosks within 28 days of the award of the contract. Manufacturing of the electrical kiosks shall commence only on approval of the workshop drawings by the Engineer.

The footings of the kiosks shall be cast in-situ after positioning of the kiosk and shall include two 100mm ducts with slow bends for access to the kiosk.

(b) LV Switchboards, Distribution Boards, Control panels and Switchgear Specifications

The following specifications shall apply to all electrical kiosks and minisubs supplied:

(i) Standards and Protection

Equipment shall be in accordance with the applicable SABS 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.

Boards, equipment and materials which are exposed to sunlight and are susceptible to damage or accelerated deterioration due to the UV, shall be protected:

- by means of a housing, covering or canopy from direct sunlight, or

- shall be treated with a protective surface coating

(ii) Free-standing boards

Free-standing boards shall be of the free-standing pedestal type with doors and locks as specified and shall be so designed as to enable the board to be extended without undue difficulty.

Boards shall comply with BS 5486: 1977 (Factory Built Assemblies of Low Voltage Switchgear).

The boards shall be constructed of minimum 1,6mm sheet steel suitably stiffened and reinforced by a 2mm sheet metal framework and shall be complete with all equipment, internal wiring and labelling. They shall be IP65 rated.

(iii) Flush and surface-mounted boards

Both flush and surface mounted boards shall consist of an architrave frame which shall carry the chassis for equipment, panel and door and a bonding tray onto which the architrave frame shall be secured.

Distribution boards shall comply with SANS 1180: Part I and II as applicable.

The tray shall be constructed of a minimum of 1,2mm sheet steel suitably braced by means of gussets and shall be of adequate size to accommodate specified equipment without congestion.

(iv) Extendibility

The boards shall be extendible and have an initial spare cubicle capacity of 10% or as specified on the drawings.

(v) Access

Sufficient removable panels shall be provided to afford access to all equipment for maintenance, service and replacement purposes.

The back panels shall be of similar construction to the front panels.

(vi) Clearances

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.

Equipment on boards may be installed abutting. Undue cramping of equipment and wiring shall, however, not be permitted and the following minimum clearances must be maintained:

- Clearance of not less than 75mm between sides, top and bottom of architrave and any equipment mounted on the chassis.
- Clearance of not less than 75mm between rows of equipment (measured between terminals).

(vii) Doors

Doors shall be provided as required and prescribed. Where doors of sheet steel finished in the colour specified are required they shall be manufactured of the same gauge material as the remainder of the panels.

Doors shall be suitably braced to ensure stiffness and shall have a smooth, flat finish.

Door hinges shall be heavy duty and shall be constructed to permit easy removal of doors.

Where hinges are used they shall preferably be concealed. If a surface mounted hinge is used it shall be chromium plated. Provision shall be made for adjustment of hinges to facilitate lining up of distorted doors.

All doors shall be fitted with locks unless otherwise specified. Locks shall be electronic locks, with bypass, which are connected to and controlled by the SANRAL ECMS.

(viii) Removable panels

Panels of sheet steel, finished in the colour specified, shall be suitably stiffened, with machine punched slots to allow for flush mounting of equipment.

All removable front panels shall be secured by means of quick release fasteners similar and equivalent to a suitable size.

(ix) Dust and vermin proofing

All boards shall be completely vermin proofed.

No holes other than those required for cable or conduit 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.

Where doors or removable covers are situated and are required to be dust proofed, they shall be dust proofed by means of a minimum of 10mm thick non-perishable gasket, resistant to deterioration from heat, chemicals and moisture and capable of being compressed to half its original thickness.

Where doors are flush fitting, gaskets shall be glued to the fixed flange.

In the case of projecting doors, gaskets shall be glued to the door and not the associated framework.

Similarly suitable gaskets shall be used wherever push-buttons, indicator lights, isolator handles, etc. pass through a door or panel.

Switchgear shall be vermin proof both in the service and isolated positions.

(x) Painting and protection

All boards shall be finished with an epoxy/polyester baked powder coating process to SANS 1274: 1979 in the colour specified by the Engineer.

The interior of all board and panel cases shall be finished with quality white epoxy/polyester baked powder coating.

All metal parts shall be decreased, rinsed, pickled, rinsed, 324 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.

(xi) Labelling

All safety warning notices shall be in English.

All boards 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 any board.

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 number of 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 – 20mm, other labels – 6mm.

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 2mm thick transparent acrylic plastic ('PERSPEX') or equivalent panel, shall be installed on the inside of the door of the boards or cubicles and circuits shall be designated on this board.

Any special door keys (in duplicate), special tools, slinging eye bolts and foundation bolts, shall be supplied with each board.

(xiii) Equipment Mounting

Switchgear, control gear, motor control gear, etc. Shall be positioned and installed as indicated on the relevant drawings or as approved.

The gear shall be installed so that it is positioned squarely on its supporting steelwork, i.e. "lined up" in both the vertical and horizontal planes.

(xiv) Bus bars

Bus bars shall be installed in all boards and may be installed either horizontally or vertically and in main boards shall be run in a separate compartment, isolated from the rest of the board.

Bus bars and connections shall be in accordance with SANS 784.

Spacing of busbars shall be calculated in accordance with SANS 784, but shall not be less than 50mm.

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 must 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 40mm.

Connections to the bus bars must be effected 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 100mm long painted (or other approved) phase colouring bands spaced not more than 300mm apart.

The following colours shall be used:

TABLE G2.6/2: APPLICABLE COLOURING FOR BUS BARS

NUMB ER OF PHAS ES	PHASE COLOUR	NEUTRAL COLOUR	EART H COLO UR	SPECIA L PURPO SE COLOU R
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 1,55A/mm² for copper and 1,0A/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. Also bus bars 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.**

(xv) Wiring

All internal wiring to the boards shall be carried out in PVC insulated to SANS 150 having a minimum of 3 strands per conductor, and colour coded in accordance with the table below:

TABLE G2.6/3: APPLICABLE COLOUR CODING FOR WIRING

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

A 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 10mm². All terminals shall be either bolted or screwed. All terminals for wires smaller than 16mm² 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 any case terminal clamp screws shall not bear directly on the conductor.

Wiring of any one cubicle shall not run through other cubicles unless the wiring is run in conduit or ducting.

Wires shall be clearly marked at all termination points in accordance with the numbering of the wiring diagram, by means of numbered ferrules, or other approved method.

When the board main switch is switched off, no live incoming or other wiring shall be accessible. The incoming terminals must be screened. Where connections are taken from the incoming side of the main switch, a screen marked 'Isolate Feeder before removing Screen' shall cover them. If any circuits are energised from other sources, clear warning notices to that effect shall be fitted and such terminals shall be clearly marked.

Removable links shall be provided in each contactor and control circuit for connecting future interlock connections.

(xvi) Earthing

All boards shall be fitted with earth bars.

Free-standing boards shall be fitted with a continuous full length earth bus bar.

All sections of the board, mounting plates and all equipment on them shall be earthed to the earth bar.

Hinged doors shall be earthed to the board by means of a flexible earth strap.

(xvii) Terminals

Terminal assemblies shall consist of a metal mounting rail onto which terminal modules are fixed.

For cables up to and including 10mm², clamp type terminals may be provided, but the type where the clamp screws bear directly on the conductor will not be accepted.

For exceeding 10mm², 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.

Additional spare terminals shall also be provided as specified or indicated on the drawings for the purpose of looping additional remote circuits, with a minimum of 20%.

(xviii) 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:

TABLE G2.6/4: MINIMUM SPECIFICATIONS FOR SURGE ARRESTERS

Description	Requirement
Nominal discharge current	30kA
Voltage protection level	2 kV
Response time	<=25 neck

(xix) Moulded Case Circuit Breakers (MCCB's)

All moulded case circuit breakers shall comply with SANS 156. 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.

(xx) Contactors

Contactors shall comply with SANS IEC 947. They shall be suitably rated for the type of load controlled and shall be selected to provide a minimum of 5 years operation at normal switching frequency for the controlled load without contact replacement or repair.

(xxi) Current Transformers and Panel Meters

Current transformers shall be epoxy-resin encapsulated. The rated burden shall be not less than 10VA. They shall comply with BS3938 and shall comply with the following table.

TABLE G2.6/5: TRANSFORMER METERING AND PROTECTION REQUIREMENTS

Application	Primary Current	Class
Metering	Up to 250A	1
Protection	All	3

Instantaneous reading ammeters shall be of the moving iron type. They shall be connected via a phase selector switch with an "OFF" position.

Maximum demand reading ammeters shall be of the combined maximum demand and instantaneous type. One meter per phase shall be installed. They shall comprise a thermal maximum demand ammeter with drag pointer combined with a moving iron instantaneous pointer. The drag pointer reset knob shall be sealable. The bi-metal system shall be ambient temperature compensated and shall have a 15 minute response.

Voltmeters shall be of the moving iron type. One instrument shall be provided in each instance connected via a selector switch to read line to line voltages and also line to neutral voltages. LV voltmeters shall operate off a nominal line to line voltage of 400V. The scales between 90% and 110% of nominal voltage shall be graduated in 1.25% divisions.

Power factor indicators shall be of the moving iron type suitable for use on unbalanced loads.

(xxii) MV Isolators

All MV (11kV) isolators shall be of the "load break, fault make" type and have a handle forming and integral part of the panel door so that the isolator cannot be closed without the door being fully shut; conversely the door cannot be opened unless the isolator is opened first.

Isolator handles shall have an integral key lock or padlocking facility.

(xxiii) kWh; kWh maximum demand; kVA maximum demand; kWh/kVA maximum demand and kWh/kW maximum demand meters

The metering of the entire system shall take place in the 11kV RMU. The meter shall be according to the local supply authority specifications and shall include the metering CTs and VTs required.

(xxiv) Supply Authority Equipment

Apparatus and requirements of the Supply Authority are not indicated on the diagrams and it is expected of the Contractor to install any such apparatus, accessories and systems as may be required by the Supply Authority as part of his contract price.

In all instances where provision is to be made on boards for the Supply Authority's main switch and/or metering equipment the Contractor must ensure that all requirements of the Authorities concerned in this respect are met.

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

(a) Earthing of minisubs

The primary requirement of minisub earthing is to guarantee maximum safety with regards to electrical hazards.

