

TCC/2023/05/0001/28813/RFP

TRANSNET CORPORATE CENTRE (TCC)

an Operating Division of **TRANSNET SOC LTD**

[hereinafter referred to as **Transnet**]

[Registration No. 1990/000900/30]

REQUEST FOR PROPOSAL (RFP)

TURNKEY EPC - ENGINEERING, DESIGN, PROCUREMENT, CONSTRUCTION, COMMISSIONING AND CLOSE OUT OF PROJECT UKUVUSELELA AUTOMOTIVE PROJECT: GAUTENG – EASTERN CAPE HIGH-CAPACITY RAIL CORRIDOR FOR AUTOMOTIVE VOLUMES FROM PRETORIA TO THE PORT OF PORT ELIZABETH (GQEBERHA)

RFP NUMBER: TCC/2023/05/0001/28813/RFP

ISSUE DATE: 26 May 2023

BRIEFING SESSION DATE: 19 June 2023@11h00

CLOSING DATE: 25 August 2023

CLOSING TIME: 14h00 PM

BID VALIDITY PERIOD: 12 weeks from Closing Date

NAME OF TENDERER:.....

Tenderer contact person:.....

Tenderer contact details:Phone.....Email.....

Part T1: Tendering Procedures

- T1.1 Tender notice and invitation to tender
- T1.2 Tender data
- T1.3 CIDB Standard conditions of tender

Part T2: Returnable Documents

- T2.1 List of returnable documents
- T2.2 Returnable schedules

Part C1: Agreement and Contract Data

- C1.1 Form of Offer and Acceptance
- C1.2 Contract Data (Part 1 & 2)

Part C2: Pricing data

- C2.1 Pricing Instructions (Option A)
- C2.2 Activity Schedule

Part C3: Scope of Work

- C3.1 Scope of work

Part C4: Site information

- C4.1 Site Information

THE TENDER

Part T1: Tender Procedures

T1.1 Tender Notice and Invitation to Tender

T1.2 Tender Data

T1.1 Tender Notice and Invitation to Tender

DESCRIPTION	TURNKEY EPC - ENGINEERING, DESIGN, PROCUREMENT, CONSTRUCTION, COMMISSIONING AND CLOSE OUT OF PROJECT UKUVUSELELA AUTOMOTIVE PROJECT: GAUTENG – EASTERN CAPE HIGH-CAPACITY RAIL CORRIDOR FOR AUTOMOTIVE VOLUMES FROM PRETORIA TO THE PORT OF PORT ELIZABETH (GQEBERHA)
TENDER ADVERT	All Transnet tenders are advertised on the National Treasury's e-Tender Publication Portal, CIDB and the Transnet website. Should one of these media (i.e. National Treasury's e-Tender Publication Portal, CIDB or Transnet website) not be available, Tenderers are advised to check on the other media for advertised tenders.
COMMUNICATION	Any addenda to the RFP or clarifications will be published on the e-tender portal and Transnet website. Tenderers are required to check the e-tender portal or Transnet website prior to finalising their bid submissions for any changes or clarifications to the RFP. Transnet will not be held liable if Tenderers do not receive the latest information regarding this RFP with the possible consequence of either being disadvantaged or disqualified as a result thereof.
BRIEFING SESSION	<p>Compulsory Briefing Session</p> <p>A compulsory briefing will be conducted on Microsoft Teams on the 19 June 2023 @11h00 for a period of \pm 2 hours. The briefing session will start punctually, and information will not be repeated for the benefit of Respondents arriving late.</p> <p>Respondents failing to attend the compulsory RFP briefing will be disqualified.</p> <p>Respondents are to send an email to Xolile.mthimunye@transnet.co.za to request the link for the briefing session. Requests are to be made 1 day before Briefing Session Date</p> <p>Attendance Register will be recorded from the request to be send the briefing Session and also confirmed during the Compulsory Briefing Meeting.</p>
CLOSING DATE	<p>14h00 25 August 2023</p> <p>Tenderers must ensure that bids are uploaded timeously onto the system.</p>

	<p>As a general rule, if a bid is late, it will not be accepted for consideration.</p> <p><i>Tenderers are required to ensure that electronic bid submissions are done at least a day before the closing date to prevent issues which they may encounter due to their internet speed, bandwidth or the size of the number of uploads they are submitting. Please do not wait for the last hour to submit. A Tenderer can upload 30mb per upload and multiple uploads are permitted.</i></p>
VALIDITY PERIOD	<p>12 weeks from Closing Date</p> <p>Tenderers are to note that they may be requested to extend the validity period of their bid, at the same terms and conditions, if the internal evaluation process has not been finalised within the validity period. However, once the adjudication body has approved the process and award of the business to the successful Tenderer(s), the validity of the successful Tenderer(s)' bid will be deemed to remain valid until a final contract has been concluded.</p>

1 COMMUNICATION

- 1.1 Specific queries relating to this RFP should be submitted to xolile.mthimunye@transnet.net before **12:00 pm on 11 August 2023**. In the interest of fairness and transparency Transnet's response to such queries will then be made available to other Tenderers.
- 1.2 It is prohibited for Respondents to attempt, either directly or indirectly, to canvass any officer or employee of Transnet in respect of this RFP between the closing date and the date of the award of the business.
- 1.3 Respondents found to be in collusion with one another will be automatically disqualified and restricted from doing business with organs of state for a specified period.
- 1.4 Respondents may also, at any time after the closing date of the RFP, communicate with the contact person specified in Section 1 of this RFP on any matter relating to its RFP response
- 1.5 Respondents are to note that changes to its submission will not be considered after the closing date.

2 PROPOSAL SUBMISSION

Transnet has implemented a new electronic tender submission system, the e-Tender Submission Portal, in line with the overall Transnet digitalization strategy where suppliers can view advertised tenders, register their information, log their intent to respond to bids and upload their bid proposals/responses on to the system.

a) The Transnet e-Tender Submission Portal can be accessed as follows:

- Log on to the Transnet eTenders management platform website (<https://www.transnet.net>);
- Click on "TENDERS";
- Scroll towards the bottom right hand side of the page;

- On the blue window click on "register on our new eTender Portal";
- Click on "ADVERTISED TENDERS" to view advertised tenders;
- Click on "SIGN IN/REGISTER – for Tenderer to register their information (must fill in all mandatory information);
- Click on "SIGN IN/REGISTER" - to sign in if already registered;
- Toggle (click to switch) the "Log an Intent" button to submit a bid;
- Submit bid documents by uploading them into the system against each tender selected.
- No late submissions will be accepted. The Tenderer guide can be found on the Transnet Portal transnetetenders.azurewebsites.net

3 CONFIDENTIALITY

All information related to this RFP is to be treated with strict confidentiality. In this regard Tenderers are required to certify that they have acquainted themselves with the Non-Disclosure Agreement. All information related to a subsequent contract, both during and after completion thereof, will be treated with strict confidence. Should the need however arise to divulge any information gleaned from provision of the Works, which is either directly or indirectly related to Transnet's business, written approval to divulge such information must be obtained from Transnet.

4 DISCLAIMERS

Respondents are hereby advised that Transnet is not committed to any course of action as a result of its issuance of this RFP and/or its receipt of Proposals. In particular, please note that Transnet reserves the right to:

- 4.1 Award the business to the highest scoring Tenderer/s unless objective criteria justify the award to another tenderer;
- 4.2 Not necessarily accept the lowest priced tender or an alternative Tender;
- 4.3 Go to the open market if the quoted rates (for award of work) are deemed unreasonable;
- 4.4 Should the Tenderers be awarded business on strength of information furnished by the Tenderer, which after conclusion of the contract is proved to have been incorrect, Transnet reserves the right to terminate the contract;
- 4.5 Request audited financial statements or other documentation for the purposes of a due diligence exercise;
- 4.6 Not accept any changes or purported changes by the Tenderer to the tender rates after the closing date;
- 4.7 Verify any information supplied by a Tenderer by submitting a tender, the Tenderer/s hereby irrevocably grant the necessary consent to the Transnet to do so;
- 4.8 Conduct the evaluation process in parallel. The evaluation of Tenderers at any given stage must therefore not be interpreted to mean that Tenderers have necessarily passed any previous stage(s);

- 4.9 Unless otherwise expressly stated, each tender lodged in response to the invitation to tender shall be deemed to be an offer by the Tenderer. The Employer has the right in its sole and unfettered discretion not to accept any offer.
- 4.10 Not be held liable if tenderers do not provide the correct contact details during the clarification session and do not receive the latest information regarding this RFP with the possible consequence of being disadvantaged or disqualified as a result thereof.
- 4.11 Transnet reserves the right to exclude any Tenderers from the tender process who has been convicted of a serious breach of law during the preceding 5 [five] years including but not limited to breaches of the Competition Act 89 of 1998, as amended. Tenderers are required to indicate in tender returnable [clause 12 on T2.20], [Breach of Law] whether or not they have been found guilty of a serious breach of law during the past 5 [five] years.
- 4.12 Transnet reserves the right to perform a risk analysis on the preferred Tenderer to ascertain if any of the following might present an unacceptable commercial risk to Transnet:
- Unduly high or low tendered rates or amounts in the tender offer
 - Contract data of contract provided by the Tenderer; or
 - The contents of the tender returnable which are to be included in the contract
- 4.13 Award a contract in connection with this Proposal at any time after the RFP's closing date;
- 4.14 Award a contract for only a portion of the proposed Goods/Services which are reflected in the scope of this RFP;
- 4.15 Split the award of the contract between more than one Supplier/Service provider, should it at Transnet's discretion be more advantageous in terms of, amongst others, cost or developmental considerations;

5 NATIONAL TREASURY'S CENTRAL SUPPLIER DATABASE

Tenderer are required to self-register on National Treasury's Central Supplier Database (CSD) which has been established to centrally administer supplier information for all organs of state and facilitate the verification of certain key supplier information. The CSD can be accessed at <https://secure.csd.gov.za/>

Transnet urges its clients, suppliers and the general public to report any fraud or corruption to

TIP-OFFS ANONYMOUS:

**Ethics Helpdesk** (Pty) LTD.
Ethics Management System™

You can choose to be **Anonymous** or **Non-Anonymous** on **ANY** of the platforms
PLEASE RETAIN YOUR REFERENCE NUMBER

				
	AI Voice Bot "Jack" Speak to our AI Voice Chat Bot "JACK", you converse with him like chatting to a human, with the option to record a message and speak to an agent at anytime.	What's App Speak to an Agent via What's App.	Speak to an Agent Speak to an Agent via the platform with no call or data charge	Telegram Speak to an Agent via Telegram
 0800 003 056	 086 551 4153	 reportit@ethicshelpdesk.com	 *120*0785980808#	

T1.2 Tender Data

The conditions of tender are the Standard Conditions of Tender as contained in Annexure C of the CIDB Standard for Uniformity in Engineering and Construction Works Contracts. The Standard for Uniformity in Construction Procurement was first published in Board Notice 62 of 2004 in Government Gazette No 26427 of 9 June 2004. It was subsequently amended in Board Notice 67 of 2005 in Government Gazette No 28127 of 14 October 2005, Board Notice 93 of 2006 in Government Gazette No 29138 of 18 August 2006, Board Notice No 9 of 2008 in Government Gazette No 31823 of 30 January 2009, Board Notice 86 of 2010 in Government Gazette No 33239 of 28 May 2010, Board Notice 136 of 2015 in Government Gazette 38960 of 10 July 2015 and Board Notice 423 of 2019 in Government Gazette No 42622 of 8 August 2019.

The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

Each item of data given below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies.

Clause Number	Tender Data
C.1.1	The Employer is TRANSNET SOC LTD (Reg No. 1990/000900/30)
C.1.2	<p>The Tender Documents issued by the Employer comprise:</p> <p>Part T1: Tendering Procedures</p> <p>T1.1 Tender notice and invitation to tender</p> <p>T1.2 Tender data</p> <p>T1.3 CIDB Standard conditions of tender</p> <p>Part T2: Returnable Documents</p> <p>T2.1 List of returnable documents</p> <p>T2.2 Returnable schedules</p> <p>Part C1: Agreement and Contract Data</p> <p>C1.1 Form of Offer and Acceptance</p> <p>C1.2 Contract Data (Part 1 & 2)</p> <p>Part C2: Pricing data</p> <p>C2.1 Pricing Instructions (Option A)</p> <p>C2.2 Activity Schedule</p> <p>Part C3: Scope of Work</p> <p>C3.1 Scope of Work</p> <p>Part C4: Site information</p> <p>C4.1 Site Information</p>

C.1.4	The Employer's Agent is Telephone number: Email address:	Xolile Mthimunye 066 248 6622 Xolile.mthimunye@transnet.net
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All communication during the Tender period shall be made to the Contact Person stated in C.1.4

C.1.5	Cancellation and Re-Invitation of Tenders C1.5.1 An employer may, prior to the award of the tender, cancel a tender if- <ul style="list-style-type: none"> a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation; b) funds are no longer available to cover the total envisaged expenditure; or c) no acceptable tenders are received. d) there is a material irregularity in the tender process. C1.5.2 The decision to cancel a tender invitation must be published in the same manner in which the original tender invitation was advertised C1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time.
C.1.6 C.1.6.1	Procurement procedures Unless otherwise stated in the tender data, a contract will, subject to C.3.13, be concluded with the tenderer who in terms of C.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.
C.2.1 C.2.1.1 C.2.1.2	Eligibility Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer. Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the Basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.
C.2.2. C.2.2.1	Cost of tendering Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.
C.2.3	Check documents Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.
C.2.4	Confidentiality and copyright of documents Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.
C.2.6	Acknowledge addenda Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.

C.2.7	Clarification meeting The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender. Attendance Register will be confirmed during the TEAMS (Virtual) Meeting
C.2.8	Seek clarification Request clarification of the tender documents, if necessary, by notifying the employer at least ten (10) working days before the closing time stated in the tender data.
C.2.11	Alterations to documents Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.
C.2.12	Alternative bids will not be considered.
C.2.13	Submitting a tender offer C.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works identified in the contract data and described in the scope of works, unless stated otherwise in the tender data. C.2.13.3 Each tender offer shall be in the English Language. C.2.13.4 Sign the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer. The Employer's details and identification details that are to be shown on each tender C.2.13.5
C.2.13.9	Telephonic, telegraphic, facsimile or e-mailed tender offers will not be accepted.
C.2.15	Closing time 14h00 25 August 2023 Tenderers must ensure that bids are uploaded timeously onto the system. As a general rule, if a bid is late, it will not be accepted for consideration. <i>Tenderers are required to ensure that electronic bid submissions are done at least a day before the closing date to prevent issues which they may encounter due to their internet speed, bandwidth or the size of the number of uploads they are submitting. Please do not wait for the last hour to submit. A Tenderer can upload 30mb per upload and multiple uploads are permitted.</i>
C.2.16	Tender offer validity C.2.16.1 The tender offer validity period is 12 weeks from Closing Date. Tenderers are to note that they may be requested to extend the validity period of their tender, on the same terms and conditions, if Transnet's internal evaluation and governance approval processes has not been finalised within the validity period. C.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension. C.2.16.3 Accept that a tender submission that has been submitted to the employer only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. C.2.16.4

	Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the submission clearly marked as "SUBSTITUTE".
C.2.17	Clarification of tender offer after submission Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.
C.2.20	Submit securities, bonds and policies If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the contract data.
C.3.1	Respond to requests from the tenderer The Employer will respond to requests for clarification received up to five (5) working days before the tender closing time.
	Opening of tender submissions Bids will not be opened and read out (communicated to Tenderers)
C.3.8	Test for Responsiveness <ol style="list-style-type: none"> 1. Tenderer has attended a compulsory Briefing Session An authorised representative of the tendering entity or a representative of tendering entity that intends to form a Joint Venture (JV) must attend the compulsory clarification meeting. 2. (i) Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, designation of 9 CE (class of construction work) are eligible to have their tenders evaluate (ii) For Joint Venture: the lead partner has a contractor grading designation of not lower than one level below the required class of construction works under consideration and possesses the required recognition status; and the combined Contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a Contractor grading designation determined in accordance with the sum tendered for a 9 CE (class of construction work) or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations <p>The tenderer shall provide a certified copy of its signed joint venture agreement</p>
C.3.9	Arithmetical errors, omissions and discrepancies.
C.3.9.1	Check responsive tenders for discrepancies between amounts In amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.
C.3.9.2	Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with C.3.11 for:

<p>C.3.9.3</p> <p>C.3.9.4</p>	<p>a) the gross misplacement of the decimal point in any unit rate; b) omissions made in completing the pricing schedule or bills of quantities; or c) arithmetic errors in: (i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or the summation of the prices.</p> <p>Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.</p> <p>Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:</p> <p>a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.</p> <p>b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.</p>				
<p>C.3.10</p>	<p>Clarification of a tender offer</p> <p>Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.</p>				
<p>C3.11</p>	<p>Stage 1 Test for Responsiveness (as per clause C.3.8)</p> <p>Stage 2 Mandatory Administration Criteria</p> <p>(a) Tenderer has completed in full and signed Form of offer [C1.1.]</p> <p>Stage 3 Functionality Evaluation Criteria</p> <p>Functionality is the terminology used to define the technical ability of the Tenderer, based on experience to deliver the required product in accordance with the specialised quality, reliability and functionality.</p> <p>Points allocated for Functionality shall be evaluated in accordance with the criteria as listed below. An overall minimum threshold of 70 points out of 100 must be achieved for the tender to be eligible for further evaluation.</p> <p>Only those tenderers who attain the minimum number of evaluation points for Functionality will be eligible for further evaluation, failure to meet the minimum threshold will result in the tender being disqualified and removed from any further consideration.</p> <table border="1"> <thead> <tr> <th>Criteria</th><th>Max Points</th></tr> </thead> <tbody> <tr> <td> Tenderer Experience The Tenderer should provide company references of similar (Civil/Railway Construction) Projects <ul style="list-style-type: none"> 0-3 project [0] 4 projects [3] 5 or more projects [8] </td><td>8</td></tr> </tbody> </table>	Criteria	Max Points	Tenderer Experience The Tenderer should provide company references of similar (Civil/Railway Construction) Projects <ul style="list-style-type: none"> 0-3 project [0] 4 projects [3] 5 or more projects [8] 	8
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	<p>Tenderer Experience</p> <p>The Tenderer should provide (Max 3x company references) of similar (Civil/Railway Construction) Projects</p> <ul style="list-style-type: none"> • <R300m Including Vat project [0] • Between R300m and < R500m Including Vat project [1] • Between R500m and < R1b Including Vat project [2] • R1b or more Including Vat project [3] 	9
	<p>Key Personnel: Project Manager</p> <ul style="list-style-type: none"> • Project Manager has no relevant (BSc Eng/B-Tech/BSc – Engineering/QS/Construction) qualification and is not registered as PMP [0] • Project Manager has relevant (BSc Eng/B-Tech/BSc – Engineering/QS/Construction) qualification, But not registered as PMP [0] • Project Manager is registered as PMP, with No relevant (BSc Eng/B-Tech/BSc – Engineering/QS/Construction) Qualification [0] • Project Manager has relevant (BSc Eng/B-Tech/BSc – Engineering/QS/Construction) qualification and is registered as PMP [1] <p>Project Manager has experience working as “Project Manager ” in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> • 0-3 project [0] • 4 or more projects [1] 	2
	<p>Key Personnel: Contracts Manager</p> <ul style="list-style-type: none"> • Contracts Manager has no relevant (BSc Eng/B-Tech/BSc – Engineering/QS/Construction) qualification [0] • Contracts Manager has relevant (BSc Eng/B-Tech/BSc – Engineering/QS/Construction) qualification [1] <p>Contracts Manager has experience working as “Contracts Manager” in similar (value & duration) Railway Construction Projects where NEC was used</p> <ul style="list-style-type: none"> • 0-3 project [0] • 4 or more projects [1] 	2
	<p>Key Personnel: Construction Manager</p> <ul style="list-style-type: none"> • Construction Manager has no relevant (BSc Eng/B-Tech/BSc – Civil/QS/Construction) qualification [0] • Construction Manager has relevant (BSc Eng/B-Tech/BSc – Civil/QS/Construction) qualification [1] <p>Construction Manager has experience working as “Construction Manager” in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> • 0-3 project [0] • 4 or more projects [1] 	3

	<p>Construction Manager has experience working as "Construction Manager" in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> • < R600m Incl. Vat project [0] • R600m or more Incl. Vat project [1] 	
	<p>Key Personnel: Senior Contract/Commercial Manager</p> <ul style="list-style-type: none"> • Senior Contract/Commercial Manager has no relevant (Degree/ Btech in Engineering/accounting/law/QS) qualification [0] • Senior Contract/Commercial Manager has relevant (Degree/ Btech in Engineering/accounting/law/QS) qualification [1] <p>Senior Contract/Commercial Manager has experience working as "Senior Contract/Commercial Manager" in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> • 0-3 project [0] • 4 or more projects [1] <p>Senior Contract/Commercial Manager has experience working as "Senior Contract/Commercial Manager" in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> • < R1b Incl. Vat project [0] • R1b or more Incl. Vat project [1] 	3
	<p>Key Personnel: Lead Planner</p> <p>Lead Planner has experience working as "Lead Planner" in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> • 0-3 project [0] • 4 or more projects [1] 	1
	<p>Key Personnel: Geotechnical Engineer/Engineering Geologist</p> <ul style="list-style-type: none"> • Geotechnical Engineer has no relevant (BSc Eng/B Eng Civil) qualification and is not registered with Engineering Council of South Africa (ECSA) as a professional engineer (civil) [0] • Geotechnical Engineer has relevant (BSc Eng/B Eng Civil) qualification, But is not registered with Engineering Council of South Africa (ECSA) as a professional engineer (civil) [0] • Geotechnical Engineer/Engineering Geologist is registered with Engineering Council of South Africa (ECSA) as a professional engineer (civil), with No relevant (BSc Eng/B Eng Civil) Qualification [0] • Geotechnical Engineer has relevant (BSc Eng/B Eng Civil) qualification and is registered with Engineering Council of South Africa (ECSA) as a professional engineer (civil) [0.8] <p>Or</p> <ul style="list-style-type: none"> • Engineering Geologist has no relevant (BSc honours degree in engineering geology) qualification and is not registered at the South African Council for Natural and Scientific Professions (SACNASP) as a Pr. Sci. Nat, [0] • Engineering Geologist Geologist has relevant (BSc honours degree in engineering geology) qualification, But is not registered at the South African Council for Natural and Scientific Professions (SACNASP) as a Pr. Sci. Nat, [0] 	1.6

	<ul style="list-style-type: none"> Engineering Geologist is registered at the South African Council for Natural and Scientific Professions (SACNASP) as a Pr. Sci. Nat, with No relevant (BSc honours degree in engineering geology) Qualification [0] Engineering Geologist has relevant (BSc honours degree in engineering geology) qualification and is registered at the South African Council for Natural and Scientific Professions (SACNASP) as a Pr. Sci. Nat, [0.8] <p>Geotechnical Engineer/Engineering Geologist has experience working as "Geotechnical Engineer/Engineering Geologist" in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [0.8] 	
	<p>Key Personnel: Civil/Perway Engineer</p> <ul style="list-style-type: none"> Civil/Perway Engineer has no relevant (BSc Eng/ B Eng/BTech Civil) qualification and is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (civil) [0] Civil/Perway Engineer has relevant (BSc Eng/ B Eng/BTech Civil) qualification, But is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (civil) [0] Civil/Perway Engineer is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (civil), But with No relevant (BSc Eng/ B Eng/BTech Civil) Qualification [0] Civil/Perway Engineer has relevant (BSc Eng/ B Eng/BTech Civil) qualification and is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (civil) [3] <p>Civil/Perway Engineer has experience working as "Civil/Perway Engineer" in similar in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [3] 	6
	<p>Key Personnel: Structural Engineer</p> <ul style="list-style-type: none"> Structural Engineer has no relevant (BSc Eng/ B Eng/BTech - Civil) qualification and is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (civil) [0] Structural Engineer has relevant (BSc Eng/ B Eng/BTech - Civil) qualification but is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (civil) [0] Structural Engineer is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (civil), but with No relevant (BSc Eng/ B Eng/BTech Civil) Qualification [0] Structural Engineer has relevant (BSc Eng/ B Eng/BTech Civil) qualification and is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (civil) [1] <p>Structural Engineer has experience working as "Structural Engineer" in similar (value & duration) Railway Construction Projects</p>	2

	<ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [1] 	
	<p>Key Personnel: Ohte Engineer (Electrical Engineer)</p> <ul style="list-style-type: none"> Ohte Engineer has no relevant (BSc Eng/B Eng/BTech - Electrical) qualification and is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical) [0] Ohte Engineer has relevant (BSc Eng/ B Eng/BTech - Electrical) qualification, But is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical) [0] Ohte Engineer is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical) But has No relevant (BSc Eng/B Eng/BTech - Electrical) Qualification [0] Ohte Engineer has relevant (BSc Eng/ B Eng/BTech - Electrical) qualification and is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical) [1] <p>Ohte Engineer has experience working as "Ohte Engineer" in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [1] 	2
	<p>Key Personnel: Traction Subs Engineer (Electrical Engineer)</p> <ul style="list-style-type: none"> Traction Subs Engineer has no relevant (BSc Eng/B Eng/BTech - Electrical) qualification and is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical) [0] Traction Subs Engineer has relevant (BSc Eng/ B Eng/BTech - Electrical) qualification, But is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical) [0] Traction Subs Engineer is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical) But has No relevant (BSc Eng/B Eng/BTech - Electrical) Qualification [0] Traction Subs Engineer has relevant (BSc Eng/ B Eng/BTech - Electrical) qualification and is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical) [0.2] <p>Traction Subs Engineer has experience working as "Traction Subs Engineer" in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [0.2] 	0.4
	<p>Key Personnel: EL&P Engineer (Electrical Engineer)</p> <ul style="list-style-type: none"> EL&P Engineer has no relevant (BSc Eng/B Eng/BTech - Electrical) qualification and is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical) [0] EL&P Engineer has relevant (BSc Eng/ B Eng/BTech - Electrical) qualification, But is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical) [0] 	1.2

	<ul style="list-style-type: none"> EL&P Engineer is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical) But has No relevant (BSc Eng/B Eng/BTech - Electrical) Qualification [0] EL&P Engineer has relevant (BSc Eng/ B Eng/BTech - Electrical) qualification and is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical) [0.6] <p>EL&P Engineer has experience working as "EL&P Engineer" in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [0.6] 	
	<p>Key Personnel: Signalling Engineer (Electrical/ Electronic Engineer)</p> <ul style="list-style-type: none"> Signalling Engineer has no relevant (BSc Eng/B Eng/BTech - Electrical/Electronic) qualification and is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical/Electronic) [0] Signalling Engineer has relevant (BSc Eng/ B Eng/BTech - Electrical/Electronic) qualification, But is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical/Electronic) [0] Signalling Engineer is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical/Electronic) But has No relevant (BSc Eng/B Eng/BTech - Electrical/Electronic) Qualification [0] Signalling Engineer has relevant (BSc Eng/ B Eng/BTech - Electrical/Electronic) qualification and is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Electrical/Electronic). [1.2] <p>Signalling Engineer has experience working as "Signalling Engineer" in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [1.2] 	2.4
	<p>Key Personnel: Mechanical Engineer</p> <ul style="list-style-type: none"> Mechanical Engineer has no relevant (BSc Eng/ B Eng/BTech - Mechanical) qualification and is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Mechanical) [0] Mechanical Engineer has relevant (BSc Eng/ B Eng/BTech - Mechanical) qualification, But is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Mechanical) [0] Mechanical Engineer is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Mechanical) But has No relevant (BSc Eng/ B Eng/BTech - Mechanical) Qualification [0] Mechanical Engineer has relevant (BSc Eng/ B Eng/BTech - Mechanical) qualification and is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer/ Professional Technologist (Mechanical) [0.2] 	0,4

	<p>Mechanical Engineer has experience working as "Mechanical Engineer" in similar (value & duration) Railway Construction Projects.</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [0.2] 	
	<p>Key Personnel: Geotechnical Site Engineer</p> <ul style="list-style-type: none"> Geotechnical Site Engineer has no relevant (BSc Eng/BTech - Civil) qualification and is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer (civil) [0] Geotechnical Site Engineer has relevant (BSc Eng/BTech - Civil) qualification, But is not registered with Engineering Council of South Africa (ECSA) as a Professional Engineer (civil) [0] Geotechnical Site Engineer is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer (civil), But has No relevant (BSc Eng/BTech - Civil) Qualification [0] Geotechnical Site Engineer has relevant (BSc Eng/BTech Civil) qualification and is registered with Engineering Council of South Africa (ECSA) as a Professional Engineer (civil) [1.2] <p>Or</p> <ul style="list-style-type: none"> Engineering Geologist has no relevant (BSc honours degree in engineering geology) qualification and is not registered with the South African Council for Natural and Scientific Professions (SACNASP) as a Pr. Sci. Nat, [0] Engineering Geologist has relevant (BSc honours degree in engineering geology) qualification, But is not registered with the South African Council for Natural and Scientific Professions (SACNASP) as a Pr. Sci. Nat, [0] Engineering Geologist is registered with the South African Council for Natural and Scientific Professions (SACNASP) as a Pr. Sci. Nat, But has No relevant (BSc honours degree in engineering geology) Qualification [0] Engineering Geologist has relevant (BSc honours degree in engineering geology) qualification and is registered with the South African Council for Natural and Scientific Professions (SACNASP) as a Pr. Sci. Nat, [1.2] <p>Geotechnical Site Engineer /Engineering Geologist has experience working as "Geotechnical Engineer/Engineering Geologist" in similar (value & duration) Railway Construction Projects.</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [1.2] 	2.4
	<p>Key Personnel: Civil/Perway Site Engineer</p> <ul style="list-style-type: none"> Civil/Perway Site Engineer has No relevant (National Diploma/ BSc Eng/BEng/BTech Engineering - Civil) Qualification [0] Civil/Perway Site Engineer has (National Diploma/ BSc Eng/BEng/BTech Engineering - Civil) Qualification [3] <p>Civil/Perway Site Engineer has experience working as "Civil/Perway Site Engineer" in similar (value & duration) Railway Construction Projects.</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [3] 	6

	<p>Key Personnel: Structural Site Engineer</p> <ul style="list-style-type: none"> Structural Site Engineer has No relevant (National Diploma/ BSc Eng/BEng/BTech Engineering - Civil) Qualification [0] Structural Site Engineer has (National Diploma/ BSc Eng/BEng/BTech Engineering - Civil) Qualification [1.2] <p>Structural Site Engineer has experience working as "Structural Site Engineer" in similar (value & duration) Railway Construction Projects.</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [1.2] 	2.4
	<p>Key Personnel: OHTe Site Engineer (Electrical Site Engineer)</p> <ul style="list-style-type: none"> OHTe Site Engineer has no relevant (National Diploma/BSc Eng/BEng/BTech Engineering - Electrical) qualification [0] OHTe Site Engineer has (National Diploma/BSc Eng/BEng/BTech degree Engineering - Electrical) Qualification [1.2] <p>OHTe Site Engineer has experience working as "OHTe Site Engineer" in similar (value & duration) Railway Construction Projects.</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [1.2] 	2.4
	<p>Key Personnel: Traction Subs Site Engineer (Electrical Site Engineer)</p> <ul style="list-style-type: none"> Traction Subs Site Engineer has No relevant (National Diploma/ BSc Eng/BEng/BTech Engineering - Electrical) Qualification [0] Traction Subs Site Engineer has (National Diploma/ BSc Eng/BEng/BTech Engineering - Electrical)Qualification [0.3] <p>Traction Subs Site Engineer has experience working as "Traction Subs Site Engineer" in similar (value & duration) Railway Construction Projects.</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [0.3] 	0.6
	<p>Key Personnel: EL&P Site Engineer (Electrical Site Engineer)</p> <ul style="list-style-type: none"> EL&P Site Engineer has No relevant (National Diploma/ BSc Eng/BEng/BTech Engineering - Electrical) Qualification [0] EL&P Site Engineer has (National Diploma/ BSc Eng/BEng/BTech Engineering – Electrical) Qualification [0.9] <p>EL&P Site Engineer has experience working as "EL&P Site Engineer" in similar (value & duration) Railway Construction Projects</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [0.9] 	1.8

	Key Personnel: Signalling Site Engineer (Electrical Site Engineer) <ul style="list-style-type: none"> Signalling Site Engineer has no relevant (National Diploma/ BSc Eng/BEng/BTech Engineering – Electrical/Electronic) Qualification [0] Signalling Site Engineer has (National Diploma/ BSc Eng/BEng/BTech Engineering – Electrical/Electronic) Qualification [1.5] <p>Signalling Site Engineer has experience working as “Signalling Site Engineer” in similar (value & duration) Railway Construction Projects.</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [1.5] 	3
	Key Personnel: Mechanical Site Engineer <ul style="list-style-type: none"> Mechanical Site Engineer has no relevant (National Diploma/ BSc Eng/BEng/BTech Engineering – Electrical/Electronic) Qualification [0] Mechanical Site Engineer has (National Diploma/ BSc Eng/BEng/BTech Engineering – Electrical/Electronic) Qualification [0.3] <p>Mechanical Site Engineer has experience working as “Mechanical Site Engineer” in similar (value & duration) Railway Construction Projects.</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [0.3] 	0.6
	Key Personnel: Land surveyor <ul style="list-style-type: none"> Land surveyor has no relevant (BSc/BTech degree - Land Survey) qualification and is not registered with PLATO/ South African Geomatics Council (SAGC). [0] Land surveyor has relevant (BSc/BTech degree -Land Survey) qualification, But is not registered with PLATO/ South African Geomatics Council (SAGC). [0] Land surveyor is registered with PLATO/ South African Geomatics Council (SAGC), But has No relevant (BSc/BTech degree -Land Survey) Qualification [0] Land surveyor has relevant (BSc/BTech degree - Land Survey) qualification and is registered with PLATO/ South African Geomatics Council (SAGC). [0.6] <p>Land surveyor has experience working as “Land surveyor” in similar (value & duration) Railway Construction Projects.</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [0.6] 	1.2
	Tenderer Key Personnel: Quality Officer <ul style="list-style-type: none"> Quality Officer has no relevant (National Diploma/Btech - quality) qualification and does not have valid ISO 9001:2015 certificate [0] Quality Officer has relevant (National Diploma/Btech - quality) qualification , But does not have valid ISO 9001:2015 certificate [0] Quality Officer has a valid ISO 9001:2015 certificate, But has no relevant (National Diploma/Btech - quality) qualification [0] 	1.2

	<ul style="list-style-type: none"> Quality Officer has relevant (National Diploma/Btech - quality) qualification and has a valid ISO 9001:2015 certificate [0.6] <p>Quality Officer has experience working as "Quality Officer" in similar (value & duration) Railway Construction Projects.</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [0.6] 	
	<p>Tenderer Key Personnel: Safety Officer</p> <ul style="list-style-type: none"> Safety Officer has no relevant (Diploma/Degree in Occupational Health and Safety management/ Construction Health and Safety/Safety) qualification and is not registered as SACPCMP [0] Safety Officer relevant (Diploma/Degree in Occupational Health and Safety management/ Construction Health and Safety/Safety) qualification, But is not registered as SACPCMP [0] Safety Officer is registered as SACPCMP, But has No relevant (Diploma/Degree in Occupational Health and Safety management/ Construction Health and Safety/Safety) Qualification [0] Safety Officer has relevant (Diploma/Degree in Occupational Health and Safety management/ Construction Health and Safety/Safety) qualification and is registered as SACPCMP [0.6] <p>Safety Officer has experience working as "Safety Officer" in similar (value & duration) Railway Construction Projects.</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [0.6] 	1.2
	<p>Tenderer Key Personnel: Environmental Officer</p> <ul style="list-style-type: none"> Safety Officer has no relevant (Degree/Bsc Environment Management) qualification and is not registered as SACNASP/ EAPASA [0] Safety Officer relevant (Degree/Bsc Environment Management) qualification, But is not registered as SACNASP/ EAPASA [0] Safety Officer is registered as SACNASP/ EAPASA, But has No relevant ((Degree/Bsc Environment Management) Qualification [0] Safety Officer has relevant ((Degree/Bsc Environment Management) qualification and is registered as SACNASP/ EAPASA [0.6] <p>Environmental Officer has experience working as "Environmental Officer" in similar (value & duration) Railway Construction Projects.</p> <ul style="list-style-type: none"> 0-3 project [0] 4 or more projects [0.6] 	1.2
	<p>Tenderer Environmental Policy</p> <p>The Tenderer should provide a plan for the works which will demonstrate the tenderers understanding of the work required and demonstrate how the works will be managed for the duration of the project. The Environmental Management System (EMS) must include:</p>	6

	<ul style="list-style-type: none"> conformance to Transnet's Standard Operating Procedure for Engineering/Construction Environmental Management; Minimum Standards for Engineering/Construction Environmental Management [1] <p>In addition, The tenderer must provide an environmental policy signed by Top Management which include:</p> <ul style="list-style-type: none"> the purpose and context of the tenderer's business [1] Tenderer's commitment to fulfil their environmental compliance (legal) obligations [1] Commitment to the protection of the environment, including prevention of pollution [1] Framework for setting environmental objectives [1] Commitment to continual improvement of their EMS [1] 	
	<p>Tenderer Quality Plan</p> <p>The Tenderer should provide a plan for the works which will demonstrate the tenderers understanding of the works required and demonstrate how the works will be managed for the duration of the project. The Quality Control Plan must include:</p> <ul style="list-style-type: none"> clearly identify all inspection per Engineering discipline [1] show different test required per Engineering discipline [1] show verification requirements to meet contractual obligations [1] Show standards, specification, documentation and reports required per Engineering discipline [1] Show drawings and how drawings are laid out as required by the project scope [1] 	5
	<p>Tenderer Safety, Health & Environmental Policy</p> <p>The Tenderer should provide a plan for the works which will demonstrate the tenderers understanding of the works required and demonstrate how the works will be managed for the duration of the project. The Safety, Health & Environmental Policy must include:</p> <ul style="list-style-type: none"> Commitment to Safety, prevention of pollution & Continuous improvement [1] Compliance to legal requirements, appropriate to the nature of contractor's activities [1] Include objectives and targets [1] Role & Responsibility for S16.2 CEO, Designer (CR 6) & CR9.1 Risk Assessor, CR8.1 Construction Manager, CR8.7 Construction Supervisor, Health and Safety Manager & CR8.5 Safety officer [1] List of job categories for project and competencies required per category [1] 	7

	<ul style="list-style-type: none"> • Training Matrix for all employees who will be working on the project. - This matrix must include Management and highlight training planned dates [1] <p>In Addition, Safety, Health & Environmental Policy must include:</p> <p>the Overview of the project specific Baseline Risk Assessment (RA), indicating major activities of the project namely;</p> <ul style="list-style-type: none"> • Preliminary Geotechnical Study, Survey, Perway Design and Construction, OHTE & In the Port Rail infrastructure Yards [1] 	
	<p>Tenderer Programme</p> <p>The Tenderer should provide a Programme for the works which will demonstrate the tenderers understanding of the works required and demonstrate how the works will be managed for the duration of the project. The Programme must include:</p> <ul style="list-style-type: none"> • Contract period as per contract data, Key Dates, Planned Completion Date & Completion Date; allowance for interfacing including but not limited to relevant TFR/PRASA departments/installations, other disciplines, Employer's engineering team, other contractors, as well as interfacing between new and existing technologies. [1] • All activities to be logically tied using critical path method (CPM) [1] • The Programme must be at Level 3 Schedule [1] • The programme must be done using Software Programme (i.e Primavera P6/ MS Project/Excel) [1] 	<p>4</p>
	<p>Tenderer Method Statement/Approach Paper</p> <p>The Tenderer should provide Method statement on how the contractor will undertake Engineering design process and construction methodologies. The method Statement must include:</p> <ul style="list-style-type: none"> • compliance to Rail design principles relating to the safe handling of trains at crossing loops and in yards; compliance to Rail design principles for interfacing of new technologies to the existing technologies [1] • compliance to Rail design principles of mechanical, electrical, civils, perway, geotechnical, signalling and related supporting infrastructure facilities [1] • Rail infrastructure design capability; Rail operations knowledge, and associated knowledge of maintenance requirements, Rail capacity integrated dynamic simulation capability, taking into account the entire logistics chain [1] • Tenderer to provide the basic engineering designs based on a reasonable consistent assumption basis for the purpose of applying for an EIA to include the following <u>but not limited</u> to: <ul style="list-style-type: none"> ▪ Yard Design for Kaalfontein and Waltloo; Rail design in the Port of Port Elizabeth rail siding, Loop extensions 17 off along the main line [1] 	<p>10</p>

	<ul style="list-style-type: none"> ▪ Basic general arrangement layouts with associated existing & proposed infrastructure and approved by both EAPASA registered Environmental specialist and ECSA Professionally Registered Engineers [1] • The Tenderer should provide Method statement on how the contractor will undertake Method of Procurement and Fabrication process. The method Statement must include: <ul style="list-style-type: none"> • Strategy of procurement of material, specialised services and long lead items, The approach to design, pre-manufacturing activities and meetings, QA/QC (FAT) [1] • Interfacing with the Employer's Engineering Team, relevant TFR/PRASA departments as well as other stakeholders; Interfacing of new technologies to the existing technologies [1] • Acceptable manufacturing processes and systems up to final approved product , manufacturing process that show reduction of manufacturing time and increased productivity [1] • The Tenderer should provide Method statement on how the contractor will undertake Method of Construction/Installation and Commissioning process. The method Statement must include: <ul style="list-style-type: none"> • The approach to site establishment, pre-installation activities and meetings; Interfacing with the Employer's Engineering Team, relevant TFR/PRASA departments, other contractors on site (whether or not related to the work).; Interfacing of new technologies to the existing technologies. [1] • Installation logistics, Site acceptance testing, commissioning procedures and handover [1] 																
	Total Score	100															
	Minimum Score	70															
<p>Stage 4 Price and Specific Goals (90/10)</p> <p>(a) Tenderers will be evaluated and adjudicated by the Employer using "The 90/10 preference point system" which awards points on the basis of:</p> <table border="1"> <thead> <tr> <th colspan="3">Preferential Point System 90/10</th> </tr> <tr> <th colspan="2">Specific Goals</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>30% Subcontracting to EME o QSE that is 100% Black Owned</td> <td>5%</td> <td></td> </tr> <tr> <td>BBBEE</td> <td>5%</td> <td></td> </tr> <tr> <td>Total</td> <td>10</td> <td>90%</td> </tr> </tbody> </table>			Preferential Point System 90/10			Specific Goals		Price	30% Subcontracting to EME o QSE that is 100% Black Owned	5%		BBBEE	5%		Total	10	90%
Preferential Point System 90/10																	
Specific Goals		Price															
30% Subcontracting to EME o QSE that is 100% Black Owned	5%																
BBBEE	5%																
Total	10	90%															

B-BBEE Status Level of Contributor	Number of points (90/10 system)
1	5
2	4
3	3
4	2
5	1
6	0
7	0
8	0
Non-compliant contributor	0

Transnet reserves the right to amend or replace the preference point system used in accordance with the company's tender procedure.

Stage 5 Determine acceptability of preferred tenderer(Objective Criteria):

Perform a risk analysis on the preferred tenderer to ascertain if any of the following might present an unacceptable commercial risk to the employer:

- Unduly high or unduly low tendered rates or amounts in the tender offer;
- Contract data provided by the tendered; or
- The contents of the tender returnable which are to be included in the contract

C.3.13 Acceptance of tender offer

Accept the tender offer; if in the opinion of the employer, it does not present any risk and only if the tenderer:

- is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement;
- can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract;
- has the legal capacity to enter into the contract;
- is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer, has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing;
- complies with the legal requirements, if any, stated in the tender data; and
- is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

Annex C

Standard Conditions of Tender

C.1 General

C.1.1 Actions

C.1.1.1 The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in C.2 and C.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.

C.1.1.2 The employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

Note: 1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of Impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.

2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.

C.1.1.3 The employer shall not seek and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract.

C.1.2 Tender Documents

The documents issued by the employer for the purpose of a tender offer are listed in the tender data.

C.1.3 Interpretation

C.1.3.1 The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.

C.1.3.2 These conditions of tender, the tender data and tender schedules which are required for tender evaluation purposes, shall form part of any contract arising from the invitation to tender.

C.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

- a) **conflict of interest** means any situation in which:
 - i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfill his or her duties impartially;
 - ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
 - iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.
- b) **comparative offer** means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration;
- c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process;
- d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels;

C.1.4 Communication and employer's agent

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be readily read, copied and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the tender data.

C.1.5 Cancellation and Re-Invitation of Tenders

C.1.5.1 An employer may, prior to the award of the tender, cancel a tender if -

- a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation;

- b) funds are no longer available to cover the total envisaged expenditure; or
- c) no acceptable tenders are received.
- d) there is a material irregularity in the tender process.

C.1.5.2 The decision to cancel a tender invitation must be published in the same manner in which the original tender invitation was advertised

C.1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time.

C.1.6 Procurement procedures

C.1.6.1 General

Unless otherwise stated in the tender data, a contract will, subject to C.3.13, be concluded with the tenderer who in terms of C.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.

C.1.6.2 Competitive negotiation procedure

C.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

C.1.6.2.2 All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the tender data shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information.

Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

C.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to revise their tender offer based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

C.1.6.2.4 The contract shall be awarded in accordance with the provisions of C.3.11 and C.3.13 after tenderers have been requested to submit their best and final offer.

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the tender data, and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

C.1.6.3.2 Option 2

C.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

C.1.6.3.2.2 The employer shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the tender data, and award the contract in terms of these conditions of tender.

C.2 Tenderer's obligations

C.2.1 Eligibility

C.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer.

C.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.

C.2.2 Cost of tendering

C.2.2.1 Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.

C.2.2.2 The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.

C.2.3 Check documents

Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.

C.2.4 Confidentiality and copyright of documents

Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.

C.2.5 Reference documents

Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.

C.2.6 Acknowledge addenda

Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.

C.2.7 Clarification meeting

Attend, where required, a clarification meeting at which tenderers may familiarize themselves with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the tender data.

C.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the tender data.

C.2.9 Insurance

Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

C.2.10 Pricing the tender offer

C.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable fourteen (14) days before the closing time stated in the tender data.

C.2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.

C.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.

C.2.10.4 State the rates and prices in Rand unless instructed otherwise in the tender data. The conditions of contract identified in the contract data may provide for part payment in other currencies.

C.2.11 Alterations to documents

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.

C.2.12 Alternative tender offers

C.2.12.1 Unless otherwise stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

C.2.12.2 Accept that an alternative tender offer must be based only on the criteria stated in the tender data or criteria otherwise acceptable to the employer.

C.2.12.3 An alternative tender offer must only be considered if the main tender offer is the winning tender.

C.2.13 Submitting a tender offer

C.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

C.2.13.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

C.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.

C.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

C.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked "financial proposal" and place the remaining returnable documents in an envelope marked "technical proposal". Each envelope shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.

C.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

C.2.14 Information and data to be completed in all respects

Accept that tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.

C.2.15 Closing time

C.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.

C.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

C.2.16 Tender offer validity

C.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.

C.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.

C.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. If the validity period stated in C.2.16 lapses before the employer evaluating tender, the contractor reserves the right to review the price based on Consumer Price Index (CPI).

C.2.16.4 Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as "SUBSTITUTE".

C.2.17 Clarification of tender offer after submission

Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

Note: *Sub-clause C.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.*

C.2.18 Provide other material

C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment.

Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.

C.2.18.2 Dispose of samples of materials provided for evaluation by the employer, where required.

C.2.19 Inspections, tests and analysis

Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.

C.2.20 Submit securities, bonds and policies

If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the contract data.

C.2.21 Check final draft

Check the final draft of the contract provided by the employer within the time available for the employer to issue the contract.

C.2.22 Return of other tender documents

If so instructed by the employer, return all retained tender documents within twenty-eight (28) days after the expiry of the validity period stated in the tender data.

C.2.23 Certificates

Include in the tender submission or provide the employer with any certificates as stated in the tender data.

C.3 The employer's undertakings**C.3.1 Respond to requests from the tenderer**

C.3.1.1 Unless otherwise stated in the tender Data, respond to a request for clarification received up to five (5) working days before the tender closing time stated in the Tender Data and notify all tenderers who collected tender documents.

C.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:

- a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;
- b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
- c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

C.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three (3) working days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who collected tender documents.

C.3.3 Return late tender offers

Return tender offers received after the closing time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.

C.3.4 Opening of tender submissions

C.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

C.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, number of points claimed for its BBBEE status level and time for completion for the main tender offer only.

C.3.4.3 Make available the record outlined in C.3.4.2 to all interested persons upon request.

C.3.5 Two-envelope system

C.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.

C.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any points claimed on BBBEE status level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

C.3.6 Non-disclosure

Not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.

C.3.7 Grounds for rejection and disqualification

Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.

C.3.8 Test for responsiveness

C.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:

- a) complies with the requirements of these Conditions of Tender,
- b) has been properly and fully completed and signed, and
- c) is responsive to the other requirements of the tender documents.

C.3.8.2 A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer's opinion, would:

- a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
- b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or
- c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

C.3.9 Arithmetical errors, omissions and discrepancies

C.3.9.1 Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

C.3.9.2 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with C.3.11 for:

- a) the gross misplacement of the decimal point in any unit rate;
- b) omissions made in completing the pricing schedule or bills of quantities; or
- c) arithmetic errors in:
 - i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
 - ii) the summation of the prices.

C.3.9.3 Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.

C.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

- a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.
- b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

C.3.10 Clarification of a tender offer

Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

C.3.11 Evaluation of tender offers

The Standard Conditions of Tender standardize the procurement processes, methods and procedures from the time that tenders are invited to the time that a contract is awarded. They are generic in nature and are made project specific through choices that are made in developing the Tender Data associated with a specific project.

Conditions of tender are by definition the document that establishes a tenderer's obligations in submitting a tender and the employer's undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures.

The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following system requirements:	
Requirement	Qualitative interpretation of goal
Fair	The process of offer and acceptance is conducted impartially without bias, providing simultaneous and timely access to participating parties to the same information.
Equitable	Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.
Transparent	The only grounds for not awarding a contract to a tenderer who satisfies all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments and conflicts of interest.
Competitive	The system provides for appropriate levels of competition to ensure cost effective and best value outcomes.
Cost effective	The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and least resources to effectively manage and control procurement processes.

The activities associated with evaluating tender offers are as follows:

- a) Open and record tender offers received
- b) Determine whether or not tender offers are complete
- c) Determine whether or not tender offers are responsive

- d) Evaluate tender offers
- e) Determine if there are any grounds for disqualification
- f) Determine acceptability of preferred tenderer
- g) Prepare a tender evaluation report
- h) Confirm the recommendation contained in the tender evaluation report

C.3.11.1 General

The employer must appoint an evaluation panel of not less than three persons conversant with the proposed scope of works to evaluate each responsive tender offer using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

C.3.12 Insurance provided by the employer

If requested by the proposed successful tenderer, submit for the tenderer's information the policies and/or certificates of insurance which the conditions of contract identified in the contract data, require the employer to provide.

C.3.13 Acceptance of tender offer

Accept the tender offer; if in the opinion of the employer, it does not present any risk and only if the tenderer:

- a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement;
- b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract;
- c) has the legal capacity to enter into the contract;
- d) is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer, has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing;
- e) complies with the legal requirements, if any, stated in the tender data; and
- f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

C.3.14 Prepare contract documents

C.3.14.1 If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

- a) addenda issued during the tender period,
- b) inclusion of some of the returnable documents and
- c) other revisions agreed between the employer and the successful tenderer.

C.3.14.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

C.3.15 Complete adjudicator's contract

Unless alternative arrangements have been agreed or otherwise provided for in the contract, arrange for both parties to complete formalities for appointing the selected adjudicator at the same time as the main contract is signed.

C.3.16 Registration of the award

An employer must, within twenty-one (21) working days from the date on which a contractor's offer to perform a construction works contract is accepted in writing by the employer, register and publish the award on the CIDB Register of Projects.

C.3.17 Provide copies of the contracts

Provide to the successful tenderer the number of copies stated in the Tender Data of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

C.3.18 Provide written reasons for actions taken

Provide upon request written reasons to tenderers for any action that is taken in applying these conditions of tender but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers or might prejudice fair competition between tenderers.

Part T2: Returnable Documents

- | | |
|-------------|-------------------------------------|
| T2.1 | List of Returnable Documents |
| T2.2 | Returnable Schedules |

Returnable Schedules required for tender evaluation purposes only	Completed (tick)
A1: Record of Addenda to Tender Documents	
A2: Certificate of Authority for Signatory	
A3: B-BBEE Verification Certificate	
A4: Proof of relevant valid Construction Industry Development Board registration	
A5: Schedule of the Tenderer's Experience	
A6: Schedule of Current Commitments	
A7: Certificate of Acquaintance with RFP, Master Agreement & Applicable Documents	
A8: CV's and Qualifications of key personnel	
A9: Environmental Management Plan	
A10: Quality Plan	
A11: Preliminary Safety, Health and Environmental Plan	
A12: Occupational Health and Safety Questionnaire	
A13: Occupational Health and Safety Cost Breakdown	
A14: Tenderer Programme	
A15: Method Statement/ Approach Paper	
A16: Schedule of Proposed Sub Contractors	
2 Other documents required	
B1: Tenderer registration on CSD (Central Data Base from National Treasury)	
B2: Supplier Declaration	
B3: RFP Declaration	
B4: RFQ Breach of Law	
B5: POPIA	
B6: SBD 4: Tenderer's Disclosure	
B7: SBD 6.1: Preference Points Claim Form in terms of the Preferential Procurement Regulations 2017	
B8: Tax compliance status pin certificate issued by the South African Revenue Services.	
B9: 3 Year Audited Finance Statement	
B10: Original Bank Letter of Good Standing	
B11: Service Provider Integrity Pact	
B12: Supplier Code of Conduct	
B13: Domestic Prominent Influential Persons (DPPI) Or Foreign Prominent Public Officials (FPPO)	
B14: Job-Creation schedule	
3 Returnable Schedules required for tender that will be incorporated into the contract	
C1: Proof of registration for Tenderer's Letter of Good Standing with the Workers Compensation Commission (COID)	
C2: SBD 6.2: Declaration certificate for local production and content for designated sectors	
C3: Pro -Forma Guarantee	
C4: Insurance to be provided by Contractor	
C5: Risk Management	
C6: Proposed Amendment and Qualification	
4 C1 Agreement and Contract Data	
5 C2 Pricing Data	

FORM A1: RECORD OF ADDENDA TO TENDER DOCUMENT

This is to certify that:

The Tenderer confirms that the following communication received from the Employer before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer:

	Date	Title or Detail
1.		
2.		
3.		
4.		
5.		
6.		
7.		

Attach additional pages if more space is required

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM A2: CERTIFICATE OF AUTHORITY OF SIGNATORY

Indicate the status of the tenderer by ticking the appropriate box hereunder. The tenderer must complete the certificate set out below for his category of organisation or alternatively attach a certified copy of a company / organisation document which provides the same information for the relevant category as requested here.

A - COMPANY	B - PARTNERSHIP	C - JOINT VENTURE	D - SOLE PROPRIETOR

A. Certificate for Company

I, _____ chairperson of the board of directors _____
 _____, hereby confirm that by resolution of the board taken
 on _____ (date), Mr/Ms _____, acting in the
 capacity of _____, was authorised to sign all documents in
 connection with this tender offer and any contract resulting from it on behalf of the company.

B. Certificate for Partnership

We, the undersigned, being the **key partners** in the business trading as _____
 _____ hereby authorise Mr/Ms _____
 acting in the capacity of _____, to sign all documents in
 connection with the tender offer for Contract _____ and any contract
 resulting from it on our behalf.

Name	Address	Signature	Date

NOTE: This certificate is to be completed and signed by the full number of Partners necessary to commit the Partnership. Attach additional pages if more space is required.

C. Certificate for Joint Venture

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorise Mr/Ms _____, an authorised signatory of the company _____, acting in the capacity of lead partner, to sign all documents in connection with the tender offer for Contract _____ and any contract resulting from it on our behalf.

This authorisation is evidenced by the attached power of attorney signed by legally authorised signatories of all the partners to the Joint Venture.

Furthermore we attach to this Schedule a copy of the joint venture agreement which incorporates a statement that all partners are liable jointly and severally for the execution of the contract and that the lead partner is authorised to incur liabilities, receive instructions and payments and be responsible for the entire execution of the contract for and on behalf of any and all the partners.

Name of firm	Address	Authorising signature, name (in caps) and capacity

D. Certificate for Sole Proprietor

I, _____, hereby confirm that I am the sole owner of the
business trading as _____.

Signed

Date

Name

Position

Sole Proprietor

FORM A3: VALID B-BBEE CERTIFICATE

The bid must include an original or certified copy of the B-BBEE verification certificate issued by a SANAS accredited ratings agency, or an IRBA Registered Accounting Practice or a Sworn Affidavit certified by the Commissioner of Oath.

The Preferential Procurement Regulations Part 3, section 11 (9) states that, "A person awarded a contract may not sub-contract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is sub-contracted to an Exempted Micro Enterprise that has the capability and ability to execute the sub-contract.

A trust, consortium or joint venture, will qualify for points for their B-BBEE status level as a legal entity, if the entity submits their B-BBEE status level certificate.

A trust, consortium or joint venture will qualify for points for their B-BBEE status level as an unincorporated entity, if the entity submits their consolidated B-BBEE scorecard as if they were a group structure and that such a consolidated B-BBEE scorecard is prepared for every separate bid.

A person will not be awarded points for B-BBEE status level if it is indicated in the bid documents that such a Tenderer intends sub-contracting more than 25% of the value of the contract to any other enterprise that does not qualify for at least the points that such a Tenderer qualifies for, unless the intended sub-contractor is an EME that has the capability and ability to execute the sub-contract.

A person awarded a contract may not sub-contract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is sub-contracted to an EME that has the capability and ability to execute the sub-contract.

FORM A4: PROOF OF RELEVANT VALID CONSTRUCTION INDUSTRY DEVELOPMENT BOARD REGISTRATION

Note to tenderers:

Tenderers are to indicate their CIDB Grading by filling in the table below. **Attach a copy of the CIDB Grading Designation or evidence of being capable of being so registered.**

CRS Number	Status	Grading	Expiry Date

- Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a **9CE** (class of construction work), are eligible to have their tenders evaluated.

2. Joint Venture (JV)

Joint ventures are eligible to submit tenders subject to the following:

- every member of the joint venture is registered with the CIDB;
- the lead partner has a contractor grading designation of not lower than one level below the required grading designation in the class of construction works under consideration and possesses the required recognition status; (Not applicable).
- combined Contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a Contractor grading designation determined in accordance with the sum tendered for a **9CE** (class of construction work) or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations

The tenderer shall provide a certified copy of its signed joint venture agreement.

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM A5: SCHEDULE OF THE TENDERER'S RECENT EXPERIENCE RELATED TO THIS CONTRACT

#	Project/Contract Description	Client Name	Start Date (M/Y)	Industry (e.g Rail)	Client Contact Person and Number	Value of work (Incl. VAT)
					Name: Contact Number: Email Address:	

NB: Tenderer must only provide completed projects, i.e Projects that are still in progress will not be considered

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM A6: SCHEDULE OF CURRENT COMMITMENTS

1. The tenderer shall list below all projects with which the proposed key personnel are currently involved
2. In the event of a joint venture enterprise, details of all the members of the joint venture shall similarly be attached to this form

#	Project/Contract	Client	Start Date & End Date (M/Y)	Duration (months)	Contact Person and Number	Value of work (Inc. VAT)

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM A7: CERTIFICATE OF ACQUAINTANCE WITH RFP, MASTER AGREEMENT & APPLICABLE DOCUMENTS

NAME OF TENDERING ENTITY/s:

1. By signing this certificate I/we acknowledge that I/we have made myself/ourselves thoroughly familiar with, and agree with all the conditions governing this RFP. This includes those terms and conditions of the Contract, the Supplier Integrity Pact, Non-Disclosure Agreement etc. contained in any printed form stated to form part of the documents thereof, but not limited to those listed in this clause.
2. I/we furthermore agree that Transnet SOC Ltd shall recognise no claim from me/us for relief based on an allegation that I/we overlooked any tender/contract condition or failed to take it into account for the purpose of calculating my/our offered prices or otherwise.
3. I/we understand that the accompanying Tender will be disqualified if this Certificate is found not to be true and complete in every respect.
4. For the purposes of this Certificate and the accompanying Tender, I/we understand that the word "competitor" shall include any individual or organisation, other than the Tenderer, whether or not affiliated with the Tenderer, who:
 - a) has been requested to submit a Tender in response to this Tender invitation;
 - b) could potentially submit a Tender in response to this Tender invitation, based on their qualifications, abilities or experience; and
 - c) provides the same Services as the Tenderer and/or is in the same line of business as the Tenderer
5. The Tenderer has arrived at the accompanying Tender independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium will not be construed as collusive Tendering.
6. In particular, without limiting the generality of paragraph 5 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - a) prices;
 - b) geographical area where Services will be rendered [market allocation]
 - c) methods, factors or formulas used to calculate prices;

- d) the intention or decision to submit or not to submit, a Tender;
 - e) the submission of a tender which does not meet the specifications and conditions of the tender; or
 - f) Tendering with the intention not winning the tender.
7. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the Services to which this tender relates.
8. The terms of the accompanying tender have not been, and will not be, disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening or of the awarding of the contract.
9. I/We am/are aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to tenders and contracts, tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and/or may be reported to the National Prosecuting Authority [NPA] for criminal investigation. In addition, Tenderers that submit suspicious tenders may be restricted from conducting business with the public sector for a period not exceeding 10 [ten] years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

Signed on this _____ day of _____ 20____

SIGNATURE OF TENDERER

FORM A8: CV'S AND QUALIFICATIONS OF KEY PERSONNEL

Name and Surname						
Proposed position for the Position			Project Manager			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From -To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname							
Proposed position for the Position			Contracts Manager				
Professional Membership							
Date of Birth							
Nationality							
Qualification (Attach Proof of qualification)							
Professional Registration (Attach Certificate)							
Experience							
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	Type of contract used for the Project (e.g NEC)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Construction Manager			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Snr Contracts/Commercial Manager			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Lead Planner			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From -To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Geotechnical Engineer/ Engineering Geologist			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Civil/Perway Engineer			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Structural Engineer			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From -To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Electrical Engineer/ Technologist			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

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NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			OHTE Engineer (Electrical Engineer)			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Tractions Sub Engineer (Electrical Engineer)			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

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NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			EL & P Engineer (Electrical Engineer)			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From -To)

***1 & 2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			SignallingEngineer (Electrical/ Electronic Engineer)			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From -To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Mechanical Engineer			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Geotechnical Site Engineer			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Civil/Perway Site Engineer			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Structural Site Engineer			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From -To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			OHTE Site Engineer (Electrical Site Engineering)			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Traction Subs Site Engineer (Electrical Site Engineering)			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Signalling Site Engineer (Electrical/ Electronic Site Engineering)			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Mechanical Site Engineer			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Land Suveyor			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Quality Officer			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Safety Officer			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

Name and Surname						
Proposed position for the Position			Environment Officer			
Professional Membership						
Date of Birth						
Nationality						
Qualification (Attach Proof of qualification)						
Professional Registration (Attach Certificate)						
Experience						
Employer	Client	Client Contact (Name, Contact Number, Email address)	Scope of work Description (Provide more information where the description is not clear)	Industry (e.g Railway)	*1Scope of work Value (Incl. VAT)	*2Scope of Work Duration (From - To)

***1 &2 – Experience in Similar (Railway Projects) refers to: R300m or more Project value Including VAT and 1 Year or more Project Duration**

Tenderer must complete the table above, Tenderers who substitute the above table with their own document/ table/Reference Letter etc, must ensure that their substitute document/table etc include the same heading specified in the table

NB: Documents/table etc that do not contain the provided heading before may not be clear for evaluation, and thus lead to disqualification

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM A9: ENVIRONMENTAL MANAGEMENT PLAN

- Transnet SOC Limited – Environmental Risk Management Policy ;
 - Project Environmental Specification (PES) which comprises of the following as a minimum:
 - Standard Operating Procedure for Engineering/Construction Environmental Management
 - Minimum Standards for Engineering/Construction Environmental Management
1. The tenderer must provide evidence of how their Environmental Management System (EMS) will ensure conformance to the abovementioned requirements.
 2. The tenderer must provide an environmental policy signed by Top Management which, as a minimum:
 - Is appropriate given the purpose and context of the tenderer's business;
 - Includes a commitment to fulfil the tenderer's environmental compliance (legal) obligations;
 - Includes a commitment to the protection of the environment, including prevention of pollution;
 - Provides framework for setting environmental objectives; and
 - Includes a commitment to continual improvement of their EMS;

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM A10: QUALITY PLAN

Reference Standard; QAL-STD-0001 General Quality Requirements for Contractors and Suppliers and ISO 9001:2015 QMS requirements.

The General requirements For Contractors and Suppliers Standard (QAL-STD-0001) will be used as a guideline to populate the Project Quality plan's quality control activities.

The consortium shall develop a Project Quality Plan that conforms to the requirement of ISO 9001:2015. Due consideration must be given to the deliverables required to execute and complete the contract as per the QMS requirements (ISO 9001:2015), as well as the QAL-STD- 0001 General Quality Requirements for Contractors and Suppliers. Project Quality Plan for the contract SHALL cover project scope and be aligned to ISO 9001:2015 QMS requirements.

1. Quality Control Plan MUST cover
 - all Engineering disciplines (Civil, Mechanical, Signal, Electrical)
 - clearly identify all inspection per Engineering discipline
 - show different test required per Engineering discipline
 - show verification requirements to meet contractual obligations
 - Show standards required per Engineering discipline
 - Show specification required per Engineering discipline
 - Show drawings and how drawings are laid out as required by the project scope

Attach a copy of the Plan to this page. A Valid ISO 9001:2015 certification. If it is a joint venture, any ISO 9001:2015 certificate of those in partnership will be accepted by a recognised international body must be stated and proof attached.

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM A11: PRELIMINARY HEALTH AND SAFETY PLAN

The tenderer must submit the following documents:

1. Safety, Health & Environmental Policy signed by the Tenderer's Delegated Person. The policy must include the below five elements -
 - Commitment to Safety, prevention of pollution,
 - Continuous improvement,
 - Compliance to legal requirements, appropriate to the nature of contractor's activities,
 - Hold management accountable for development of the safety systems
 - Include objectives and targets.
2. Roles & Responsibilities, such as S16.2 CEO, Designer (CR 6), CR8.1 Construction Manager, Health and Safety Manager, CR8.5 Safety officer, CR8.7 Construction Supervisor, CR9.1 Risk Assessor,
3. List of job categories for project and competencies required per category and develop a training Matrix for all employees who will be working on the project. This matrix must include Management and highlight training planned dates.
4. Overview of the project specific Baseline Risk Assessment (RA), indicating major activities of the project namely;
 - Preliminary Geotechnical Study, Survey
 - Perway Design and Construction
 - OHTE
 - In the Port Rail infrastructure Yards
5. Complete and return with tender documentation the Contractor Safety Questionnaire included to this Evaluation Schedule as a returnable, attach all required supporting documents and complete your company three year synopsis of SHE incidents, description, type and action taken to prevent re-occurrence.
6. Evidence that the Principal Contractor have made adequate provisions for the cost of Health & Safety "Activity Schedule": CR 3(5) (b)(iii) read with CR 5(1)(g)

Attached submissions to this schedule:

.....

.....

.....

.....

.....

.....

.....

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM A12: OCCUPATIONAL HEALTH AND SAFETY QUESTIONNAIRE

1. SAFE WORK PERFORMANCE																			
1A. Injury Experience / Historical Performance - Alberta																			
Use the previous three years injury and illness records to complete the following:																			
Year																			
Number of medical treatment cases																			
Number of restricted work day cases																			
Number of lost time injury cases																			
Number of fatal injuries																			
Total recordable frequency																			
Lost time injury frequency																			
Number of worker man-hours																			
<table border="1"> <tr> <td>1 - Medical Treatment Case</td> <td>Any occupational injury or illness requiring treatment provided by a physician or treatment provided under the direction of a physician</td> </tr> <tr> <td>2 - Restricted Work Day Case</td> <td>Any occupational injury or illness that prevents a worker from performing any of his/her craft jurisdiction duties</td> </tr> <tr> <td>3 - Lost Time injury Cases</td> <td>Any occupational injury that prevents the worker from performing any work for at least one day</td> </tr> <tr> <td>4 - Total Recordable Frequency</td> <td>Total number of Medical Treatment, Restricted Work and Lost Time Injury cases multiplied by 200,000 then divided by total man-hours</td> </tr> <tr> <td>5- Lost Time Injury Frequency</td> <td>Total number of Lost Time Injury cases multiplied by 200,000 then divide by total man-hours</td> </tr> </table>				1 - Medical Treatment Case	Any occupational injury or illness requiring treatment provided by a physician or treatment provided under the direction of a physician	2 - Restricted Work Day Case	Any occupational injury or illness that prevents a worker from performing any of his/her craft jurisdiction duties	3 - Lost Time injury Cases	Any occupational injury that prevents the worker from performing any work for at least one day	4 - Total Recordable Frequency	Total number of Medical Treatment, Restricted Work and Lost Time Injury cases multiplied by 200,000 then divided by total man-hours	5- Lost Time Injury Frequency	Total number of Lost Time Injury cases multiplied by 200,000 then divide by total man-hours						
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2 - Restricted Work Day Case	Any occupational injury or illness that prevents a worker from performing any of his/her craft jurisdiction duties																		
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5- Lost Time Injury Frequency	Total number of Lost Time Injury cases multiplied by 200,000 then divide by total man-hours																		
1B. Workers' Compensation Experience																			
Use the previous three years injury and illness records to complete the following (if applicable):																			
Industry Code:		Industry Classification:																	
<table border="1"> <tr> <td>Year</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Industry Rate</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Contractor Rate</td> <td></td> <td></td> <td></td> </tr> <tr> <td>% Discount or Surcharge</td> <td></td> <td></td> <td></td> </tr> </table>				Year				Industry Rate				Contractor Rate				% Discount or Surcharge			
Year																			
Industry Rate																			
Contractor Rate																			
% Discount or Surcharge																			
Is your Workers' Compensation account in good standing?		<input type="checkbox"/> Yes <input type="checkbox"/> No																	
(Please provide letter of confirmation)																			

2. CITATIONS					
2A.	Has your company been cited, charged or prosecuted under Health, Safety and/or Environmental Legislation in the last 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide details:				
2B.	Has your company been cited, charged or prosecuted under the above Legislation in another Country, Region or State? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide details:				
3. CERTIFICATE OF RECOGNITION					
Does your company have a Certificate of Recognition? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, what is the Certificate No. _____ Issue Date _____					
4. SAFETY PROGRAM					
Do you have a written safety program manual? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, provide a copy for review					
Do you have a pocket safety booklet for field distribution? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, provide a copy for review					
Does your safety program contain the following elements:					
	YES	NO		YES	NO
CORPORATE SAFETY POLICY	<input type="checkbox"/>	<input type="checkbox"/>	EQUIPMENT MAINTENANCE	<input type="checkbox"/>	<input type="checkbox"/>
INCIDENT NOTIFICATION POLICY	<input type="checkbox"/>	<input type="checkbox"/>	EMERGENCY RESPONSE	<input type="checkbox"/>	<input type="checkbox"/>
RECORDKEEPING & STATISTICS	<input type="checkbox"/>	<input type="checkbox"/>	HAZARD ASSESSMENT	<input type="checkbox"/>	<input type="checkbox"/>
REFERENCE TO LEGISLATION	<input type="checkbox"/>	<input type="checkbox"/>	SAFE WORK PRACTICES	<input type="checkbox"/>	<input type="checkbox"/>
GENERAL RULES & REGULATIONS	<input type="checkbox"/>	<input type="checkbox"/>	SAFE WORK PROCEDURES	<input type="checkbox"/>	<input type="checkbox"/>
PROGRESSIVE DISCIPLINE POLICY	<input type="checkbox"/>	<input type="checkbox"/>	WORKPLACE INSPECTIONS	<input type="checkbox"/>	<input type="checkbox"/>
RESPONSIBILITIES	<input type="checkbox"/>	<input type="checkbox"/>	INVESTIGATION PROCESS	<input type="checkbox"/>	<input type="checkbox"/>
PPE STANDARDS	<input type="checkbox"/>	<input type="checkbox"/>	TRAINING POLICY & PROGRAM	<input type="checkbox"/>	<input type="checkbox"/>
ENVIRONMENTAL STANDARDS	<input type="checkbox"/>	<input type="checkbox"/>	COMMUNICATION PROCESSES	<input type="checkbox"/>	<input type="checkbox"/>
MODIFIED WORK PROGRAM	<input type="checkbox"/>	<input type="checkbox"/>			

5. TRAINING PROGRAM

5A. Do you have an orientation program for new hire employees? ☐ Yes ☐ No

If Yes, include a course outline. Does it include any of the following:

	YES	NO		YES	NO
GENERAL RULES & REGULATIONS	<input type="checkbox"/>	<input type="checkbox"/>	CONFINED SPACE ENTRY	<input type="checkbox"/>	<input type="checkbox"/>
EMERGENCY REPORTING	<input type="checkbox"/>	<input type="checkbox"/>	TRENCHING & EXCAVATION	<input type="checkbox"/>	<input type="checkbox"/>
INJURY REPORTING	<input type="checkbox"/>	<input type="checkbox"/>	SIGNS & BARRICADES	<input type="checkbox"/>	<input type="checkbox"/>
LEGISLATION	<input type="checkbox"/>	<input type="checkbox"/>	DANGEROUS HOLES & OPENINGS	<input type="checkbox"/>	<input type="checkbox"/>
RIGHT TO REFUSE WORK	<input type="checkbox"/>	<input type="checkbox"/>	RIGGING & CRANES	<input type="checkbox"/>	<input type="checkbox"/>
PERSONAL PROTECTIVE EQUIPMENT	<input type="checkbox"/>	<input type="checkbox"/>	MOBILE VEHICLES	<input type="checkbox"/>	<input type="checkbox"/>
EMERGENCY PROCEDURES	<input type="checkbox"/>	<input type="checkbox"/>	PREVENTATIVE MAINTENANCE	<input type="checkbox"/>	<input type="checkbox"/>
PROJECT SAFETY COMMITTEE	<input type="checkbox"/>	<input type="checkbox"/>	HAND & POWER TOOLS	<input type="checkbox"/>	<input type="checkbox"/>
HOUSEKEEPING	<input type="checkbox"/>	<input type="checkbox"/>	FIRE PREVENTION & PROTECTION	<input type="checkbox"/>	<input type="checkbox"/>
LADDERS & SCAFFOLDS	<input type="checkbox"/>	<input type="checkbox"/>	ELECTRICAL SAFETY	<input type="checkbox"/>	<input type="checkbox"/>
FALL ARREST STANDARDS	<input type="checkbox"/>	<input type="checkbox"/>	COMPRESSED GAS CYLINDERS	<input type="checkbox"/>	<input type="checkbox"/>
AERIAL WORK PLATFORMS	<input type="checkbox"/>	<input type="checkbox"/>	WEATHER EXTREMES	<input type="checkbox"/>	<input type="checkbox"/>

5B. Do you have a program for training newly hired or promoted supervisors? ☐ Yes ☐ No
(If Yes, submit an outline for evaluation. Does it include instruction on the following:

	Yes	No		Yes	No
EMPLOYER RESPONSIBILITIES	<input type="checkbox"/>	<input type="checkbox"/>	SAFETY COMMUNICATION	<input type="checkbox"/>	<input type="checkbox"/>
EMPLOYEE RESPONSIBILITIES	<input type="checkbox"/>	<input type="checkbox"/>	FIRST AID/MEDICAL PROCEDURES	<input type="checkbox"/>	<input type="checkbox"/>
DUE DILIGENCE	<input type="checkbox"/>	<input type="checkbox"/>	NEW WORKER TRAINING	<input type="checkbox"/>	<input type="checkbox"/>
SAFETY LEADERSHIP	<input type="checkbox"/>	<input type="checkbox"/>	ENVIRONMENTAL REQUIREMENTS	<input type="checkbox"/>	<input type="checkbox"/>
WORK REFUSALS	<input type="checkbox"/>	<input type="checkbox"/>	HAZARD ASSESSMENT	<input type="checkbox"/>	<input type="checkbox"/>
INSPECTION PROCESSES	<input type="checkbox"/>	<input type="checkbox"/>	PRE-JOB SAFETY INSTRUCTION	<input type="checkbox"/>	<input type="checkbox"/>
EMERGENCY PROCEDURES	<input type="checkbox"/>	<input type="checkbox"/>	DRUG & ALCOHOL POLICY	<input type="checkbox"/>	<input type="checkbox"/>
INCIDENT INVESTIGATION	<input type="checkbox"/>	<input type="checkbox"/>	PROGRESSIVE DISCIPLINARY POLICY	<input type="checkbox"/>	<input type="checkbox"/>
SAFE WORK PROCEDURES	<input type="checkbox"/>	<input type="checkbox"/>	SAFE WORK PRACTICES	<input type="checkbox"/>	<input type="checkbox"/>
SAFETY MEETINGS	<input type="checkbox"/>	<input type="checkbox"/>	NOTIFICATION REQUIREMENTS	<input type="checkbox"/>	<input type="checkbox"/>

6. SAFETY ACTIVITIES

Do you conduct safety inspections?