Therefore every effort shall be made to obtain an earth resistance value of minisubs of **1 Ohm** or less. Where ground conditions make this impossible without incurring unrealistic costs a maximum value of 10 Ohms will be accepted for the minisub and transformer neutral earthing subject to the approval of the Engineer.

The earthing system shall be contained within the minisub foundations to prevent theft. The earthing of the minisubs shall as a minimum include four 1.5m earth spikes (installed in the corners of the foundation excavation) plus a trench earth of at least three coils of 70mm² copper earth conductor connecting the spikes.

Two 70mm² copper tails shall be provided for extending the minisub earthing with a trench earth if required.

The entire minisub earthing scheme shall be clamped to the reinforcing steel 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.

Where precast minisub footings are used, the earthing scheme describe above shall be installed under the concrete cover between the precast footing and the security fence .

The main earth bar shall consist of an adequate length of minimum 50mm x 6.3mm tinned copper bar. It shall be supported by means of cycloaliphatic resin insulators in a suitable position to be readily accessible for earth connections and inspection. Conductors connecting equipment to it shall be 70mm² copper terminated in compression type lugs.

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 pigtailed 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 6m of any other spike.

(b) Earthing of Electrical Kiosks

A 2.4m x 16mm Cu earth spike shall be installed at each EK and connected to the EK earth bar by a 25mm² 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 10 ohms. Additives shall be added to the soil to achieve the required reading.

The kiosk Crows' foot earth shall consist of 3 lengths 70mm² stranded copper conductors of 7m each, installed in such a way to form 120° angles between the conductors (Crow's foot). At the center of the 120° angle all wires shall be Exo-welded together with a 70mm² 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.

(c) Earthing of Lighting Masts and Poles

The primary requirement of lighting mast earthing is to ensure adequate lightning protection of the installation is accordance with SANS 62305.

Therefore every effort shall be made to obtain an earth resistance value of lighting masts of **30 Ohm** or less. Where ground conditions make this impossible without incurring unrealistic costs a maximum value of **50 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 1.5m earth spikes (installed in the corners of the foundation excavation) plus a trench earth of at least three coils of 70mm² copper earth conductor connecting the spikes.

One 70mm² 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 6m 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.

(d) Earthing Material and Installation methods

(i) Earth Spikes

Earth spikes shall comprise 16mm sectional steel cored rods with a minimum of 0.25mm 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 1m 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.

(ii) 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 80mm².

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

(iii) 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 32mm x 4mm 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 750mm intervals. All connections shall be made using brass or stainless steel bolts, nuts and washers, together with a star lock washer, on minisubs.

(iv) 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 value being exceeded this must be brought to the Engineer's attention.

(e) Surge Arrestors

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(f)(vi)
- b) Masts and poles – see below
- c) Luminaires – refer paragraph 2.10(c)

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 minimum specifications as stated in Table G2.6/4 above.

(f) Lightning Finials

Each 15m and 12m mast shall be fitted with a M16 x 1.5m 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, KIOSK, MAST / POLE, MANHOLE, SLEEVE AND CABLE SECURITY MEASURES

(a) Security Enclosure

The security measures for the minisubs and kiosks shall be designed and manufactured in accordance with this technical specification and Drawing Nos. TD-E-P-1000-1-V1, TD-E-P-1002-1-V1 and TD-E-P-1003-1-V1.

The minisubs and kiosks shall be enclosed in a steel mesh cage security enclosures sized as follows:

- L 3 m x W 3 m x H 2.3 m for the minisub
- 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 30MPa concrete foundation. The concrete base plinths of the mini-sub and kiosk shall be surrounded by concrete reinforced 150mm thick flooring that shall extend 1000mm beyond the perimeter fencing, in order to prevent burrowing under the fencing and vegetation growth within the fencing.

All cage gates shall be equipped with electronic locks, with bypass, which are connected and controlled by the SANRAL ECMS.

(c) Electronic Security System

Each minisub/kiosk site 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:

- electronically activated locking mechanism per door,
- door sensors,
- vibration sensor on kiosk and cage.
- an electronic back-up / override system

In addition, vibration sensors shall be installed on masts and poles.

Tilt sensors shall be installed on masts and poles. The sensors on the masts and poles shall be combined tilt and vibration sensors.

The electronic security system shall comply with the following specifications:

(i) 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:

1. Ingres Protection Rating- IP 66
2. Communications– Long Range Bi-directional RF (RX: 863-873MHz, TX: 864-873MHz)
3. Range - 2km radius
4. End-to-End encryption- AES 128-bit
5. Rated Current - <1A
6. Operating Voltage-3-5V DC
7. Battery Type - LiFePo
8. Ambient Temperature Range- -10°C to +50°C
9. Relative Humidity - 40% to 90% RH
10. PCB Coating- Conformal Coating
11. PCB Surge Protection – Integrated

(ii) Magnetic & Optical Open/Close Sensors

(For Substations, Mini Substations, Outdoor Transformers, LV Kiosks, Enclosures, and Gates)

Minimum Requirements:

1. Sensor devices should be robust in construction for industrial use.
2. The sensor should have a reliable detection against tampering with high immunity against false alarms.
3. 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.
4. All access doors of vandalized substations, mini-substations or enclosures shall be fitted with door sensors (magnetic or optical).
5. To be installed strategically for optimal functioning.

(iii) Vibration Sensors

(For Substations, Mini Substations, Outdoor Transformers, LV Kiosks, Enclosures, Lighting Structures and Fences)

Minimum Requirements:

1. Vibrations are detected through a piezo element.
2. The sensitivity should be subject to three parameters i.e. vibration, time and frequency.
3. Sensor devices should be robust in construction for industrial use.
4. The sensor should have a reliable detection against tampering with high immunity against false alarms.
5. 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.
6. To be installed strategically for optimal functioning.

(iv) LoRaWAN Gateway Device

(For each project location with end devices)

Minimum Requirements:

1. Single Gateway to control up to 1000 devices in range of at least 2km radius.
2. Gateways are to be used in long range star network architectures.
3. Ingress Protection Rating IP 66
4. Communications– Long Range Bi-directional RF (RX: 863-873MHz, TX: 864-873MHz)
5. Range – 2 km radius
6. End-to-End encryption- AES 128-bit
7. Ambient Temperature Range- -10°C to +50°C
8. Relative Humidity - 40% to 90% RH
9. PCB Coating- Conformal Coating
10. Ethernet Communication- Protocol IPv4

(v) Electronic Controller

(For the access control of all Substations, Mini Substations, Outdoor Transformers, LV Kiosks, and Enclosures fitted with electronically activated locksets)

1. The controller shall be a Bi-Directional Communication device

2. The main controller output should be the primary source for all required locking arrangement systems and sensor devices
 3. The battery back-up power will be the secondary source for the controller when the primary source is not available.
 4. 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.
 5. 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
 6. 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
 7. Override controller should report via the same Master Control and Monitoring Software.
 8. 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.
 9. 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.
 10. The controller must be adequately protected against lightning and power surges
 11. Controllers should be RTC (Real-Timeclock) compatible for date/time stamping of all events and alarms
 12. The Main Controller shall be compatible with both solenoid and motor driven locking arrangement systems.
- (vi) Event / Alarm Logging & Reporting:
1. 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.
 2. The controller and software shall store the record of the date and time when the enclosure was opened and closed on a data base.
 3. A health / status check should be performed every 60 minutes automatically between the controller and software (Bi-directional Communication)
 4. 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.
 5. The preferred operation shall be from a Smart Device and Centralised Control Centre with Authentic Cloud Base Software
 6. Any events/ alarms that occur in the field shall be automatically sent to the control and monitoring system
 7. The event shall be identified and displayed together with the address of the enclosure (geographical area, street address, enclosure number, controller serial number)
 8. 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.
 9. Communication Signal Strength should be monitored and a weak or no signal event should be recorded and reported immediately for the required attention

10. 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.
 11. Mains power failure time period should be accurately as possible be recorded in regards when power was disconnected and when power was restored again
 12. Three phase monitoring and any missing phase must be reported if required
 13. Three Phase + Neutral Ampere on all lighting circuit feeder cables should be recorded.
 14. Any abnormal operation of accessing the enclosure should be immediately reported by means of the controller and software to selected persons.
 15. 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.
 16. The controller and software shall report normal authorised access activities to a software database for record keeping.
 17. The controller and software shall alert selected people when enclosure doors are open for longer than 4 hours at a time.
 18. 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.
 19. The system should be able to notify / alert selected people of any alarm events via SMS and / or e-mails.
- (vii) Battery Backup:
1. 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.
 2. The backup power source shall be rated for at least 4 years operating life
 3. The backup power shall be protected against incoming surges
 4. 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
 5. The backup power source shall be protected against excessive discharges
 6. On-board charger to be used to not overcharged batteries to prolong their useful lifespan
 7. The charger must monitor the battery's voltage, temperature or time under charge to determine the optimum charge current and to terminate charging
 8. 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.
- (i) Power Requirements:
1. 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
 2. A clip-on neutral screw type terminal connection block shall be mounted next to the controller, a neutral conductor from the main neutral busbar shall be utilised to supply the neutral terminal connection block, the

neutral supply shall be from the connection block and not directly from the busbar

3. A clip-on earth screw type terminal connection block shall be mounted next to the controller, an insulated earth conductor from the main earth busbar shall be utilised to supply the earth terminal connection block, the earth supply shall be from the connection block and not directly from the busbar
4. 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
5. The controller and control circuit equipment shall be clearly labelled / marked

(ii) Antenna:

1. As far as possible all antennas should be internal
2. Should be RoHS compliant
3. Antennas should be high gain omni-directional and should match the correct communication controller module and operating frequencies for the application
4. Antennas should be omni-directional i.e. no faraday cage must be formed
5. Where communication is inadequate with an internal fitted antenna, an external antenna should be fitted
6. External / Outdoor Antennas Should Conform to The Following:
 - A moulded (e.g. 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

(iii) Data Usage:

1. Data usage should be kept to the minimal to reduce costs but not to compromise required performance
2. 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
3. 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.

(iv) Override Controller:

1. 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.
2. 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-

subs, 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

3. The override controller shall be protected against incoming surges any harmful overcurrent, short-circuit and earth fault conditions
4. The override controller shall be protected against incoming voltages greater than 12V DC and up to 415V AC
5. 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.
6. 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.
7. The override controller should be Bluetooth / Wi-Fi operated
8. 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 can have access to the locking arrangement devices.
9. The operation is via the Master Software and must still record all access events including the user details
10. Should be compatible with the latest Android operating system.

2.9 LIGHTING MASTS AND POLES

NOTES :

1. **The masts and poles are specified and measured in section B6700.**
2. **All masts and poles shall be fitted with required electrical cabling and components as part of the tendered rate.**

(a) Lighting Masts, Cable Terminations and Labelling

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 MS.

A miniature circuit breaker shall be installed per mast or pole as follows:

30m / 40m masts: 20A 3-phase plus neutral
18m mid-hinge masts: 10A single phase plus neutral
10m or 5 m poles: 5A single phase

Each mast or pole shall be fitted with a surge arrester as specified in paragraph 2.7(e).

Termination in poles may be up to 35mm² and bridge terminals shall be supplied that can accommodate cable size up to 50mm².

All masts and poles shall be numbered with labels with black letters on yellow background and a minimum letter size of 75mm. 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.

(b) 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 30m and 40m high mast foundations and bolts are to be constructed as stand-alone footings and are included in the scope of the civil works.

The 18m mid-hinge mast foundations and bolts are integrated into the median barrier and are included in the scope of the civil works.

The bases and bolts for the 9.4m baseplate poles are integrated in to the bridge parapets and retaining wall barriers and are included in the scope of the civil works.

The bases and bolts for the upper ramp parapet luminaire brackets are integrated in to the bridge parapets and are included in the scope of the civil works.

Excavation and backfill for 11.8m buried poles are measured under items B22.01 &.02.

(c) Galvanised Steel Poles 10m m-h and 5m m-h

The poles and luminaires shall be designed and manufactured in accordance with this technical specification and Drawing Nos. TD-E-P-2001-1 and TD-E-P-8000-1-V1 Single Anti-Slide Spigot Attachment

Galvanized steel poles shall be installed in the positions shown on the drawing and detailed in the schedule of co-ordinates.

Direct buried poles shall be located at approximately 3.7m behind the yellow shoulder line.

Parapet and retaining wall barrier mounted poles shall be bolted on to the foundations provided by the main contractor for the civil works.

Poles shall be fitted with galvanised steel spigots or out reaches as tendered and approved by the Engineer.

Poles shall be fitted with luminaires as tendered and approved by the Employer.

Fibre glass poles shall not be accepted.

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 3m 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.

(d) Mid-hinge Galvanised Steel Masts

The Masts shall be designed and manufactured in accordance with this technical specification and Drawing Nos. TD-E-P-7001-1-V1 - 20m Scissor Mast with ES and TD-E-P-9000-1-V1 12m Scissor Mast with ES

Mid-hinge masts are not required in this scope of work.

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 4mm 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 mid-hinge masts shall be designed to support four luminaires of unit mass of approximately 15 kg each.

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.

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 the Employer.

The necessary precautionary measures shall be taken to prevent damage to the trailing cable while lowering or raising the mast.

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 50MPa 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 16mm² or 25mm² 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.

(e) 30m and 40m Galvanised Steel High Masts

This subcontract does not included 30 and 40m high masts. The specification below is retained for reference only.

All masts shall be designed to SANS 10225 Code of Practice utilizing the following input variables:

Terrain Category:	2
Design wind speed:	144 km/h
Altitude:	50 m

All design calculations and simulation reports shall be submitted with tenders. Failure to submit this documentation may result in a tender being declared non-responsive.

All welds are to be carried out by coded welders, using both the CO₂ and submerged-arc welding processes, depending on plate thicknesses and weld positions. Sample testing, using the DPI weld test procedure, shall be carried out as required.

A minimum thickness of 4mm, **regardless of material used**, is to be maintained in any part of the mast shaft construction. The material used in the fabrication of the mast shaft shall be Grade 300WA steel (Equivalent to BS4360) or equivalent.

Each mast shall be fitted with an access door fabricated from steel of at least 6mm² in thickness. Access doors to masts shall be fitted with vandal proof bolts and locknuts.

The mast shaft and all ancillary steelwork shall be hot dipped galvanized to ISO 1461

The mast manufacturer shall be an ISO9001 certified mast supplier. Tenderers shall submit proof of manufacturer's certification with their tenders. Failure to submit proof shall render the tender non-responsive.

No welding on site shall be permitted.

Grouting for all masts shall be done after installation with non-shrink cementitious grout with a minimum compressive strength of 50MPa at 28 days. Weep holes shall be provided in the grouting.

All masts shall provide for fitting for 10 or 12 luminaires in a circular arrangement or equivalent. The luminaire ring shall be manufactured in two half-sections, which are bolted together on site. The ring radius shall be 600mm. The luminaire brackets shall bolt on to the ring. The ring shall be a welded steel construction and hot dipped galvanised for corrosion protection. The luminaire ring shall be manufactured from 76 x38 rolled channel section and shall be fitted with a 20mm diameter steel bumper ring below the rolled channel. The luminaire ring shall dock into three guides fixed to the top pulley assembly. A detailed drawing shall be submitted with tenders. Failure to comply shall render the tender non-responsive.

The pulley assembly shall be a fabricated steel housing, containing the 2 X 280mm diameter LM6 cast aluminium pulleys, over which the steel wire ropes pass. A similar mechanism may be proposed.

Separators, one between the pulleys and one on the outside of each pulley, shall be provided to separate the wire ropes and trailing cables and to prevent these from wrapping together, should the ring be lowered in windy conditions. Each external separator shall have two close-fitted guides on the outside, to prevent the wire ropes and cables from climbing off the pulleys. A similar mechanism may be proposed.

Additional deep-groove pulley/s shall be fitted for the electrical trailing cable/s. All pulleys shall run on stainless steel shafts. A similar mechanism may be proposed.

The entire assembly shall be protected against the ingress of water, with a molded fibreglass canopy, which shall be bolted to the assembly with a bolt which incorporates a lightning spike.

Two steel wire ropes shall be supplied for the purposes of lowering the luminaire ring. Three wire rope systems will not be considered. The steel wire ropes, supplied with both the mast and the portable winch or equivalent, shall be 7/19 construction grade 316 stainless steel or equivalent. The ropes shall be 6mm or 8mm diameter of 6 x 19 construction. The breaking load of the ropes shall be calculated and designed by an Engineer to adequately raise and lower the specified luminaires and luminaire mounting ring.

All rope connections shall be by means of copper "TALURIT" ferrules and crimped with hydraulic crimping tools.

(i) Portable Winch

The portable winch for the raising and lowering of the luminaire ring shall be a double drum type which meets all international safety requirements, to ensure that, in the event of one of the ropes breaking, the luminaire ring is still secured by the second rope. Single drum winch systems will not be considered.

The worm and wheel of the winch shall be fully immersed in an oil bath and shall have a gear ratio of 50 : 1. The winch ropes shall be terminated in such a manner that distortion and twisting of the ropes is prevented and four turns of the rope remain on the drum, after the ring has been completely lowered.

The driving spindle of the winch shall be automatically locked, when not in use.

The power drive to the winch shall be a single-phase, single speed electric motor, fitted with a reduction gear box and shall slot into the winch slide when in use. The drive shall be supplied complete with a 3 metre cable and remote forward/reverse control switch, for safe operation.

The drive shall be fitted with a torque limiting device, which is set to slip before any damage can be done to the wire ropes, in the event of over-winding.

Hydraulic Power tools will not be considered.

An equivalent lowering and raising mechanism for the luminaire ring may be considered.

(ii) **Electrical Equipment**

The following Electrical Equipment shall be included with each mast:

1. Electrical Trailing Cable :

The electrical trailing cable, which supplies power to the luminaries shall supply power to 12 x 400W luminaries.

The trailing cable shall be flexible unarmoured with "Nitril" insulation with either 5 or 7 conductors of not less than 2.5mm² each.

The lower end of the cable shall terminate in a multi-pin male socket, which in turn, plugs into a multi-pin female socket, mounted in the mast distribution board.

The upper end of the cable shall be fixed to the luminaire ring by means of a cast aluminium clamp and terminate directly in the junction box, mounted on the luminaire ring.

2. Junction Box

A weather-proof junction box shall be fixed to the luminaire ring to provide the termination point for the trailing cable, as well as for the cables which supply power to the luminaires. The junction box shall also fitted with a multi-pin plug, which accepts a test lead, used to test the floodlights, with the ring in the lowered position.

3. Distribution Board

The mast shall be fitted with a totally enclosed, fibreglass distribution board, fitted in a convenient position in the base of the mast and accessible through the mast access door. Luminaire circuit breakers shall be installed as specified in paragraph G3.2.1 above. In addition the DB shall be fitted with a 20A single phase plus neutral MCB and earth leakage unit.

(a) Designs to be submitted

Photometric simulation reports and electronic IES files shall be submitted with tenders for all offered solutions. For this purpose AutoCAD drawings have been issued with these tender documents. Designs shall be based on the mast/pole mounting heights and locations as indicated in this specification and on the drawings. These have been pre-determined as part of the design of the civil works for the median barrier, bridge parapets and retaining wall barriers

Simulation reports shall be done using the design software **Dialux**.

(i) N5: Designs 1

Designs are required the sections of the N5 freeway, The photometric simulation reports shall clearly demonstrate that the luminaires offered meet the requirements for A3 freeway with Median and < 200vphpl based on SANS 10098:2007 Table 1:

L_n	U_o	U_l	TI
0.5 cd/m ²	0.4	0.5	20 max

These design parameters shall apply to all freeway sections.

(ii) Traffic Circles : N5

The photometric simulation reports shall clearly demonstrate that the luminaires offered meet the requirements of illuminance.

E_m	E_{min}	E_{max}	U_o	U_d
27 lux	13 lux	55 lux	0.48	0.24

All design calculations shall be done using a **maintenance factor of 0.8**

Any tender in which no design is submitted or in which the design does not adhere to or meet the above requirements will be deemed non-responsive.