Yes No Weekly Monthly Quarterly

☐ ☐ ☐ ☐ ☐

Describe your safety inspection process (include participation, documentation requirements, follow-up, report distribution).

Who follows up on inspection action items? _____					
Do you hold site safety meetings for field employees? If Yes, how often?					
Yes	No	Daily	Weekly	Biweekly	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do you hold site meetings where safety is addressed with management and field supervisors?					
Yes	No	Weekly	Biweekly	Monthly	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is pre-job safety instruction provided before to each new task? <input type="checkbox"/> Yes <input type="checkbox"/> No					
Is the process documented? <input type="checkbox"/> Yes <input type="checkbox"/> No					
Who leads the discussion? _____					
Do you have a hazard assessment process? <input type="checkbox"/> Yes <input type="checkbox"/> No					
<ul style="list-style-type: none"> Are hazard assessments documented? If yes, how are hazard assessments communicated and implemented on each project? Who is responsible for leading the hazard assessment process? 					

Does your company have policies and procedures for environmental protection, spill clean-up, reporting, waste disposal, and recycling as part of the Health & Safety Program?					
<input type="checkbox"/> Yes <input type="checkbox"/> No					
How does your company measure its H&S success?					
<ul style="list-style-type: none"> Attach separate sheet to explain 					
7. SAFETY STEWARDSHIP					
7A Are incident reports and report summaries sent to the following and how often?					
	Yes	No	Monthly	Quarterly	Annually
Project/Site Manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Managing Director	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety Director/Manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
/Chief Executive Officer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7B How are incident records and summaries kept? How often are they reported internally?					
	Yes	No	Monthly	Quarterly	Annually
Incidents totalled for the entire company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incidents totalled by project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Subtotalled by superintendent 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Subtotalled by foreman 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7C How are the costs of individual incidents kept? How often are they reported internally?					
	Yes	No	Monthly	Quarterly	Annually
Costs totalled for the entire company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Costs totalled by project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	• Subtotalled by superintendent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Subtotalled by foreman/general foreman	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7D	Does your company track non-injury incidents?					
		Yes	No	Monthly	Quarterly	Annually
	Near Miss	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Property Damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Environmental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8 PERSONNEL

List key health and safety officers planned for this project. Attach resume.

Name	Position/Title	Designation

Supply name, address and phone number of your company's corporate health and safety representative. Does this individual have responsibilities other than health, safety and environment?

Name	Address	Telephone Number

Other responsibilities:

9 REFERENCES

List the last three company's your form has worked for that could verify the quality and management commitment to your occupational Health & Safety program

Name and Company	Address	Phone Number

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

TCC/2023/05/0001/28813/RFP

FORM A13: OCCUPATIONAL HEALTH AND SAFETY COST BREAKDOWN

Tenderer (Company)		Responsible Person	Designation	Date
Project/Tender Title		Project/Tender No.	Project Location / Description	
TURNKEY EPC - ENGINEERING, DESIGN, PROCUREMENT, CONSTRUCTION, COMMISSIONING AND CLOSE OUT OF PROJECT UKUVUSELELA AUTOMOTIVE PROJECT: GAUTENG – EASTERN CAPE HIGH-CAPACITY RAIL CORRIDOR FOR AUTOMOTIVE VOLUMES FROM PRETORIA TO THE PORT OF PORT ELIZABETH (GQEBERHA)		TCC/2023/05/0001/28813/RFP	From Pretoria to the Port of Port Elizabeth	
#	Cost element	Unit Cost (R)	# of Units	Total Cost (R)
1.	Human Resources			
2.	Systems Documentation			
3.	Meetings & Administration			
4.	H&S Training			
5.	PPE & Safety Equipment			
6.	Signage & Barricading			
7.	Workplace Facilities			
8.	Emergency & Rescue Measures			
9.	Hygiene Surveys & Monitoring			
10.	Medical Surveillance			
11.	Safe Transport of Workers			
12.	HazMat Management (e.g. asbestos /silica)			
13.	Substance Abuse Testing (3 kits @R500 pm)			
14.	H&S Reward & Recognition			
		Total Health and Safety Estimate (R)		
		Total Estimate Value (R)		
		H&S Cost as % of Tender value		

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM A14: PROGRAMME

The tender must provide a programme which provides the detail that would indicate the order and timing of activities to carry out the services in terms of the *Employer's* requirements and within the stipulated timeframes.

Programmes submitted must include the following:

- Ability to execute the works in terms of the Employer's requirements within the required timeframe indicating the order and timing of the design, procurement, construction, commissioning and handover that will take place in order to provide the works.
- Key Dates, Planned Completion Date & Completion Date
- All activities to be logically tied using critical path method (CPM).
- Detailed Schedule
- Software Programme (Preferably Primavera or MS Project)

Engineering, Procurement, Construction, Commission and Close out = 30 months after award (i.e. including all holidays)

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM A15: METHOD STATEMENT/APPROACH PAPER

Tenderer must Demonstrate company experience in comparable projects similar in size and nature with regard to the following:

- Method statement on how the contractor will undertake Engineering design process.
 - Demonstrate compliance to Rail design principles relating to the safe handling of trains at crossing loops and in yards
 - Demonstrate compliance to Rail design principles of mechanical, electrical, civils, perway, geotechnical, signalling and related supporting infrastructure facilities.
 - Demonstrate Rail infrastructure design capability
 - Demonstrate Rail operations knowledge, and associated knowledge of maintenance requirements
 - Demonstrate Rail capacity integrated dynamic simulation capability, taking into account the entire logistics chain
 - Tenderers to provide the basic engineering designs based on a reasonable consistent assumption basis for the purpose of applying for an EIA to include the following but not limited to:
 - Yard Design for Kaalfontein and Waltloo
 - Loop extensions 17 off along the main line
 - Rail design in the Port of Port Elizabeth rail siding
 - Basic general arrangement layouts with associated existing & proposed infrastructure and approved by both EAPASA registered Environmental specialist and ECSA Professionally Registered Engineers.
- Method of Procurement and Fabrication:
 - Strategy of procurement of material, specialised services and long lead items.
 - Tenderer should narratively demonstrate the approach to design, pre-manufacturing activities and meetings, QA/QC (FAT).
 - Interfacing with the Employer's Engineering Team, relevant TFR/PRASA departments as well as other stake-holders.
 - Acceptable manufacturing processes and systems up to final approved product.
 - Demonstrate manufacturing process that show reduction of manufacturing time and increased productivity.
- Method of Construction/Installation and Commissioning:
 - Tenderer should narratively demonstrate the approach to site establishment, pre-installation activities and meetings.
 - Interfacing with the Employer's Engineering Team, relevant TFR/PRASA departments, other contractors on site (whether or not related to the works).
 - Installation logistics.
 - Site acceptance testing, commissioning procedures and handover.

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM A16: SCHEDULE OF PROPOSED SUB-CONTRACTORS

- We notify you that it is our intention to employ the following Subcontractors for work in this contract.

Tenderer must attach the following as supporting documents:

- Subcontractor CSD registration
- Subcontractor BBBEE Certification or Affidavit
- Subcontractor Tax compliant Pin

Name of Proposed Subcontractor			Address		Nature of work		Amount of Work	Percentage of work
% Black Owned	EME	QSE	Youth	Women	Disabilities	Rural/ Underdeveloped areas/ Townships	Military Veterans	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Name of Proposed Subcontractor			Address		Nature of work		Amount of Work	Percentage of work
% Black Owned	EME	QSE	Youth	Women	Disabilities	Rural/ Underdeveloped areas/ Townships	Military Veterans	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Name of Proposed Subcontractor			Address		Nature of work	Amount of Work	Percentage of work	
% Black Owned	EME	QSE	Youth	Women	Disabilities	Rural/ Underdeveloped areas/ Townships	Military Veterans	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

The Tenderer confirm to maintain or improve the Subcontracting status for the duration of the contract.

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

TCC/2023/05/0001/28813/RFP

**FORM B1: REGISTRATION ON THE NATIONAL TREASURY CENTRAL
SUPPLIER DATABASE**

This is to Certify that:

The Tenderer's is registered with the Department of National Treasury's Central Supplier Database.

Please attach proof of valid registration of CSD to this page.

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM B2: SUPPLIER DECLARATION FORM

Respondents are to furnish the following documentation and complete the Supplier Declaration Form below:

1. **Original or certified** cancelled cheque **OR** letter from the Respondent's bank verifying banking details [**with bank stamp**]
2. **Certified copy** of Identity Document(s) of Shareholders/Directors/Members [*where applicable*]
3. **Certified copy** of Certificate of Incorporation, CM29 / CM9 [*name change*]
4. **Certified copy** of Share Certificates [CK1/CK2 if CC]
5. Original or certified letterhead confirm physical and postal addresses
6. **Original or certified** valid SARS Tax Clearance Certificate [RSA entities only]
7. **Certified copy** of VAT Registration Certificate [RSA entities only]
8. A signed letter from your entity's auditor or accountant confirming most recent annual turnover figures or certified BBBEE certificate
9. **Certified copy** of valid Company Registration Certificate [*if applicable*]

Note: No contract shall be awarded to any South African Respondent whose tax matters have not been declared by SARS to be in order.

Note: No agreement shall be awarded to any Respondent whose tax matters have not been declared by SARS to be in order.

Company Trading Name							
Company Registered Name							
Company Registration Number Or ID Number If A Sole Proprietor							
Form of entity	CC	Trust	Pty Ltd	Limited	Partnership	Sole Proprietor	
VAT number (if registered)							
Company Telephone Number							
Company Fax Number							
Company E-Mail Address							
Company Website Address							
Bank Name				Bank Account Number			
Postal Address						Code	
Physical Address						Code	

Contact Person					
Designation					
Telephone					
Email					
Annual Turnover Range (Last Financial Year)	< R5 Million		R5-35 million		> R35 million
Does Your Company Provide	Products		Services		Both
Area Of Delivery	National		Provincial		Local
Is Your Company A Public Or Private Entity			Public		Private
Does Your Company Have A Tax Directive Or IRP30 Certificate			Yes		No
Main Product Or Service Supplied (E.G.: Stationery/Consulting)					
BEE Ownership Details					
% Black Ownership		% Black women ownership		% Disabled person/s ownership	
Does your company have a BEE certificate		Yes		No	
What is your broad based BEE status (Level 1 to 9 / Unknown)					
How many personnel does the firm employ		Permanent		Part time	
Transnet Contact Person					
Contact number					
Transnet operating division					
Duly Authorised To Sign For And On Behalf Of Firm / Organisation					
Name			Designation		
Signature			Date		
Stamp And Signature Of Commissioner Of Oath					
Name			Date		
Signature			Telephone No.		

FORM B3: RFP DECLARATION

NAME OF COMPANY: _____

We _____ do hereby certify that:

1. Transnet has supplied and we have received appropriate tender offers to any/all questions (as applicable) which were submitted by ourselves for tender clarification purposes;
2. we have received all information we deemed necessary for the completion of this Tender;
3. at no stage have we received additional information relating to the subject matter of this tender from Transnet sources, other than information formally received from the designated Transnet contact(s) as nominated in the tender documents;
4. we are satisfied, insofar as our company is concerned, that the processes and procedures adopted by Transnet in issuing this tender and the requirements requested from tenderers in responding to this tender have been conducted in a fair and transparent manner; and
5. furthermore, we acknowledge that a direct relationship exists between a family member and/or an owner / member / director / partner / shareholder (unlisted companies) of our company and an employee or board member of the Transnet Group as indicated below: *[Respondent to indicate if this section is not applicable]*

FULL NAME OF OWNER/MEMBER/DIRECTOR/

PARTNER/SHAREHOLDER:

ADDRESS:

Indicate nature of relationship with Transnet:

[Failure to furnish complete and accurate information in this regard may lead to the disqualification of your response and may preclude a Respondent from doing future business with Transnet]

We declare, to the extent that we are aware or become aware of any relationship between ourselves and Transnet (other than any existing and appropriate business relationship with Transnet) which could unfairly advantage our company in the forthcoming adjudication process, we shall notify Transnet immediately in writing of such circumstances.

6. We accept that any dispute pertaining to this tender will be resolved through the Ombudsman process and will be subject to the Terms of Reference of the Ombudsman. The Ombudsman process must first be exhausted before judicial review of a decision is sought. (Refer "Important Notice to respondents" below).
7. We further accept that Transnet reserves the right to reverse a tender award or decision based on the recommendations of the Ombudsman without having to follow a formal court process to have such award or decision set aside.
8. We have acquainted ourselves and agree with the content of Form A9 & Form B12 & "Service Provider Integrity Pact".

For and on behalf of duly authorised thereto
Name:
Signature:
Date:

IMPORTANT NOTICE TO TENDERERS

Transnet has appointed a Procurement Ombudsman to investigate any material complaint in respect of tenders exceeding R5,000,000.00 (five million S.A. Rand) in value. Should a Tenderer have any material concern regarding an tender process which meets this value threshold, a complaint may be lodged with Transnet's Procurement Ombudsman for further investigation.

It is incumbent on the Tenderer to familiarise himself/herself with the Terms of Reference for the Transnet Procurement Ombudsman, details of which are available for review at Transnet's website www.transnet.net.

An official complaint form may be downloaded from this website and submitted, together with any supporting documentation, within the prescribed period, to procurement.ombud@transnet.net

For transactions below the R5,000,000.00 (five million S.A. Rand) threshold, a complaint may be lodged with the Chief Procurement Officer of the relevant Transnet Operating Division.

All Tenderers should note that a complaint must be made in good faith. If a complaint is made in bad faith, Transnet reserves the right to place such a tenderer on its List of Excluded Tenderers.

Signed: _____ Date: _____

Name: _____ Position: _____

Tenderer: _____

TCC/2023/05/0001/28813/RFP

FORM B4: REQUEST FOR QUOTATION – BREACH OF LAW

NAME OF COMPANY: _____

I / We _____ do hereby certify that ***I/we have/have not been*** found guilty during the preceding 5 (five) years of a serious breach of law, including but not limited to a breach of the Competition Act, 89 of 1998, by a court of law, tribunal or other administrative body. The type of breach that the Tenderer is required to disclose excludes relatively minor offences or misdemeanours, e.g. traffic offences.

Where found guilty of such a serious breach, please disclose:

NATURE OF BREACH:

DATE OF BREACH:

Furthermore, I/we acknowledge that Transnet SOC Ltd reserves the right to exclude any Tenderer from the tendering process, should that person or company have been found guilty of a serious breach of law, tribunal or regulatory obligation.

Signed on this _____ day of _____ 20____

SIGNATURE OF TENDER

FORM B5: PROTECTION OF PERSONAL INFORMATION

Agreement in terms of Protection of Personal Information Act, 4 of 2013 ("POPIA")

1. PREAMBLE AND INTRODUCTION

- 1.1. The rights and obligation of the Parties in terms of the Protection of Personal Information Act, 4 of 2013 ("POPIA") are included as forming part of the terms and conditions of this contract.

2. PROTECTION OF PERSONAL INFORMATION

- 2.1. The following terms shall bear the same meaning as contemplated in Section 1 of the Protection of

Person information act, No. of 2013 "(POPIA)":

consent; data subject; electronic communication; information officer; operator; person; personal information; processing; record; Regulator; responsible party; special information; as well as any terms derived from these terms.

- 2.2. The Operator will process all information by the Transnet in terms of the requirements contemplated in Section 4(1) of the POPIA:

Accountability; Processing limitation; Purpose specification; Further processing limitation; Information quality; Openness; Security safeguards and Data subject participation.

- 2.3. The Parties acknowledge and agree that, in relation to personal information of Transnet and the information of a third party that will be processed pursuant to this Agreement , the _____ Operator _____ is (.....)

[insert name of Tenderer/Contractor] hereinafter Operator and the Data subject is "Transnet". Operator will process personal information only with the knowledge and

authorisation of Transnet and will treat personal information and the information of a third party which comes to its knowledge as confidential and will not disclose it, unless so required by law or subject to the exceptions contained in the POPIA.

- 2.4. Transnet reserves all the rights afforded to it by the POPIA in the processing of any of its information as contained in this Agreement and the Operator is required to comply with all prescripts as detailed in the POPIA relating to all information concerning Transnet.
- 2.5. In terms of this Agreement, the Operator acknowledges that it will obtain and have access to personal information of Transnet and the information of a third party and agrees that it shall only process the information disclosed by Transnet in terms of this Agreement and only for the purposes as detailed in this Agreement and in accordance with any applicable law.
- 2.6. Should there be a need for the Operator to process the personal information and the information of a third party in a way that is not agreed to in this Agreement, the Operator must request consent from Transnet to the processing of its personal information or and the information of a third party in a manner other than that it was collected for, which consent cannot be unreasonably withheld.
- 2.7. Furthermore, the Operator will not otherwise modify, amend or alter any personal information and the information of a third party submitted by Transnet or disclose or permit the disclosure of any personal information and the information of a third party to any third party without prior written consent from Transnet.
- 2.8. The Operator shall, at all times, ensure compliance with any applicable laws put in place and maintain sufficient measures, policies and systems to manage and secure against all forms of risks to any information that may be shared or accessed pursuant to the services offered to Transnet in terms of this Agreement (physically, through a computer or any other form of electronic communication).
- 2.9. The Operator shall notify Transnet in writing of any unauthorised access to personal information and the information of a third party , cybercrimes or suspected cybercrimes, in its knowledge and report such crimes or suspected crimes to the relevant authorities in accordance with applicable laws, after becoming aware of such crimes or suspected crime. The Operator must inform Transnet of the breach as soon as it has occurred to allow Transnet to take all necessary remedial steps to mitigate the extent of the loss or compromise of personal information and the information of a third party and to restore the integrity of the affected personal information as quickly as is possible.

- 2.10. Transnet may, in writing, request the Operator to confirm and/or make available any personal information and the information of a third party in its possession in relation to Transnet and if such personal information has been accessed by third parties and the identity thereof in terms of the POPIA.
- 2.11. Transnet may further request that the Operator correct, delete, destroy, withdraw consent or object to the processing of any personal information and the information of a third party relating to the Transnet or a third party in the Operator's possession in terms of the provision of the POPIA and utilizing Form 2 of the POPIA Regulations .
- 2.12. In signing this addendum that is in terms of the POPIA, the Operator hereby agrees that it has adequate measures in place to provide protection of the personal information and the information of a third party given to it by Transnet in line with the 8 conditions of the POPIA and that it will provide to Transnet satisfactory evidence of these measures whenever called upon to do so by Transnet.

The Operator is required to provide confirmation that all measures in terms of the POPIA are in place when processing personal information and the information of a third party received from Transnet:

YES	
NO	

- 2.13. Further, the Operator acknowledges that it will be held liable by Transnet should it fail to process personal information in line with the requirements of the POPIA. The Operator will be subject to any civil or criminal action, administrative fines or other penalty or loss that may arise as a result of the processing of any personal information that Transnet submitted to it.
- 2.14. Should a Tenderer have any complaints or objections to processing of its personal information, by Transnet, the Tenderer can submit a complaint to the Information Regulator on <https://www.justice.gov.za/infoereg/>, click on contact us, click on complaints.IR@justice.gov.za

3. SOLE AGREEMENT

3.1. The Agreement, constitute the sole agreement between the parties relating to the subject matter referred to in paragraph 1.1 of this and no amendment/variation/change shall be of any force and effect unless reduced to writing and signed by or on behalf of both parties.

Signed at _____ on this _____ day of _____ 2021

Name: _____

Title: _____

Signature: _____

_____ **(Tenderer).**

(Operator)

Authorised signatory for and on behalf of
(Tenderer) who

warrants that he/she is duly authorised to sign this Agreement.

AS WITNESSES:

<p>1. Name: _____</p> <p>2. Name: _____</p>	<p>Signature: _____</p> <p>Signature: _____</p>
---	---

FORM B6: TENDERER'S DISCLOSURE**12 PURPOSE OF THE FORM**

12.1 Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the Tenderer to make this declaration in respect of the details required hereunder.

12.2 Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

13 Tenderer's declaration

13.1 Is the Tenderer, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest¹ in the enterprise, employed by the state?

YES/NO

13.1.1. If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	Identity Number	Name of State institution

¹ the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.

13.2 Do you, or any person connected with the Tenderer, have a relationship with any person who is employed by the procuring institution?

YES/NO

13.2.1. If so, furnish particulars:

.....

13.3 Does the Tenderer or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract?

YES/NO

13.3.1. If so, furnish particulars:

.....

14 DECLARATION

I, the undersigned, (name)..... in submitting the accompanying bid, do hereby make the following statements that I certify to be true and complete in every respect:

14.1 I have read and I understand the contents of this disclosure;

14.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;

14.3 The Tenderer has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium² will not be construed as collusive bidding.

14.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.

² Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

14.5 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

14.6 There have been no consultations, communications, agreements or arrangements made by the Tenderer with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the Tenderer was not involved in the drafting of the specifications or terms of reference for this bid.

14.7 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 12, 13 and 14 ABOVE IS CORRECT.

I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

BREACH OF LAW

We further hereby certify that *I/we* (the bidding entity and/or any of its directors, members or partners) **have/have not been** [delete as applicable] found guilty during the preceding 5 [five] years of a serious breach of law, including but not limited to a breach of the Competition Act, 89 of 1998, by a court of law, tribunal or other administrative body. The type of breach that the Respondent is required to disclose excludes relatively minor offences or misdemeanours, e.g. traffic offences. This includes the imposition of an administrative fine or penalty.

Where found guilty of such a serious breach, please disclose:

NATURE OF BREACH:

DATE OF BREACH: _____

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Furthermore, I/we acknowledge that Transnet SOC Ltd reserves the right to exclude any Respondent from the bidding process, should that person or entity have been found guilty of a serious breach of law, tribunal or regulatory obligation.

SIGNED at _____ on this ____ day of _____ 20__

For and on behalf of _____	AS WITNESS:
duly authorised hereto	
Name:	Name:
Position:	Position:
Signature:	Signature:
Date:	Registration No of Company/CC
Place:	Registration Name of Company/CC

SBD 6.1

FORM B7: B-BBEE PREFERENCE POINTS CLAIM FORM

This preference form must form part of all bids invited. It contains general information and serves as a claim for preference points for Broad-Based Black Economic Empowerment [**B-BBEE**] Status Level of Contribution.

Transnet will award preference points to companies who provide valid proof of their B-BBEE status using either the latest version of the generic Codes of Good Practice or Sector Specific Codes (if applicable).

NB: BEFORE COMPLETING THIS FORM, TENDERERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS.

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 The value of this bid is estimated to exceed R50 000 000 (all applicable taxes included) and therefore the 90/10 preference point system shall be applicable. Despite the stipulated preference point system, Transnet shall use the lowest acceptable bid to determine the applicable preference point system in a situation where all received acceptable bids are received outside the stated preference point system.

1.3 Preference points for this bid shall be awarded for:

- (a) Price; and
- (b) B-BBEE Status Level of Contribution.

1.4 The maximum points for this bid are allocated as follows:

	POINTS
PRICE	90
B-BBEE STATUS LEVEL OF CONTRIBUTION	5
Total points for Price and B-BBEE must not exceed	100

1.5 Failure on the part of a Tenderer to submit proof of B-BBEE status level of contributor together with the bid will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.6 The purchaser reserves the right to require of a Tenderer, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2. DEFINITIONS

- (a) **"all applicable taxes"** includes value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies;
- (b) **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;
- (c) **"B-BBEE status level of contributor"** means the B-BBEE status received by a measured entity based on its overall performance using the relevant scorecard contained in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;
- (d) **"bid"** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the supply/provision of services, works or goods, through price quotations, advertised competitive bidding processes or proposals;
- (e) **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (f) **"EME"** means an Exempted Micro Enterprise as defines by Codes of Good Practice under section 9 (1) of the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (g) **"functionality"** means the ability of a Tenderer to provide goods or services in accordance with specification as set out in the bid documents
- (h) **"Price"** includes all applicable taxes less all unconditional discounts.
- (i) **"Proof of B-BBEE Status Level of Contributor"**
 - i) the B-BBEE status level certificate issued by an authorised body or person;
 - ii) a sworn affidavit as prescribed by the B-BBEE Codes of Good Practice; or
 - iii) any other requirement prescribed in terms of the B-BBEE Act.
- (j) **"QSE"** means a Qualifying Small EEnterprise as defines by Codes of Good Practice under section 9 (1) of the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (k) **"rand value"** means the total estimated value of a contract in South African currency, calculated at the time of bid invitations, and includes all applicable taxes and excise duties.

3. POINTS AWARDED FOR PRICE

3.1 THE 90/10 PREFERENCE POINT SYSTEMS

A maximum of 90 points is allocated for price on the following basis:

90/10

$$P_s = 90 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where

- P_s = Points scored for comparative price of bid under consideration
- P_t = Comparative price of bid under consideration
- P_{\min} = Comparative price of lowest acceptable bid

4. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTION

- 4.1 In terms of the Preferential Procurement Regulations, preference points must be awarded to a Tenderer for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of points
1	5
2	4
3	3
4	2
5	1
6	0
7	0
8	0
Non-compliant contributor	0

- 4.2 The table below indicates the required proof of B-BBEE status depending on the category of enterprises:

Enterprise	B-BBEE Certificate & Sworn Affidavit
Large	Certificate issued by SANAS accredited verification agency
QSE	<p>Certificate issued by SANAS accredited verification agency</p> <p>Sworn Affidavit signed by the authorised QSE representative and attested by a Commissioner of Oaths confirming annual turnover and black ownership (only black-owned QSEs - 51% to 100% Black owned)</p> <p>[Sworn affidavits must substantially comply with the format that can be obtained on the DTI's website at www.dti.gov.za/economic_empowerment/bee_codes.jsp.]</p>
EME³	<p>Sworn Affidavit signed by the authorised EME representative and attested by a Commissioner of Oaths confirming annual turnover and black ownership</p> <p>Certificate issued by CIPC (formerly CIPRO) confirming annual turnover and black ownership</p> <p>Certificate issued by SANAS accredited verification agency only if the EME is being measured on the QSE scorecard</p>

³ In terms of the Implementation Guide: Preferential Procurement Regulations, provides that in the Transport Sector, EMEs can provide a letter from accounting officer or get verified and be issued with a B-BBEE certificate by SANAS accredited professional or agency as the Transport Sector Code has not been aligned to the generic Codes. EMEs in the Transport Sector are not allowed to provide a sworn affidavit as the generic codes are not applicable to them.

- 4.3 A trust, consortium or joint venture (including unincorporated consortia and joint ventures) must submit a consolidated B-BBEE Status Level verification certificate for every separate bid.
- 4.4 Tertiary Institutions and Public Entities will be required to submit their B-BBEE status level certificates in terms of the specialized scorecard contained in the B-BBEE Codes of Good Practice.
- 4.5 A person will not be awarded points for B-BBEE status level if it is indicated in the bid documents that such a Tenderer intends sub-contracting more than 25% of the value of the contract to any other enterprise that does not qualify for at least the points that such a Tenderer qualifies for, unless the intended sub-contractor is an EME that has the capability and ability to execute the sub-contract.
- 4.6 A person awarded a contract may not sub-contract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is sub-contracted to an EME that has the capability and ability to execute the sub-contract.
- 4.7 Tenderers are to note that the rules pertaining to B-BBEE verification and other B-BBEE requirements may be changed from time to time by regulatory bodies such as National Treasury or the DTI. It is the Tenderer's responsibility to ensure that his/her bid complies fully with all B-BBEE requirements at the time of the submission of the bid.

5. BID DECLARATION

- 5.1 Tenderers who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

6. B-BBEE STATUS LEVEL OF CONTRIBUTION CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 6.1

- 6.1 B-BBEE Status Level of Contribution: . =(maximum of 10 points)
- (Points claimed in respect of paragraph 6.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-CONTRACTING

- 7.1 Will any portion of the contract be sub-contracted?

(Tick applicable box)

YES		NO	
-----	--	----	--

- 7.1.1 If yes, indicate:

- i) What percentage of the contract will be subcontracted.....%
- ii) The name of the sub-contractor.....
- iii) The B-BBEE status level of the sub-contractor.....
- iv) Whether the sub-contractor is an EME or QSE.

(Tick applicable box)

YES		NO	
-----	--	----	--

- v) Specify, by ticking the appropriate box, if subcontracting is to the below designated groups:

Designated Group: An EME or QSE which is at last 51% owned by:	EME ✓	QSE ✓
Black people		

Black people who are youth		
Black people who are women		
Black people with disabilities		
Black people living in rural or underdeveloped areas or townships		
Cooperative owned by black people		
Black people who are military veterans		
OR		
Any EME		
Any QSE		

8. DECLARATION WITH REGARD TO COMPANY/FIRM

- 8.1 Name of company/firm:.....
- 8.2 VAT registration number:.....
- 8.3 Company registration number:.....
- 8.4 TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
- ☐ One person business/sole propriety
- ☐ Close corporation
- ☐ Company
- ☐ (Pty) Limited

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

.....

.....

8.6 COMPANY CLASSIFICATION

- ☐ Manufacturer
- ☐ Supplier
- ☐ Professional Supplier/Service provider
- ☐ Other Suppliers/Service providers, e.g. transporter, etc.

[TICK APPLICABLE BOX]

- 8.7 Total number of years the company/firm has been in business:.....

- 8.8 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contribution indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraph 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;
- iv) If a Tenderer submitted false information regarding its B-BBEE status level of contributor or any other matter required, which will affect or has affected the evaluation of a bid, or where a Tenderer has failed to declare any subcontracting arrangements or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have
 - (a) disqualify the person from the bidding process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
 - (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
 - (d) if the successful Tenderer subcontracted a portion of the bid to another person without disclosing it, Transnet reserves the right to penalise the bidder up to 10 percent of the value of the contract;
 - (e) recommend that the Tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the audi alteram partem (hear the other side) rule has been applied; and
 - (f) forward the matter for criminal prosecution.

WITNESSES

1.

2.

.....

SIGNATURE(S) OF BIDDERS(S)

DATE:

ADDRESS

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

TCC/2023/05/0001/28813/RFP

**FORM B8: TAX COMPLIANCE STATUS PIN CERTIFICATE ISSUED BY
THE SOUTH AFRICAN REVENUE SERVICES**

This is to certify that:

The Tenderer's Tax Matters have been declared in order by the South African Revenue Services. In the event of a Joint Venture, each member shall comply with this requirement.

Please attach a valid Tax Compliance Status Pin Certificate issued by the South African Revenue Services.

If a company or close corporation has not yet been formed at the time of submitting a bid, the prospective shareholders or members must each supply a tax clearance certificate in their personal capacities.

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM B9: THREE (3) YEARS AUDITED FINANCIAL STATEMENTS

Attached to this schedule is the last three (3) years audited financial statements of the single tenderer/members of the Joint Venture.

NAME OF COMPANY/IES and INDEX OF ATTACHMENTS:

[illegible]

Signed: _____

Date: _____

Name: _____

Position:

Tenderer:

FORM B10: AN ORIGINAL BANK LETTER OF GOOD FINANCIAL STANDING (BANK RATING) FOR THE TENDER SUM

This is to certify that:

The Tenderer is in Good Financial Standing for the Tender Sum.

Information to be included in bank letter of good financial standing:

Bank Report on : (Tenderer's Name)

Account No :

Bank :

Bank Code :

Amount : (Tender value)

Duration : 60 months

BUSINESS POTENTIAL CODE (MARK X AGAINST APPLICABLE CLASSIFICATION)

() **A UNDOUBTED FOR ENQUIRY**

() **B GOOD FOR AMOUNT QUOTED**

() **C GOOD FOR AMOUNT QUOTED IF STRICTLY IN WAY OF BUSINESS**

() **D FAIR TRADE RISK**

() **E FIGURE CONSIDER TO HIGH**

() **F FINANCIAL POSITION UNKNOWN**

() **G OCCASIONALLY DISHONOURED**

() **H FREQUENTLY DISHONOURED**

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM B11: SERVICE PROVIDER INTEGRITY PACT

Important Note: All potential tenderers must read this document and certify in the RFP Declaration Form that they have acquainted themselves with, and agree with the content.

The contract with the successful tenderer will automatically incorporate this Integrity Pact and shall be deemed as part of the final concluded contract.

INTEGRITY PACT

Between

TRANSNET SOC LTD

Registration Number: 1990/000900/30

("Transnet")

And

The Contractor (hereinafter referred to as the "Tenderer/Service Providers/Contractor")

PREAMBLE

Transnet values full compliance with all relevant laws and regulations, ethical standards and the principles of economical use of resources, fairness and transparency in its relations with its Tenderers/Service Providers/Contractors.

In order to achieve these goals, Transnet and the Tenderer/Service Provider/Contractor hereby enter into this agreement hereinafter referred to as the "Integrity Pact" which will form part of the Tenderer's/Service Provider's/Contractor's application for registration with Transnet as a vendor.

The general purpose of this Integrity Pact is to agree on avoiding all forms of dishonesty, fraud and corruption by following a system that is fair, transparent and free from any undue influence prior to, during and subsequent to the currency of any procurement and/or reverse logistics event and any further contract to be entered into between the Parties, relating to such event.

All Tenderers/Service Providers/Contractor's will be required to sign and comply with undertakings contained in this Integrity Pact, should they want to be registered as a Transnet vendor.

6 OBJECTIVES

6.1 Transnet and the Tenderer/Service Provider/Contractor agree to enter into this Integrity Pact, to avoid all forms of dishonesty, fraud and corruption including practices that are anti-competitive in nature, negotiations made in bad faith and under-pricing by following a system that is fair, transparent and free from any influence/unprejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:

- a) Enable Transnet to obtain the desired contract at a reasonable and competitive price in conformity to the defined specifications of the works, goods and services; and
- b) Enable Tenderers/Service Providers/Contractors to abstain from bribing or participating in any corrupt practice in order to secure the contract.