(b) Roadway geometrics and Luminaire types

Designs for the following road geometries shall be submitted with tenders:

TABLE G2.10/1: LUMINAIRE DESIGN REQUIREMENTS FOR DIFFERENT ROADWAY GEOMETRICS

Design No	No of Lanes	Median Width	Mounting Height	Spacing	Arrangement	Minimum Lumen Output Req'd kl	Luminaire No.
N2: Mainline Freeway Sections							
1	1	5.9m max	10m	50m	Staggered	9,5 kl	Type A
2	Circle	-	10m	-	-	16,8 kl	Type B

All luminaires shall be high performance LED streetlights. All luminaires shall have a colour temperature CCT of 4000K..

A lane width of 3.7m, except where indicated in the table above, is to be used in all lighting photometric simulations.

The median width given in the table above is measured from yellow shoulder line to yellow shoulder line.

The mounting angle of all luminaires shall be 0° to 10° max. Tenderers shall indicate the proposed mounting angle in their design simulations.

The same luminaires selected may be the same for two or more of the luminaire numbers. The rationalisation of the number of different luminaire types is encouraged.

(c) LED Luminaire specifications

The minimum specification for the LED street lighting luminaires to be installed is given in the table below:

TABLE G2.10/2: MINIMUM SPECIFICATION FOR LED LUMINAIRES

Item	Requirement / specification
Fitting	LED Street light with high efficiency and low energy consumption
Performance Reqs	Compliant with and carrying SANS 475 mark or International equivalent (IEC 60598-1 and IEC 60598-2-1 and 60598-2-3) Compliant with SATS 17576
Source Flux	130 lumen/watt minimum
Luminaire Flux	120 lumen/watt minimum
Luminaire Efficacy	> 80%
Colour Temperature	4 000K (maximum) Neutral White CRI >= 80
LED Engine	Modular (Tenderers to state number of LED's per module)
LED Driver current	500 mA to 1 000 mA (maximum)
LED Specifications	Ceramic based, High Power LED. Tolerance of +/- 7% on Flux & Power Measurements
LMS compatibility (refer 2.11)	Dimming: 1 – 10V (flicker & noise free from 10 - 100%) Luminaires fitted with NEMA/ANSI C136.41 compliant 7-pin socket
Operating Voltage Power factor Harmonic Distortion	190 – 240V AC > 0.95 Total harmonic distortion shall not exceed 5% of the supply voltage, and no single harmonic shall exceed 3%.
Surge Arrestor	Nominal discharge current 10kA Voltage protection level 2 kV Response time <=25 nsec Luminaire cut-out
Lifetime @ 25oC	>100 000 hrs: Lumen depreciation less than 20% (L70) > 70 000 hrs: Lumen depreciation less than 10% (L90) Tested according to LM-08-08. Test report to be submitted.
Constant Light Output (CLO) functionality	Integrated into LED Driver Dimming curve to match inverse of depreciation curve to L90. Factory preset to "On"
Operating Temperature	-5 to +45 °C No external part of luminaire shall exceed temperature of 70 °C during or after operation
Thermal Management	Optimal external heat exchange surface Temperature sensor and cutout to prevent overheating
IP Rating Control gear compartment Optical compartment	IP66 certified (IEC – EN 60598) IP66 Certified (IEC – EN 60598)

Housing	Weather and corrosion proof marine grade die cast aluminium –AC-44300 or better in accordance with DIN EN 1706	(d) Further minimum requirements for all luminaires In addition, the LED drivers in the luminaires shall be fully
Front Protector	Heat and Impact Resistant. Flat Glass or PMMA Poly Methyl Methacrylate with sealed joint to housing.	
Impact Resistance	IK 08 (IEC – EN62262)	
All screws bolts and metal parts	Stainless Steel	

programmable high performance LED drivers. The drivers shall be fitted with a 1 – 10V dimming interface.

Constant Light Output (CLO) functionality shall be integrated into the LED Driver. The dimming curve shall match the inverse of the depreciation curve to L90. The CLO function shall be factory preset to “On”.

The LED driver shall provide inrush current limiting.

The LED driver shall provide an End-of-life indicator function which is factory preset to “On”.

(i) Standards

The luminaires shall comply with SANS 60598-1, SANS 60598-2-3 and SANS 475 or International Equivalent.

The luminaires shall be class 1 as per SANS 60598-1 and shall be of the totally enclosed type.

The luminaires shall be designed for use under conditions of heavy atmospheric pollution and exposure to high levels of solar (including ultraviolet) radiation, at a mean altitude of 100 m, and be suitable for operation at ambient temperatures from -15°C to +45°C. The luminaires will also be exposed to wind, rain, hail and sleet in service.

The luminaires shall have an ingress protection rating of a minimum of IP 66.

Compliance with these standards and ratings shall be certified by a test report issued by an accredited test authority acceptable to the Employer.

All luminaires offered under this contract shall bear either both the SANS 475 mark and the SANS 60598 mark, or the IEC 60598 mark.

All luminaires shall be delivered completely assembled.

(ii) Construction and materials

The luminaires shall be weather-proof, hail-proof, insect-proof, corrosion-proof and resistant to both solar and ultra-violet radiation. In addition, they shall be robustly constructed and resistant to vandalism. All parts and components of the luminaire shall be designed to shed water, and no accumulation of condensation or precipitation shall occur.

In order to prevent risks associated with road safety, all luminaires shall be designed to avoid disintegration in the event of vehicular impact. The forces generated after a vehicle collides with a pole can be substantial, and to this end the luminaire housing shall be secured to the spigot and the design of the luminaire shall be such that the control gear remains attached

to the spigot even after a severe impact. Preference will be given to luminaire designs where no part of the luminaire detaches itself from the pole i.e. no secondary missiles are deflected into, or onto, traffic or pedestrians. The luminaries shall be constructed from durable lightweight materials for which all parts are compatible and failure or deterioration shall not occur due to electrolytic action or by differential thermal expansion

All spigot entries shall be designed to fit easily over the spigot and shall be truly parallel to the fitting axis. Spigot entries shall be constructed of corrosion-resistant materials and compatible with the galvanised mild steel spigot such that deterioration by electrolytic action shall not occur. The luminaries shall be secured to the spigot by means of at least two stainless steel (grade 304 or equivalent) screws conforming to ISO 4762. Alternative fixing arrangements may be considered if full details are provided at time of tender or on request from the Employer.

All ferrous components shall be hot-dip galvanised in accordance with SANS ISO 1461 for heavy duty applications. Small components (clips, screws, bolts, nuts, washers, etc.) shall be manufactured from stainless steel (grade 304 or equivalent).

(iii) Electrical requirements

The internal wiring of the luminaires shall comply with clause 3.10 of SANS 60598-2-3 or International equivalent. It shall be flexible and **suitably rated to withstand the voltages and temperatures** encountered in service. All wiring shall comply with the requirements of SANS 1507 and where applicable, SANS 529 or International equivalent. The wiring colours shall be as follows: live – red (or brown), neutral – black (or blue) and earth – green/yellow.

The neutral conductor of the incoming supply shall be connected to the screw thread portion of Edison screw type lamp-holders and the live conductor shall be connected to the central contact, and the internal wiring of the luminaire shall be arranged accordingly.

Terminals and electric connections shall comply with clause 3.9 of SANS 60598-2-3. In addition, the luminaries shall incorporate a terminal block mounted in a reasonably accessible position as close to the point of entry as possible. The material of the terminal block shall be non-tracking and the terminals shall be made of non-corroding material such as brass. Terminals made of aluminium shall not be acceptable.

Any wiring passing through metal shall be suitably grommeted, sleeved or otherwise protected to avoid abrasion of the insulation.

Capacitors shall only be connected to the primary (line) side of transformer ballasts. After connection of the power factor correction capacitor, the power factor shall not be less than 0,85 (lagging).

The luminaries shall be earthed in accordance with clause 3.8 of SANS 60598-2-3.

Metal parts of luminaires which may become alive in the event of an insulation fault and which are not accessible when the luminaire is mounted but which are liable to come into contact with the supporting surface shall be permanently and reliably connected to an earth terminal and shall withstand the test specified in SANS 60598-2-3. An earth terminal shall be provided in all instances, even if the luminaire is fully insulated and even if all conductive parts which could become alive in the event of an insulation fault are not accessible. This is to facilitate future wiring should the luminaire be replaced by one which requires an earth connection.

Protection against electric shock (of at least IP 2X) shall be maintained for all methods and positions of installation in normal use. Protection shall also be maintained after removal of all parts which can be removed by hand.

All parts of an earth terminal shall be made of brass or similar corrosion-resistant material and the contact surfaces shall be bare metal and not painted or varnished surfaces.

All earth connections shall be effected by means of suitable lugs. All possibility of electrolytic corrosion shall be avoided.

(iv) Guarantee

Suppliers shall guarantee each street lighting luminaire for a minimum period of two years from the date of manufacture. Street lighting luminaires bearing a date of manufacture exceeding four (4) months prior to the date of delivery shall not be accepted.

This guarantee is primarily intended to be a material guarantee. This means that if any luminaire is unsuitable for use, or its IP ratings are compromised within a period of two years from date of delivery, it shall be replaced free of charge by the manufacturer.

Failure of the luminaire in terms of this clause would entail degradation of the luminaire material (e.g. DMC or other polymeric material, or aluminium) by ultraviolet radiation for example, to a point where cracks or holes appear in the luminaire housing (or diffuser), thus compromising the structural integrity and IP rating of the luminaire.

(v) Documentation

Full technical information and descriptive literature relating to the items offered shall be submitted in order that the items can be fully evaluated.

Test reports from a test authority recognised by the Employer with respect to the following tests shall be provided:

1. Type tested in accordance with SANS 475 and SANS 60598-2-3 or International Equivalent;
2. IP rating
3. Full simulation report
4. Lumen degradation
5. Colour rendering index >70
6. Cost associated with energy consumption for the whole project over fifteen years
7. Maintenance cost of luminaires over fifteen years

The following documentation shall also be provided:

1. All test reports
2. Data sheets with respect to the grade of aluminium used;
3. If painted luminaires are offered, details of the guarantee provided;
4. Details of alternative fixing arrangements if applicable;
5. Energy Star Accreditation

In addition to the items listed above, copies of the certificates confirming that tenderers bear one of the marks required shall be supplied, as well as any ISO marks in terms of quality (9000 series) or environmental management (14000 series) that the tenderer may possess.