7 COMMITMENTS OF TRANSNET

Transnet commits to take all measures necessary to prevent dishonesty, fraud and corruption and to observe the following principles:

- 7.1 Transnet hereby undertakes that no employee of Transnet connected directly or indirectly with the sourcing event and ensuing contract, will demand, take a promise for or accept directly or through intermediaries any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the Tenderer, either for themselves or for any person, organisation or third party related to the contract in exchange for an advantage in the tendering process, Tender evaluation, contracting or implementation process related to any contract.
- 7.2 Transnet will, during the registration and tendering process treat all Tenderers/ Service Providers/Contractor with equity, transparency and fairness. Transnet will in particular, before and during the registration process, provide to all Tenderers/ Service Providers/Contractors the same information and will not provide to any Tenderers/Service Providers/Contractors confidential/additional information through which the Tenderers/Service Providers/Contractors could obtain an advantage in relation to any tendering process.
- 7.3 Transnet further confirms that its employees will not favour any prospective Tenderers/Service Providers/Contractors in any form that could afford an undue advantage to a particular Tenderer during the tendering stage, and will further treat all Tenderers/Service Providers/Contractors participating in the tendering process in a fair manner.
- 7.4 Transnet will exclude from the tender process such employees who have any personal interest in the Tenderers/Service Providers/Contractors participating in the tendering process.

8 OBLIGATIONS OF THE TENDERER / SERVICE PROVIDER

- 8.1 Transnet has a '**Zero Gifts**' Policy. No employee is allowed to accept gifts, favours or benefits.
 - a) Transnet officials and employees **shall not** solicit, give or accept, or from agreeing to solicit, give, accept or receive directly or indirectly, any gift, gratuity, favour, entertainment, loan, or anything of monetary value, from any person or juridical entities in the course of official duties or in connection with any operation being managed by, or any transaction which may be affected by the functions of their office.

- b) Transnet officials and employees **shall not** solicit or accept gifts of any kind, from vendors, suppliers, customers, potential employees, potential vendors, and suppliers, or any other individual or organisation irrespective of the value.
 - c) Under **no circumstances** should gifts, business courtesies or hospitality packages be accepted from or given to prospective suppliers participating in a tender process at the respective employee's Operating Division, regardless of retail value.
 - d) Gratuities, bribes or kickbacks of any kind must never be solicited, accepted or offered, either directly or indirectly. This includes money, loans, equity, special privileges, personal favours, benefit or services. Such favours will be considered to constitute corruption.
- 8.2 The Tenderer/Service Provider/Contractor commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its Tender or during any ensuing contract stage in order to secure the contract or in furtherance to secure it and in particular the Tenderer/Service Provider/Contractor commits to the following:
- a) The Tenderer/Service Provider/Contractor will not, directly or through any other person or firm, offer, promise or give to Transnet or to any of Transnet's employees involved in the tendering process or to any third person any material or other benefit or payment, in order to obtain in exchange an advantage during the tendering process; and
 - b) The Tenderer/Service Provider/Contractor will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any employee of Transnet, connected directly or indirectly with the tendering process, or to any person, organisation or third party related to the contract in exchange for any advantage in the tendering, evaluation, contracting and implementation of the contract.
- 8.3 The Tenderer/Service Provider/Contractor will not collude with other parties interested in the contract to preclude a competitive Tender price, impair the transparency, fairness and progress of the tendering process, Tender evaluation, contracting and implementation of the contract. The Tenderer / Service Provider further commits itself to delivering against all agreed upon conditions as stipulated within the contract.

- 8.4 The Tenderer/Service Provider/Contractor will not enter into any illegal or dishonest agreement or understanding, whether formal or informal with other Tenderers/Service Providers/Contractors. This applies in particular to certifications, submissions or non-submission of documents or actions that are restrictive or to introduce cartels into the tendering process.
- 8.5 The Tenderer/Service Provider/Contractor will not commit any criminal offence under the relevant anti-corruption laws of South Africa or any other country. Furthermore, the Tenderer/Service Provider/Contractor will not use for illegitimate purposes or for restrictive purposes or personal gain, or pass on to others, any information provided by Transnet as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 8.6 A Tenderer/Service Provider/Contractor of foreign origin shall disclose the name and address of its agents or representatives in South Africa, if any, involved directly or indirectly in the registration or tendering process. Similarly, the Tenderer / Service Provider / Contractor of South African nationality shall furnish the name and address of the foreign principals, if any, involved directly or indirectly in the registration or tendering process.
- 8.7 The Tenderer/Service Provider/Contractor will not misrepresent facts or furnish false or forged documents or information in order to influence the tendering process to the advantage of the Tenderer/Service Provider/Contractor or detriment of Transnet or other competitors.
- 8.8 Transnet may require the Tenderer/Service Provider/Contractor to furnish Transnet with a copy of its code of conduct. Such code of conduct must address the compliance programme for the implementation of the code of conduct and reject the use of bribes and other dishonest and unethical conduct.
- 8.9 The Tenderer/Service Provider/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 8.10 The Tenderer/Service Provider/Contractor confirms that they will uphold the ten principles of the United Nations Global Compact (UNGC) in the fields of Human Rights, Labour, Anti-Corruption and the Environment when undertaking business with Transnet as follows:
- a) Human Rights

- Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and
- Principle 2: make sure that they are not complicit in human rights abuses.

b) Labour

- Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
- Principle 4: the elimination of all forms of forced and compulsory labour;
- Principle 5: the effective abolition of child labour; and
- Principle 6: the elimination of discrimination in respect of employment and occupation.

c) Environment

- Principle 7: Businesses should support a precautionary approach to environmental challenges;
- Principle 8: undertake initiatives to promote greater environmental responsibility; and
- Principle 9: encourage the development and diffusion of environmentally friendly technologies.

d) Anti-Corruption

- Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

9 INDEPENDENT TENDERING

9.1 For the purposes of that Certificate in relation to any submitted Tender, the Tenderer declares to fully understand that the word “competitor” shall include any individual or organisation, other than the Tenderer, whether or not affiliated with the Tenderer, who:

- a) has been requested to submit a Tender in response to this Tender invitation;
- b) could potentially submit a Tender in response to this Tender invitation, based on their qualifications, abilities or experience; and
- c) provides the same Goods and Services as the Tenderer and/or is in the same line of business as the Tenderer.

9.2 The Tenderer has arrived at his submitted Tender independently from, and without consultation, communication, agreement or arrangement with any

competitor. However, communication between partners in a joint venture or consortium will not be construed as collusive tendering.

- 9.3 In particular, without limiting the generality of paragraph 5 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
- a) prices;
 - b) geographical area where Goods or Services will be rendered [market allocation];
 - c) methods, factors or formulas used to calculate prices;
 - d) the intention or decision to submit or not to submit, a Tender;
 - e) the submission of a Tender which does not meet the specifications and conditions of the RFP; or
 - f) tendering with the intention of not winning the Tender.
- 9.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the Goods or Services to which his/her tender relates.
- 9.5 The terms of the Tender as submitted have not been, and will not be, disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official Tender opening or of the awarding of the contract.
- 9.6 Tenderers are aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to Tenders and contracts, Tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and/or may be reported to the National Prosecuting Authority [**NPA**] for criminal investigation and/or may be restricted from conducting business with the public sector for a period not exceeding 10 [ten] years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.
- 9.7 Should the Tenderer find any terms or conditions stipulated in any of the relevant documents quoted in the Tender unacceptable, it should indicate which conditions are unacceptable and offer alternatives by written submission on its company letterhead, attached to its submitted Tender. Any such submission shall be subject to review by Transnet's Legal Counsel who shall determine

whether the proposed alternative(s) are acceptable or otherwise, as the case may be.

10 DISQUALIFICATION FROM TENDERING PROCESS

- 10.1 If the Tenderer/Service Provider/Contractor has committed a transgression through a violation of section 3 of this Integrity Pact or in any other form such as to put its reliability or credibility as a Tenderer/Service Provider/Contractor into question, Transnet may reject the Tenderer's / Service Provider's / Contractor's application from the registration or tendering process and remove the Tenderer/Service Provider/Contractor from its database, if already registered.
- 10.2 If the Tenderer/Service Provider/Contractor has committed a transgression through a violation of section 3, or any material violation, such as to put its reliability or credibility into question. Transnet may after following due procedures and at its own discretion also exclude the Tenderer/Service Provider /Contractor from future tendering processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, which will include amongst others the number of transgressions, the position of the transgressors within the company hierarchy of the Tenderer/Service Provider/Contractor and the amount of the damage. The exclusion will be imposed for up to a maximum of 10 (ten) years. However, Transnet reserves the right to impose a longer period of exclusion, depending on the gravity of the misconduct.
- 10.3 If the Tenderer/Service Provider/Contractor can prove that it has restored the damage caused by it and has installed a suitable corruption prevention system or taken other remedial measures as the circumstances of the case may require, Transnet may at its own discretion revoke the exclusion or suspend the imposed penalty.

11 TRANSNET'S LIST OF EXCLUDED TENDERERS (BLACKLIST)

- 11.1 The process of restriction is used to exclude a company/person from conducting future business with Transnet and other organs of state for a specified period. No Tender shall be awarded to a Tenderer whose name (or any of its members, directors, partners or trustees) appear on the Register of Tender Defaulters kept

by National Treasury, or who have been placed on National Treasury's List of Restricted Suppliers. Transnet reserves the right to withdraw an award, or cancel a contract concluded with a Tenderer should it be established, at any time, that a tenderer has been restricted with National Treasury by another government institution.

- 11.2 All the stipulations on Transnet's restriction process as laid down in Transnet's Supply Chain Policy and Procurement Procedures Manual (CPM included) are included herein by way of reference. Below follows a condensed summary of this restriction procedure.
- 11.3 On completion of the restriction procedure, Transnet will submit the restricted entity's details (including the identity number of the individuals and registration number of the entity) to National Treasury for placement on National Treasury's Database of Restricted Suppliers for the specified period of exclusion. National Treasury will make the final decision on whether to restrict an entity from doing business with any organ of state for a period not exceeding 10 years and place the entity concerned on the Database of Restricted Suppliers published on its official website.
- 11.4 The decision to restrict is based on one of the grounds for restriction. The standard of proof to commence the restriction process is whether a "*prima facie*" (i.e., on the face of it) case has been established.
- 11.5 Depending on the seriousness of the misconduct and the strategic importance of the Goods/Services, in addition to restricting a company/person from future business, Transnet may decide to terminate some or all existing contracts with the company/person as well.
- 11.6 A Service Provider or Contractor to Transnet may not subcontract any portion of the contract to a blacklisted company.
- 11.7 Grounds for blacklisting include: If any person/Enterprise which has submitted a Tender, concluded a contract, or, in the capacity of agent or subcontractor, has been associated with such Tender or contract:
 - a) Has, in bad faith, withdrawn such Tender after the advertised closing date and time for the receipt of Tenders;
 - b) has, after being notified of the acceptance of his Tender, failed or refused to sign a contract when called upon to do so in terms of any condition forming part of the Tender documents;

- c) has carried out any contract resulting from such Tender in an unsatisfactory manner or has breached any condition of the contract;
 - d) has offered, promised or given a bribe in relation to the obtaining or execution of the contract;
 - e) has acted in a fraudulent or improper manner or in bad faith towards Transnet or any Government Department or towards any public body, Enterprise or person;
 - f) has made any incorrect statement in a certificate or other communication with regard to the Local Content of his Goods or his B-BBEE status and is unable to prove to the satisfaction of Transnet that:
 - (i) he made the statement in good faith honestly believing it to be correct; and
 - (ii) before making such statement, he took all reasonable steps to satisfy himself of its correctness;
 - g) caused Transnet damage, or to incur costs in order to meet the contractor's requirements and which could not be recovered from the contractor;
 - h) has litigated against Transnet in bad faith.
- 11.8 Grounds for blacklisting include a company/person recorded as being a company or person prohibited from doing business with the public sector on National Treasury's database of Restricted Service Providers or Register of Tender Defaulters.
- 11.9 Companies associated with the person/s guilty of misconduct (i.e., entities owned, controlled or managed by such persons), any companies subsequently formed by the person(s) guilty of the misconduct and/or an existing company where such person(s) acquires a controlling stake may be considered for blacklisting. The decision to extend the blacklist to associated companies will be at the sole discretion of Transnet.

12 PREVIOUS TRANSGRESSIONS

- 12.1 The Tenderer/Service Provider/Contractor hereby declares that no previous transgressions resulting in a serious breach of any law, including but not limited to, corruption, fraud, theft, extortion and contraventions of the Competition Act 89 of 1998, which occurred in the last 5 (five) years with any other public sector undertaking, government department or private sector company that could

justify its exclusion from its registration on the Tenderer's/Service Provider's/Contractor's database or any tendering process.

12.2 If it is found to be that the Tenderer/Service Provider/Contractor made an incorrect statement on this subject, the Tenderer/Service Provider/Contractor can be rejected from the registration process or removed from the Tenderer/Service Provider/Contractor database, if already registered, for such reason (refer to the Breach of Law Returnable Form contained in the document.)

13 SANCTIONS FOR VIOLATIONS

13.1 Transnet shall also take all or any one of the following actions, wherever required to:

- a) Immediately exclude the Tenderer/Service Provider/Contractor from the tendering process or call off the pre-contract negotiations without giving any compensation to the Tenderer/Service Provider/Contractor. However, the proceedings with the other Tenderer/Service Provider/Contractor may continue;
- b) Immediately cancel the contract, if already awarded or signed, without giving any compensation to the Tenderer/Service Provider/Contractor;
- c) Recover all sums already paid by Transnet;
- d) Encash the advance bank guarantee and performance bond or warranty bond, if furnished by the Tenderer/Service Provider/Contractor, in order to recover the payments, already made by Transnet, along with interest;
- e) Cancel all or any other contracts with the Tenderer/Service Provider/Contractor; and
- f) Exclude the Tenderer/Service Provider/Contractor from entering into any Tender with Transnet in future.

14 CONFLICTS OF INTEREST

14.1 A conflict of interest includes, inter alia, a situation in which:

- a) A Transnet employee has a personal financial interest in a tendering / supplying entity; and
- b) A Transnet employee has private interests or personal considerations or has an affiliation or a relationship which affects, or may affect, or may be perceived to affect his / her judgment in action in the best interest of Transnet or could affect

the employee's motivations for acting in a particular manner, or which could result in, or be perceived as favouritism or nepotism.

14.2 A Transnet employee uses his / her position, or privileges or information obtained while acting in the capacity as an employee for:

- a) Private gain or advancement; or
- b) The expectation of private gain, or advancement, or any other advantage accruing to the employee must be declared in a prescribed form.

Thus, conflicts of interest of any Tender committee member or any person involved in the sourcing process must be declared in a prescribed form.

14.3 If a Tenderer/Service Provider/Contractor has or becomes aware of a conflict of interest i.e., a family, business and / or social relationship between its owner(s)/ member(s)/director(s)/partner(s)/shareholder(s) and a Transnet employee/ member of Transnet's Board of Directors in respect of a Tender which will be considered for the Tender process, the Tenderer/Service Provider/ Contractor:

- a) must disclose the interest and its general nature, in the Request for Proposal ("RFX") declaration form; or
- b) must notify Transnet immediately in writing once the circumstances have arisen.

14.4 The Tenderer/Service Provider/Contractor shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any committee member or any person involved in the sourcing process, where this is done, Transnet shall be entitled forthwith to rescind the contract and all other contracts with the Tenderer/Service Provider/Contractor.

15 DISPUTE RESOLUTION

15.1 Transnet recognises that trust and good faith are pivotal to its relationship with its Tenderer / Service Provider / Contractor. When a dispute arises between Transnet and its Tenderer / Service Provider / Contractor, the parties should use their best endeavours to resolve the dispute in an amicable manner, whenever possible. Litigation in bad faith negates the principles of trust and good faith on which commercial relationships are based. Accordingly, following a blacklisting process as mentioned in paragraph 11 above, Transnet will not do business with a company that litigates against it in bad faith or is involved in any action that reflects bad faith on its part. Litigation in bad faith includes, but is not limited to the following instances:

- a) **Vexatious proceedings:** these are frivolous proceedings which have been instituted without proper grounds;
- b) **Perjury:** where a Tenderer / Service Provider / Contractor make a false statement either in giving evidence or on an affidavit;
- c) **Scurrilous allegations:** where a Tenderer / Service Provider / Contractor makes allegations regarding a senior Transnet employee which are without proper foundation, scandalous, abusive or defamatory; and
- d) **Abuse of court process:** when a Tenderer / Service Provider / Contractor abuses the court process in order to gain a competitive advantage during a Tender process.

16 GENERAL

- 16.1 This Integrity Pact is governed by and interpreted in accordance with the laws of the Republic of South Africa.
- 16.2 The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the law relating to any civil or criminal proceedings.
- 16.3 The validity of this Integrity Pact shall cover all the tendering processes and will be valid for an indefinite period unless cancelled by either Party.
- 16.4 Should one or several provisions of this Integrity Pact turn out to be invalid the remainder of this Integrity Pact remains valid.
- 16.5 Should a Tenderer/Service Provider/Contractor be confronted with dishonest, fraudulent or corruptive behaviour of one or more Transnet employees, Transnet expects its Tenderer/Service Provider/Contractor to report this behaviour directly to a senior Transnet official/employee or alternatively by using Transnet's "Tip-Off Anonymous" hotline number 0800 003 056, whereby your confidentiality is guaranteed.

The Parties hereby declare that each of them has read and understood the clauses of this Integrity Pact and shall abide by it. To the best of the Parties' knowledge and belief, the information provided in this Integrity Pact is true and correct.

TCC/2023/05/0001/28813/RFP

I duly authorised by the tendering entity, hereby certify that the tendering entity are **fully acquainted** with the contents of the Integrity Pact and further **agree to abide by it** in full.

Signature

Date

FORM B12: SUPPLIER CODE OF CONDUCT

Transnet SOC Limited aims to achieve the best value for money when buying or selling goods and obtaining services. This however must be done in an open and fair manner that supports and drives a competitive economy. Underpinning our process are several acts and policies that any supplier dealing with Transnet must understand and support. These are:

- The Transnet Procurement Policy – A guide for Tenderers.
- Section 217 of the Constitution - the five pillars of Public PSCM (Procurement and Supply Chain Management): fair, equitable, transparent, competitive and cost effective;
- The Public Finance Management Act (PFMA);
- The Broad Based Black Economic Empowerment Act (BBBEE)
- The Prevention and Combating of Corrupt Activities Act (PRECCA); and
- The Construction Industry Development Board Act (CIDB Act).

This code of conduct has been included in this contract to formally appraise Transnet Suppliers of Transnet's expectations regarding behaviour and conduct of its Suppliers.

Prohibition of Bribes, Kickbacks, Unlawful Payments, and Other Corrupt Practices

Transnet is in the process of transforming itself into a self-sustaining State Owned Enterprise, actively competing in the logistics industry. Our aim is to become a world class, profitable, logistics organisation. As such, our transformation is focused on adopting a performance culture and to adopt behaviours that will enable this transformation.

1. Transnet SOC Limited will not participate in corrupt practices. Therefore, it expects its suppliers to act in a similar manner.

- Transnet and its employees will follow the laws of this country and keep accurate business records that reflect actual transactions with, and payments to, our suppliers.
- Employees must not accept or request money or anything of value, directly or indirectly, from suppliers.
- Employees may not receive anything that is calculated to:
 - Illegally influence their judgement or conduct or to ensure the desired outcome of a sourcing activity;
 - Win or retain business or to influence any act or decision of any person involved in sourcing decisions; or

- Gain an improper advantage.
 - There may be times when a supplier is confronted with fraudulent or corrupt behaviour of Transnet employees. We expect our Suppliers to use our “Tip-offs Anonymous” Hot line to report these acts. (0800 003 056).
- 2. *Transnet SOC Limited is firmly committed to the ideas of free and competitive enterprise.***
- Suppliers are expected to comply with all applicable laws and regulations regarding fair competition and antitrust practices.
 - Transnet does not engage with non-value adding agents or representatives solely for the purpose of increasing BBBEE spend (fronting).
- 3. *Transnet’s relationship with suppliers requires us to clearly define requirements, to exchange information and share mutual benefits.***
- Generally, suppliers have their own business standards and regulations. Although Transnet cannot control the actions of our suppliers, we will not tolerate any illegal activities. These include, but are not limited to:
 - Misrepresentation of their product (origin of manufacture, specifications, intellectual property rights, etc);
 - Collusion;
 - Failure to disclose accurate information required during the sourcing activity (ownership, financial situation, BBBEE status, etc.);
 - Corrupt activities listed above; and
 - Harassment, intimidation or other aggressive actions towards Transnet employees.
 - Suppliers must be evaluated and approved before any materials, components, products or services are purchased from them. Rigorous due diligence is conducted and the supplier is expected to participate in an honest and straight forward manner.
 - Suppliers must record and report facts accurately, honestly and objectively. Financial records must be accurate in all material respects.

Conflicts of Interest

A conflict of interest arises when personal interests or activities influence (or appear to influence) the ability to act in the best interests of Transnet SOC Limited.

- Doing business with family members.
- Having a financial interest in another company in our industry

Where possible, contracts will be negotiated to include the above in the terms of such contracts. To the extent such terms are not included in contractual obligations and any of the above code is breached, then Transnet reserves its right to review doing business with these suppliers.

I, _____ of _____
(insert name of Director or as per Authority Resolution from Board of Directors) *(insert name of Company)*

hereby acknowledge having read, understood and agree to the terms and conditions set out in the "Transnet Supplier Code of Conduct."

Signed this on day _____ at _____

 Signature

FORM B13: DOMESTIC PROMINENT INFLUENTIAL PERSONS (DPIP) OR FOREIGN PROMINENT PUBLIC OFFICIALS (FPPO)

Transnet is free to procure the services of any person within or outside the Republic of South Africa in accordance with applicable legislation. Transnet shall not conduct or conclude business transactions, with any Respondents without having:

- Considered relevant governance protocols;
- Determined the DPIP or FPPO status of that counterparty; and
- Conducted a risk assessment and due diligence to assess the potential risks that may be posed by the business relationship.

As per the Transnet Domestic Prominent Influential Persons (DPIP) and Foreign Prominent Public Officials (FPPO) and Related Individuals Policy available on Transnet website <https://www.transnet.net/search/pages/results.aspx?k=FPIDP#k=DPIP>, Respondents are required to disclose any commercial relationship with a DPIP or FPPO (as defined in the Policy) by completing the following section:

The below form contains personal information as defined in the Protection of Personal Information Act, 2013 (the "Act"). By completing the form, the signatory consents to the processing of her/his personal information in accordance with the requirements of the Act. Consent cannot unreasonably be withheld.

Is the Respondent
(Complete with a "Yes" or "No")

A DPIP/FPPO		Closely Related to a DPIP/FPPO		Closely Associated to a DPIP / FPPO	
--------------------	--	---------------------------------------	--	--	--

List all known business interests, in which a DPIP/FPPO may have a direct/indirect interest or significant participation or involvement.

No	Name of Entity / Business	Role in the entity / Business (Nature of interest / Participation)	Shareholding %	Registration Number	Status (Mark the applicable option with an X)	
					Active	Non-Active
1						
2						
3						

Respondents declaring a commercial relationship with a DPIP or FPPO are to note that Transnet is required to annually publish on its website a list of all business contracts entered with DPIP or FPPO. This list will include successful Respondents, if applicable.

2. SERVICE LEVELS

- 2.1 Transnet reserves the right to request that any member of the Service provider's team involved on the Transnet account be replaced if deemed not to be adding value for Transnet.
- 2.2 The Service provider guarantees that it will achieve a 95% [ninety-five per cent] service level on the following measures:
- a) Random checks on compliance with quality/quantity/specifications
 - b) On-time delivery
- 2.3 The Service provider must provide a telephone number for customer service calls.
- 2.4 Failure of the Service provider to comply with stated service level requirements will give Transnet the right to cancel the contract in whole, without penalty to Transnet, giving 30 [thirty] calendar days' notice to the Service provider of its intention to do so.

Acceptance of Service Levels:

YES		NO	
-----	--	----	--

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM B13: JOB-CREATION SCHEDULE

The Government has identified State Owned Enterprises sourcing activities as a key enabler to achieve the National Development Plan (NDP) objective of reducing unemployment from the current baseline of 28% to 6%.

In order to give effect to these job creation objectives, Tenderers are required to provide the following undertaking of new jobs that will be created (either by them or by their subcontractors) should they be awarded this tender.

Tenderers to note, that if successful, any deviations from the Job creation Schedule in the contract phase will be subject to acceptance by the *Project Manager* in terms of the Conditions of Contract. Please also note the applicable Z clauses in Contract Data by *Employer*.

(a) Please indicate total number of new jobs that will be created over the term of the contract:

Total number and value of new jobs created	Total number of new jobs	Total rand value of new jobs created

(b) Of the total number of new jobs created, please indicate the number and value of new jobs to be created for the following designated groups:

	Total number of new jobs	Total rand value of new jobs
Black men		
Black women		
Black Youth		
Black people living in rural or underdeveloped areas or townships		
Black People with Disabilities		

- (c) Of the total number of new jobs created, please indicate the number of skilled, semi-skilled and unskilled new jobs that will be created over the term of the contract:

	Total number of Skilled jobs	Total number of Semi-skilled jobs	Total number of Unskilled jobs
Black men			
Black women			
Black Youth			
Black people living in rural or underdeveloped areas or townships			
Black People with Disabilities			
Other			

- (d) Please indicate the number of new jobs to be created, broken down per quarter over the term of the contract.

Year 1	Q1	Q2	Q3	Q4
Total number of new jobs				
Number of new jobs for Black men				
Number of new jobs for black women				
Number of new jobs for black youth				
Number of new jobs for black people living in rural or underdeveloped areas or townships				
Number of new jobs for black People with Disabilities				
Number of new jobs for other categories				
Number of new skilled jobs				
Number of new semi-skilled jobs				
Number of new unskilled jobs				

Year 2	Q1	Q2	Q3	Q4
Total number of new jobs				
Number of new jobs for Black men				
Number of new jobs for black women				
Number of new jobs for black youth				
Number of new jobs for black people living in rural or underdeveloped areas or townships				
Number of new jobs for black People with Disabilities				
Number of new jobs for other categories				
Number of new skilled jobs				
Number of new semi-skilled jobs				
Number of new unskilled jobs				

Year 3	Q1	Q2	Q3	Q4
Total number of new jobs				
Number of new jobs for Black men				
Number of new jobs for black women				
Number of new jobs for black youth				
Number of new jobs for black people living in rural or underdeveloped areas or townships				
Number of new jobs for black People with Disabilities				
Number of new jobs for other categories				
Number of new skilled jobs				
Number of new semi-skilled jobs				
Number of new unskilled jobs				

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

TCC/2023/05/0001/28813/RFP

**FORM C1: PROOF OF REGISTRATION FOR CONTRACTOR'S WCA
REGISTRATION**

This is to certify that:

The Tenderer is registered and is in good standing with the Workmen's Compensation Fund as approved by the Department of Labour, in terms of section 80 of the Compensation for Injury and Disease Act (COID) (Act 130 of 1993)

Please attach proof of registration

For Joint Venture or Patnership, Attach Letter of good standing for all JV Members

FORM C2: DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS

This Standard Bidding Document (SBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, Tenderers must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2017, the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 (Edition 1) and the Guidance on the Calculation of Local Content together with the Local Content Declaration Templates [Annex C (Local Content Declaration: Summary Schedule), D (Imported Content Declaration: Supporting Schedule to Annex C) and E (Local Content Declaration: Supporting Schedule to Annex C)].

1. General Conditions

- 1.1. Preferential Procurement Regulations, 2017 (Regulation 8) makes provision for the promotion of local production and content.
- 1.2. Regulation 8.(2) prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.
- 1.3. In terms of Regulation 16(2) of the Preferential Procurement Regulations, 2017, any sector designated and minimum threshold determined for local production and content for purposes of regulation 9 of the 2011 Regulations and in force immediately before the repeal of the 2011 Regulations, are regarded as having been done under regulation 8(1) of the 2017 Regulations.
- 1.4. Where necessary, for bids referred to in paragraph 1.2 above, a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.
- 1.5. A person awarded a contract in relation to a designated sector, may not sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.
- 1.6. The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 2011 as follows:

$$LC = [1 - x / y] * 100$$

Where

- x is the imported content in Rand
y is the bid price in Rand excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by South African Reserve Bank (SARB) at 12:00 on the date of advertisement of the bid as indicated in paragraph 4.1 below.

The SABS approved technical specification number SATS 1286:2011 is accessible on http://www.thedti.gov.za/industrial_development/ip.jsp at no cost.

- 1.7. A bid will be disqualified if this Declaration Certificate and the Annex C (Local Content Declaration: Summary Schedule) are not submitted as part of the bid documentation;

2. The stipulated minimum threshold(s) for local production and content (refer to Annex A of SATS 1286:2011) for this bid is/are as follows:

<u>Description of services, works or goods threshold</u>	<u>Stipulated minimum</u>
Steel products and components for construction	100%
Rail Perway (Track) Infrastructure	90%
Cement	100%
Rail Signalling System	65%

4. Does any portion of the services, works or goods offered have any imported content?
(Tick applicable box)

YES		NO	
-----	--	----	--

- 4.1 If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.5 of the general conditions must be the rate(s) published by SARB for the specific currency at 12:00 on the date of advertisement of the bid.

The relevant rates of exchange information is accessible on www.reservebank.co.za

Indicate the rate(s) of exchange against the appropriate currency in the table below (refer to Annex A of SATS 1286:2011):

Currency	Rates of exchange
US Dollar	
Pound Sterling	
Euro	
Yen	
Other	

NB: Tenderers must submit proof of the SARB rate (s) of exchange used.

5. Where, after the award of a bid, challenges are experienced in meeting the stipulated minimum threshold for local content the dti must be informed accordingly in order for the dti to verify and in consultation with the AO/AA provide directives in this regard.

**LOCAL CONTENT
DECLARATION (REFER TO
ANNEX B OF SATS 1286:2011)**

LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CLOSE CORPORATION, PARTNERSHIP OR INDIVIDUAL)

IN RESPECT OF BID NO. TCC/2023/05/0001/28813/RFP ISSUED BY:

TRANSNET

- The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the Tenderer.
- Guidance on the Calculation of Local Content together with Local Content Declaration Templates (Annex C, D and E) is accessible on <http://www.thdti.gov.za/industrialdevelopment/ip.jsp>. Tenderer should first complete Declaration D. After completing Declaration D, Tenderer should complete Declaration E and then consolidate the information on Declaration C. **Declaration C should be submitted with the bid documentation at the closing date and time of the bid in order to substantiate**

the declaration made in paragraph (c) below. Declarations D and E should be kept by the Tenderer/Tenderers for verification purposes for a period of at least 5 years. The successful Tenderer/Tenderer is required to continuously update Declarations C, D and E with the actual values for the duration of the contract.

I, the undersigned, (full names), do hereby declare, in my capacity as of (name of Tenderer entity), the following:

- (a) The facts contained herein are within my own personal knowledge.
- (b) I have satisfied myself that:
 - (i) the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286:2011; and
- (c) The local content percentage (%) indicated below has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E which has been consolidated in Declaration C:

Steel products and components for construction

Bid price, excluding VAT (y)	R
Imported content (x), as calculated in terms of SATS 1286:2011	R
Stipulated minimum threshold for local content (paragraph 3 above)	
Local content %, as calculated in terms of SATS 1286:2011	

Rail Perway (Track) Infrastructure

Bid price, excluding VAT (y)	R
Imported content (x), as calculated in terms of SATS 1286:2011	R
Stipulated minimum threshold for local content (paragraph 3 above)	
Local content %, as calculated in terms of SATS 1286:2011	

Cement

Bid price, excluding VAT (y)	R
Imported content (x), as calculated in terms of SATS 1286:2011	R
Stipulated minimum threshold for local content (paragraph 3 above)	
Local content %, as calculated in terms of SATS 1286:2011	

Rail Signalling System

Bid price, excluding VAT (y)	R
Imported content (x), as calculated in terms of SATS 1286:2011	R
Stipulated minimum threshold for local content (paragraph 3 above)	
Local content %, as calculated in terms of SATS 1286:2011	

If the bid is for more than one product, the local content percentages for each product contained in Declaration C shall be used instead of the table above. The local content percentages for each product has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E.

- (d) I accept that the Procurement Authority / Institution has the right to request that the local content be verified in terms of the requirements of SATS 1286:2011.
- (e) I understand that the awarding of the bid is dependent on the accuracy of the information

furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286:2011, may result in the Procurement Authority / Institution imposing any or all of the remedies as provided for in Regulation 14 of the Preferential Procurement Regulations, 2017 promulgated under the Preferential Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____**DATE:** _____**WITNESS No. 1** _____**DATE:** _____**WITNESS No. 2** _____**DATE:** _____

FORM C3: PRO FORMA PERFORMANCE GUARANTEE

It is hereby agreed by the Tenderer that a Performance Guarantee drafted **exactly** as provided in the tender documents will be provided by the Guarantor named below, which is a **bank or insurer registered in South Africa**:

Name of Guarantor
(Bank/Insurer)

Address

The Performance Guarantee shall be provided within **2 (Two)** weeks after the Contract Date defined in the contract unless otherwise agreed to by the parties.

Signed

Name

Capacity

On behalf of (name of tenderer)

Date

Confirmed by Guarantor's Authorised Representative

Signature(s)

Name (print)

Capacity

On behalf of Guarantor
(Bank/insurer)

Date

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM C4: INSURANCE PROVIDED BY THE CONTRATOR

Clause 83.1 in NEC3 Term Service Contract (June 2005)(amended June 2006 and April 2013) requires that the *Contractor* provides the insurance stated in the insurance table except any insurance which the *Employer* is to provide as stated in the Contract Data.

Please provide the following details for insurance which the *Contractor* is still to provide. Notwithstanding this information all costs related to insurance are deemed included in the tenderer's rates and prices

Insurance against (See clause 83.2 of the TSC)	Name of Insurance Company	Cover	Premium
Liability for death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract			
Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R 5 000 000			
Insurance in respect of loss of or damage to own property and equipment.			
(Other)			

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM C5: RISK MANAGEMENT [ASSESSMENT SCHEDULE]

Tenderers to identify and evaluate the potential risk elements associated with the Works and possible mitigation thereof. The risk elements and the mitigation as identified thereof by the Tenderer are to be submitted.

If No Risks are identified "No Risks" must be stated on this schedule.

Tenderers are also to evaluate any risk/s stated by the Employer in Contract Data Part C1 and provide possible mitigation thereof.

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

FORM C6: PROPOSED AMENDMENTS AND QUALIFICATIONS

The Tenderer should record any deviations or qualifications he may wish to make to the tender documents in this Returnable Schedule. Alternatively, a tenderer may state such deviations and qualifications in a covering letter to his tender and reference such letter in this schedule.

The Tenderer's attention is drawn to clause F.3.8 of the Standard Conditions of Tender referenced in the Tender Data regarding the employer's handling of material deviations and qualifications.

Page	Clause or item	Proposal

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

THE CONTRACT

Part C1: Agreement and Contract Data

C1.1 Form of Offer and Acceptance

C1.2 Contract Data (Part 1 & 2)

C1.3 Form of Guarantee

C1.1 Form of Offer

Offer

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of:

TURNKEY EPC - ENGINEERING, DESIGN, PROCUREMENT, CONSTRUCTION, COMMISSIONING AND CLOSE OUT OF PROJECT UKUVUSELELA AUTOMOTIVE PROJECT: GAUTENG – EASTERN CAPE HIGH-CAPACITY RAIL CORRIDOR FOR AUTOMOTIVE VOLUMES FROM PRETORIA TO THE PORT OF PORT ELIZABETH (GQEBERHA)

The tenderer, identified in the Offer signature block, has examined the documents listed in the Tender Data and addenda thereto as listed in the Returnable Schedules, and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance the tenderer offers to perform all of the obligations and liabilities of the *Contractor* under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the *conditions of contract* identified in the Contract Data.

The *currency of this contract* is the South African Rand.

The offered total of the Prices exclusive of VAT is	R
Value Added Tax @ 15% is	R
The offered total of the Prices inclusive of VAT is	R
(in words)	

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This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, whereupon the tenderer becomes the party named as the *Contractor* in the *conditions of contract* identified in the Contract Data.

Signature(s)

Name(s)

Capacity

**For the
tenderer:**

(Insert name and address of
organisation)

Name &
signature of
witness

Date

Tenderer's CIDB registration number:

Acceptance

By signing this part of this Form of Offer and Acceptance, the *Employer* identified below accepts the tenderer's Offer. In consideration thereof, the *Employer* shall pay the *Contractor* the amount due in accordance with the *conditions of contract* identified in the Contract Data. Acceptance of the tenderer's Offer shall form an agreement between the *Employer* and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:

Part C1 Agreements and Contract Data, (which includes this Form of Offer and Acceptance)

Part C2 Pricing Data

Part C3 Scope of Work: Service Information

and drawings and documents (or parts thereof), which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Returnable Schedules as well as any changes to the terms of the Offer agreed by the tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Form of Offer and Acceptance. No amendments to or deviations from said documents are valid unless contained in this Schedule.

The tenderer shall within two weeks of receiving a completed copy of this agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the *conditions of contract* identified in the Contract Data at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any).