Failure to provide any or all of the information required above may result in rejection of the tender by SANRAL.

(e) Photocell Specifications

Each luminaire shall be fitted with an IP66 NEMA/ANSI C136.41 compliant 7-pin socket.

This shall be used for future fitment of LMS luminaire controllers.

Each luminaire shall be supplied with a pre-installed photocell control device fitted to the 7-pin NEMA socket.

This will allow for an “always energised” power infrastructure and will ensure that each luminaire operates as a stand-alone device until the LMS is implemented.

The minimum specification for the luminaires photocell is:

Table G 10/2: Minimum Photocell Specifications

Item	Specification
Device	NEMA socket mounted luminaire photocell
Applicable Standard	Compliant with SANS 1777-2004
Sensor Type	Filtered silicon photodiode
Sensor Control	Microprocessor
Switching Levels	On: > 80 lux i.e. luminaire off Off: < 40 lux i.e luminaire on Differential: 1:0.5
Switching cycles	>200 000 on resistive load
Operating Voltage	200 -250V ac
Maximum Load	600 W
Insulation Resistance	500V DC
Power Consumption	<0.35W
Operating Temperature	-20 °C to +60 °C
Ingress Protection	IP 65
Material	UV stabilised cover cone

2.11 LIGHTING MANAGEMENT SYSTEM

(a) Objectives of LMS

A Lighting Management System (LMS) shall be implemented for the entire lighting scheme with the following objectives:

(i) 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 10pm and 3 am.

(ii) 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.

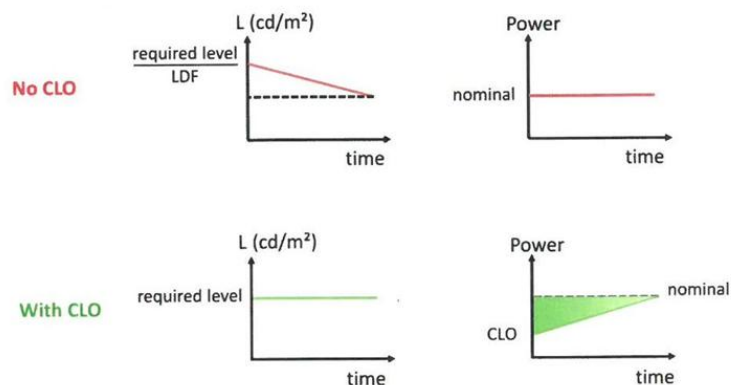


FIGURE G2.11-1: DEPICTION OF CLO CONCEPT

(iii) 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.

(b) LMS Architecture

The Lighting Management System shall be based on the following System Architecture:

The LMS topology shall be based on the standard topology as shown in this specification and drawing no. TD-E-P-4000-1-V1 LMS Topology and TD-E-P-4001-1-V1 Nema Socket on Luminaire.

- i. Luminaire controllers which interface to the dimming controller of the luminaire
- ii. Segment controllers which are the interface between the level 1 and 2 communications described in c)
- iii. 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

iv. 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.

The requirements for each of the above components are detailed in the specifications below.

(c) SANRAL Pilot LMS

Tenderers should note that SANRAL has previously implemented a power line communications (PLC) based pilot lighting management system on the N2 lighting scheme near KSIA. SANRAL is now implementing a wireless Electronic Control and Monitoring System (ECMS) (as specified in subclause 2.8.1) at Umgeni Interchange. SANRAL requires that LMS functionality be integrated into the ECMS.

(d) Scope and Requirements

The scope of work under this contract includes the supply, installation, commissioning and testing of a complete Lighting Management System including, but not limited to the components specified below.

Tenderers shall state in their tender responses if:

- i. The offered luminaire and segment controllers are compatible with the SANRAL ECMS software
- ii. The offered LMS software is compatible with and can be integrated with the SANRAL ECMS software

The LMS shall provide at least the following information to the SANRAL ECMS:

- Type of fittings used including wattage
- Location of fitting
- Date of commissioning

(e) Luminaire controllers

luminaires shall have LED drivers equipped with a dimming interface (1-10V) and shall be fitted with a NEMA/ANSI C136.41 compliant 7-pin socket, as specified in 2.11.3.

The luminaire controllers shall be fitted to each luminaire using the NEMA/ANSI C136.41 compliant 7-pin socket.

The luminaire controller shall provide dimming functionality, central and stand-alone switching as well as communications with the central LMS directly or via the segment controllers.

The luminaire controller shall have an integrated tilt and vibration sensor.

(i) Segment controllers

Tenderers shall state if segment controllers are required or if selected luminaire controllers can function as segment controllers (thus dispensing with separate segment controllers)

Segment controllers shall be fitted into suitably constructed pole mounted enclosures.

The segment controllers shall route the communications between the luminaire controllers and the central LMS system.

(ii) Communications Infrastructure

Tenderers shall clearly state in their tenders which communication media and protocols are proposed for both the Level 1 and Level 2 communications.

It is envisaged that the Level 2 communications will be wireless communications, whilst Level 1 may be cellular 3G with the FMS fibre optic network available as a backup.

The scope of work includes the provision of a complete and fully functional communications system including SIM cards, subscriptions and data costs for a period of 2 years.

(f) **Wireless Communications**

Where wireless (ISM/mesh/ZigBee) communications are proposed, pricing shall be given for all the required base stations and subscriber modules.

(g) **Cellular Data communications**

If Cellular Data communications is proposed tenderers shall state which cellular service provider will be utilised.

The scope of work includes provision of a complete GSM/UTMS APN solution including service provider APN, radius server, routers, link to Traffic Management Centre (TMC) in Pietermaritzburg and securely provisioned SIM cards with data contracts.

Tenderers shall engage with and include Cellular network/service providers in their tenders and confirm that the SP will enter into a SLA to provide network coverage and uptime.

Tenderers shall confirm the extent of the cellular data coverage that will be provided and guaranteed by their selected network provider for each of:

- GPRS/Edge
- 3G
- 3.5G: HSDPA/HSUPA
- LTE

On commencement of the contract the contractor shall, together with the network provider, carry out testing of network coverage/signal strength and implementation of improvements where required, for the complete route.

The SIM cards shall be supplied and provisioned by the SP as follows:

1. The real-time communications shall be bi-directional unless specified otherwise for certain actions and certain data.
2. No voice calls shall be allowed.

3. No SMS messages shall be allowed in either direction
4. Communications with only certain configurable IP addresses shall be allowed.
5. No wildcard allowed (i.e. no internet access allowed).

The scope includes the supply of a data usage monitoring and reporting using a tool to be and the implementation of a data management solution.

(h) Internet of Things (IoT) communications

If IoT communications is proposed tenderers shall state which IoT service provider will be utilised. In addition, tenderers shall provide details of the proposed frequency spectrum and protocol i.e. Sigfox, LoraWAN, NB-IoT or other.

The scope of work includes provision of a complete IoT solution including IoT modules (integrated into luminaire controllers), IoT infrastructure, hosting and link to TMC in Pietermaritzburg.

Tenderers shall engage with and include the IoT network/service provider in their tenders and confirm that the SP will enter into a SLA to provide network coverage and uptime.

Tenderers shall confirm the **extent of IoT network coverage that will be provided and guaranteed** by their selected network.

On commencement of the contract the contractor shall, together with the network provider, carry out testing of network coverage/signal strength and implementation of improvements where required, for the complete route.

The scope includes the supply of a data usage monitoring and reporting using a tool to be and the implementation of a data management solution.

(i) Central System

The following shall be supplied, installed and configured under this contract:

- Server hardware, operating systems and software
- Workstation PCs hardware, operating systems and software
- LMS applications software

All computer hardware and software shall be compatible with existing SANRAL IT infrastructure. All computer hardware and software shall be approved by SANRAL before procurement.

(i) Servers

Setup and configuration of all servers shall be done by the Contractor and shall include all operating systems and/or relevant software for a fully functional system.

All servers, wiring, network, back-up power/filtering units shall fit within 19-inch racks, and all wiring shall be clearly labelled and physically supported using support devices.

Servers shall comply with following specification as a minimum:

1. CPU: Intel Xeon; min. 2.5 GHz
2. Main memory: min. 64GB

3. HDD: RAID 5 Configuration with minimum 4TB capacity partitioned for OS and Data (upgradable to 16TB)
4. Dual Gigabyte network ports
5. Windows Server 2021
6. Hot swappable disk drives
7. Hot swappable power supply
8. Hot swappable fan

(ii) Workstations

Power efficient operator workstations shall be supplied, installed and configured under this contract.

The workstations shall have the following minimum specifications:

1. CPU: Minimum Intel Core i5 3 GHz
2. Main memory: minimum 16GB
3. HDD: Minimum 500 GB hard disk
4. Housing: Minitower
5. Gigabit LAN Ethernet connection
6. Wireless keyboard
7. Wireless mouse/navigation devices
8. Cabling and sundry material
9. Operating system: Latest version of Windows subject to approval by SANRAL

(iii) LMS Software

The LMS application and user interface shall include but not be limited to the following functionality:

1. User profile and password management
2. Desktop customisation
3. Asset (Luminaire) inventory management
4. Management of geo-zones
5. Dimming according to dimming schedules
6. Configuration and management of dimming schedules
7. Individual and group luminaire control
8. Constant Lumen Output (CLO) control with configurable parameters
9. Luminaire fault monitoring and alarming
10. Alarm manager
11. Energy management

Tenders shall indicate if the offered LMS and security monitoring systems are integrated or conmined.

The LMS shall also provide a user-friendly report builder as well as standard reports for:

1. Equipment Inventory
2. Luminaire status
3. Dimming schedules
4. Faults and alarms
5. Energy management

All reports shall have user selectable filters for date/time, luminaire, luminaire group etc.

All devices shall self-register on the LMS database when they are plugged-in, switched on or when the LMS starts up. Self-registration data shall include but not be limited to:

1. Device type
2. Device part number
3. Device serial number
4. Luminaire wattage
5. LED count
6. Device status

(iv) Software Licenses

All Software licences shall be in the name of SANRAL such that any proprietary rights in respect of such Software licences vests in SANRAL.