Unless the tenderer (now *Contractor*) within five working days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the Parties.

Signature(s)

Name(s)

Capacity

**for the
Employer**

Transnet SOC Ltd

Name &
signature of
witness

*(Insert name and address of
organisation)*

Date

Schedule of Deviations

Note:

1. To be completed by the Employer prior to award of contract. This part of the Offer & Acceptance would not be required if the contract has been developed by negotiation between the Parties and is not the result of a process of competitive tendering.
2. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
3. A tenderer's covering letter must not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid be the subject of agreement reached during the process of Offer and Acceptance, the outcome of such agreement shall be recorded here and the final draft of the contract documents shall be revised to incorporate the effect of it.

No.	Subject	Details
1		
2		
3		
4		
5		
6		
7		

By the duly authorised representatives signing this Schedule of Deviations below, the Employer and the tenderer agree to and accept this Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules, as well as any confirmation, clarification or changes to the terms of the Offer agreed by the tenderer and the Employer during this process of Offer and Acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Form shall have any meaning or effect in the contract between the parties arising from this Agreement.

	For the tenderer:	For the Employer
Signature	_____	_____
Name	_____	_____
Capacity	_____	_____
On behalf of	<i>(Insert name and address of organisation)</i> _____	Transnet SOC Ltd
Name & signature of witness	_____ _____	_____ _____
Date	_____	_____

C1.2 Contract Data (Part 1 & 2)

Part one - Data provided by the *Employer*

Clause	Statement	Data
1	General	
	The <i>conditions of contract</i> are the core clauses and the clauses for main Option	
		A: Priced contract with activity schedule
	dispute resolution Option	W1: Dispute resolution procedure
	and secondary Options	
		X2 Changes in the law
		X7: Delay damages
		X13: Performance Bond
		X16: Retention
		X18: Limitation of liability
		X20: Key performance indicators
		Z: <i>Additional conditions of contract</i>
	of the NEC3 Engineering and Construction Contract June 2005 (amended June 2006 and April 2013)	

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11.2(13)	The <i>works</i> are	TURNKEY EPC - ENGINEERING, DESIGN, PROCUREMENT, CONSTRUCTION, COMMISSIONING AND CLOSE OUT OF PROJECT UKUVUSELELA AUTOMOTIVE PROJECT: GAUTENG – EASTERN CAPE HIGH-CAPACITY RAIL CORRIDOR FOR AUTOMOTIVE VOLUMES FROM PRETORIA TO THE PORT OF PORT ELIZABETH (GQEBERHA)
11.2(14)	The following matters will be included in the Risk Register	See Attached Risk Register
11.2(15)	The <i>boundaries of the site</i> are	As stated in Part C4.1."Description of the Site and it surroundings"
11.2(16)	The Site Information is in	Part C4
11.2(19)	The Works Information is in	Part C3
12.2	The <i>law of the contract</i> is the law of	the Republic of South Africa subject to the jurisdiction of the Courts of South Africa.
13.1	The <i>language of this contract</i> is	English
13.3	The <i>period for reply</i> is	2 weeks
2	The <i>Contractor's</i> main responsibilities	No additional data is required for this section of the <i>conditions of contract</i>.
3	Time	
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	15 Dec 2025
30.1	Access Date	1 Nov 2023
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	2 weeks of the Contract Date.

31.2	The <i>starting date</i> is	1 Nov 2023
32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	2 weeks
4	Testing and Defects	
42.2	The <i>defects date</i> is	52 (fifty two) weeks after Completion of the whole of the <i>works</i>.
43.2	The <i>defect correction period</i> is	2 weeks
5	Payment	
50.1	The <i>assessment interval</i> is monthly on the	25th (twenty fifth) day of each successive month.
51.1	The <i>currency of this contract</i> is the	South African Rand.
51.2	The period within which payments are made is	Payment will be effected on or before the last day of the month following the month during which a valid Tax Invoice and Statement were received.
51.4	The <i>interest rate</i> is	the prime lending rate of Standard Bank of South Africa.
6	Compensation events	
60.1(13)	The <i>weather measurements</i> to be recorded for each calendar month are,	<p>the cumulative rainfall (mm)</p> <p>the number of days with rainfall more than 10 mm</p> <p>the number of days with minimum air temperature less than 0 degrees Celsius</p>

the number of days with snow lying at 08:00
hours South African Time

The place where weather is to be
recorded (on the Site) is:

The *Contractor's* Site establishment area

The *weather data* are the records
of past *weather measurements*
for each calendar month which
were recorded at:

N/A

and which are available from:

**South African Weather Service 012 367 6023
or info3@weathersa.co.za.**

7	Title	No additional data is required for this section of the <i>conditions of contract</i>.
8	Risks and insurance	
80.1	These are additional <i>Employer's</i> risks	None
84.1	The <i>Employer</i> provides these insurances from the Insurance Table	
	1 Insurance against:	Loss of or damage to the <i>works</i>, Plant and Materials is as stated in the Insurance policy for Contract Works/ Public Liability.
	Cover / indemnity:	to the extent as stated in the insurance policy for Contract Works / Public Liability
	The deductibles are:	as stated in the insurance policy for Contract Works / Public Liability

2 Insurance against:	Loss of or damage to property (except the <i>works</i>, Plant and Materials & Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) arising out of or in connection with the performance of the Contract as stated in the insurance policy for Contract Works / Public Liability
Cover / indemnity	Is to the extent as stated in the insurance policy for Contract Works / Public Liability
The deductibles are	as stated in the insurance policy for Contract Works / Public Liability
3 Insurance against:	Loss of or damage to Equipment (Temporary Works only) as stated in the insurance policy for contract Works and Public Liability
Cover / indemnity	Is to the extent as stated in the insurance policy for Contract Works / Public Liability
The deductibles are:	As stated in the insurance policy for Contract Works / Public Liability
4 Insurance against:	Contract Works SASRIA insurance subject to the terms, exceptions and conditions of the SASRIA coupon
Cover / indemnity	Cover / indemnity is to the extent provided by the SASRIA coupon
The deductibles are	Contract Works <ul style="list-style-type: none"> • R500 000 per event (Major Perils, Storm, theft etc.) • R100 000 per event all other losses Liability <ul style="list-style-type: none"> • Hot Works/Spread of Fire/Trespass & Nuisance/Prevention of Access – R10m • All other – R500k

Note:

The deductibles for the insurance as stated above are listed in the document titled "Certificate of Insurance: Transnet (SOC) Limited Principal Controlled Insurance."

"Certificate of Insurance" will be shared with the successful Tenderer

84.1

The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the *Contractor* arising out of and in the course of their employment in connection with this contract for any one event is

The *Contractor* must comply at a minimum with the provisions of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 as amended.

The *Contractor* provides these additional Insurances

- 1 Where the contract requires that the design of any part of the *works* shall be provided by the *Contractor* the *Contractor* shall satisfy the *Employer* that professional indemnity insurance cover in connection therewith has been affected**
- 2 Where the contract involves manufacture, and/or fabrication of Plant & Materials, components or other goods to be incorporated into the *works* at premises other than the site, the *Contractor* shall satisfy the *Employer* that such plant & materials, components or other goods for incorporation in the *works* are adequately insured during manufacture and/or fabrication and transportation to the site.**
- 3 Should the *Employer* have an insurable interest in such items during manufacture, and/or fabrication, such interest shall be noted by endorsement to the *Contractor's* policies of insurance as well as those of any sub-contractor**

4 Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R 5 000 000/R10 000 000.

7 The insurance coverage referred to in 1, 2, 3 and 4 above shall be obtained from an insurer(s) in terms of an insurance policy approved by the *Employer*. The *Contractor* shall arrange with the insurer to submit to the *Project Manager* the original and the duplicate original of the policy or policies of insurance and the receipts for payment of current premiums, together with a certificate from the insurer or insurance broker concerned, confirming that the policy or policies provide the full coverage as required. The original policy will be returned to the *Contractor*.

84.2 The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the works, Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the *Contractor*) caused by activity in connection with this contract for any one event is

Whatever the *Contractor* requires in addition to the amount of insurance taken out by the *Employer* for the same risk.

84.2 The insurance against loss of or damage to the works, Plant and Materials as stated in the insurance policy for contract works and public liability selected from:

Principal Controlled Insurance policy for Contract OR Project Specific Insurance for the contract

9	Termination	There is no additional Contract Data required for this section of the <i>conditions of contract</i> .
10	Data for main Option clause	
B	Priced contract with Bill of Quantities	No additional data is required for this Option.
60.6	The <i>method of measurement</i> is	Activity Schedule
11	Data for Option W1	
W1.1	The <i>Adjudicator</i> is	Both parties will agree as and when a dispute arises. If the parties cannot reach an agreement on the <i>Adjudicator</i> , the Chairman of the Association of Arbitrators will appoint an <i>Adjudicator</i> .
W1.2(3)	The <i>Adjudicator nominating body</i> is: If no <i>Adjudicator nominating body</i> is entered, it is:	The Chairman of the Association of Arbitrators (Southern Africa) the Association of Arbitrators (Southern Africa)
W1.4(2)	The <i>tribunal</i> is:	Arbitration
W1.4(5)	The <i>arbitration procedure</i> is	The Rules for the Conduct of Arbitrations of the Association of Arbitrators (Southern Africa)
	The place where arbitration is to be held is	Johannesburg Gauteng, South Africa

The person or organisation who will choose an arbitrator

- if the Parties cannot agree a choice or
- if the arbitration procedure does not state who selects an arbitrator, is

The Chairman of the Association of Arbitrators (Southern Africa)

12 Data for secondary Option clauses

X1 Price Adjustment for Inflation

X1.1(a) The base date for indices is July 2023

X1.1(c)	<p>The proportions used to calculate the Price Adjustment Factors are</p>
	<p>0.30 Labour (People)</p> <p>The Consumer Price Index (CPI) for "All Items" in Table 1 (Consumer price indices for the total country) of the Statistical Release P0141 "Consumer Price Index – Additional Tables" published by Statistics South Africa. (Link- http://www.statssa.gov.za/?page_id=1854&PPN=P0141)</p>
	<p>0.15 Plant (Equipment)</p> <p>The "Plant and Equipment" index in Table 4 (Mining and construction plant and equipment price index) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South Africa. (Link - http://www.statssa.gov.za/?page_id=1854&PPN=P0151.1)</p>
	<p>0.15 Material (Civil)</p> <p>The "Civil Engineering Material - Total" index in Table 6 (Civil engineering material price indices) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South Africa. (Link – http://www.statssa.gov.za/?page_id=1854&PPN=P0151.1);</p>
	<p>0.36 Material (Electrical)</p> <p>The "Electrical Engineering Material - Total" index in Table 5 (Civil engineering material price indices) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South Africa. (Link – http://www.statssa.gov.za/?page_id=1854&PPN=P0151.1); and</p>

0.03 Material (Mechanical)		The "Mechanical Engineering" index in Table 5 (Mechanical and Electrical Engineering Input Price Indices) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South
0.01 Fuel		The Consumer Price Index (CPI) for "All Items" in Table 1 (Consumer price indices for the total country) of the Statistical Release P0141 "Consumer Price Index – Additional Tables" published by Statistics South Africa. (Link- http://www.statssa.gov.za/?page_id=1854&PPN=P0141)
X2	Changes in the law	No additional data is required for this Option
X7	Delay damages	
X7.1	Delay damages for Completion of the whole of the <i>works</i> are	R200 000,00 Per Day
X13	Performance bond	
X13.1	The amount of the performance bond is	5% of the total of the Prices
X16	Retention	
X16.1	The retention free amount is	Nil
	The retention percentage is	5% on all payments certified.
X18	Limitation of liability	

- X18.1 The *Contractor's* liability to the **The Total of the Prices**
Employer for indirect or
 consequential loss is limited to:
The deductible of the relevant insurance policy
- X18.2 For any one event, the
Contractor's liability to the
Employer for loss of or damage
 to the *Employer's* property is
 limited to:
- X18.3 The *Contractor's* liability for
 Defects due to his design which
 are not listed on the Defects
 Certificate is limited to: **The cost of correcting the Defect**
- X18.4 The *Contractor's* total liability to
 the *Employer* for all matters
 arising under or in connection
 with this contract, other than
 excluded matters, is limited to: **The Total of the Prices**
- The *end of liability date* is
5 years after Completion of the whole of the works
- X18.5

Z ***Additional conditions of contract***

The *additional conditions of contract* are:

Z1	Additional clause relating to	
Z1.1	Subcontracting	It will be a material term of this contract that the <i>Contractor</i> must subcontract a minimum of 30% of the value of the contract to EME or QSE that is 100% Black owned
Z1.2		The <i>Contractor's</i> Subcontracting percentage as detailed in the tender submission Returnable Form A16 will constitute a binding agreement throughout the duration of the contract until Completion, if not, it will be deemed that the <i>Contractor</i> has failed in full to meet the material term of the contract, which may constitute a reason for termination
Z1.3		<p>The <i>Contractor</i> shall report to the <i>Employer</i> on a Bi weekly basis during the term of the Contract, the amounts spent on each sub-contractor.</p> <p>Insert addition to Clause 26.2. The <i>Contractor</i> may not replace any sub-contractor without acceptance of the <i>Project Manager</i>. The <i>Project Manager</i> shall before acceptance of a replacement by the <i>Contractor</i> of any sub-contractor as detailed in the tender submission FormA16 obtain representations or input from the initial sub-contractor to make an informed decision as to the proposed replacement</p>
Z1.4		The sub-contracting arrangement/contract remains between the Contractor and sub-contractor.
Z1.5		<p>The <i>Contractor</i> shall provide to the <i>Employer</i>, upon receiving an instruction to do so, any documentation and/or evidence required by the <i>Employer</i>, which in the <i>Employer's</i> opinion would be necessary to verify whether the <i>Contractor</i> has maintained the subcontracting percentage.</p> <p>The <i>Contractor</i> shall provide the said documentation and/or evidence within the period stated in the instruction. The provision of the documentation and/or evidence shall not constitute a compensation event.</p>

Z3 Additional clause relating to Performance Bonds and/or Guarantees

Z3.1

The Performance Guarantee under X13 above shall be an irrevocable, on-demand performance guarantee, to be issued exactly in the form of the Pro Forma documents provided for this purpose under C1.3 (Forms of Securities), in favour of the *Employer* by a financial institution reasonably acceptable to the *Employer*.

Z4 Additional clauses relating to Joint Venture
Z4.1 Insert the additional core clause 27.5

27.5. In the instance that the *Contractor* is a joint venture, the *Contractor* shall provide the *Employer* with a certified copy of its signed joint venture agreement, and in the instance that the joint venture is an 'Incorporated Joint Venture,' the Memorandum of Incorporation, within 4 (four) weeks of the Contract Date.

The Joint Venture agreement shall contain but not be limited to the following:

- **A brief description of the Contract and the Deliverables;**
- **The name, physical address, communications addresses and domicilium citandi et executandi of each of the constituents and of the Joint Venture;**
- **The constituent's interests;**
- **A schedule of the insurance policies, sureties, indemnities and guarantees which must be taken out by the Joint Venture and by the individual constituents;**
- **Details of an internal dispute resolution procedure;**
- **Written confirmation by all of the constituents:**
 - i. **of their joint and several liabilities to the *Employer* to Provide the Works;**
 - ii. **identification of the lead partner in the joint venture**

confirming the authority of the lead partner to bind the joint venture through the *Contractor's* representative;

iii. Identification of the roles and responsibilities of the constituents to provide the Works.

- Financial requirements for the Joint Venture:

iv. the working capital requirements for the Joint Venture and the extent to which and manner whereby this will be provided and/or guaranteed by the constituents from time to time;

v. the names of the auditors and others, if any, who will provide auditing and accounting services to the Joint Venture.

Z4.2

Insert additional core clause 27.6

27.6. The *Contractor* shall not alter its composition or legal status of the Joint Venture without the prior approval of the *Employer*.

Z5 Additional obligations in
respect of Termination

Z5.1

The following will be included under core clause 91.1:

In the second main bullet, after the word 'partnership' add 'joint venture whether incorporate or otherwise (including any constituent of the joint venture)' and

Under the second main bullet, insert the following additional bullets after the last sub-bullet:

- commenced business rescue proceedings (R22)
- repudiated this Contract (R23)

Z5.2

Termination Table

The following will be included under core clause 90.2 Termination Table as follows:

Amend "A reason other than R1 – R21" to "A reason other than R1 – R23"

Z5.3

Amend "R1 – R15 or R18" to "R1 – R15, R18, R22 or R23."

Z7

**Right Reserved by the
Employer to Conduct Vetting
through SSA**

Z7.1

The *Employer* reserves the right to conduct vetting through State Security Agency (SSA) for security clearances of any *Contractor* who has access to National Key Points for the following without limitations:

1. Confidential – this clearance is based on any information which may be used by malicious, opposing or hostile elements to harm the objectives and functions of an organ of state.
2. Secret – clearance is based on any information which may be used by malicious, opposing or hostile elements to disrupt the objectives and functions of an organ of state.
3. Top Secret – this clearance is based on information which may be used by malicious, opposing or hostile elements to neutralise the objectives and functions of an organ of state.

Z8	Additional Clause Relating to Collusion in the Construction Industry	The contract award is made without prejudice to any rights the <i>Employer</i> may have to take appropriate action later with regard to any declared tender rigging including blacklisting.
Z9	Protection of Personal Information Act	The <i>Employer</i> and the <i>Contractor</i> are required to process information obtained for the duration of the Agreement in a manner that is aligned to the Protection of Personal Information Act.

C1.2 Contract Data

Part two - Data provided by the *Contractor*

The tendering *Contractor* is advised to read both the NEC3 Engineering and Construction Contract - June 2005 (with amendments June 2006 and April 2013) and the relevant parts of its Guidance Notes (ECC3-GN) in order to understand the implications of this Data which the tenderer is required to complete. An example of the completed Data is provided on pages 156 to 158 of the ECC3 Guidance Notes.

Completion of the data in full, according to Options chosen, is essential to create a complete contract.

Clause	Statement	Data
10.1	The <i>Contractor</i> is (Name):	
	Address	
	Tel No.	
	Fax No.	
11.2(8)	The <i>direct fee percentage</i> is	%
	The <i>subcontracted fee percentage</i> is	%
11.2(18)	The <i>working areas</i> are the Site and	
24.1	The <i>Contractor's</i> key persons are:	
	1 Name:	
	Job:	
	Responsibilities:	
	Qualifications:	
	Experience:	
	2 Name:	
	Job	
	Responsibilities:	

	Qualifications:	
	Experience:	
		CV's (and further key persons data including CVs) are appended to Tender Schedule entitled .
11.2(14)	The following matters will be included in the Risk Register	
31.1	The programme identified in the Contract Data is	
A	Priced contract with activity schedule	
11.2(20)	The activity schedule is in	
11.2(30)	The tendered total of the Prices is	(in figures) (in words), excluding VAT
	Data for Schedules of Cost Components	<i>Note "SCC" means Schedule of Cost Components starting on page 60 of ECC, and "SSCC" means Shorter Schedule of Cost Components starting on page 63 of ECC.</i>
41 in SSCC	The percentage for people overheads is:	%
21 in SSCC	The published list of Equipment is the last edition of the list published by	
	The percentage for adjustment for Equipment in the published list is	% (state plus or minus)
22 in SSCC	The rates of other Equipment are:	Equipment Size or capacity Rate

61 SSCC	in	The hourly rates for Defined Cost of design outside the Working Areas are	Category of employee	Hourly rate
62 SSCC	in	The percentage for design overheads is	%	
63 SSCC	in	The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:		

Signed: _____

Date: _____

Name: _____

Position: _____

Tenderer: _____

C1.3 Form of Guarantee

Pro forma Performance Guarantee

For use with the NEC3 Term Engineering and Construction - June 2005 (with amendments June 2006 and April 2013)

The *conditions of contract* stated in the Contract Data Part 1 include the following Secondary Option:

Option X13: Performance bond

The pro forma document for this Guarantee is provided here for convenience but is to be treated as part of the *Service Information*.

The organisation providing the Guarantee does so by copying the pro forma document onto its letterhead without any change to the text or format and completing the required details. The completed document is then given to the *Employer* within the time stated in the contract.

The Performance Bond needs to be issued by an institution that are reasonably acceptable to the *Employer*.

Transnet may choose to not to accept an Issuer. Should the issuer not being accepted, the performance bond needs to be replaced by an issuer that are acceptable to Transnet. Issuers need to be verified for acceptance by Transnet before a performance bond is issued.

Pro-forma Performance Bond (for use with Option X13)

(to be reproduced exactly as shown below on the letterhead of the Surety)

Transnet Corporate Centre
138 Eloff Street
Braamfontein
Johannesburg
2000

Date:

Dear Sirs,

Performance Bond for Contract No.

With reference to the above numbered contract made or to be made between

Transnet SOC Limited, Registration No. 1990/000900/30

(the *Employer*) and

{Insert registered name and address of the *Contractor*}

(the *Contractor*), for

{Insert details of the *service* from the Contract Data}

(the *service*).

I/We the undersigned

on behalf of the
Guarantor

of physical address

and duly authorised thereto do hereby bind ourselves as Guarantor and co-principal debtors in solidum for the due and faithful performance of all the terms and conditions of the Contract by the *Contractor*

and for all losses, damages and expenses that may be suffered or incurred by the *Employer* as a result of non-performance of the Contract by the *Contractor*, subject to the following conditions:

1. The terms *Employer*, *Contractor*, *Service Manager*, *service* have the meaning as assigned to them by the *conditions of contract* stated in the Contract Data for the aforesaid Contract.
2. We renounce all benefits from the legal exceptions "Benefit of Excussion and Division", "No value received" and all other exceptions which might or could be pleaded against the validity of this bond, with the meaning and effect of which exceptions we declare ourselves to be fully acquainted.
3. The *Employer* has the absolute right to arrange his affairs with the *Contractor* in any manner which the *Employer* deems fit and without being advised thereof the Guarantor shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the Guarantor. Without derogating from the foregoing compromise, extension of the service period, indulgence, release or variation of the *Contractor's* obligation shall not affect the validity of this performance bond.
4. This bond will lapse on the earlier of
 - the date that the Guarantor receives a notice from the *Service Manager* stating that the Completion Certificate for the whole of the *service* has been issued, that all amounts due from the *Contractor* as certified in terms of the contract have been received by the *Employer* and that the *Contractor* has fulfilled all his obligations under the Contract, or
 - the date that the Surety issues a replacement Performance Bond for such lesser or higher amount as may be required by the *Service Manager*.
5. Always provided that this bond will not lapse in the event the Guarantor is notified by the *Service Manager*, (before the dates above), of the *Employer's* intention to institute claims and the particulars thereof, in which event this bond shall remain in force until all such claims are paid and settled.
6. The amount of the bond shall be payable to the *Employer* upon the *Employer's* demand and no later than 7 days following the submission to the Guarantor of a certificate signed by the *Service Manager* stating the amount of the *Employer's* losses, damages and expenses incurred as a result of the non-performance aforesaid. The signed certificate shall be deemed to be conclusive proof of the extent of the *Employer's* loss, damage and expense.

7. Our total liability hereunder shall not exceed the sum of:

(say)

R _____

8. This Performance Bond is neither negotiable nor transferable and is governed by the laws of the Republic of South Africa, subject to the jurisdiction of the courts of the Republic of South Africa

Signed at _____ on this _____ day of _____ 201_

Signature(s)

Name(s) (printed)

Position in Guarantor company

Signature of Witness(s)

Name(s) (printed)

Part C2: Pricing Data

C2.1 Pricing Instruction

C2.2 Activity Schedule

C2.1 Pricing Instruction (Option A)

1 THE *CONDITIONS OF CONTRACT*

1.1 How the contract prices work and assesses it for progress payments

Clause 11 in NEC3 Engineering and Construction Contract, June 2005 (ECC) Option A states:

**Identified
and defined
terms**

11

11.2 (20) The Activity Schedule is the *activity schedule* unless later changed in accordance with this contract.

(22) Defined Cost is the cost of the components in the Shorter Schedule of Cost Components whether work is subcontracted or not excluding the cost of preparing quotations for compensation events.

(27) The Price for Work Done to Date is the total of the Prices for

- each group of completed activities and
- each completed activity which is not in a group

A completed activity is one which is without Defects which would either delay or be covered by immediately following work.

(30) The Prices are the lump sums for each of the activities on the Activity Schedule unless later changed in accordance with this contract.

1.2 Measurement and Payment

- 1.2.1 The Activity Schedule provides the basis of all valuations of the Price for Work Done to Date, payments in multiple currencies, price adjustments for inflation and general progress monitoring.
- 1.2.2 The amount due at each assessment date is based on **completed activities and/or milestones** as indicated on the Activity Schedule.
- 1.2.3 The Activity Schedule work breakdown structure provided by the *Contractor* is based on the Activity Schedule provided by the *Employer*. The activities listed by the *Employer* are the minimum activities acceptable and identify the specific activities which are required to achieve Completion. The activity schedule work breakdown structure is compiled to the satisfaction of the *Project Manager* with any additions and/or amendments deemed necessary.
- 1.2.4 The *Contractor's* detailed Activity Schedule summates back to the Activity Schedule provided by the *Employer* and is in sufficient detail to monitor completion of activities related to the Accepted Programme in order that payment of completed activities may be assessed.
- 1.2.5 The short descriptions in the Activity Schedule are for identification purposes only. All work described in the Works Information is deemed included in the activities.
- 1.2.6 The Activity Schedule is integrated with the Prices, Accepted Programme and where required the forecast rate of payment schedule.
- 1.2.7 Activities in multiple currencies are separately identified on both the Activity Schedule and the Accepted Programme for each currency.

- 1.2.8 The tendered total of the prices as stated in the Contract Data is obtained from the Activity Schedule summary. The tendered total of the prices includes for all direct and indirect costs, overheads, profits, risks, liabilities and obligations relative to the Contract.

C2.2 Activity Schedule

The Tenderer details his Activity Schedule below or makes reference to his Activity Schedule and attaches it to this schedule.

The details given below serve as guidelines only and the Tenderer may split or combine the activities to suit his particular methods. Certain activities will extend over the duration of the contract and therefore It is recommend that the tenderer price certain activities per rail loop extension and the yard rail modifications.

C2.2.1 Detailed Feasibility Activity Schedule

Project Ukuvuselela		Costs
This is just a sample and the EPC contractor must detail it to align with the scope and all the other specific studies and analysis required. The Prices are the lump sums for each of the activities on the Activity Schedule unless later changed in accordance with this contract.		
Activity ID	Activity Name	
1	Award Tender: Turnkey EPC	
Engineering Designs		
Surveys		L/sum
2	Identify Works Packages and align to Environmental Scoping	
3	Specify and procure Surveys and Investigations	
4	Contractors undertake surveys and investigations	
5	Survey and Investigation Reporting	
Basic Engineering Designs		L/sum
6	Update operational plans	
7	Port of PE (Gqeberha) traffic management plan	
8	Port of PE (Gqeberha) rail hardstand and traffic management basic engineering design	
9	Basic Engineering Designs HAZID / HAZOP	
10	Civils, hydrology and hydraulic designs	
11	Perway Basic Engineering Designs	
12	EL & P Basic Engineering Designs	
13	OHE Basic Engineering Designs	
14	Signalling Basic Engineering Designs	
15	Rail structures Basic Engineering Designs	
16	Port of PE (Gqeberha) Basic Engineering design	
17	Basic Engineering Designs Review by Consortuim	
18	Basic Engineering Designs drawings and specifications	
19	Basic Engineering Designs construction review	
20	Basic Engineering Designs schedule development workshop	
21	Basic Engineering Designs risk assessment workshop	
22	Basic Engineering Designs bill of quantity	
23	Basic Engineering Designs cost estimate	
Owners Team Review		L/sum
24	Basic Engineering Designs submission	
25	Basic Engineering Designs Review	
ESIA Works		L/sum
26	ESIA Scoping	
27	Public Participation - Round 1	
28	Acceptance of Scoping Report	
29	ESIA Specialist studies and final EIA Report	
30	Public Participation - Round 2	
31	Environmental Descision and issue of EA, WULA	
Contracts, Detail Design and Works		
Enabling Works and Detail Design		L/sum

32	Packaging and Mobilisation	
33	Contractor Preliminary Detailed Design Integrating the ESIA Approval	
34	Contractor Detailed Design	
35	Contractor Detailed Design Owners Team	
36	Contractor Enabling Works Design	
37	Contractor Enabling Works Owners Team	
38	Contractor Enabling Works	
39	Contractor Procure Long Lead Items	
40	Enabling Works Finish	
Yard Works		L/sum
41	Contractor Main Works - Waltloo	
42	Contractor Commissioning - Waltloo	
43	Contractor Main Works - Kaalfontein	
44	Contractor Commissioning - Kaalfontein	
Port of Port Elizabeth(Gqeberha) Works		L/sum
45	Contractor Main Works - Port Yard and Siding	
46	Contractor Commissioning - Port Yard and Siding	
Loop Extension Works and Commissioning		
Contractor Main Works - Bloem-Noupoort Loop Extensions		L/sum
47	Contractor Main Works - Hamilton (Bloem-Noupoort Loop Extensions)	
48	Contractor Main Works - Hertzberg (Bloem-Noupoort Loop Extensions)	
49	Contractor Main Works - Landmeter (Bloem-Noupoort Loop Extensions)	
50	Contractor Main Works - Loftler (Bloem-Noupoort Loop Extensions)	
51	Contractor Main Works - Priors (Bloem-Noupoort Loop Extensions)	
52	Contractor Main Works - Norvalspont (Bloem-Noupoort Loop Extensions)	
53	Contractor Main Works - Colesberg (Bloem-Noupoort Loop Extensions)	
54	Contractor Commissioning - Bloem-Noupoort Loop Extensions	
Contractor Main Works - Noupoort-Gqeberha Loop Extensions		L/sum
55	Contractor Main Works - Carlton (Noupoort-Gqeberha Loop Extensions)	
56	Contractor Main Works - Flonker (Noupoort-Gqeberha Loop Extensions)	
57	Contractor Main Works - Tafelberg (Noupoort-Gqeberha Loop Extensions)	
58	Contractor Main Works - Visrivier (Noupoort-Gqeberha Loop Extensions)	
59	Contractor Main Works - Marlow (Noupoort-Gqeberha Loop Extensions)	
60	Contractor Main Works - Mortimer (Noupoort-Gqeberha Loop Extensions)	
61	Contractor Main Works - Thorngrove (Noupoort-Gqeberha Loop Extensions)	
62	Contractor Main Works - Saltaire (Noupoort-Gqeberha Loop Extensions)	
63	Contractor Main Works - Alicedale (Noupoort-Gqeberha Loop Extensions)	
64	Contractor Main Works - Coerney (Noupoort-Gqeberha Loop Extensions)	
65	Contractor Commissioning - Noupoort-Gqeberha Loop Extensions	
Closeout and Handover		L/sum
66	Project Closeout and Handover	
Close out Milestone		L/sum
67	Project Closeout	

Concept	Activity Description
HEALTH & SAFETY	
	OHS Design Health and safety criteria report and final Baseline HIRA
	Human factors in construction Health and Safety management plan.
	Consider the implications to the design and apply during the HAZOP study
	Health and Safety Management System
	Project OHS Risk Management
	Procurement/Commercial Processes
	Hazardous Area Classification (HAC)
ENVIRONMENT, STAKEHOLDER & COMMUNITY SCOPING AND MANAGEMENT PLAN	
	Baseline Assessment (Natural, Sensory, Socio-Economic, Mapping)

Baseline Assessment by Specialists
Site Visits
Heritage
Heritage Impact Assessments in terms of Section 38 of NHRA
A scoping site assessment will be required at the Ford Precinct
Heritage Impact Assessment for the loops.
Palaeontology
Fossil Chance Find Protocol must be added to the EMPr.
Aquatic
A 32 m regulation area in accordance with the National Environmental Management Act, 1998 (Act No. 107 of 1998) should be assigned for cryptic wetlands and drainage lines;
A 100 m regulation area in accordance with the National Water Act, 1998 (Act No. 36 of 1998) should be assigned to drainage lines; and
A 500 m regulation area in accordance with the National Water Act, 1998 (Act No. 36 of 1998) should be assigned to wetlands.
Construction will be included in the EMPr.
Infield specialist studies.
Biodiversity Maintenance Plan
Geotechnical Studies (Detailed geological investigations inclusive of investigation/interpretative - and design report(s), documentation for the construction/implementation of designs along the proposed rail corridor.
Culverts and Underpasses and Various Structures
Loop Extension
Climatic data
Hydrology
Hydrogeology
Geochemistry
Flora & Fauna
Marine data if required
Social data
Environmental design requirements and criteria finalized and incorporated into project designs (construction drawings, layouts, equipment lists, etc.) and included in EIA reports.
Fourteen of the sites require WUL in terms of section 21 of the NWA.
Fifteen sites fall within sensitive areas (CBAs/PAs) and will require an EA as they trigger Listed Activities in terms of GNR 983 and GNR 985 of the EIA Regulations published in terms of the NEMA.
Five sites may require biodiversity permits as they contain sensitive species (floral and faunal) and are situated in highly sensitive areas (CBAs).
All the loops will require an application for a Phase 1 heritage exemption in terms of section 38 of the NHRA
Kaalfontein and PoPE will require a Phase1 Heritage Impact Assessment
Waltloo will require a scoping heritage assessment
Where the new ground will be disturbed, a palaeontological CFP must be implemented.
GIS Mapping
Stakeholder Mapping & Engagement
Social Risk
Client Review and Approval
Preparation of Draft Environmental Report and PPP documents (Letters, site notices and newspaper advert)
Environmental Design Criteria
Environmental Authorisation and Permitting (existing licenses? What extensions and or new?)
Project Screening and sustainability
Client Review
Incorporate Client's Comments
Distribution of Draft Pre-Feasibility Report for Public Review

Final Environmental feasibility Report and PPP documents
Public Meetings
Incorporation of Public Comments and Report Finalisation
Presentation of the Study Findings to the Project Team and Project Close Out
Environment, Stakeholder & Community Scoping and Management Plan
Environmental Authorization
Environmental Authorisation (EA) received prior to construction.
Environmental Management Plans
Plans submitted and approved with Environmental authorization (if required). Specific Record of Decision conditions included in Final EMP.
Water use Licenses
Mining permits for material management
Preparation for submissions. Review schedule for applications and include in project program.
Permits received,. Inclusion of permit conditions into final EMP.
Social Risk
Stakeholder engagement actions.
Sustainable socio-economic development plan.
Resettlement and relocation.
Social KPIs and monitoring and reporting strategy.
Screening and Project Sustainability
Equator Principles Assessment
SUSTAINABLE DEVELOPMENT DESIGN
Project Sustainability Objectives
Project Sustainability Benchmarks
Project Sustainability KPIs
Sustainability Risks and Opportunities Register
Team Sustainability Alignment
Sustainability Design Decisions Register
Sustainability Alternatives Analysis
Sustainability Engineering Design Criteria
Project Footprint
Sustainable Public Procurement (SPP)
CIVILS DESIGN
Conduct the design of temporary and early works
Conduct detailed Topographical survey (for Civil and Rail)
Conduct a constructability assessment
Conduct stormwater drainage designs and hydrology & hydraulics
General Layouts/Site layouts
Conduct Road designs (Layouts/Cross-section/Longitudinal sections/details)
Develop a Logistics Plan - inbound and outbound material, equipment and resources
Identification of detailed land acquisition requirements
Earthworks Detail Design and Specifications
Prepare documentation for the initial RSR processes (falls under Rail PLP requirements below)
Construction Methodology
Stormwater and subsurface drainage (for civil and rail)
Conceptual Designs & Detailed Design/Fabrication Drawings
Dominant Source for Cost Estimate (Materials Take-offs (MTOs) / BOQs) / Bills of Quantities)
Engineering Design Criteria and Design Report (for Civil and Rail)
Construction Phase
Earthworks – Investigations and Testing

Earthworks - Construction Monitoring
Stormwater and sub-surface drainage (for civil and rail)
Fencing
Construction of Temporary and Early works
Construction of Wet Services
Borrow Pits
Construction of Access/Service Roads
RAIL
Service Design
Rail Operational Capacity
Train Dynamics Design and Simulations
OHTE
Power Supply
Signalling
Condition Monitoring
Layouts/Cross-section/Longitudinal sections/details
Site conditions
Survey Hydrological and hydraulics
Engineering Design Criteria and Design Report
Engineering Work Packages
Standard Specifications
Material Specifications
Construction Methodology
Equipment Calculations
Technical bid evaluations
Equipment List
Conceptual Designs & Detailed Design/Fabrication Drawings
Dominant Source for Cost Estimate (Materials Take-offs (MTOs / BOQs) / Bills of Quantities)
Design for safety plan and procedures
Construction
Bulk Earthworks (Cut & Fills)
Installation of Rail Track superstructure (m)
Turnouts
Layerworks (Rail Substructure)
Level Crossings
Construction of stormwater and subsurface drainage
Quality Control
Testing and Commissioning
Rehabilitation
ELECTRICAL
Electrical Design Criteria
Electrical Equipment List
Electrical EWP's
Electrical Standard Specifications
Equipment Data Sheets (Critical / Long Lead Equipment)
Equipment Data Sheets (Non-Critical Equipment)
Equipment Specifications (Critical / Long Lead Equipment)
Equipment Specifications (Non-Critical Equipment)
Technical Bid Evaluations (Critical / Long Lead Equipment)

Technical Bid Evaluations (Non-Critical Equipment)
Electrical Installation Contracts
Electrical Calculations and Studies (Load flow, fault level, etc.)
Single Line Diagrams
Cable Schedules and Overhead Lines
Connected Load List including Motor List
Schematic Diagrams
Termination Diagrams
Electrical Race Way and Cable Tray (Ladder)
Underground
Electrical 3D Model and Layouts
MECHANICAL
Mechanical work plan
Mechanical project specific procedures
Mechanical design criteria
Mechanical deliverables list
Mechanical Engineering Estimates
Mechanical Equipment list
Mechanical Equipment calculations
Equipment data sheets
Materials take offs
Mechanical tie-in list
Reports
PROJECT EXECUTION SYSTEMS
Project Execution Systems (PES) Plan
Project Information and Communications Technology (ICT) Plan
Project Information Quality Management Plan (IQMP)
Project Systems Procedures
Site IT Plan
ICT Disaster Recovery Plan (DRP)
RISK MANAGEMENT
Project Risk & Opportunity Management Plan (RMP) (Systematic process of deciding how to approach, plan, and execute risk management activities)
Project Risk and Opportunity Management Register (Risks typically identified in facilitated workshops)
Cost Risk Analysis (using @Risk software)
Schedule Risk Analysis (using Primavera risk analysis (PRA) software)
Risk Response Actions (Developing options to enhance opportunities and reduce threats to the project's objectives)
Monitoring, Review & Reporting (Follow up on Mitigation Plans - tracks identified risks, monitors residual risks, and identifies new risks)
Project Risk Management Awareness
SCHEDULE MANAGEMENT
Project Master Schedule
Engineering Schedule
Procurement Schedule
Construction Schedule
Commissioning and Start-up Schedule

Tie-in Schedule (Brownfields only)
Quantitative Risk Profiling
Schedule Basis Description
COST ESTIMATES
Capital Cost Estimate
Operating Cost Estimate
Estimate Plan
Estimate Basis
Labour Rate
Productivity
Construction Equipment
Freight
EPCM
Owner's Costs
Temporary Facilities
Balance of Indirect
Escalation
Contingency
FOREX
Taxes
Project Risk
PROCUREMENT & CONTRACT MANAGEMENT
Develop a Procurement Package Plan
CONSTRUCTION MANAGEMENT
Constructability
Modularisation / Pre-Assembly
Construction Work Packages (CWP)
Construction Execution Plan (CEP)
Construction Schedule
Construction Procedures
Site Organization Chart
Construction Indirect
HSEC Management Plan
Industrial Relations
Community Relations
QA / QC Programme
Labour Training Plan
COMMISSIONING PLAN
Commissioning / Start-up Plan
VALUE IMPROVING PROCESSES
Technology Selection
Process Simplification
Process Reliability Modelling
Energy Optimisation
Waste Minimisation
Design-to-Capacity (Fit-for-purpose design)
Sustainable Development
Designing for Safety
Designing for Start-up

Risk Management
Predictive Maintenance
Value Engineering - Project Value Analysis (PVA)
Standardization
Customised Standards and Specifications
Facility Spares
Design Tools
Constructability Reviews
QUALITY MANAGEMENT
Project Objectives
Quality (Execution) Management Plan
Management System and Procedures
Quality Man plan and Resources
Project Review Programme
Project QA / QC Function Performance
Continuous Improvement
Quality Performance Periodic Report
Consultants / Specialists Quality Requirements
Supplier / Contractor Quality Requirements
Compliance with Building Regulations
Establish Quality Requirements and Risks
Budget Man Hours
OPERATIONAL READINESS
OR Business Requirements
OR Human Resource Plan (Inc. Training)
OR Design Influences (Design Effectiveness)
OR Operational Preparedness
OR Executive Planning
OR Assurance
OWNER REQUIREMENTS SPECIFICATION
The development context
Description of the opportunity or challenge
Business Case objectives and benefits
Success factors / evaluation criteria
Health & Safety criteria
Environment, Community and Social criteria
Physical performance criteria: (material types / properties, throughput, operational capacity, operating parameters – hours per day / week / annum, other) – current and future
Constraints: (geographical, physical, technical, existing facilities, operational, community, time budgeted cash flow, other)
Limitations: (e.g., Owner-mandated constraints - "capacity not to exceed"; "maximum height restriction"
Operational readiness considerations: (Owner's vs. project team responsibilities, personnel, training, capital vs. human intensive solutions, IT/systems, business and operational processes, maintenance, logistics, operational performance efficiencies, etc. Refer to OR sheet)
Assumptions
Identified potential solution options and outline scopes of work
Financial criteria
Risks
Sustainable development objectives and benchmarks
Applicable standards and specifications

Order of Magnitude investment expectations
Owner's capital cost estimate expectation
Study budget and basis
Time frame for study execution
Deliverables and formats
Owner's responsibilities: (owner deliverables, participation in project, access to premises, personnel, information, sign-offs/approvals, etc.)
Owner(s) sign off on ORS
SECURITY MANAGEMENT
Security Risk Assessments
Legal Register
Security Threat and Incident Management
Adherence to Security Contract Requirements
Monitoring, Review and Reporting
SURVEY
Conduct survey/site inspections of existing features around the project sites (Port yards and rail), including underground and overland services, power lines, rivers, water courses and wetlands, and all built infrastructure
Comprehensive Tacheometrical, cadastral and sub surface (as required) survey of all key rail infrastructure and all other elements forming the scope of the project.
Conduct Topographical surveys to an appropriate level for a concept requirements.
GEOTECHNICAL
Comprehensive Geotechnical Studies including various field geotechnical investigations, sampling, laboratory testing and analysis, borrow pit identification and licensing, submission of investigation/interpretative - and design report(s) to inform of all structural elements forming the scope of the project.
Documentation for construction/implementation of the Consultant's designs, including, but not limited to, Construction drawings, Detailed Bill of Quantities, Technical Specifications and Works Information/Scope of Works.
RAIL SIMULATIONS
Agree assumptions
Define options for simulation
Agree Simulation Plan
Modelling and train simulation of an alternate routing option, and the impact analysis including multicriteria analysis against the base proposed solution in terms of infrastructure requirements, cost, schedule and scope definition.
Undertake simulation and Impact analysis from Kaalfontein to Waltloo to PoPE
Produce draft simulation report as per the scope of works.
Produce a final detailed simulation report as per the scope of works.
YARD SIMULATIONS (Kaalfontein, Waltloo, PoPE)
Agree assumptions
Define options for simulation
Agree Simulation Plan
Prepare data for Yard Simulations
Set up and run Planned Yard Simulations
Produce draft report of high level findings for Design Team
Client Review of Yard Simulation Report
Produce final Yard Simulation Report
COST ESTIMATES
Workshop with Client on Draft Design (Final Multi Criteria Assessment)
Concept (60% Engineering) including client comments
Construction Schedule (includes procurement package plan)
Impact analysis on Cost, Schedule & scope of Infrastructure
Constructability Review
Land acquisition. Identify, value and feed into report

Update BoQ
Update Cost Estimate
EXECUTION PLANNING
Owner Requirements Specification
Project Execution Plans
Project Set-up
Scope of Rail Yards & Loop Extensions
Capital Projects Services Contract / Commercial Agreement
JV / Alliance Relationships
Business Case
Owner Interfaces
Execution / Contracting Strategies
Quality Plan
Organisational Plan (HR)
Health and Safety Management Plan (Refer to – Health and Safety section)
Environmental and Social Work Plan
Compliance with Statutory Requirements
Engineering Plan
Procurement Plan (Refer to - Procurement section)
Contracting Plan (Refer to - Procurement section)
Labour Studies
Logistics Studies (Refer to - Procurement section)
Construction Plan (Refer to – Construction Management section)
Cost and Schedule Management Plan
Project Controls Plan
Change Management Plan
Communications Plan
Project Close Out Plan
Lessons Learned from Previous Projects
Progress meeting and general admin
Detail Designs / Construction Activity Description
HEALTH AND SAFETY
The EPCM contractor shall source the services of the Construction Health and Safety Agent to assist in the development of the health and safety PLP deliverables.
Health and Safety Management Plan
The health and safety plan shall highlight the Project Manager as the lead for Health and safety on the Project; The H&S Plan shall incorporate H&S Organogram, Roles and responsibilities and the project SHEQ Policy. This plan shall include the project communication plan, project risk management plan, development of relevant standards and safe work procedures
Design for Health and Safety Report
This document shall detail the impact to health and safety by the designs, taking into consideration the implications of Hazop studies to the designs.
Occupational Health Baseline Report
This document shall cover the health risk assessment
Health and Safety Baseline Report
This report shall highlight the project high level hazard identification and risk assessment. This shall include the hazardous area classification (HAC)
Health and Safety Specifications
This document shall be compiled based on the health and safety baseline report.

Health and Safety Legal and Other requirements Register
The register shall identify all applicable H&S legislation, by-laws, standards and other requirements
Schedule of project health and safety cost estimates / budget
ENVIRONMENT, STAKEHOLDER & COMMUNITY SCOPING and MANAGEMENT
The EPCM contractor shall be responsible to for the below deliverables through an EAPASA registered Environmental Specialist for the entire scope of the project. All documents should be reviewed and approved by a TFR Environmental Specialist. All permits and licenses should be done in close consultation with the TFR Environmental Specialist
Environmental Baseline Survey Report
The collection of Climatic data, hydrology, hydrogeology, geochemistry, flora, fauna, marine data, social data on a project site
Environmental Legal and Risk Register
The register shall identify all applicable Environmental legislation, by-laws, standards and any other statutory requirements
Environmental and Social Management Plan/Report
A preliminary screening study that identifies project environmental and social aspects and impacts.
Sustainable Design Report
Preliminary (high level) screening study and identification of project activities, environmental aspects and impacts.
Review and update the Project Execution Plan and Project Design Criteria
Ascertain that the environmental aspects and impacts that would results in environmental design requirements and criteria are factored into the project design and project execution plan.
Application of Project Permits and Licenses
The application process for any identified licenses and permits applicable to the project prior commencement
SUSTAINABLE DEVELOPMENT DESIGN
Project Sustainability Objectives
Project Sustainability Benchmarks
Project Sustainability KPIs
Sustainability Risks and Opportunities Register
Team Sustainability Alignment
Sustainability Design Decisions Register
Sustainability Alternatives Analysis
Sustainability Engineering Design Criteria
Project Footprint
CIVILS
Property Impacts-No further property impacts identified.
Definitive Geotechnical Data
Detailed Topographical Survey (for Civil and Rail)
Foundation design data based on location-specific boreholes for critical structures. All lab tests completed.
Civil Design Criteria (update this element) -All Civil design criteria defined and approved by Owner. Issued for use.
Site Conditions -* Site-specific topographical data with levels ± 0.3 m. * Definitive seismic study * Site-specific climatic data
Digital Terrain Model (to consult RCE and update element)- Topographic data imported from detailed survey.
Seismic Data (stipulate reliable sources)- Definitive seismic study
Hydrology (Flooding) (stipulate reliable sources) i.e. National Roads Standard-Detailed design and documentation completed and issued for construction.
(stipulate reliable source)-Updated models / consultation imported into GIS to identify conflicts, property impacts, land use, etc
Bulk Earthworks / Drainage Design (stormwater drainage report template + calculations) Consult environmental engineering-Completed detailed design and documentation issued for construction.
Detailed Earthworks / Drainage Design- Completed detailed design and documentation issued for construction.
Pavement Design-Completed detailed design and documentation issued for construction.
Standard Specifications e.g. components/items-Specifications approved and issued for construction.
Material Take-offs / Bills of Quantities (What materials needed; quantities)-Quantities and details derived from IFC models

Material Sourcing (Where materials are to be found / sourced; availability; delivery logistics and costs issues) - (Link to SCS) -Action the approved philosophy.
Infrastructure Plans (Road access; utility corridors, sleeves for cables etc)- Issued for construction.
Wet Services - Provisional (Dams; desalination; piping; treatment, effluent, sewer, water supply (domestic & fire) etc) (Updated -) Issued for construction.
People / Material / Traffic Flow (review and update)-Relevant items issued for construction.
Transportation / Storage of Consumables, Products, non-consumables-Relevant items issued for construction.
SIGNALLING
ENGINEERING (Split per station and deliverable/activity listed below)
Design Criteria
Inputs into RSR submissions for design, construction and commissioning phases
Inputs into EMC plan as part of the RSR submissions
Inputs into Enterprise Change Proposal (ECP)
Site survey
Signalling Line Diagrams (lollipop diagrams) for sign-off by Client before developing Line Plans
Train Dynamics Design and Simulations
Signalling Line Plans (Including submission for train dynamics verification by TFR Train Design and resultant updates)
Interface drawings (including but not limited to relevant TFR/PRASA departments/installations, other disciplines, other contractors, as well as interfacing between new and existing technologies)
Concept drawings for new relay rooms (equipment floor layouts) – where needed
Concept drawings for new apparatus rooms (equipment floor layouts)
Block diagrams: (a) Condition Assessment Systems (b) Telecontrol (c) Telecommunications (d) Yard Automation (e) Other
Risk assessment of Signalling Line Plans and Train operating methodology - signed off
Investigation and risk assessment of Level Crossing Protection – signed off
Design report: (a) Colourlight Signalling investigation (b) RTO and TWS investigation (c) Yard automation investigation (d) AC immunisation investigation (e) Power requirements with calculations (f) Equipment space requirements (g) Telecontrol (h) Telecommunications (i). Level Crossing Protection (j) Condition Assessment Systems (j) Other
Tender Packs for Procurement of Plant and Materials, Equipment, Specialised Services and other sub-contracted works (split per work package): (a) Works Information - signed off (b) Train Operating methodology (including train control) - signed off (c) List of Specifications (d) List of drawings (e) Site Information (f) Guideline Activity Schedule (for preferred contract option i.e. Option A) (g) Bill of Quantities (BOQ) for alternative contract option i.e. Option B (h) Updated Design Criteria - signed off (i) Signed off drawings (j) Supplier approved lists

(k) Free-issue Plant and Material list (Free-issue from the perspective of the Subcontractor versus the <i>Contractor</i>)
Inputs into Owner's Requirement Specification (ORS)
CONSTRUCTION (including but not limited to interfacing with relevant TFR/PRASA departments/installations, other disciplines, Employer's engineering team, other contractors, as well as interfacing between new and existing technologies)
Planning (Split per station)
Design (Split per station and component listed below)- Detailed Signed off Installation drawings and Test copies, as well as software data generation <ul style="list-style-type: none"> (a) Cable Plans (b) CTC book of circuits (c) Relay room book of circuits (d) Apparatus room/case Plans (e) Non-illuminated train control diagrams (f) Train diagrams for RTO/TWS sections (g) Data generation for CS90, Axle Counters, Interlocking CPUs/PLCs etc (h) Condition Assessment Systems (i) Telecommunications (j) Telecontrol (k) Level Crossing Protection (l) Other
Supply of Plant and Materials (Split per station) -
Manufacturing (Split per station)
Site Establishment (Split per station) – including Equipment and facilities
Installation (Split per station and component listed below) <ul style="list-style-type: none"> (a) Colourlight Signalling (b) RTO/TWS sections (c) Yard <i>Works</i> (d) CTC centres (e) Condition Assessment Systems (f) Telecommunications (g) Telecontrol (h) Level Crossing Protection (i) Other
Testing and Commissioning (Split per station and component listed below) <ul style="list-style-type: none"> (a) Factory Inspections (b) Factory Acceptance Testing (FAT) (c) Designer inspections (d) Site Inspections (e) Site Acceptance Testing (SAT) (f) Final integration Testing and Commissioning
CLOSE-OUT <ul style="list-style-type: none"> (a) Commissioning certificates (b) Commissioning logs (c) Asset register (d) Interim maintenance copies of design documents (e) Spares list and spare equipment (f) Tool list and special tools (g) Signed off as-built drawings (h) Equipment manuals (O&M, RMM, TRG, User manuals, etc.) (i) System manuals <ul style="list-style-type: none"> • Signalling design principles • Signalling maintenance procedures • Standard circuit designs • Technical procedures (j) Certificate of practical completion

(k) Commissioning work package
(l) Copies of inspection & test records
(m) Certificate of acceptance
(n) Signal test certificates
(o) Other
RAIL
Service Design- Performance criteria finalised and signed off. RSR Application for Permit.
Rail Operational Capacity-Operational capacity finalised, design criteria signed off, performance criteria signed off.
Condition Monitoring-Performance spec issued for detailed engineering, RSR.
Layouts-Layout finalised with "issued for construction" drawings.
Site conditions-Outstanding specific surveys as identified during Feasibility
Survey Hydrological
Engineering Design Criteria- Issued for design
Engineering Work Packages -Checked and approved to issue for use status.
Standard Specifications-Technical recommendation issued for approval for all other packages.
Equipment Calculations-Detailed design completed and issued for tender / construction.
Technical bid evaluations-All equipment identified, technical data final and tagged to appropriate procurement packages and contracts. Vendor data included. Issued design for construction.
Equipment List -Issued for use. Issued to RSR for permit application.
Detailed Design/Fabrication Drawings - Quantities and details derived from IFC drawings
Dominant Source for Cost Estimate
Material Sourcing
Design for safety plan and procedures
STRUCTURES
Conduct Conditional Assessment on existing structures
Foundation Concepts
Structural Concepts
Compliance with Building Regulations (Where relevant)
Standard Specifications and Drawings
Structural Design Criteria
Foundation Detail Design
Corrosion Protection
Geotechnical investigation and report
Structural Detail Design
Structural Modelling
100% Approved for Construction (AFC) Structural Drawings
Architectural Design for Facilities (Depending on the outcome of the conditional assessment)
Bill of Quantities (BOQs)
Rebar Detailing
Construction
Shop Drawings (where applicable)
Build Layerworks for culverts
Build Layerworks for the Bridge
Foundation Construction (Culverts)
Foundation Construction (Bridge, depending on the outcome of the conditional assessment)
Culvert Extension (walls, wingwalls, headwall, scour protection, inlet and outlet slab, etc)
Bridge construction (Pier, abutments, wing walls, deck, handrails and etc depending on the outcome of the conditional assessment)
Facilities construction (depending on the outcome of the conditional assessment)
ELECTRICAL

Electrical (OHTE)
Basic Engineering Design
Detailed Engineering Design
Manufacturing and Factory Acceptance Test
Construction and Installation
Commissioning
Handover & Close out
Electrical (Traction Substations)
Basic Engineering Design
Detailed Engineering Design
Manufacturing and Factory Acceptance Test
Construction and Installation
Commissioning
Handover & Close out
Electrical (EL&P)
Basic Engineering Design
Detailed Engineering Design
Manufacturing and Factory Acceptance Test
Construction and Installation
Commissioning
Handover & Close out
MECHANICAL
Mechanical work plan
Mechanical project specific procedures
Quality Gate Inspection Time frames - manufacturing and construction
Mechanical Standard specifications - Issued for design and manufacturing
Mechanical design criteria - Based on Technical standard, technical requirements and technical specifications.
Mechanical deliverables list
Conceptual Designs - Based on any custom mechanical designed systems.
Mechanical Engineering Estimates
Mechanical Equipment list
Mechanical Equipment Selection and evaluation process conducted.
Mechanical Equipment and custom designed systems - calculations and studies - (Efficiency, FMEA, loading, buckling, etc)
Equipment - Technical specifications and data sheets
Material and Equipment List (BOQ's)
Mechanical tie-in list
3D models of mechanical designed systems - Models to be in .STEP format
Technical 2D drawings - Annotated drawings for all mechanical equipment and designs.
Design for Safety Plan and Procedures
Engineering Change Procedures in place
Reports - Design Reports, Structural Simulations using FEA, Technical Specifications, Datasheets, and Design calculations.
PROJECT EXECUTION SYSTEMS

Project Execution Systems (PES) Plan
Project Information and Communications Technology (ICT) Plan
Project Information Quality Management Plan (IQMP)
Project Systems Procedures
Site IT Plan
ICT Disaster Recovery Plan (DRP)
RISK MANAGEMENT
Project Risk & Opportunity Management Plan (RMP) (Systematic process of deciding how to approach, plan, and execute risk management activities)
Project Risk and Opportunity Management Register (Risks typically identified in facilitated workshops)
Cost Risk Analysis (using @Risk software)
Schedule Risk Analysis (using Primavera risk analysis (PRA) software)
Risk Response Actions (Developing options to enhance opportunities and reduce threats to the project's objectives)
Monitoring, Review & Reporting (Follow up on Mitigation Plans - tracks identified risks, monitors residual risks, and identifies new risks)
Project Risk Management Awareness
SCHEDULE MANAGEMENT
Project Master Schedule
Engineering Schedule
Procurement Schedule
Construction Schedule
Commissioning and Start-up Schedule
Tie-in Schedule (Brownfields only)
Quantitative Risk Profiling
Schedule Basis Description
COST ESTIMATE
Capital Cost Estimate
Operating Cost Estimate
Estimate Plan
Estimate Basis
Labour Rate
Productivity
Construction Equipment
Freight
EPCM
Owner's Costs
Temporary Facilities
Balance of Indirect
Escalation
Contingency
FOREX
Taxes
Project Risk
PROCUREMENT & CONTRACT MANAGEMENT
Develop a Procurement Package Plan

Tender evaluation
CONSTRUCTION MANAGEMENT
Constructability
Modularisation / Pre-Assembly
Construction Work Packages (CWP)
Construction Execution Plan (CEP)
Construction Schedule
Construction Procedures
Site Organization Chart
Construction Indirect
HSEC Management Plan
Industrial Relations
Community Relations
QA / QC Programme
Labour Training Plan
COMMISSIONING PLAN
Commissioning / Start-up Plan
VALUE IMPROVING PROCESSES
Technology Selection
Process Simplification
Process Reliability Modelling
Energy Optimisation
Waste Minimisation
Design-to-Capacity (Fit-for-purpose design)
Sustainable Development
Designing for Safety
Designing for Start-up
Risk Management
Predictive Maintenance
Value Engineering - Project Value Analysis (PVA)
Standardization
Customised Standards and Specifications
Facility Spares
Design Tools
Constructability Reviews
QUALITY MANAGEMENT
Quality (Execution) Management Plan
Project goals, objectives, and expectations and metrics specified in an Owner Requirements Specification, referenced by the PEP, or in the PEP itself.
- Register of Standards and procedures for projects
- Project reviews and audits
- Quality Team QA / QC Roles and Activity
- Project Deliverable QA
-Quality Team QA / QC Roles and Activity
- Project Deliverable QA
- Project Deliverable QC
- NCR Management
Specialist works
- Quality Performance Tracking

Completeness and correctness: endorsed by PQM and PM.
Management System and Procedures
Quality: define and approve structure and format, assess compliance. Other disciplines, create, implement, review and maintain.
Quality Manplan and Resources
Project QA / QC team in place. Resource capacity and competence matches the workload.
Actual vs. Planned performance acceptable.
Completeness and correctness: endorsed by PQM and PM.
OPERATIONAL READINESS
OR Business Requirements
OR Human Resource Plan (Inc. Training)
OR Design Influences (Design Effectiveness)
OR Operational Preparedness
OR Executive Planning
OR Assurance
OWNER REQUIREMENTS SPECIFICATION
The development context
Description of the opportunity or challenge
Success factors / evaluation criteria
Health & Safety criteria
Environment, Community and Social criteria
Physical performance criteria: (material types / properties, throughput, operational capacity, operating parameters – hours per day / week / annum, other) – current and future
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Limitations: (e.g., Owner-mandated constraints - "capacity not to exceed"; "maximum height restriction"
Operational readiness considerations: (Owner's vs. project team responsibilities, personnel, training, capital vs. human intensive solutions, IT/systems, business and operational processes, maintenance, logistics, operational performance efficiencies, etc. Refer to OR sheet)
Assumptions
Identified potential solution options and outline scopes of work
Financial criteria
Risks
Sustainable development objectives and benchmarks
Applicable standards and specifications
Order of Magnitude investment expectations
Owner's capital cost estimate expectation
Study budget and basis
Time frame for study execution
Deliverables and formats
Owner's responsibilities: (owner deliverables, participation in project, access to premises, personnel, information, sign-offs/approvals, etc.)
Owner(s) sign off on ORS
SECURITY MANAGEMENT
Security Risk Assessments
Legal Register
Security Threat and Incident Management
Adherence to Security Contract Requirements
Monitoring, Review and Reporting
EXECUTION PLANNING
Owner Requirements Specification
Project Execution Plans
Project Set-up
Scope of Rail Yards & Loop Extensions

Capital Projects Services Contract / Commercial Agreement
JV/Alliance Relationships
Business Case
Owner Interfaces
Execution/Contracting Strategies
Quality Plan
Organisational Plan (HR)
Health and Safety Management Plan (Refer to – Health and Safety section)
Environmental and Social Work Plan
Compliance with Statutory Requirements
Engineering Plan
Procurement Plan (Refer to - Procurement section)
Contracting Plan (Refer to - Procurement section)
Labour Studies
Logistics Studies (Refer to - Procurement section)
Construction Plan (Refer to – Construction Management section)
Cost and Schedule Management Plan
Project Controls Plan
Change Management Plan
Communications Plan
Project Close Out Plan
Lessons Learned from Previous Projects
Progress meeting and general admin
PROJECT CLOSE
Draft final Project Report
Review final Project Report with client
Lessons Learnt
Revise and address comments
Issue Final Project Report
Hand over Project Data

Cost Estimate Loop Line Extensions at Hamilton						
PART A: CONSTRUCTION						
A.1 PRELIMINARY AND GENERAL						
Item	Description	Unit	Quantity	Rate	Amount	
A.1.1	Fixed Costs	Sum				
A.1.2	Time Related Costs	Month				
	Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS						
					0	
Item	Description	Unit	Quantity	Rate	Amount	
A.2.1	Clear Site	m ²				
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³				
A.2.1.2	b) Cut to fill	m ³				
A.2.1.3	c) Hard excavation to spoil	m ³				
A.2.2	In-situ preparation ;					
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³				
	Import & Compact:					
	150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³				
A.2.2.2						

A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
A.3.1.1	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			

[illegible]

	Tension Length No. 1 Catenary Contact Earth wire Dropper spans Tensioning Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary Splice and tension 107 contact wire Splice and tension 160 catenary wire Splice and tension 150 earth wire Anchors (Double Stay wires) Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715 Anchors (Single Stay wires) Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	metre metre metre No. ea No No No No Each				
	Subtotal Wirework					R -
	Bonding and Earthing Supply & Install Mast to Rail Bonds (Expanded collar or WAM system Supply & Install Switch Structure Bonding (Expanded collar or WAM system) Supply & Install lightning arrestors on cantilever structures Supply and install cross bonds	 Each Each Each Each				
	Subtotal Bonding and Earthing					R -
	MISCELLANEOUS Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12 Switching of 25kV & 6,6kV - Taking work permits & track occupations Supply & Install Height Gauge (Complete) Supply & Install Warning Boards & Signs	 Each rate only Each Each				
	Subtotal for Miscellaneous					R -
	Total: OHTE					R -
Part C SIGNALLING						
Item	Description	Unit	Quantity	Rate	Amount	
	Standard Signal Poles (Multi Aspec CLS)	ea				
	Mechanical 2 or 3 way route indicator	ea				
	Apparatus case - Complete	set				
	Track Circuits & Relays	set				
	Transformers	ea				
	Electrical Points Indicator	ea				
	cabling	R/km				
	SUB-TOTAL: SIGNALLING					
PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						

	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation: (a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			
	1/61.03	Access and drainage: (a) Access	Lump Sum			
1.6	1/61.04	Backfill to excavations utilising: (a) Material from the excavation	m ³			
1.7		(b) Imported material	m ³			
1.8	1/61.05	Fill within a restricted area (extra over item 61.04)	m ³			
1.9		Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³ -km			
1.10	1/61.06	Overbreak in excavation in hard material	m ²			
1.11	1/61.07	Foundation fill consisting of: (a) Rock fill	m ³			
1.12	1/61.08	(d) Mass concrete (Class 15/38)	m ³			
1.13		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
1.14						
		Subtotal: Foundations for Structures				
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide: (a) Class F1 surface finish to: (i) Approach slabs (ii) Abutments (iii) Footings (iv) Wingwalls (b) Class F3 surface finish to: (i) Abutments (ii) Wingwalls (iii) Deck	m ² m ² m ² m ² m ² m ² m ² m ² m ²			
2.1						
2.2						
2.3						
2.4						
2.5						
2.6						
2.7						
	1/62.03	Horizontal formwork to provide: (b) Class F3 surface finish to: (i) Deck	m ²			
2.8						
		Subtotal: Falsework, Formwork and Concrete Finish				
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for: (a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
		Subtotal: Steel Reinforcement for Structures				
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete: (a) Durability Concrete (Class W): (i) Deck (W40/19) (ii) Abutments (W40/19) (iii) Earwalls (W30/19) (b) Normal Concrete (i) Foundations (30/19) (ii) Approach slabs (30/19) (iii) Blinding (15/19) (iv) End Blocks (30/19) (vi) Wingwalls (30/19)	m ³ m ³ m ³ m ³ m ³ m ³ m ³ m ³ m ³			
4.1						
4.2						
4.3						
4.4						
4.5						
4.6						
4.7						
4.8						
	1/B64.07	Curing of concrete: (a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
4.9						
		Subtotal: Concrete for Structures				

5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes:				
		(a) Drainage pipes:				
5.7		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
		(b) Weep holes:				
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures						
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer				
		(a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
Subtotal: Testing Materials and Workmanship						
Total: PART C BRIDGE DECK/EXTENSIONS						
PART E ROADS						
	Reference	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC				
		Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):				
		(a) Traffic accommodation for Road	km			
		Temporary traffic-control facilities:				
		(a) Additional flagmen	man-day			
		(c) Variable message signs (VMS)	No.			
		(d) Amber flicker lights (set of two)	No.			
		Operational Health, Safety and Environmental Officers				
		(a) Operational Health and Safety officer	month			
		(b) Environmental officer	month			
		(c) Transport and equipment for operational health and safety officer	month			
Subtotal: Accommodation of Traffic						
	Section 1700	CLEARING AND GRUBBING				
		Clearing and grubbing:				
		(a) Road	ha			
Subtotal: Clearing and Grubbing						

	Section 2100	DRAINS				
		Clearing and shaping existing open drains	m ³			
		Subtotal: Drains				
	Section 5400	GUARDRAILS				
		Guardrails on timber posts:				
		(a) Galvanized	m			
		Guardrails on steel posts:				
		(a) Galvanized	m			
		End treatments:				
		(f) Terminal section:				
		(i) 19,05 m length	No			
		Reflective plates	No			
		Nailing of gang nail plates on top of timber guardrail posts	No			
		Subtotal: Guardrails				
	Section 5600	ROAD SIGNS				
		Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from:				
		(i) Area not exceeding 2 m ²	m ²			
		(ii) Area exceeding 2 m ² but not 10 m ²	m ²			
		Road sign supports (overhead road sign structures excluded):				
		(b) Timber:				
		(i) 75 mm diameter	m			
		(iii) 150 mm diameter	m			
		Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402	m ³			
		Extra-over item 56.05 for cement-treated soil backfill	m ³			
		Dismantling and storing road signs with a surface area of:				
		(a) Up to 2 m ²	No			
		(b) Exceeding 2 m ² but not 10 m ²	No			
		Danger Plates (Red Class III on white Class III):				
		(a) Type A (1 200 mm x 250 mm) (at bridges)	No			
		(b) Type B (800 mm x 200 mm) (at culverts/guardrails)	No			
		Subtotal: Road Signs				
	Section 5700	ROAD MARKINGS				
		Retro-reflective road-marking paint:				
		(a) White lines (broken or unbroken):				
		(ii) 150 mm wide	km			
		(b) Yellow lines (broken or unbroken):				
		(i) 150 mm wide	km			
		Road studs:				
		(i) Stimsonite C80 or similar	No			
		Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km			
		Subtotal: Road Markings				
	Section 5800	LANDSCAPING AND PLANTING PLANTS				
		Trimming:				
		(a) Machine trimming	m ²			
		(b) Hand trimming	m ²			
		Preparing the areas for grassing:				
		(a) Ripping	ha			
		(b) Scarifying for loosening topsoil	ha			

	<p>(c) Topsoiling within the road reserve, where the following materials are used:</p> <p>(i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance</p> <p>Grassing:</p> <p>(c) Hydro seeding:</p> <p>(i) Providing an approved seed mixture for hydro seeding</p> <p>(iii) Hydro seeding</p>	m ³			
	Subtotal: Landscaping and Planting Plants				
Section 5900	<p>FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS</p> <p>Finishing road and road reserve:</p> <p>(b) Single carriageway roads</p> <p>Treatment of old roads and temporary deviations</p>	km km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	<p>Mass Earthworks</p> <p>Cut and borrow to fill, including free-haul up to 0.5 km.</p> <p>(a) Material in compacted layer thicknesses of 200mm and less:</p> <p>(i) Compacted to 90% of modified AASHTO density</p> <p>(1) Material obtained from cut or borrow</p> <p>(2) Material obtained from commercial sources</p> <p>(iii) Eight roller passes compaction (for mine dump rock)</p> <p>Three roller passes compaction:</p> <p>(a) Vibratory roller</p> <p>Finishing-off cut and fill slopes, medians and interchange areas</p> <p>(b) Fill slopes</p> <p>Extra over item 33.01 for excavating material from the pavements and fills of existing roads:</p> <p>(a) Non-cemented material</p> <p>(b) Cemented material</p> <p>Overhaul</p>	m ³ m ³ m ³ m ² m ² m ³ m ³ m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	<p>Pavement Layers of Gravel Material</p> <p>Pavement layers constructed from gravel obtained from commercial sources (unlimited haul)</p> <p>(a) Gravel selected layer compacted to:</p> <p>(i) 93% of modified AASHTO density</p> <p>(1) 200mm thick, G9 material</p> <p>(2) 200mm thick, G7 material</p> <p>(3) 200mm thick, G6 material</p> <p>(h) Gravel wearing course compacted to:</p> <p>(ii) 95% of modified AASHTO density (150mm thick)</p>	m ³ m ³ m ³ m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	<p>Asphalt base and surfacing</p> <p>Tack coat of 30% stable-grade emulsion</p> <p>Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen)</p> <p>(a) Continuously graded (medium)</p>	litre t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				R -
PART F	SUNDRIES				
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				

PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
SUB-TOTAL: PART F PROFESSIONAL SERVICES					
TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G					
cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees					

Cost Estimate Loop Line Extensions at Hertzberg					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					0
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller) Import & Compact:	m ³			
A.2.2.2	150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				

A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m³			
A.3.3.2	Distribute ballast	m³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			
Subtotal Mast Foundations					
	Steelwork				
	Masts				
	Supply and install 64kNM UC mast-9m (CEE-TMB-67)	Each			
	Supply and install 85kNM UC mast-9m (CEE-TMB-68)	Each			
	CANTILEVERS/SMALL PART STEELWORK				
	Auto Tension Construction				
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres	Each			

	<p>Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres</p> <p>Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.</p> <p>Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)</p> <p>Track Switches</p> <p>Supply & Install 4500A track switch mounted on steel mast at location PS0/07</p> <p>Supply and install section insulator 25kV AC.</p> <p>Mid Point Anchor Structures</p> <p>Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation</p> <p>Supply and install mast numbering boards</p>	Each Each Each Each Each No	0		
	Subtotal Steelwork				
	<p>Wirework</p> <p>Conductors</p> <p>Supply 107mm2 Cu Contact Wire</p> <p>Supply 160mm2 Tiger Wire</p> <p>Supply & Install 150mm2 Al Earth Wire</p> <p>Droppers</p> <p>Supply Droppers Complete 11-16m Span</p> <p>Supply Droppers Complete 17-22m Span</p> <p>Supply Droppers Complete 23-28m Span</p> <p>Supply Droppers Complete 29-34m Span</p> <p>Supply Droppers Complete 35-40m Span</p> <p>Supply Droppers Complete 41-46m Span</p> <p>Supply Droppers Complete 47-52m Span</p> <p>Supply Droppers Complete 53-58m Span</p> <p>Supply Droppers Complete 59-64m Span</p> <p>Supply Droppers Complete 65-70m Span</p> <p>Jumpers</p> <p>Supply & Install Catenary, Contact Jumpers complete with clamps</p> <p>Wiring</p> <p>Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:</p> <p>Tension Length No. 1</p> <p>Catenary</p> <p>Contact</p> <p>Earth wire</p> <p>Dropper spans</p> <p>Tensioning</p> <p>Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary</p> <p>Splice and tension 107 contact wire</p> <p>Splice and tension 160 catenary wire</p> <p>Splice and tension 150 earth wire</p> <p>Anchors (Double Stay wires)</p> <p>Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715</p> <p>Anchors (Single Stay wires)</p> <p>Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715</p>	metre metre metre span span span span span span span span span span span No metre metre metre No. ea No No No No Each			
	Subtotal Wirework				
	Bonding and Earthing				