All licences shall be once-off licences and shall be valid indefinitely.

The license key shall not be node-locked to hardware (i.e. a floating license shall be supplied).

The floating license shall provide full functionality of the applications and database to at least 10 clients and shall be upgradable to an unlimited number of clients.

(v) Support and Updates

All version upgrades and support for five (5) years from date of issue of Taking over Certificate shall be included in the initial software licence pricing. Software support shall include at least the following:

1. All SW updates in full and bug fixes
2. Major functional updates at substantially discounted prices
3. Hotline and support number
4. E-mail support.
5. Online technical forums

All applications shall be supported by a comprehensive software support and management system including change control, bug tracking, priority levels etc. This can be of the type FogBugz, equivalent or better.

Major new releases of software applications shall be backwards compatible. Previous releases shall be supported for at least 3 years since date of new software release.

2.12 MAINTENANCE

(a) General

The scope of work includes maintenance of the entire installation for a period of 24 months from the date of issue of the Taking-Over Certificate i.e. during the 12-month defects liability period and for a further 12 months thereafter.

The extent of the installation included in the maintenance is the 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:

- i. Responsive maintenance, performed to correct a system or component breakdown/fault
- ii. 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.
- iii. 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.
- iv. 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 and SANAL ECMS to assist with maintenance e.g.

- i. Respond to alarms/fault notifications
- ii. Identify replacement luminaires
- iii. Testing of installation and replaced luminaires.

(b) 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. The Employer 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 2.10.4 d).

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

At the end of the maintenance period the Contractor shall hand over the entire spares stock to the Employer in good working order, at a price to be agreed, together with the asset register/database set up on the LMS.

2.13 SCHEDULE OF DRAWINGS

DRAWING NO.	DESCRIPTION
TP1801-IC-R-11-SL-001	TRAFFIC CIRCLE 1 - KM 34.102 - ROAD LIGHT LAYOUT
TP1801-IC-R-11-SL-002	TRAFFIC CIRCLE 2 - KM 34.427 ROAD LIGHT LAYOUT
TP1801-IC-R-11-SL-003	TRAFFIC CIRCLE 3 - KM 35.047 ROAD LIGHT LAYOUT
TP1801-IC-R-11-SL-004	TRAFFIC CIRCLE 4 - KM 35.396 ROAD LIGHT LAYOUT
TP1801-IC-R-11-SL-005	DISTRIBUTION KIOSK – SCHEMATIC LAYOUT
SANRAL TYPICAL DRAWINGS	
TD-E-P-1003-1-V1	Anti-Vandal Kiosk with ES
TD-E-P-2001-1 -V1	Anti-Vandal Pole with ES (DB)
TD-E-P-3000-1-V1	Cable Trench
TD-E-P-3002-1-V1	Sleeve Installation
TD-E-P-4000-1-V1	LMS Topology
TD-E-P-4001-1-V1	Nema Socket on Luminaire
TD-E-P-6000-1-V1	Labelling & Tagging Detail
TD-E-P-8000-1-V1	Single Anti-Slide Spigot Attachment

SECTION H3: QUALITY ASSURANCE SPECIFICATION

TABLE OF CONTENTS

ITEM PAGE	DESCRIPTION	
<u>3.1</u>	<u>GENERAL</u>	C3-363
<u>3.2</u>	<u>QUALITY ASSURANCE SYSTEM</u>	C3-363
<u>3.3</u>	<u>DRAWINGS AND DOCUMENTATION</u>	C3-363
<u>3.4</u>	<u>INSPECTIONS, TESTS AND COMMISSIONING</u>	C3-365
<u>3.5</u>	<u>CERTIFICATE OF COMPLIANCE BY AN ACCREDITED PERSON</u>	C3-367
<u>3.6</u>	<u>LABELS AND NOTICES</u>	C3-367
<u>3.7</u>	<u>DEFECTS LIABILITY, EQUIPMENT GUARANTEES, MAINTENANCE AND REPAIR</u>	C3-368

SECTION H3: 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 the Employer for approval. The quality assurance system shall include procedures for:

- a) installation
- b) commissioning
- c) acceptance testing
- d) lighting level testing
- e) documentation control

3.3 DRAWINGS AND DOCUMENTATION

(a) 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 Contractor 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.

(b) Drawings to be submitted with 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.

(c) Workshop Drawings

Within 28 days after the contract has been awarded the contractor shall submit two (2) copies of the following drawings to the Engineer for approval:

- i. LV Kiosks: Design calculations and manufacturing drawings
- ii. Miniature Substations: Design calculations and manufacturing drawings
- iii. Poles: Design calculations and manufacturing drawings
- iv. High masts and Mid-hinge masts: Design calculations and manufacturing drawings.
- v. Luminaires: Detailed dimension drawings including mounting detail
- vi. Lighting Management System: System Architecture diagram and mounting details of all components
- vii. Security Monitoring System: System Architecture diagram and mounting details of all components

In addition, samples of all luminaires, LMS and security monitoring systems 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.

(d) 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.

3.4 INSPECTIONS, TESTS AND COMMISSIONING

(a) General

The Employer may call for the inspection or testing of all or any goods forming the subject of the Contract. The Employer 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 SABS 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.

(b) 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 must 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 Tender Price.

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 / Employer reserves the right to be present at any tests and the Contractor shall inform the Employer of all tests to enable them to be present if he so desires.

The Employer 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.

(c) 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.

(d) 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.

(e) 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 Contractor 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 / Employer completed by them as required.

3.5 CERTIFICATE OF COMPLIANCE BY AN ACCREDITED PERSON

On completion of the electrical installation the contractor shall complete the Certificate 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,

(a) 75 mm high lettering:

- Street lighting masts and poles

(b) 50 mm high lettering:

- Substation and mini sub designation.
- Outdoor switch gear designation.
- Transformer designation.
- Distribution kiosk and fused feeder panel designation.

(c) 20 mm high lettering:

- Main or sub-main board designation.
- Control panel designation.
- Indoor switch gear designation.

(d) 5 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, EQUIPMENT GUARANTEES, MAINTENANCE AND REPAIR

(a) Defects Liability

The defects liability period is defined in FIDIC general Conditions of Contract Cl 11 and the duration of the defects notification period sated 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.

(b) Equipment Guarantees

All equipment (unless otherwise specified elsewhere in this specification) shall be guaranteed against defects and failure for a period of at least **1 year from date of acceptance of the system** i.e. issuing of the taking over certificate.

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 H4: MEASUREMENT AND PAYMENT OF ELECTRICAL DISTRIBUTION AND EARTHING INFRASTRUCTURE

NOTE: SEPARATE RATES SHALL BE PROVIDED FOR MATERIALS AND LABOUR

ELECTRICAL CABLES (2.3)

1 3-Core XLPE MV 11kV Aluminium (Al) Underground Supply Cable Unit: m

The unit of measure shall be the number of metres 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.

2,3 Copper & Aluminium 3- and 4-Core PVC SWA PVC LV Cable Unit: m

Note; 4-core cables with integrated ECC

The unit of measure shall be the number of metres 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 Bare Copper Earth Cable Unit: m

The unit of measure shall be the number of metres 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.

5 3-core 11kV XLPE Cable Terminations Unit: No

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.

6 a)-k) PVC SWA PVC LV Cable Termination Unit: No

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.

6 l)-s) Bare Copper Earth Wire (BCEW) Termination Unit: 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.

7 a) Cable Warning Tape Unit: m

The unit of measure shall be the number of metres supplied and installed (trenching measured elsewhere).

The warning tape shall be installed 300mm above MV as well as LV cables.

7 b) Cable Markers Unit: No

The unit of measure shall be the cable markers supplied and installed.

8 a)-c) 3-core 11kV XLPE Cable Joints Unit: No

The unit of measure shall be the number of 11kV joints supplied and installed.

8 d)-o) PVC SWA PVC LV Cable Joints Unit: No

The unit of measure shall be the number of 3- or 4-core joints supplied and installed.
The joint shall be rated for 1000V.

8 p)-x) Bare Copper Earth Wire (BCEW) Cadweld joints Unit: No

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.

9 APPLICATION FOR POWER AND CONNECTION FEES (2.4)

a) Submission of application for electrical connection by eThekweni Unit: 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 eThekweni Electricity Unit: Sum

The unit of measure shall be a Lump sum for the payment of connection fees to eThekweni Electricity

c) Contractor's handling cost, profit and all other charges in respect of subitem 9 b) Sum for Connection Fees payable to eThekweni Electricity Unit: %

The unit of measure shall be a % markup on the payment of connection fees to eThekweni Electricity in respect of handlings costs, profit and all other charges.

d) Metering kiosk in accordance with requirements of eThekweni Electricity Unit: Sum

The unit of measure shall be a Lump Sum for the supply and installation of an 11kV Bulk Metering Unit in accordance with the specifications and requirements of eThekweni Electricity.

ELECTRICAL KIOSKS AND MINIATURE SUBSTATIONS SECTION G2 (2.6)

10. LV Electrical Distribution Kiosk. Section G2 2.6(a) Unit: No.

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 mini-sub shall be included in the rate.

11 Mini-substation (11kV /410V/ 230V) Delta/Star. Section G2 2.6.(b) – (f) Unit: 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.

12 EARTHING AND LIGHTNING PROTECTION Section G2 Para 2.7

a) Earthing of Miniature Substation. Section G2 Para 2.7(a) Unit: 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 10 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 Kiosk. Section G2 Para 2.7(b) Unit: 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 10 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 G2 Para 2.7(c) Unit: 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 30 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. Section G2 Para 2.7(f) Unit: 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 incl. Cadweld connections of earth conductors Unit: 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 incl. Cadweld connections of earth conductors Unit: No.

The unit of measure shall be the number of additional 1.6 m x 16 mm earth electrode terminations supplied and installed.

g) 70mm² Bare Copper Earth Cable Unit: m.

The unit of measure shall be the number of metres 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 G2 Para 2.7(e) Unit: No.

The unit of measure shall be the number of surge arresters supplied and installed inside masts and poles.

13 MINISUB AND KIOSK SECURITY MEASURES. SECTION G2 PARA 2.8

- a) **3 m x 3 m steel mesh fence enclosure. Section G2 Para 2.8(b)** Unit: No.