		Supply & Install Mast to Rail Bonds (Expanded collar or WAM system	Each			
		Supply & Install Switch Structure Bonding (Expanded collar or WAM system)	Each			
		Supply & Install lightning arrestors on cantilever structures	Each			
		Supply and install cross bonds	Each			
	Subtotal Bonding and Earthing					
	MISCELLANEOUS					
		Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12	Each			
		Switching of 25kV & 6,6kV - Taking work permits & track occupations	rate only			
		Supply & Install Height Gauge (Complete)	Each			
		Supply & Install Warning Boards & Signs	Each			
	Subtotal for Miscellaneous					
	Total: OHTE					
Part C SIGNALLING						
	Item	Description	Unit	Quantity	Rate	Amount
		Standard Signal Poles (Multi Aspec CLS)	ea			
		Mechanical 2 or 3 way route indicator	ea			
		Apparatus case - Complete	set			
		Track Circuits & Relays	set			
		Transformers	ea			
		Electrical Points Indicator	ea			
		cabling	R/km			
	SUB-TOTAL: SIGNALLING					
PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m³			
	1/61.03	Access and drainage:				
1.6		(a) Access	Lump Sum			
	1/61.04	Backfill to excavations utilising:				
1.7		(a) Material from the excavation	m³			
1.8		(b) Imported material	m³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m³			
		Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m³-km			
1.10	1/61.06					
1.11	1/61.07	Overbreak in excavation in hard material	m²			
	1/61.08	Foundation fill consisting of:				
1.12		(a) Rock fill	m³			

1.13		(d) Mass concrete (Class 15/38)	m ³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
Subtotal: Foundations for Structures						
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m ²			
2.2		(ii) Abutments	m ²			
2.3		(iii) Footings	m ²			
2.4		(iv) Wingwalls	m ²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m ²			
2.6		(ii) Wingwalls	m ²			
2.7		(iii) Deck	m ²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m ²			
Subtotal: Falsework, Formwork and Concrete Finish						
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
		(a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
Subtotal: Steel Reinforcement for Structures						
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				
4.1		(i) Deck (W40/19)	m ³			
4.2		(ii) Abutments (W40/19)	m ³			
4.3		(iii) Earwalls (W30/19)	m ³			
		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m ³			
4.5		(ii) Approach slabs (30/19)	m ³			
4.6		(iii) Blinding (15/19)	m ³			
4.7		(iv) End Blocks (30/19)	m ³			
4.8		(vi) Wingwalls (30/19)	m ³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes:				
		(a) Drainage pipes:				
5.7		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
		(b) Weep holes:				
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			

		Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures				
6	1/8100 1/B81.02	TESTING MATERIALS AND WORKMANSHIP Other special tests requested by the engineer (a) Additional durability tests where requested by the engineer (i) Tests for water sorptivity (ii) Tests for oxygen permeability (iii) Tests for concrete cover	Prov. Sum Prov. Sum Prov. Sum			
6.1						
6.2						
6.3						
		Subtotal: Testing Materials and Workmanship				
		Total: PART C BRIDGE DECK/EXTENSIONS				
PART E ROADS						
Reference	Description		Unit	Quantity	Rate	Amount
Section 1500	ACCOMMODATION OF TRAFFIC Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition): (a) Traffic accommodation for Road Temporary traffic-control facilities: (a) Additional flagmen (c) Variable message signs (VMS) (d) Amber flicker lights (set of two) Operational Health, Safety and Environmental Officers (a) Operational Health and Safety officer (b) Environmental officer (c) Transport and equipment for operational health and safety officer		km man-day No. No. month month month			
		Subtotal: Accommodation of Traffic				
Section 1700	CLEARING AND GRUBBING Clearing and grubbing: (a) Road		ha			
		Subtotal: Clearing and Grubbing				
Section 2100	DRAINS Clearing and shaping existing open drains		m ³			
		Subtotal: Drains				
Section 5400	GUARDRAILS Guardrails on timber posts: (a) Galvanized Guardrails on steel posts: (a) Galvanized End treatments: (f) Terminal section: (i) 19,05 m length Reflective plates Nailing of gang nail plates on top of timber guardrail posts		m m No No No			
		Subtotal: Guardrails				
Section 5600	ROAD SIGNS Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from:					

	(i) Area not exceeding 2 m ² (ii) Area exceeding 2 m ² but not 10 m ² Road sign supports (overhead road sign structures excluded): (b) Timber: (i) 75 mm diameter (iii) 150 mm diameter Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402 Extra-over item 56.05 for cement-treated soil backfill Dismantling and storing road signs with a surface area of: (a) Up to 2 m ² (b) Exceeding 2 m ² but not 10 m ² Danger Plates (Red Class III on white Class III): (a) Type A (1 200 mm x 250 mm) (at bridges) (b) Type B (800 mm x 200 mm) (at culverts/guardrails)	m ² m ² m m m ³ m ³ No No No No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide (b) Yellow lines (broken or unbroken): (i) 150 mm wide Road studs: (i) Stimsonite C80 or similar Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	 km km No km			
	Subtotal: Road Markings				R -
Section 5800	LANDSCAPING AND PLANTING PLANTS Trimming: (a) Machine trimming (b) Hand trimming Preparing the areas for grassing: (a) Ripping (b) Scarifying for loosening topsoil (c) Topsoiling within the road reserve, where the following materials are used: (i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	 m ² m ² ha ha m ³ kg ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS Finishing road and road reserve: (b) Single carriageway roads Treatment of old roads and temporary deviations	 km km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				R -
Section 3300	Mass Earthworks Cut and borrow to fill, including free-haul up to 0.5 km. (a) Material in compacted layer thicknesses of 200mm and less: (i) Compacted to 90% of modified AASHTO density				

	(1) Material obtained from cut or borrow (2) Material obtained from commercial sources (iii) Eight roller passes compaction (for mine dump rock) Three roller passes compaction: (a) Vibratory roller Finishing-off cut and fill slopes, medians and interchange areas (b) Fill slopes Extra over item 33.01 for excavating material from the pavements and fills of existing roads: (a) Non-cemented material (b) Cemented material Overhaul	m³ m³ m³ m² m² m³ m³ m³-km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material Pavement layers constructed from gravel obtained from commercial sources (unlimited haul) (a) Gravel selected layer compacted to: (i) 93% of modified AASHTO density (1) 200mm thick, G9 material (2) 200mm thick, G7 material (3) 200mm thick, G6 material (h) Gravel wearing course compacted to: (ii) 95% of modified AASHTO density (150mm thick)	 m³ m³ m³ m³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing Tack coat of 30% stable-grade emulsion Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen) (a) Continuously graded (medium)	litre t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
	SUB-TOTAL: PART F PROFESSIONAL SERVICES				
	TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G				
	cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees				

	Cost Estimate Loop Line Extensions at Landmeter

PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					
					0
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
	Import & Compact:				
A.2.2.2	150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
A.3.1.1	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			

	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancilliary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			
Subtotal Mast Foundations					
	Steelwork				
	Masts				
	Supply and install 64kNM UC mast-9m (CEE-TMB-67)	Each			
	Supply and install 85kNM UC mast-9m (CEE-TMB-68)	Each			
	CANTILEVERS/SMALL PART STEELWORK				
	Auto Tension Construction				
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.	Each			
	Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)	Each	0		
	Track Switches				
	Supply & Install 4500A track switch mounted on steel mast at location PS0/07	Each			
	Supply and install section insulator 25kV AC.	Each			
	Mid Point Anchor Structures				
	Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation	No			
	Supply and install mast numbering boards				
Subtotal Steelwork					
	Wirework				
	Conductors				
	Supply 107mm2 Cu Contact Wire	metre			
	Supply 160mm2 Tiger Wire	metre			
	Supply & Install 150mm2 Al Earth Wire	metre			

	Droppers Supply Droppers Complete 11-16m Span Supply Droppers Complete 17-22m Span Supply Droppers Complete 23-28m Span Supply Droppers Complete 29-34m Span Supply Droppers Complete 35-40m Span Supply Droppers Complete 41-46m Span Supply Droppers Complete 47-52m Span Supply Droppers Complete 53-58m Span Supply Droppers Complete 59-64m Span Supply Droppers Complete 65-70m Span Jumpers Supply & Install Catenary, Contact Jumpers complete with clamps Wiring Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows: Tension Length No. 1 Catenary Contact Earth wire Dropper spans Tensioning Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary Splice and tension 107 contact wire Splice and tension 160 catenary wire Splice and tension 150 earth wire Anchors (Double Stay wires) Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715 Anchors (Single Stay wires) Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	span span span span span span span span span span span No metre metre metre No. ea No No No No Each			
	Subtotal Wirework				
	Bonding and Earthing Supply & Install Mast to Rail Bonds (Expanded collar or WAM system) Supply & Install Switch Structure Bonding (Expanded collar or WAM system) Supply & Install lightning arrestors on cantilever structures Supply and install cross bonds	Each Each Each Each			
	Subtotal Bonding and Earthing				
	MISCELLANEOUS Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12 Switching of 25kV & 6.6kV - Taking work permits & track occupations Supply & Install Height Gauge (Complete) Supply & Install Warning Boards & Signs Subtotal for Miscellaneous	Each rate only Each Each			
	Total: OHTE				
Part C SIGNALLING					
Item	Description	Unit	Quantity	Rate	Amount
	Standard Signal Poles (Multi Aspec CLS)	ea			

		Mechanical 2 or 3 way route indicator Apparatus case - Complete Track Circuits & Relays Transformers Electrical Points Indicator cabling	ea set set ea ea R/km				
		SUB-TOTAL: SIGNALLING					
	PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions							
BRIDGE at km xx							
	Item	Description	Unit	Quantity	Rate	Amount	
1	1/6100	FOUNDATIONS FOR STRUCTURES					
1.1	1/61.01	Additional foundation investigations	Prov Sum				
	1/61.02	Excavation: (a) Excavating soft material situated within the following successive depth ranges: (i) 0m up to 2m	m ³				
1.2		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³				
1.3		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³				
1.4		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³				
1.5			m ³				
	1/61.03	Access and drainage: (a) Access	Lump Sum				
1.6	1/61.04	Backfill to excavations utilising: (a) Material from the excavation	m ³				
1.7		(b) Imported material	m ³				
1.8			m ³				
1.9	1/61.05	Fill within a restricted area (extra over item 61.04) Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³				
1.10	1/61.06	Overbreak in excavation in hard material	m ³ -km				
1.11	1/61.07		m ²				
	1/61.08	Foundation fill consisting of: (a) Rock fill	m ³				
1.12		(d) Mass concrete (Class 15/38)	m ³				
1.13		(e) Concrete screed (75mm thick, Class 15/19)	m ³				
1.14			m ³				
		Subtotal: Foundations for Structures					
		FALSEWORK, FORMWORK AND CONCRETE FINISH					
2	1/6200	Vertical formwork to provide: (a) Class F1 surface finish to: (i) Approach slabs (ii) Abutments (iii) Footings (iv)Wingwalls (b) Class F3 surface finish to: (i) Abutments (ii) Wingwalls (iii) Deck	m ² m ² m ² m ² m ² m ² m ² m ²				
2.1			m ²				
2.2			m ²				
2.3			m ²				
2.4			m ²				
2.5			m ²				
2.6			m ²				
2.7			m ²				
	1/62.03	Horizontal formwork to provide: (b) Class F3 surface finish to: (i) Deck	m ²				
2.8			m ²				
		Subtotal: Falsework, Formwork and Concrete Finish					
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES					
	1/63.01	Steel reinforcement for: (a) The complete structure :					
3.1		(i) Mild-steel bars	t				

3.2		(ii) High-yield-stress steel bars	t			
Subtotal: Steel Reinforcement for Structures						
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				
4.1		(i) Deck (W40/19)	m ³			
4.2		(ii) Abutments (W40/19)	m ³			
4.3		(iii) Earwalls (W30/19)	m ³			
		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m ³			
4.5		(ii) Approach slabs (30/19)	m ³			
4.6		(iii) Blinding (15/19)	m ³			
4.7		(iv) End Blocks (30/19)	m ³			
4.8		(vi) Wingwalls (30/19)	m ³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes:				
		(a) Drainage pipes:				
5.7		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
		(b) Weep holes:				
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures						
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer				
		(a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
Subtotal: Testing Materials and Workmanship						
Total: PART C BRIDGE DECK/EXTENSIONS						
PART E ROADS						
	Reference	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC				
		Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):				

	(a) Traffic accommodation for Road	km			
	Temporary traffic-control facilities:				
	(a) Additional flagmen	man-day			
	(c) Variable message signs (VMS)	No.			
	(d) Amber flicker lights (set of two)	No.			
	Operational Health, Safety and Environmental Officers				
	(a) Operational Health and Safety officer	month			
	(b) Environmental officer	month			
	(c) Transport and equipment for operational health and safety officer	month			
	Subtotal: Accommodation of Traffic				
Section 1700	CLEARING AND GRUBBING				
	Clearing and grubbing:				
	(a) Road	ha			
	Subtotal: Clearing and Grubbing				
Section 2100	DRAINS				
	Clearing and shaping existing open drains	m ³			
	Subtotal: Drains				
Section 5400	GUARDRAILS				
	Guardrails on timber posts:				
	(a) Galvanized	m			
	Guardrails on steel posts:				
	(a) Galvanized	m			
	End treatments:				
	(f) Terminal section:				
	(i) 19,05 m length	No			
	Reflective plates	No			
	Nailing of gang nail plates on top of timber guardrail posts	No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS				
	Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from:				
	(i) Area not exceeding 2 m ²	m ²			
	(ii) Area exceeding 2 m ² but not 10 m ²	m ²			
	Road sign supports (overhead road sign structures excluded):				
	(b) Timber:				
	(i) 75 mm diameter	m			
	(iii) 150 mm diameter	m			
	Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402	m ³			
	Extra-over item 56.05 for cement-treated soil backfill	m ³			
	Dismantling and storing road signs with a surface area of:				
	(a) Up to 2 m ²	No			
	(b) Exceeding 2 m ² but not 10 m ²	No			
	Danger Plates (Red Class III on white Class III):				
	(a) Type A (1 200 mm x 250 mm) (at bridges)	No			
	(b) Type B (800 mm x 200 mm) (at culverts/guardrails)	No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS				

	Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide (b) Yellow lines (broken or unbroken): (i) 150 mm wide Road studs: (i) Stimsonite C80 or similar Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km			
		km			
		No			
		km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS Trimming: (a) Machine trimming (b) Hand trimming Preparing the areas for grassing: (a) Ripping (b) Scarifying for loosening topsoil (c) Topsoiling within the road reserve, where the following materials are used: (i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	m ² m ² ha ha m ³ kg ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS Finishing road and road reserve: (b) Single carriageway roads Treatment of old roads and temporary deviations	km km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks Cut and borrow to fill, including free-haul up to 0.5 km. (a) Material in compacted layer thicknesses of 200mm and less: (i) Compacted to 90% of modified AASHTO density (1) Material obtained from cut or borrow (2) Material obtained from commercial sources (iii) Eight roller passes compaction (for mine dump rock) Three roller passes compaction: (a) Vibratory roller Finishing-off cut and fill slopes, medians and interchange areas (b) Fill slopes Extra over item 33.01 for excavating material from the pavements and fills of existing roads: (a) Non-cemented material (b) Cemented material Overhaul	m ³ m ³ m ³ m ² m ² m ³ m ³ m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material Pavement layers constructed from gravel obtained from commercial sources (unlimited haul) (a) Gravel selected layer compacted to: (i) 93% of modified AASHTO density (1) 200mm thick, G9 material	m ³			

	(2) 200mm thick, G7 material	m ³			
	(3) 200mm thick, G6 material	m ³			
	(h) Gravel wearing course compacted to:				
	(ii) 95% of modified AASHTO density (150mm thick)	m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing				
	Tack coat of 30% stable-grade emulsion	litre			
	Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen)				
	(a) Continuously graded (medium)	t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				
PART G: PROFESSIONAL SERVICES					
F.1	PROFESSIONAL SERVICES				
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
	SUB-TOTAL: PART F PROFESSIONAL SERVICES				
	TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G				
cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees					

Cost Estimate Loop Line Extensions at Lofter					
PART A: CONSTRUCTION					
A.1	PRELIMINARY AND GENERAL				
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
	Subtotal: Accommodation of Traffic				
A.2	EARTHWORKS				
Item	Description	Unit	Quantity	Rate	Amount

A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller) Import & Compact:	m ³			
A.2.2.2	150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					

PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			
	Subtotal Mast Foundations				
	Steelwork				
	Masts				
	Supply and install 64kNM UC mast-9m (CEE-TMB-67)	Each			
	Supply and install 85kNM UC mast-9m (CEE-TMB-68)	Each			
	CANTILEVERS/SMALL PART STEELWORK				
	Auto Tension Construction				
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.	Each			
	Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)	Each	0		
	Track Switches				
	Supply & Install 4500A track switch mounted on steel mast at location PS0/07	Each			
	Supply and install section insulator 25kV AC.	Each			
	Mid Point Anchor Structures				
	Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation	No			
	Supply and install mast numbering boards				
	Subtotal Steelwork				
	Wirework				
	Conductors				
	Supply 107mm ² Cu Contact Wire	metre			
	Supply 160mm ² Tiger Wire	metre			
	Supply & Install 150mm ² Al Earth Wire	metre			
	Droppers				
	Supply Droppers Complete 11-16m Span	span			
	Supply Droppers Complete 17-22m Span	span			
	Supply Droppers Complete 23-28m Span	span			
	Supply Droppers Complete 29-34m Span	span			
	Supply Droppers Complete 35-40m Span	span			

	Supply Droppers Complete 41-46m Span	span			
	Supply Droppers Complete 47-52m Span	span			
	Supply Droppers Complete 53-58m Span	span			
	Supply Droppers Complete 59-64m Span	span			
	Supply Droppers Complete 65-70m Span	span			
	Jumpers				
	Supply & Install Catenary, Contact Jumpers complete with clamps	No			
	Wiring				
	Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:				
	Tension Length No. 1				
	Catenary	metre			
	Contact	metre			
	Earth wire	metre			
	Dropper spans	No.			
	Tensioning				
	Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary	ea			
	Splice and tension 107 contact wire	No			
	Splice and tension 160 catenary wire	No			
	Splice and tension 150 earth wire	No			
	Anchors (Double Stay wires)				
	Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715	No			
	Anchors (Single Stay wires)				
	Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	Each			
	Subtotal Wirework				
	Bonding and Earthing				
	Supply & Install Mast to Rail Bonds (Expanded collar or WAM system)	Each			
	Supply & Install Switch Structure Bonding (Expanded collar or WAM system)	Each			
	Supply & Install lightning arrestors on cantilever structures	Each			
	Supply and install cross bonds	Each			
	Subtotal Bonding and Earthing				
	MISCELLANEOUS				
	Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12	Each			
	Switching of 25kV & 6,6kV - Taking work permits & track occupations	rate only			
	Supply & Install Height Gauge (Complete)	Each			
	Supply & Install Warning Boards & Signs	Each			
	Subtotal for Miscellaneous				
	Total: OHTE				
Part C	SIGNALLING				
Item	Description	Unit	Quantity	Rate	Amount
	Standard Signal Poles (Multi Aspec CLS)	ea			
	Mechanical 2 or 3 way route indicator	ea			
	Apparatus case - Complete	set			
	Track Circuits & Relays	set			
	Transformers	ea			
	Electrical Points Indicator	ea			

		cabling	R/km			
		SUB-TOTAL: SIGNALLING				
		PART D BRIDGE DECKS/EXTENSIONS				
		PART C - BRIDGES & Concrete Structure Extensions				
		BRIDGE at km xx				
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			
	1/61.03	Access and drainage:				
1.6		(a) Access	Lump Sum			
	1/61.04	Backfill to excavations utilising:				
1.7		(a) Material from the excavation	m ³			
1.8		(b) Imported material	m ³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m ³			
1.10	1/61.06	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³ -km			
1.11	1/61.07	Overbreak in excavation in hard material	m ²			
	1/61.08	Foundation fill consisting of:				
1.12		(a) Rock fill	m ³			
1.13		(d) Mass concrete (Class 15/38)	m ³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
		Subtotal: Foundations for Structures				
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m ²			
2.2		(ii) Abutments	m ²			
2.3		(iii) Footings	m ²			
2.4		(iv) Wingwalls	m ²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m ²			
2.6		(ii) Wingwalls	m ²			
2.7		(iii) Deck	m ²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m ²			
		Subtotal: Falsework, Formwork and Concrete Finish				
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
		(a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
		Subtotal: Steel Reinforcement for Structures				
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				

4.1		(i) Deck (W40/19)	m ³			
4.2		(ii) Abutments (W40/19)	m ³			
4.3		(iii) Earwalls (W30/19)	m ³			
4.4		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m ³			
4.5		(ii) Approach slabs (30/19)	m ³			
4.6		(iii) Blinding (15/19)	m ³			
4.7		(iv) End Blocks (30/19)	m ³			
4.8		(vi) Wingwalls (30/19)	m ³			
4.9	1/B64.07	Curing of concrete: (a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes:				
		(a) Drainage pipes:				
		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed				
5.7			m			
		(b) Weep holes:				
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures						
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer				
		(a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
Subtotal: Testing Materials and Workmanship						R 0.00
Total: PART C BRIDGE DECK/EXTENSIONS						
PART E ROADS						
	Reference	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC				
		Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):				
		(a) Traffic accommodation for Road	km			
		Temporary traffic-control facilities:				

	(a) Additional flagmen (c) Variable message signs (VMS) (d) Amber flicker lights (set of two)	man-day No. No.			
	Operational Health, Safety and Environmental Officers (a) Operational Health and Safety officer (b) Environmental officer (c) Transport and equipment for operational health and safety officer	month month month			
	Subtotal: Accommodation of Traffic				
Section 1700	CLEARING AND GRUBBING				
	Clearing and grubbing: (a) Road	ha			
	Subtotal: Clearing and Grubbing				
Section 2100	DRAINS				
	Clearing and shaping existing open drains	m ³			
	Subtotal: Drains				
Section 5400	GUARDRAILS				
	Guardrails on timber posts: (a) Galvanized	m			
	Guardrails on steel posts: (a) Galvanized	m			
	End treatments: (f) Terminal section: (i) 19,05 m length	No			
	Reflective plates	No			
	Nailing of gang nail plates on top of timber guardrail posts	No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS				
	Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from: (i) Area not exceeding 2 m ² (ii) Area exceeding 2 m ² but not 10 m ²	m ² m ²			
	Road sign supports (overhead road sign structures excluded): (b) Timber: (i) 75 mm diameter (iii) 150 mm diameter	m m			
	Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402 Extra-over item 56.05 for cement-treated soil backfill	m ³ m ³			
	Dismantling and storing road signs with a surface area of: (a) Up to 2 m ² (b) Exceeding 2 m ² but not 10 m ²	No No			
	Danger Plates (Red Class III on white Class III): (a) Type A (1 200 mm x 250 mm) (at bridges) (b) Type B (800 mm x 200 mm) (at culverts/guardrails)	No No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS				
	Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide	km			

	(b) Yellow lines (broken or unbroken): (i) 150 mm wide Road studs: (i) Stimsonite C80 or similar Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km No km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS Trimming: (a) Machine trimming (b) Hand trimming Preparing the areas for grassing: (a) Ripping (b) Scarifying for loosening topsoil (c) Topsoiling within the road reserve, where the following materials are used: (i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	m² m² ha ha m³ kg ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS Finishing road and road reserve: (b) Single carriageway roads Treatment of old roads and temporary deviations	km km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks Cut and borrow to fill, including free-haul up to 0.5 km. (a) Material in compacted layer thicknesses of 200mm and less: (i) Compacted to 90% of modified AASHTO density (1) Material obtained from cut or borrow (2) Material obtained from commercial sources (iii) Eight roller passes compaction (for mine dump rock) Three roller passes compaction: (a) Vibratory roller Finishing-off cut and fill slopes, medians and interchange areas (b) Fill slopes Extra over item 33.01 for excavating material from the pavements and fills of existing roads: (a) Non-cemented material (b) Cemented material Overhaul	m³ m³ m³ m² m² m³ m³ m³-km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material Pavement layers constructed from gravel obtained from commercial sources (unlimited haul) (a) Gravel selected layer compacted to: (i) 93% of modified AASHTO density (1) 200mm thick, G9 material (2) 200mm thick, G7 material (3) 200mm thick, G6 material (h) Gravel wearing course compacted to: (ii) 95% of modified AASHTO density (150mm thick)	m³ m³ m³ m³			

Subtotal: Pavement Layers Gravel Material					
Section 4200	Asphalt base and surfacing				
	Tack coat of 30% stable-grade emulsion	litre	0		
	Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen)				
	(a) Continuously graded (medium)	t	0		
Subtotal: Asphalt base and surfacing					
Total: PART D ROADS					
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
SUB-TOTAL: PART E - SUNDRIES					
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
SUB-TOTAL: PART F PROFESSIONAL SERVICES					
TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G					
cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees					

Cost Estimate Loop Line Extensions at Priors					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				

A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
	Import & Compact:				
A.2.2.2	150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
A.3.1.1	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				

	Mast Foundations (Rates assume hand pickable soil) 64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57 85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57 Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12 Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each Each Each Each			
	Subtotal Mast Foundations				
	Steelwork Masts Supply and install 64kNM UC mast-9m (CEE-TMB-67) Supply and install 85kNM UC mast-9m (CEE-TMB-68) CANTILEVERS/SMALL PART STEELWORK Auto Tension Construction Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod. Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172) Track Switches Supply & Install 4500A track switch mounted on steel mast at location PS0/07 Supply and install section insulator 25kV AC. Mid Point Anchor Structures Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation Supply and install mast numbering boards	Each Each Each Each Each Each Each Each Each Each Each Each Each Each Each No	0		
	Subtotal Steelwork				
	Wirework Conductors Supply 107mm2 Cu Contact Wire Supply 160mm2 Tiger Wire Supply & Install 150mm2 Al Earth Wire Droppers Supply Droppers Complete 11-16m Span Supply Droppers Complete 17-22m Span Supply Droppers Complete 23-28m Span Supply Droppers Complete 29-34m Span Supply Droppers Complete 35-40m Span Supply Droppers Complete 41-46m Span Supply Droppers Complete 47-52m Span Supply Droppers Complete 53-58m Span Supply Droppers Complete 59-64m Span Supply Droppers Complete 65-70m Span	metre metre metre span span span span span span span span span span span			

	Jumpers Supply & Install Catenary, Contact Jumpers complete with clamps Wiring Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows: Tension Length No. 1 Catenary Contact Earth wire Dropper spans Tensioning Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary Splice and tension 107 contact wire Splice and tension 160 catenary wire Splice and tension 150 earth wire Anchors (Double Stay wires) Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715 Anchors (Single Stay wires) Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	No			
	metre				
	metre				
	metre				
	No.				
	ea				
	No				
	No				
	No				
	No				
	Each				
Subtotal Wirework					
	Bonding and Earthing Supply & Install Mast to Rail Bonds (Expanded collar or WAM system) Supply & Install Switch Structure Bonding (Expanded collar or WAM system) Supply & Install lightning arrestors on cantilever structures Supply and install cross bonds	Each			
		Each			
		Each			
		Each			
Subtotal Bonding and Earthing					
	MISCELLANEOUS Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12 Switching of 25kV & 6,6kV - Taking work permits & track occupations Supply & Install Height Gauge (Complete) Supply & Install Warning Boards & Signs	Each			
		rate only			
		Each			
		Each			
Subtotal for Miscellaneous					
Total: OHTE					
Part C	SIGNALLING				
Item	Description	Unit	Quantity	Rate	Amount
	Standard Signal Poles (Multi Aspec CLS)	ea			
	Mechanical 2 or 3 way route indicator	ea			
	Apparatus case - Complete	set			
	Track Circuits & Relays	set			
	Transformers	ea			
	Electrical Points Indicator	ea			
	cabling	R/km			
SUB-TOTAL: SIGNALLING					

PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			
	1/61.03	Access and drainage:				
1.6		(a) Access	Lump Sum			
	1/61.04	Backfill to excavations utilising:				
1.7		(a) Material from the excavation	m ³			
1.8		(b) Imported material	m ³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m ³			
1.10	1/61.06	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³ -km			
1.11	1/61.07	Overbreak in excavation in hard material	m ²			
	1/61.08	Foundation fill consisting of:				
1.12		(a) Rock fill	m ³			
1.13		(d) Mass concrete (Class 15/38)	m ³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
		Subtotal: Foundations for Structures				
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m ²			
2.2		(ii) Abutments	m ²			
2.3		(iii) Footings	m ²			
2.4		(iv) Wingwalls	m ²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m ²			
2.6		(ii) Wingwalls	m ²			
2.7		(iii) Deck	m ²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m ²			
		Subtotal: Falsework, Formwork and Concrete Finish				
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
		(a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
		Subtotal: Steel Reinforcement for Structures				
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				
4.1		(i) Deck (W40/19)	m ³			
4.2		(ii) Abutments (W40/19)	m ³			
4.3		(iii) Earwalls (W30/19)	m ³			
		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m ³			
4.5		(ii) Approach slabs (30/19)	m ³			
4.6		(iii) Blinding (15/19)	m ³			
4.7		(iv) End Blocks (30/19)	m ³			

4.8	1/B64.07	(vi) Wingwalls (30/19) Curing of concrete: (a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ³			
4.9			m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes:				
		(a) Drainage pipes:				
5.7		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
		(b) Weep holes:				
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures						
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer				
		(a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
Subtotal: Testing Materials and Workmanship						
Total: PART C BRIDGE DECK/EXTENSIONS						
PART E ROADS						
	Reference	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC				
		Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):				
		(a) Traffic accommodation for Road	km			
		Temporary traffic-control facilities:				
		(a) Additional flagmen	man-day			
		(c) Variable message signs (VMS)	No.			
		(d) Amber flicker lights (set of two)	No.			
		Operational Health, Safety and Environmental Officers				
		(a) Operational Health and Safety officer	month			
		(b) Environmental officer	month			
		(c) Transport and equipment for operational health and safety officer	month			

	Subtotal: Accommodation of Traffic				
Section 1700	CLEARING AND GRUBBING				
	Clearing and grubbing: (a) Road	ha			
	Subtotal: Clearing and Grubbing				
Section 2100	DRAINS				
	Clearing and shaping existing open drains	m ³			
	Subtotal: Drains				
Section 5400	GUARDRAILS				
	Guardrails on timber posts: (a) Galvanized	m			
	Guardrails on steel posts: (a) Galvanized	m			
	End treatments: (f) Terminal section: (i) 19,05 m length	No			
	Reflective plates	No			
	Nailing of gang nail plates on top of timber guardrail posts	No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS				
	Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from: (i) Area not exceeding 2 m ² (ii) Area exceeding 2 m ² but not 10 m ²	m ² m ²			
	Road sign supports (overhead road sign structures excluded): (b) Timber: (i) 75 mm diameter (iii) 150 mm diameter	m m			
	Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402	m ³			
	Extra-over item 56.05 for cement-treated soil backfill	m ³			
	Dismantling and storing road signs with a surface area of: (a) Up to 2 m ² (b) Exceeding 2 m ² but not 10 m ²	No No			
	Danger Plates (Red Class III on white Class III): (a) Type A (1 200 mm x 250 mm) (at bridges) (b) Type B (800 mm x 200 mm) (at culverts/guardrails)	No No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS				
	Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide	km			
	(b) Yellow lines (broken or unbroken): (i) 150 mm wide	km			
	Road studs: (i) Stimsonite C80 or similar	No			
	Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS				

	Trimming:				
	(a) Machine trimming	m ²			
	(b) Hand trimming	m ²			
	Preparing the areas for grassing:				
	(a) Ripping	ha			
	(b) Scarifying for loosening topsoil	ha			
	(c) Topsoiling within the road reserve, where the following materials are used:				
	(i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance	m ³			
	Grassing:				
	(c) Hydro seeding:				
	(i) Providing an approved seed mixture for hydro seeding	kg			
	(iii) Hydro seeding	ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS				
	Finishing road and road reserve:				
	(b) Single carriageway roads	km			
	Treatment of old roads and temporary deviations	km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks				
	Cut and borrow to fill, including free-haul up to 0.5 km.				
	(a) Material in compacted layer thicknesses of 200mm and less:				
	(i) Compacted to 90% of modified AASHTO density				
	(1) Material obtained from cut or borrow	m ³			
	(2) Material obtained from commercial sources	m ³			
	(iii) Eight roller passes compaction (for mine dump rock)	m ³			
	Three roller passes compaction:				
	(a) Vibratory roller	m ²			
	Finishing-off cut and fill slopes, medians and interchange areas				
	(b) Fill slopes	m ²			
	Extra over item 33.01 for excavating material from the pavements and fills of existing roads:				
	(a) Non-cemented material	m ³			
	(b) Cemented material	m ³			
	Overhaul	m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material				
	Pavement layers constructed from gravel obtained from commercial sources (unlimited haul)				
	(a) Gravel selected layer compacted to:				
	(i) 93% of modified AASHTO density				
	(1) 200mm thick, G9 material	m ³			
	(2) 200mm thick, G7 material	m ³			
	(3) 200mm thick, G6 material	m ³			
	(h) Gravel wearing course compacted to:				
	(ii) 95% of modified AASHTO density (150mm thick)	m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing				
	Tack coat of 30% stable-grade emulsion	litre			
	Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen)				
	(a) Continuously graded (medium)	t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				

PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
SUB-TOTAL: PART E - SUNDRIES					
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate	0.15		
SUB-TOTAL: PART F PROFESSIONAL SERVICES					
TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G					
cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees					

Cost Estimate Loop Line Extensions at Norvalspont					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
A.2.2.2	Import & Compact: 150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				

A.3.1.2	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
A.3.1.3	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
A.3.2.3	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
A.3.3.3	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			
Subtotal Mast Foundations					R -

<p>Steelwork</p> <p>Masts</p> <p>Supply and install 64kNM UC mast-9m (CEE-TMB-67)</p> <p>Supply and install 85kNM UC mast-9m (CEE-TMB-68)</p> <p>CANTILEVERS/SMALL PART STEELWORK</p> <p>Auto Tension Construction</p> <p>Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres</p> <p>Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres</p> <p>Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres</p> <p>Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.</p> <p>Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)</p> <p>Track Switches</p> <p>Supply & Install 4500A track switch mounted on steel mast at location PS0/07</p> <p>Supply and install section insulator 25kV AC.</p> <p>Mid Point Anchor Structures</p> <p>Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation</p> <p>Supply and install mast numbering boards</p>	Each			
	Each			
	Each			
	Each			
	Each			
	Each			
	Each			
	Each			
	Each			
	Each			
0				
<p>Subtotal Steelwork</p>				
<p>Wirework</p> <p>Conductors</p> <p>Supply 107mm2 Cu Contact Wire</p> <p>Supply 160mm2 Tiger Wire</p> <p>Supply & Install 150mm2 Al Earth Wire</p> <p>Droppers</p> <p>Supply Droppers Complete 11-16m Span</p> <p>Supply Droppers Complete 17-22m Span</p> <p>Supply Droppers Complete 23-28m Span</p> <p>Supply Droppers Complete 29-34m Span</p> <p>Supply Droppers Complete 35-40m Span</p> <p>Supply Droppers Complete 41-46m Span</p> <p>Supply Droppers Complete 47-52m Span</p> <p>Supply Droppers Complete 53-58m Span</p> <p>Supply Droppers Complete 59-64m Span</p> <p>Supply Droppers Complete 65-70m Span</p> <p>Jumpers</p> <p>Supply & Install Catenary, Contact Jumpers complete with clamps</p> <p>Wiring</p> <p>Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:</p> <p>Tension Length No. 1</p> <p>Catenary</p> <p>Contact</p> <p>Earth wire</p>	metre			
	metre			
	metre			
	span			
	span			
	span			
	span			
	span			
	span			
	span			
No				
<p>metre</p> <p>metre</p> <p>metre</p>				

		Dropper spans	No.			
		Tensioning				
		Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary	ea			
		Splice and tension 107 contact wire	No			
		Splice and tension 160 catenary wire	No			
		Splice and tension 150 earth wire	No			
		Anchors (Double Stay wires)				
		Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715	No			
		Anchors (Single Stay wires)				
		Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	Each			
		Subtotal Wirework				
		Bonding and Earthing				
		Supply & Install Mast to Rail Bonds (Expanded collar or WAM system)	Each			
		Supply & Install Switch Structure Bonding (Expanded collar or WAM system)	Each			
		Supply & Install lightning arrestors on cantilever structures	Each			
		Supply and install cross bonds	Each			
		Subtotal Bonding and Earthing				
		MISCELLANEOUS				
		Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12	Each			
		Switching of 25kV & 6,6kV - Taking work permits & track occupations	rate only			
		Supply & Install Height Gauge (Complete)	Each			
		Supply & Install Warning Boards & Signs	Each			
		Subtotal for Miscellaneous				
		Total: OHTE				
Part C SIGNALLING						
	Item	Description	Unit	Quantity	Rate	Amount
		Standard Signal Poles (Multi Aspec CLS)	ea			
		Mechanical 2 or 3 way route indicator	ea			
		Apparatus case - Complete	set			
		Track Circuits & Relays	set			
		Transformers	ea			
		Electrical Points Indicator	ea			
		cabling	R/km			
		SUB-TOTAL: SIGNALLING				
PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				