The unit of measure shall be the number of 3 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 m x 1.5 m steel mesh fence enclosure. Section G2 Para 2.8(b)** Unit: No.

The unit of measure shall be the number of 1.5 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 G2 Para 2.8(c)** Unit: 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 G2 Para 2.8(c)** Unit: 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 G2 Para 2.8(c)** Unit: 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 (2.8(c))**

Unit: 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) **0.5mm² 4 Pair Instrumentation Cable (2.8(c))** Unit: 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) **0.5mm² 4 Pair Instrumentation Cable terminations (2.8(c))** Unit: 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 (2.8(c))** Unit: 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 (2.8(c))** Unit: 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 (2.8.3)** Unit: 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.

14 TESTING AND DOCUMENTATION

a) **Soil resistivity tests by specialist subcontractor (per test)** Unit: 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 in Section G2 Para 2.3(j)** Unit: 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** Unit: 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** Unit: Sum

The unit of measure shall be a Lump sum for the issuing of a CoC for the electrical installation.

e) **Provision of as-built documentation** Unit: 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.

SECTION H5: LUMINAIRES – (SECTION G2.10)

NOTE: SEPARATE RATES SHALL BE PROVIDED FOR MATERIALS AND LABOUR

1 STREETLIGHT LUMINAIRES

a)-n) Luminaire Types L1 to L10: Section G2 2.10

—

Unit:

No.

The unit of measure shall be the number of luminaires supplied, installed according to the manufacturer's requirements and commissioned.

The luminaires shall be supplied, installed, commissioned and aimed by the contractor. Any defective luminaires found after installation will be the responsibility of the contractor and shall be replaced at his cost.

2 LIGHTING MANAGEMENT SYSTEM Section G2 2.11

a) Luminaire Controllers (Section G 2.11.5)

Unit: No.

The unit of measure shall be the number of luminaire controllers supplied, installed according to the manufacturer's requirements and commissioned.

The luminaire controllers shall be supplied, installed, commissioned and tested by the contractor. Any defective controllers found after installation will be the responsibility of the contractor and shall be replaced at his cost.

b) Segment Controllers (Section G 2.11.6)

Unit: No.

The unit of measure shall be the number of segment controllers supplied, installed according to the manufacturer's requirements and commissioned.

The segment controllers shall be supplied, installed, commissioned and tested by the contractor. Any defective segment controllers found after installation will be the responsibility of the contractor and shall be replaced at his cost.

Note: If the lighting management system offered does not require segment controllers (e.g. luminaire controllers function as or without segment controllers), then this item shall be tendered as R0.00 rate.

c) Communications Infrastructure (Section G 2.11.7)

Unit: No.

The unit of measure shall be a Lump Sum for the supply, installation, testing and commissioning of all communications infrastructure required in addition to luminaire/segment controllers and public cellular/IoT networks.

d) LMS / SANRAL ECMS Workstation (Section G 2.11.8.2)

Unit: No.

The unit of measure shall be the number of LMS Workstations supplied, installed, tested and commissioned.

e) LMS / SANRAL ECMS Server (Section G 2.11.8.1)

Unit: No.

The unit of measure shall be the number of LMS Servers supplied, installed, tested and commissioned.

- f) **LMS / SANRAL ECMS Software (Section G 2.11.8.3-5)** Unit: Sum.
The unit of measure shall be Lump Sum for the supply, installation, testing and commissioning of all LMS Software including all licences and version upgrades/support for 5 years
- g) **Data Costs (Section G 2.11.6)** Unit: Months.
The unit of measure shall be the number of segment controllers supplied, installed according to the manufacturer's requirements and commissioned.
- 3 Testing, Commissioning and Switching of Lighting Installation**
- a) **Lighting Management System** Unit: Sum
The unit of measure shall be a Lump Sum for the full testing, commissioning, setting to work and handing over of the Lighting Management System
- b) **Luminaires** Unit: 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. The rate shall include for extensive lighting level tests to confirm that the parameters of the simulation and specification have been achieved.
- c) **Pilot Installation** Unit: Sum
The unit of measure shall be a Lump Sum for the full testing, commissioning, setting to work, switching on and demonstration of the pilot installation. The rate shall include for extensive lighting level tests to confirm that the parameters of the simulation and specification have been achieved and the demonstration of the functionality/integration of the LMS and security systems as specified in 2.2.5.
- 4 Documentation as specified in Section G2 2.10(d)(v)** Unit: Sum
The unit of measure shall be a Lump Sum for the provision of the specified documentation
- 5 Any other items as may be necessary to complete the installation** Unit: Sum
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.

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

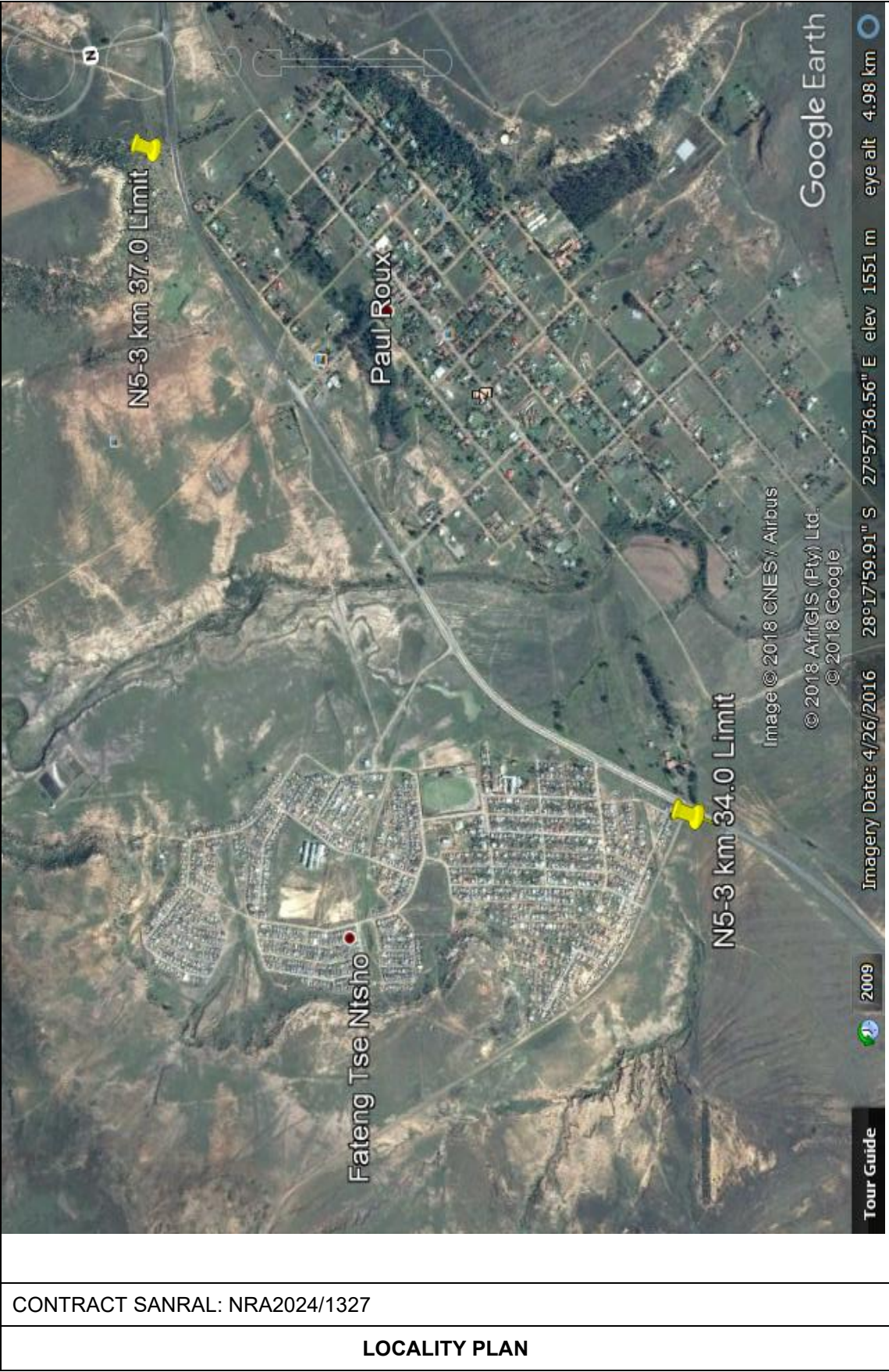
CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT
OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

PART C4: SITE INFORMATION

TABLE OF CONTENTS	PAGE
C4.1 LOCALITY PLAN	C-378
C4.2 GENERAL ROUTINE ROAD MAINTENANCE INFORMATION	C-379
C4.3 CONSTRUCTION WORK	C-379

C4.1 LOCALITY PLAN



C4.2 GENERAL ROUTINE ROAD MAINTENANCE INFORMATION

Include the General Routine Road Maintenance Information.

A routine road maintenance (RRM) contract is currently in place along the route under consideration.

The RRM contact details are as follows:

- Route manager : Q & A Consulting Engineers (Mr. Nathan Rothman)
+27 64 903 3534
- Contractor : DAMIAN,S CONTRACTORS (Mr. Isaac Murivhami)
074 356 2402

C4.3 CONSTRUCTION WORK

The construction Works consists, amongst others, of the following:

NATIONAL ROUTE 5 - SECTION 3

EXISTING ROAD CROSS-SECTION

The road cross-section of the existing road varies along the route. The section from km 34,0 to 35,2 has a

- Lane width: 3,7 m
- Slow shoulder width: 2,0 m
- Fast shoulder width: 0,5 - 1,0 m
- Raised median, varying width: 2,0 - 4,5 m
- Basic formation width: \pm 15,4 m

The road cross-section from km 35,2 to km 35,6 has;

- Four lanes (two per direction): 3,7 m
- Left Shoulder: 1,2 m

The road cross-section over the bridge consists of two lanes of 3,7 m (one per direction) with shoulders of 2,1 and 2,6 m, left and right respectively with a 1,2 m walkway along the bridge on the left.

CROSS SECTION OF THE N5 OVER THE SAND RIVER BRIDGE

The road cross-section from km 35,6 to km 37,6 consists of:

- Three lanes : 3,7 m
- Left Shoulder : 1,2 m

The area is typically flat with a few shallow cuts. The cuts have earth drains which are functional. No major work to the batter slopes is envisaged.

EXISTING PAVEMENT AND WALKWAYS

The existing pavement is in a relatively good condition with no obvious failures or defects observed. Apart from the inclusion of 4 traffic circles no other work is envisaged on the N5 pavement.

Shoulder drop offs were reported in the assessment report and should be attended to by the RRM. A basic allowance to remedy shoulder drop offs was made by this project, to be used if required.

WORK ON N5 SECTION 3

Construction of 4 traffic circles on the N5 between the townships of Fateng-Tse Ntsho, Motlomo and Paul Roux.

Main Works

- Construction of four traffic circles at km 34.2, 34.37, 35.05 and 35.40

Compulsory works, supplementary to main design

- Moving of transportation layby at km 35.15
- Addition of traffic circle advanced warning signage
- Additional road markings
- Additional street lighting
- Addition of rumble strips before the traffic circles
- Additional lengths of walkways
- Addition of pedestrian crossings at traffic circles
- Addition of gabion baskets as an erosion prevention measure at km 36,20
- Addition of fencing
- Edge beam construction where necessary
- Shoulder rework where necessary

FEEDER ROADS IN PAUL ROUX TOWNSHIP

Extension of existing concrete walkway by 25 m.

Upgrading of frequently used walkways through the veld of approximately 3 km on municipal land.

TABLE 1 – DETAILS OF PAUL ROUX FEEDER ROADS UNDER CONSIDERATION NO.

No.	Street name	Length (m)	Avg. width (m)	Alignment
1	Adams str	641	8	North - south
2	Voortrekker str	1 056	7	East-west
3	Bobbert str	585	7	North-south
4	Van Rooyen str	580	9	North - south

GENERAL CROSS-SECTIONAL DIMENSIONS AND ROAD CONFIGURATIONS

The surfaced road widths vary between 7 – 9m with gravel shoulders of 2 – 3m, the latter mentioned providing access, pedestrian accommodation, parking and further related functionalities.

Surface drainage measures vary from lined channels beside the gravel shoulders with covered culvert pipes to provide access to adjacent properties in the town centre, to non-mountable kerb-channel combinations to no formal drainage measures other than shaped earth drains / areas to accommodate surface water run-off as the streets move away from the town centre.

Services in the form of electrical and telecommunication posts and cables are typically situated outside the lined drains, with street lighting provided in instances (situated within the gravel shoulder for Adams Street).

EXISTING ROAD PAVEMENT / SURFACING CONDITION

Adams, Voortrekker and Bobbert streets

From a visual perspective Adams Street, Voortrekker Street and Bobbert Street exhibit similar distress manifestations in the form of localized failures developing into potholes of small size (less than 500mm diam.). The localized failures vary in extent from extensive to lesser occurrences.

In most instances repair has been attempted / undertaken by localized filling of the failures with asphaltic patching materials of undiscernible origin and make-up.

Edge breaking and ravelling of the surfaced edge occurs extensively in the town centre and where local access or off-street parking is required / offered.

From a visual inspection of the existing unsurfaced shoulder as well as the prevalent failure mechanism it was estimated that the road pavement structures contain a Waterbound Macadam base. The surfacing comprises a sand / graded seal of considerable age which is dry and brittle when broken down using a geological hammer.

Van Rooyen street

The failure mechanism of the pavement structure of van Rooyen street is different to that described for the remaining streets in the sub-section above in that distress manifests in the following manner(s).

- Block cracking (large pattern) with longitudinal cracking most prevalent over the larger extent of the street surfaced area.
- Secondary cracking of the longitudinal cracks and crocodile cracking at frequent positions, mostly related to the wheel paths of the travelled lane and at intersection positions, with increased occurrences noted for the southbound lane.
- Edge breaks and ravelling of the surfaced edge.
- Potholes / failures where extensive crocodile cracking has not been repaired / treated.

In general terms the existing surfacing seems of lesser age than the remaining streets described in the previous sub-section. Distress manifestations are however not only surfacing / upper pavement structure related and could be indicative of overall pavement bearing capacity shortcomings / deeper related issues.

EXISTING SURFACE DRAINAGE INFRASTRUCTURE AND RELATED CONDITIONS

Adams Street

Commencing from the northern T-junction at the church and travelling from north to south along Adams Street in the direction of the downward slope and towards the N5 intersection, the following surface drainage measures are in place (as observed):

- A constructed stone pitched wall on the lefthand side with shaping to form a channel and a concrete lined trapezoidal drain on the righthand side. Access over the canal (left side) to adjacent properties is provided by covered pipe / box culverts.

- The channel (lefthand side) terminates at the Voortrekker Street intersection whereafter no formal drainage measures other than shaping outside the gravel shoulder is present. The trapezoidal drain is of short length whereafter a kerb with suitable shaping ensues on the righthand side.
- The kerb-channel starts once more on the lefthand side past the shopfronts and houses from Park Street and continues to the intersection with Scheepers street.
- Further south towards the N5 intersection no formal surface drainage measures exist and the run-off water is carried on the road.
- General drainage conditions are poor in the vicinity of the Adams Street / N5 intersection.

Voortrekker street

Commencing from the western side at the OVK trading post and travelling from west to east with the downward slope along the road, the following drainage measures have been observed.

- A kerb with shaped channel on both sides of the road, though sporadic in appearance on the lefthand side where the trade post access is situated. In instances concrete lining is further evident for the channel below the kerb.
- Access over the channel is once more provided by covered pipe / box culverts at property access points.
- The kerbed channels continue past Adams Street intersection by means of culverts under the road, all the way down to van Rooyen street, although changing to a covered pipe culvert scenario at various instances where access / parking / intersecting roads have been accommodated / allowed for.

Stormwater run-off as assessed during a rainy spell is generally good for the street under consideration, although run-off from the intersecting roads runs into Voortrekker Street at intersection positions. In instances damaged kerbs were also noted.

Bobbert street

Commencing from the northern T-junction with Voortrekker Street and travelling from north to south along Bobbert Street in die direction of the downward slope and towards the N5 intersection, the following surface drainage measures are in place (as observed):

- A kerb with shaped channel on both sides of the road, with provision for access over the channel provided by covered pipe / box culverts at property access points.
- At the intersection with Scheepers street, the kerb-channel terminates on the lefthand side, but continues on the righthand side though no culverts are provided under the intersecting road approaches.
- The kerb-channel on the righthand side terminates at Roos Street intersection, with no further formal drainage measures in place along the street under consideration other than limited shaping of the gravel shoulders / outside the gravel shoulder.
- Towards the intersection with the N5 there exists a defined run-off area towards a small dam in close vicinity of the N5, although no formal drainage measures exist for the defined run-off area.

Van Rooyen Street

Commencing from the northern intersection with Oosthuysen Street, travelling from north to south along van Rooyen street in die direction of the downward slope, the following surface drainage measures are in place (as observed):

- A stone-pitched / brick wall with shaping in order to create a channel on the lefthand side of the road, with a kerb-channel combination on the righthand side, both continuing up to the intersection with Cilliers street.
- After the Cilliers street intersection, the kerb-channel configuration continues on the righthand side with no formal drainage measures (other than marginal shaping) noted on the lefthand side of the road.
- The kerb-channel section terminates for a short section on the righthand side where an open erf / property is situated on the corner of van Rooyen / Market streets, but continues once more for a short section past the property on the south western intersection corner after the Market Street intersection before being led away from the road reserve.

WORKS AND RELATED IMPLICATIONS

Road surfacing

- Keep existing with minimal patching / repair where necessary.
- Crack seal.
- Apply coarse graded slurry with SBR modified binder to protect / preserve existing infrastructure in so far as possible.

Pavement layers

- Remain as is

Gravel shoulders

- Remain unsurfaced, but with significant shaping in order to improve surface run-off / pedestrian ease of movement

Surface Drainage

- Remain as is

Pedestrian facilities

- Remain as is other than for pedestrian crossings at intersections (road marking)

Influence on Services

- None

Road markings

- Apply new to applicable / improved standards (with new surfacing)

Road signage

- Upgrade / formalize for all intersections

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT SANRAL: NRA 2024/1327R

APPOINTMENT OF A SERVICE PROVIDER FOR THE COMMUNITY DEVELOPMENT PROJECT FOR THE IMPROVEMENT
OF PEDESTRIAN FACILITIES ON NATIONAL ROUTE 5 SECTION 3 FROM KM 34.0 TO PAUL ROUX (KM37.0)

PART C5: ANNEXURES TO CONTRACT DOCUMENT

TABLE OF CONTENTS

ADDENDA:	COPIES OF ALL ADDENDAS ISSUED
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 A3.6:	LOCAL CONTENT DECLARATION: SUMMARY SCHEDULE (ANNEXURE C)
FORM A6 (SBD2):	CERTIFICATE OF TAX COMPLIANCE
FORM A7	CERTIFICATE OF INSURANCE COVER
FORM A11:	REGISTRATION WITH CIDB
FORM A13 (SBD6.1):	TENDERER'S B-BBEE VERIFICATION CERTIFICATE
FORM A14 (SBD1)	INVITATION TO BID
FORM C2:	SCHEDULE OF SPECIAL MATERIALS
FORM C3:	ORGANISATIONAL STRUCTURE
FORM C4:	KEY PERSONNEL EXPERIENCE - CONTRACTS MANAGER
FORM C5:	KEY PERSONNEL EXPERIENCE - CONTRACTOR'S REPRESENTATIVE
FORM C6:	KEY PERSONNEL EXPERIENCE - CONSTRUCTION HEALTH AND SAFETY OFFICER (CHSO) WITHIN COMPANY
FORM C7:	KEY PERSONNEL EXPERIENCE - TARGETED GROUP DEVELOPMENT COORDINATOR
FORM C8:	REGISTERED PERSON WITHIN THE COMPANY
LETTER OF ACCEPTANCE BY SANRAL	
LETTER OF ACKNOWLEDGEMENT BY CONTRACTOR	

Note to tenderer:

The Annexure will include completed returnable schedules and correspondence which form part of the contract.