1.2		(a) Excavating soft material situated within the following successive depth ranges: (i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			
1.6	1/61.03	Access and drainage: (a) Access	Lump Sum			
1.7	1/61.04	Backfill to excavations utilising: (a) Material from the excavation	m ³			
1.8		(b) Imported material	m ³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04) Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³			
1.10	1/61.06	Overbreak in excavation in hard material	m ³ -km			
1.11	1/61.07	Foundation fill consisting of: (a) Rock fill	m ²			
1.12	1/61.08	(d) Mass concrete (Class 15/38)	m ³			
1.13		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
1.14						
Subtotal: Foundations for Structures						
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide: (a) Class F1 surface finish to: (i) Approach slabs (ii) Abutments (iii) Footings (iv) Wingwalls (b) Class F3 surface finish to: (i) Abutments (ii) Wingwalls (iii) Deck	m ² m ² m ² m ² m ² m ² m ²			
2.1						
2.2						
2.3						
2.4						
2.5						
2.6						
2.7						
	1/62.03	Horizontal formwork to provide: (b) Class F3 surface finish to: (i) Deck	m ²			
2.8						
Subtotal: Falsework, Formwork and Concrete Finish						
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for: (a) The complete structure : (i) Mild-steel bars (ii) High-yield-stress steel bars	t t			
3.1						
3.2						
Subtotal: Steel Reinforcement for Structures						
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete: (a) Durability Concrete (Class W): (i) Deck (W40/19) (ii) Abutments (W40/19) (iii) Earwalls (W30/19) (b) Normal Concrete (i) Foundations (30/19) (ii) Approach slabs (30/19) (iii) Blinding (15/19) (iv) End Blocks (30/19) (vi) Wingwalls (30/19)	m ³ m ³ m ³ m ³ m ³ m ³ m ³ m ³			
4.1						
4.2						
4.3						
4.4						
4.5						
4.6						
4.7						
4.8						
	1/B64.07	Curing of concrete: (a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
4.9						
Subtotal: Concrete for Structures						

5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
5.1	1/B66.05	Expansion joints				
		(a) Roller	m			
5.2	1/B66.06	Filled Joints				
		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes:				
		(a) Drainage pipes:				
		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed				
5.7		(b) Weep holes:	m			
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures						
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer				
		(a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
Subtotal: Testing Materials and Workmanship						
Total: PART C BRIDGE DECK/EXTENSIONS						
PART E ROADS						
	Reference	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC				
		Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):				
		(a) Traffic accommodation for Road	km			
		Temporary traffic-control facilities:				
		(a) Additional flagmen	man-day			
		(c) Variable message signs (VMS)	No.			
		(d) Amber flicker lights (set of two)	No.			
		Operational Health, Safety and Environmental Officers				
		(a) Operational Health and Safety officer	month			
		(b) Environmental officer	month			
		(c) Transport and equipment for operational health and safety officer	month			
Subtotal: Accommodation of Traffic						

Section 1700	CLEARING AND GRUBBING				
	Clearing and grubbing: (a) Road	ha			
	Subtotal: Clearing and Grubbing				
Section 2100	DRAINS				
	Clearing and shaping existing open drains	m ³			
	Subtotal: Drains				
Section 5400	GUARDRAILS				
	Guardrails on timber posts: (a) Galvanized Guardrails on steel posts: (a) Galvanized End treatments: (f) Terminal section: (i) 19,05 m length Reflective plates Nailing of gang nail plates on top of timber guardrail posts				
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS				
	Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from: (i) Area not exceeding 2 m ² (ii) Area exceeding 2 m ² but not 10 m ² Road sign supports (overhead road sign structures excluded): (b) Timber: (i) 75 mm diameter (iii) 150 mm diameter Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402 Extra-over item 56.05 for cement-treated soil backfill Dismantling and storing road signs with a surface area of: (a) Up to 2 m ² (b) Exceeding 2 m ² but not 10 m ² Danger Plates (Red Class III on white Class III): (a) Type A (1 200 mm x 250 mm) (at bridges) (b) Type B (800 mm x 200 mm) (at culverts/guardrails)	m ² m ² m m m ³ m ³ No No No No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS				
	Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide (b) Yellow lines (broken or unbroken): (i) 150 mm wide Road studs: (i) Stimsonite C80 or similar Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km km No km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS				

	Trimming: (a) Machine trimming (b) Hand trimming Preparing the areas for grassing: (a) Ripping (b) Scarifying for loosening topsoil (c) Topsoiling within the road reserve, where the following materials are used: (i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	m ² m ² ha ha m ³ kg ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS Finishing road and road reserve: (b) Single carriageway roads Treatment of old roads and temporary deviations	km km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks Cut and borrow to fill, including free-haul up to 0.5 km. (a) Material in compacted layer thicknesses of 200mm and less: (i) Compacted to 90% of modified AASHTO density (1) Material obtained from cut or borrow (2) Material obtained from commercial sources (iii) Eight roller passes compaction (for mine dump rock) Three roller passes compaction: (a) Vibratory roller Finishing-off cut and fill slopes, medians and interchange areas (b) Fill slopes Extra over item 33.01 for excavating material from the pavements and fills of existing roads: (a) Non-cemented material (b) Cemented material Overhaul	m ³ m ³ m ³ m ² m ² m ³ m ³ m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material Pavement layers constructed from gravel obtained from commercial sources (unlimited haul) (a) Gravel selected layer compacted to: (i) 93% of modified AASHTO density (1) 200mm thick, G9 material (2) 200mm thick, G7 material (3) 200mm thick, G6 material (h) Gravel wearing course compacted to: (ii) 95% of modified AASHTO density (150mm thick)	m ³ m ³ m ³ m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing Tack coat of 30% stable-grade emulsion Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen) (a) Continuously graded (medium)	litre t			

Subtotal: Asphalt base and surfacing					
Total: PART D ROADS					
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
SUB-TOTAL: PART E - SUNDRIES					
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate	0.15		
SUB-TOTAL: PART F PROFESSIONAL SERVICES					
TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G					
cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees					

Cost Estimate Loop Line Extensions at Colesberg					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
A.2.2.2	Import & Compact:				
A.2.2.3	150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.4	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.5	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.6	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
A.3.1.1	b) 1/12 LH or RH (New Complete)	No			

A.3.1.2	c) 1/9 LH or RH (New Complete) Supply, deliver, stockpile and distribute PWM: a) Rails only 57kg/m (second-hand) b) Sleepers concrete galvanized P2 @700 crs c) Pandrol e Clip d) GPI Pads e) Stopblock 57kg/m timber bearers complete	No t No No No No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts a) 1:12 LH or RH b) 1:9 LH or RH c) Stopblock	No No No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box: a) Turnout 1:12 b) Turnout 1:9 c) Trackwork (by hand) d) Stopblock	No No m No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron b) 900 dia pipe culverts complete with headwalls & apron c) 1200x900 Portal culvert with wing walls, head walls & apron slab d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m m m m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			
Subtotal Mast Foundations					
	Steelwork Masts				

	Supply and install 64kNM UC mast-9m (CEE-TMB-67)	Each			
	Supply and install 85kNM UC mast-9m (CEE-TMB-68)	Each			
	CANTILEVERS/SMALL PART STEELWORK				
	Auto Tension Construction				
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.	Each			
	Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)	Each	0		
	Track Switches				
	Supply & Install 4500A track switch mounted on steel mast at location PS0/07	Each			
	Supply and install section insulator 25kV AC.	Each			
	Mid Point Anchor Structures				
	Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation	No			
	Supply and install mast numbering boards				
	Subtotal Steelwork				
	Wirework				
	Conductors				
	Supply 107mm ² Cu Contact Wire	metre			
	Supply 160mm ² Tiger Wire	metre			
	Supply & Install 150mm ² Al Earth Wire	metre			
	Droppers				
	Supply Droppers Complete 11-16m Span	span			
	Supply Droppers Complete 17-22m Span	span			
	Supply Droppers Complete 23-28m Span	span			
	Supply Droppers Complete 29-34m Span	span			
	Supply Droppers Complete 35-40m Span	span			
	Supply Droppers Complete 41-46m Span	span			
	Supply Droppers Complete 47-52m Span	span			
	Supply Droppers Complete 53-58m Span	span			
	Supply Droppers Complete 59-64m Span	span			
	Supply Droppers Complete 65-70m Span	span			
	Jumpers				
	Supply & Install Catenary, Contact Jumpers complete with clamps	No			
	Wiring				
	Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:				
	Tension Length No. 1				
	Catenary	metre			
	Contact	metre			
	Earth wire	metre			
	Dropper spans	No.			
	Tensioning				
	Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary	ea			
	Splice and tension 107 contact wire	No			

		Splice and tension 160 catenary wire	No			
		Splice and tension 150 earth wire	No			
		Anchors (Double Stay wires)				
		Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715	No			
		Anchors (Single Stay wires)				
		Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	Each			
		Subtotal Wirework				
		Bonding and Earthing				
		Supply & Install Mast to Rail Bonds (Expanded collar or WAM system)	Each			
		Supply & Install Switch Structure Bonding (Expanded collar or WAM system)	Each			
		Supply & Install lightning arrestors on cantilever structures	Each			
		Supply and install cross bonds	Each			
		Subtotal Bonding and Earthing				
		MISCELLANEOUS				
		Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12	Each			
		Switching of 25kV & 6,6kV - Taking work permits & track occupations	rate only			
		Supply & Install Height Gauge (Complete)	Each			
		Supply & Install Warning Boards & Signs	Each			
		Subtotal for Miscellaneous				
		Total: OHTE				
Part C SIGNALLING						
	Item	Description	Unit	Quantity	Rate	Amount
		Standard Signal Poles (Multi Aspec CLS)	ea			
		Mechanical 2 or 3 way route indicator	ea			
		Apparatus case - Complete	set			
		Track Circuits & Relays	set			
		Transformers	ea			
		Electrical Points Indicator	ea			
		cabling	R/km			
		SUB-TOTAL: SIGNALLING				
PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			

1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			
1.6	1/61.03	Access and drainage:				
		(a) Access	Lump Sum			
1.7	1/61.04	Backfill to excavations utilising:				
1.8		(a) Material from the excavation	m ³			
1.9		(b) Imported material	m ³			
1.10	1/61.05	Fill within a restricted area (extra over item 61.04)	m ³			
1.11	1/61.06	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³ -km			
1.12	1/61.07	Overbreak in excavation in hard material	m ²			
1.13	1/61.08	Foundation fill consisting of:				
1.14		(a) Rock fill	m ³			
		(d) Mass concrete (Class 15/38)	m ³			
		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
Subtotal: Foundations for Structures						
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m ²			
2.2		(ii) Abutments	m ²			
2.3		(iii) Footings	m ²			
2.4		(iv) Wingwalls	m ²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m ²			
2.6		(ii) Wingwalls	m ²			
2.7		(iii) Deck	m ²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m ²			
Subtotal: Falsework, Formwork and Concrete Finish						
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
		(a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
Subtotal: Steel Reinforcement for Structures						
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				
4.1		(i) Deck (W40/19)	m ³			
4.2		(ii) Abutments (W40/19)	m ³			
4.3		(iii) Earwalls (W30/19)	m ³			
		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m ³			
4.5		(ii) Approach slabs (30/19)	m ³			
4.6		(iii) Blinding (15/19)	m ³			
4.7		(iv) End Blocks (30/19)	m ³			
4.8		(vi) Wingwalls (30/19)	m ³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				

		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures (c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes: (a) Drainage pipes:				
5.7		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
		(b) Weep holes:				
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
		Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures				
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer (a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
		Subtotal: Testing Materials and Workmanship				
		Total: PART C BRIDGE DECK/EXTENSIONS				
PART E ROADS						
Reference	Description	Unit	Quantity	Rate	Amount	
Section 1500	ACCOMMODATION OF TRAFFIC					
	Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):					
	(a) Traffic accommodation for Road	km				
	Temporary traffic-control facilities:					
	(a) Additional flagmen	man-day				
	(c) Variable message signs (VMS)	No.				
	(d) Amber flicker lights (set of two)	No.				
	Operational Health, Safety and Environmental Officers					
	(a) Operational Health and Safety officer	month				
	(b) Environmental officer	month				
	(c) Transport and equipment for operational health and safety officer	month				
	Subtotal: Accommodation of Traffic					
Section 1700	CLEARING AND GRUBBING					
	Clearing and grubbing:					
	(a) Road	ha				
	Subtotal: Clearing and Grubbing					
Section 2100	DRAINS					
	Clearing and shaping existing open drains	m ³				
	Subtotal: Drains					
Section 5400	GUARDRAILS					
	Guardrails on timber posts:					
	(a) Galvanized	m				
	Guardrails on steel posts:					

	(a) Galvanized End treatments: (f) Terminal section: (i) 19,05 m length Reflective plates Nailing of gang nail plates on top of timber guardrail posts	m No No No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from: (i) Area not exceeding 2 m ² (ii) Area exceeding 2 m ² but not 10 m ² Road sign supports (overhead road sign structures excluded): (b) Timber: (i) 75 mm diameter (iii) 150 mm diameter Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402 Extra-over item 56.05 for cement-treated soil backfill Dismantling and storing road signs with a surface area of: (a) Up to 2 m ² (b) Exceeding 2 m ² but not 10 m ² Danger Plates (Red Class III on white Class III): (a) Type A (1 200 mm x 250 mm) (at bridges) (b) Type B (800 mm x 200 mm) (at culverts/guardrails)				
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide (b) Yellow lines (broken or unbroken): (i) 150 mm wide Road studs: (i) Stimsonite C80 or similar Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km km No km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS Trimming: (a) Machine trimming (b) Hand trimming Preparing the areas for grassing: (a) Ripping (b) Scarifying for loosening topsoil (c) Topsoiling within the road reserve, where the following materials are used: (i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	m ² m ² ha ha m ³ kg ha			

Subtotal: Landscaping and Planting Plants					
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS				
	Finishing road and road reserve:				
	(b) Single carriageway roads	km			
	Treatment of old roads and temporary deviations	km			
Subtotal: Finishing the Road and Road Reserve and Treating old roads					
Section 3300	Mass Earthworks				
	Cut and borrow to fill, including free-haul up to 0.5 km.				
	(a) Material in compacted layer thicknesses of 200mm and less:				
	(i) Compacted to 90% of modified AASHTO density				
	(1) Material obtained from cut or borrow	m ³			
	(2) Material obtained from commercial sources	m ³			
	(iii) Eight roller passes compaction (for mine dump rock)	m ³			
	Three roller passes compaction:				
	(a) Vibratory roller	m ²			
	Finishing-off cut and fill slopes, medians and interchange areas				
	(b) Fill slopes	m ²			
	Extra over item 33.01 for excavating material from the pavements and fills of existing roads:				
	(a) Non-cemented material	m ³			
	(b) Cemented material	m ³			
	Overhaul	m ³ -km			
Subtotal: Mass Earthworks					
Section 3400	Pavement Layers of Gravel Material				
	Pavement layers constructed from gravel obtained from commercial sources (unlimited haul)				
	(a) Gravel selected layer compacted to:				
	(i) 93% of modified AASHTO density				
	(1) 200mm thick, G9 material	m ³			
	(2) 200mm thick, G7 material	m ³			
	(3) 200mm thick, G6 material	m ³			
	(h) Gravel wearing course compacted to:				
	(ii) 95% of modified AASHTO density (150mm thick)	m ³			
Subtotal: Pavement Layers Gravel Material					
Section 4200	Asphalt base and surfacing				
	Tack coat of 30% stable-grade emulsion	litre			
	Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen)				
	(a) Continuously graded (medium)	t			
Subtotal: Asphalt base and surfacing					
Total: PART D ROADS					
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
SUB-TOTAL: PART E - SUNDRIES					
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate	0.15		
SUB-TOTAL: PART F PROFESSIONAL SERVICES					
TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G					

	<p>cost % breakdown</p> <p>Part A: Perway Construction & Material</p> <p>Part B: OHTE</p> <p>Part C: Signalling</p> <p>Part D: Bridges & Concrete Structure Extensions</p> <p>Part E: Roads</p> <p>Part E: Sundries</p> <p>Part G: Professional Fees</p>
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Cost Estimate Loop Line Extensions at Carlton					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
A.2.2.2	Import & Compact: 150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			

A.3.2.3	c) Stopblock	No			
A.3.2.4	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			
Subtotal Mast Foundations					
	Steelwork				
	Masts				
	Supply and install 64kNM UC mast-9m (CEE-TMB-67)	Each			
	Supply and install 85kNM UC mast-9m (CEE-TMB-68)	Each			
	CANTILEVERS/SMALL PART STEELWORK				
	Auto Tension Construction				
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres	Each			

	<p>Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres</p> <p>Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.</p> <p>Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)</p> <p>Track Switches</p> <p>Supply & Install 4500A track switch mounted on steel mast at location PS0/07</p> <p>Supply and install section insulator 25kV AC.</p> <p>Mid Point Anchor Structures</p> <p>Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation</p> <p>Supply and install mast numbering boards</p>	Each			
		Each			
		Each			
		Each			
		Each			
		No			
	Subtotal Steelwork				
	<p>Wirework</p> <p>Conductors</p> <p>Supply 107mm² Cu Contact Wire</p> <p>Supply 160mm² Tiger Wire</p> <p>Supply & Install 150mm² Al Earth Wire</p> <p>Droppers</p> <p>Supply Droppers Complete 11-16m Span</p> <p>Supply Droppers Complete 17-22m Span</p> <p>Supply Droppers Complete 23-28m Span</p> <p>Supply Droppers Complete 29-34m Span</p> <p>Supply Droppers Complete 35-40m Span</p> <p>Supply Droppers Complete 41-46m Span</p> <p>Supply Droppers Complete 47-52m Span</p> <p>Supply Droppers Complete 53-58m Span</p> <p>Supply Droppers Complete 59-64m Span</p> <p>Supply Droppers Complete 65-70m Span</p> <p>Jumpers</p> <p>Supply & Install Catenary, Contact Jumpers complete with clamps</p> <p>Wiring</p> <p>Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:</p> <p>Tension Length No. 1</p> <p>Catenary</p> <p>Contact</p> <p>Earth wire</p> <p>Dropper spans</p> <p>Tensioning</p> <p>Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary</p> <p>Splice and tension 107 contact wire</p> <p>Splice and tension 160 catenary wire</p> <p>Splice and tension 150 earth wire</p> <p>Anchors (Double Stay wires)</p> <p>Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715</p> <p>Anchors (Single Stay wires)</p> <p>Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715</p>	<p>metre</p> <p>metre</p> <p>metre</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>No</p> <p>metre</p> <p>metre</p> <p>metre</p> <p>No.</p> <p>ea</p> <p>No</p> <p>No</p> <p>No</p> <p>No</p> <p>No</p> <p>Each</p>			
	Subtotal Wirework				

		Bonding and Earthing Supply & Install Mast to Rail Bonds (Expanded collar or WAM system) Supply & Install Switch Structure Bonding (Expanded collar or WAM system) Supply & Install lightning arrestors on cantilever structures Supply and install cross bonds	Each Each Each Each			
	Subtotal Bonding and Earthing					
		MISCELLANEOUS Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12 Switching of 25kV & 6,6kV - Taking work permits & track occupations Supply & Install Height Gauge (Complete) Supply & Install Warning Boards & Signs	Each rate only Each Each			
	Subtotal for Miscellaneous					
	Total: OHTE					
Part C SIGNALLING						
	Item	Description	Unit	Quantity	Rate	Amount
		Standard Signal Poles (Multi Aspec CLS)	ea			
		Mechanical 2 or 3 way route indicator	ea			
		Apparatus case - Complete	set			
		Track Circuits & Relays	set			
		Transformers	ea			
		Electrical Points Indicator	ea			
		cabling	R/km			
	SUB-TOTAL: SIGNALLING					
PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation: (a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m³			
	1/61.03	Access and drainage:				
1.6		(a) Access	Lump Sum			
	1/61.04	Backfill to excavations utilising:				
1.7		(a) Material from the excavation	m³			
1.8		(b) Imported material	m³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m³			

1.10	1/61.06	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³ -km			
1.11	1/61.07	Overbreak in excavation in hard material	m ²			
1.12	1/61.08	Foundation fill consisting of:				
1.13		(a) Rock fill	m ³			
1.14		(d) Mass concrete (Class 15/38)	m ³			
		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
Subtotal: Foundations for Structures						
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m ²			
2.2		(ii) Abutments	m ²			
2.3		(iii) Footings	m ²			
2.4		(iv) Wingwalls	m ²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m ²			
2.6		(ii) Wingwalls	m ²			
2.7		(iii) Deck	m ²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m ²			
Subtotal: Falsework, Formwork and Concrete Finish						
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
		(a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
Subtotal: Steel Reinforcement for Structures						
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				
4.1		(i) Deck (W40/19)	m ³			
4.2		(ii) Abutments (W40/19)	m ³			
4.3		(iii) Earwalls (W30/19)	m ³			
		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m ³			
4.5		(ii) Approach slabs (30/19)	m ³			
4.6		(iii) Blinding (15/19)	m ³			
4.7		(iv) End Blocks (30/19)	m ³			
4.8		(vi) Wingwalls (30/19)	m ³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				

5.7	1/66.19	Drainage pipes and weep holes: (a) Drainage pipes: (ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
5.8		(b) Weep holes: (ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures						
6	1/8100 1/B81.02	TESTING MATERIALS AND WORKMANSHIP Other special tests requested by the engineer (a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
Subtotal: Testing Materials and Workmanship						
Total: PART C BRIDGE DECK/EXTENSIONS						
PART E ROADS						
	Reference	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition): (a) Traffic accommodation for Road Temporary traffic-control facilities: (a) Additional flagmen (c) Variable message signs (VMS) (d) Amber flicker lights (set of two) Operational Health, Safety and Environmental Officers (a) Operational Health and Safety officer (b) Environmental officer (c) Transport and equipment for operational health and safety officer	 km man-day No. No. month month month			
Subtotal: Accommodation of Traffic						
	Section 1700	CLEARING AND GRUBBING Clearing and grubbing: (a) Road	 ha			
Subtotal: Clearing and Grubbing						
	Section 2100	DRAINS Clearing and shaping existing open drains	 m ³			
Subtotal: Drains						
	Section 5400	GUARDRAILS Guardrails on timber posts: (a) Galvanized Guardrails on steel posts: (a) Galvanized End treatments: (f) Terminal section: (i) 19,05 m length Reflective plates	 m m No No			

	Nailing of gang nail plates on top of timber guardrail posts	No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from: (i) Area not exceeding 2 m ² (ii) Area exceeding 2 m ² but not 10 m ² Road sign supports (overhead road sign structures excluded): (b) Timber: (i) 75 mm diameter (iii) 150 mm diameter Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402 Extra-over item 56.05 for cement-treated soil backfill Dismantling and storing road signs with a surface area of: (a) Up to 2 m ² (b) Exceeding 2 m ² but not 10 m ² Danger Plates (Red Class III on white Class III): (a) Type A (1 200 mm x 250 mm) (at bridges) (b) Type B (800 mm x 200 mm) (at culverts/guardrails)	m ² m ² m m m ³ m ³ No No No No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide (b) Yellow lines (broken or unbroken): (i) 150 mm wide Road studs: (i) Stimsonite C80 or similar Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km km No km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS Trimming: (a) Machine trimming (b) Hand trimming Preparing the areas for grassing: (a) Ripping (b) Scarifying for loosening topsoil (c) Topsoiling within the road reserve, where the following materials are used: (i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	m ² m ² ha ha m ³ kg ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS				

	Finishing road and road reserve: (b) Single carriageway roads Treatment of old roads and temporary deviations	km km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks Cut and borrow to fill, including free-haul up to 0.5 km. (a) Material in compacted layer thicknesses of 200mm and less: (i) Compacted to 90% of modified AASHTO density (1) Material obtained from cut or borrow (2) Material obtained from commercial sources (iii) Eight roller passes compaction (for mine dump rock) Three roller passes compaction: (a) Vibratory roller Finishing-off cut and fill slopes, medians and interchange areas (b) Fill slopes Extra over item 33.01 for excavating material from the pavements and fills of existing roads: (a) Non-cemented material (b) Cemented material Overhaul	m ³ m ³ m ³ m ² m ² m ³ m ³ m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material Pavement layers constructed from gravel obtained from commercial sources (unlimited haul) (a) Gravel selected layer compacted to: (i) 93% of modified AASHTO density (1) 200mm thick, G9 material (2) 200mm thick, G7 material (3) 200mm thick, G6 material (h) Gravel wearing course compacted to: (ii) 95% of modified AASHTO density (150mm thick)	m ³ m ³ m ³ m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing Tack coat of 30% stable-grade emulsion Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen) (a) Continuously graded (medium)	litre t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
	SUB-TOTAL: PART F PROFESSIONAL SERVICES				
	TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G				

	<p>cost % breakdown</p> <p>Part A: Perway Construction & Material</p> <p>Part B: OHTE</p> <p>Part C: Signalling</p> <p>Part D: Bridges & Concrete Structure Extensions</p> <p>Part E: Roads</p> <p>Part E: Sundries</p> <p>Part G: Professional Fees</p>
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Cost Estimate Loop Line Extensions at Flonker					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
A.2.2.2	Import & Compact: 150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			

A.3.3	Ballasting				
	A.3.3.1 Supply and deliver crushed stone ballast 63mm	m ³			
	A.3.3.2 Distribute ballast	m ³			
	A.3.3.3 Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
CONSTRUCTION WORKS					
Mast Foundations (Rates assume hand pickable soil)					
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			
Subtotal Mast Foundations					
Steelwork					
Masts					
	Supply and install 64kNM UC mast-9m (CEE-TMB-67)	Each			
	Supply and install 85kNM UC mast-9m (CEE-TMB-68)	Each			
CANTILEVERS/SMALL PART STEELWORK					
Auto Tension Construction					
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			

	Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.	Each			
	Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)	Each			
	Track Switches				
	Supply & Install 4500A track switch mounted on steel mast at location PS0/07	Each			
	Supply and install section insulator 25kV AC.	Each			
	Mid Point Anchor Structures				
	Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation	No			
	Supply and install mast numbering boards				
	Subtotal Steelwork				
	Wirework				
	Conductors				
	Supply 107mm ² Cu Contact Wire	metre			
	Supply 160mm ² Tiger Wire	metre			
	Supply & Install 150mm ² Al Earth Wire	metre			
	Droppers				
	Supply Droppers Complete 11-16m Span	span			
	Supply Droppers Complete 17-22m Span	span			
	Supply Droppers Complete 23-28m Span	span			
	Supply Droppers Complete 29-34m Span	span			
	Supply Droppers Complete 35-40m Span	span			
	Supply Droppers Complete 41-46m Span	span			
	Supply Droppers Complete 47-52m Span	span			
	Supply Droppers Complete 53-58m Span	span			
	Supply Droppers Complete 59-64m Span	span			
	Supply Droppers Complete 65-70m Span	span			
	Jumpers				
	Supply & Install Catenary, Contact Jumpers complete with clamps	No			
	Wiring				
	Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:				
	Tension Length No. 1				
	Catenary	metre			
	Contact	metre			
	Earth wire	metre			
	Dropper spans	No.			
	Tensioning				
	Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary	ea			
	Splice and tension 107 contact wire	No			
	Splice and tension 160 catenary wire	No			
	Splice and tension 150 earth wire	No			
	Anchors (Double Stay wires)				
	Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715	No			
	Anchors (Single Stay wires)				
	Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	Each			
	Subtotal Wirework				
	Bonding and Earthing				

		Supply & Install Mast to Rail Bonds (Expanded collar or WAM system)	Each			
		Supply & Install Switch Structure Bonding (Expanded collar or WAM system)	Each			
		Supply & Install lightning arrestors on cantilever structures	Each			
		Supply and install cross bonds	Each			
	Subtotal Bonding and Earthing					
	MISCELLANEOUS					
		Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12	Each			
		Switching of 25kV & 6,6kV - Taking work permits & track occupations	rate only			
		Supply & Install Height Gauge (Complete)	Each			
		Supply & Install Warning Boards & Signs	Each			
	Subtotal for Miscellaneous					
	Total: OHTE					
Part C SIGNALLING						
	Item	Description	Unit	Quantity	Rate	Amount
		Standard Signal Poles (Multi Aspec CLS)	ea			
		Mechanical 2 or 3 way route indicator	ea			
		Apparatus case - Complete	set			
		Track Circuits & Relays	set			
		Transformers	ea			
		Electrical Points Indicator	ea			
		cabling	R/km			
	SUB-TOTAL: SIGNALLING					
PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m³			
	1/61.03	Access and drainage:				
1.6		(a) Access	Lump Sum			
	1/61.04	Backfill to excavations utilising:				
1.7		(a) Material from the excavation	m³			
1.8		(b) Imported material	m³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m³			
		Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons				
1.10	1/61.06		m³-km			

1.11	1/61.07	Overbreak in excavation in hard material	m ²			
	1/61.08	Foundation fill consisting of:				
1.12		(a) Rock fill	m ³			
1.13		(d) Mass concrete (Class 15/38)	m ³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
Subtotal: Foundations for Structures						
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m ²			
2.2		(ii) Abutments	m ²			
2.3		(iii) Footings	m ²			
2.4		(iv) Wingwalls	m ²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m ²			
2.6		(ii) Wingwalls	m ²			
2.7		(iii) Deck	m ²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m ²			
Subtotal: Falsework, Formwork and Concrete Finish						
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
		(a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
Subtotal: Steel Reinforcement for Structures						
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				
4.1		(i) Deck (W40/19)	m ³			
4.2		(ii) Abutments (W40/19)	m ³			
4.3		(iii) Earwalls (W30/19)	m ³			
		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m ³			
4.5		(ii) Approach slabs (30/19)	m ³			
4.6		(iii) Blinding (15/19)	m ³			
4.7		(iv) End Blocks (30/19)	m ³			
4.8		(vi) Wingwalls (30/19)	m ³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes:				
		(a) Drainage pipes:				

5.7		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
5.8		(b) Weep holes: (ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
		Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures				
6	1/8100 1/B81.02	TESTING MATERIALS AND WORKMANSHIP Other special tests requested by the engineer				
6.1		(a) Additional durability tests where requested by the engineer				
6.2		(i) Tests for water sorptivity	Prov. Sum			
6.3		(ii) Tests for oxygen permeability	Prov. Sum			
		(iii) Tests for concrete cover	Prov. Sum			
		Subtotal: Testing Materials and Workmanship				
		Total: PART C BRIDGE DECK/EXTENSIONS				
PART E ROADS						
	Reference	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC				
		Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):				
		(a) Traffic accommodation for Road	km			
		Temporary traffic-control facilities:				
		(a) Additional flagmen	man-day			
		(c) Variable message signs (VMS)	No.			
		(d) Amber flicker lights (set of two)	No.			
		Operational Health, Safety and Environmental Officers				
		(a) Operational Health and Safety officer	month			
		(b) Environmental officer	month			
		(c) Transport and equipment for operational health and safety officer	month			
		Subtotal: Accommodation of Traffic				
	Section 1700	CLEARING AND GRUBBING				
		Clearing and grubbing:				
		(a) Road	ha			
		Subtotal: Clearing and Grubbing				
	Section 2100	DRAINS				
		Clearing and shaping existing open drains	m ³			
		Subtotal: Drains				
	Section 5400	GUARDRAILS				
		Guardrails on timber posts:				
		(a) Galvanized	m			
		Guardrails on steel posts:				
		(a) Galvanized	m			
		End treatments:				
		(f) Terminal section:				
		(i) 19,05 m length	No			
		Reflective plates	No			
		Nailing of gang nail plates on top of timber guardrail posts	No			
		Subtotal: Guardrails				

Section 5600	ROAD SIGNS Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from: (i) Area not exceeding 2 m ² (ii) Area exceeding 2 m ² but not 10 m ² Road sign supports (overhead road sign structures excluded): (b) Timber: (i) 75 mm diameter (iii) 150 mm diameter Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402 Extra-over item 56.05 for cement-treated soil backfill Dismantling and storing road signs with a surface area of: (a) Up to 2 m ² (b) Exceeding 2 m ² but not 10 m ² Danger Plates (Red Class III on white Class III): (a) Type A (1 200 mm x 250 mm) (at bridges) (b) Type B (800 mm x 200 mm) (at culverts/guardrails)	m ² m ² m m m ³ m ³ No No No No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide (b) Yellow lines (broken or unbroken): (i) 150 mm wide Road studs: (i) Stimsonite C80 or similar Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km km No km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS Trimming: (a) Machine trimming (b) Hand trimming Preparing the areas for grassing: (a) Ripping (b) Scarifying for loosening topsoil (c) Topsoiling within the road reserve, where the following materials are used: (i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	m ² m ² ha ha m ³ kg ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS Finishing road and road reserve: (b) Single carriageway roads	km			

	Treatment of old roads and temporary deviations	km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks				
	Cut and borrow to fill, including free-haul up to 0.5 km.				
	(a) Material in compacted layer thicknesses of 200mm and less:				
	(i) Compacted to 90% of modified AASHTO density				
	(1) Material obtained from cut or borrow	m ³			
	(2) Material obtained from commercial sources	m ³			
	(iii) Eight roller passes compaction (for mine dump rock)	m ³			
	Three roller passes compaction:				
	(a) Vibratory roller	m ²			
	Finishing-off cut and fill slopes, medians and interchange areas				
	(b) Fill slopes	m ²			
	Extra over item 33.01 for excavating material from the pavements and fills of existing roads:				
	(a) Non-cemented material	m ³			
	(b) Cemented material	m ³			
	Overhaul	m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material				
	Pavement layers constructed from gravel obtained from commercial sources (unlimited haul)				
	(a) Gravel selected layer compacted to:				
	(i) 93% of modified AASHTO density				
	(1) 200mm thick, G9 material	m ³			
	(2) 200mm thick, G7 material	m ³			
	(3) 200mm thick, G6 material	m ³			
	(h) Gravel wearing course compacted to:				
	(ii) 95% of modified AASHTO density (150mm thick)	m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing				
	Tack coat of 30% stable-grade emulsion	litre			
	Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen)				
	(a) Continuously graded (medium)	t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
	SUB-TOTAL: PART F PROFESSIONAL SERVICES				
	TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G				
cost % breakdown					
Part A: Perway Construction & Material					
Part B: OHTe					

	Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees
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Cost Estimate Loop Line Extensions at Tafelberg					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
	Import & Compact:				
	150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.2	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.3	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.4	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.5	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
A.3.1.1	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			

	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancilliary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			
Subtotal Mast Foundations					
	Steelwork				
	Masts				
	Supply and install 64kNM UC mast-9m (CEE-TMB-67)	Each			
	Supply and install 85kNM UC mast-9m (CEE-TMB-68)	Each			
	CANTILEVERS/SMALL PART STEELWORK				
	Auto Tension Construction				
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.	Each			
	Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)	Each			
	Track Switches				
	Supply & Install 4500A track switch mounted on steel mast at location PS0/07	Each			
	Supply and install section insulator 25kV AC.	Each			
	Mid Point Anchor Structures				

	Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation	No			
	Supply and install mast numbering boards				
	Subtotal Steelwork				
	Wirework				
	Conductors				
	Supply 107mm ² Cu Contact Wire	metre			
	Supply 160mm ² Tiger Wire	metre			
	Supply & Install 150mm ² Al Earth Wire	metre			
	Droppers				
	Supply Droppers Complete 11-16m Span	span			
	Supply Droppers Complete 17-22m Span	span			
	Supply Droppers Complete 23-28m Span	span			
	Supply Droppers Complete 29-34m Span	span			
	Supply Droppers Complete 35-40m Span	span			
	Supply Droppers Complete 41-46m Span	span			
	Supply Droppers Complete 47-52m Span	span			
	Supply Droppers Complete 53-58m Span	span			
	Supply Droppers Complete 59-64m Span	span			
	Supply Droppers Complete 65-70m Span	span			
	Jumpers				
	Supply & Install Catenary, Contact Jumpers complete with clamps	No			
	Wiring				
	Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:				
	Tension Length No. 1				
	Catenary	metre			
	Contact	metre			
	Earth wire	metre			
	Dropper spans	No.			
	Tensioning				
	Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary	ea			
	Splice and tension 107 contact wire	No			
	Splice and tension 160 catenary wire	No			
	Splice and tension 150 earth wire	No			
	Anchors (Double Stay wires)				
	Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715	No			
	Anchors (Single Stay wires)				
	Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	Each			
	Subtotal Wirework				
	Bonding and Earthing				
	Supply & Install Mast to Rail Bonds (Expanded collar or WAM system)	Each			
	Supply & Install Switch Structure Bonding (Expanded collar or WAM system)	Each			
	Supply & Install lightning arrestors on cantilever structures	Each			
	Supply and install cross bonds	Each			
	Subtotal Bonding and Earthing				
	MISCELLANEOUS				
	Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12	Each			
	Switching of 25kV & 6.6kV - Taking work permits & track occupations	rate only			
	Supply & Install Height Gauge (Complete)	Each			

		Supply & Install Warning Boards & Signs	Each			
		Subtotal for Miscellaneous				
		Total: OHTE				
Part C SIGNALLING						
	Item	Description	Unit	Quantity	Rate	Amount
		Standard Signal Poles (Multi Aspec CLS)	ea			
		Mechanical 2 or 3 way route indicator	ea			
		Apparatus case - Complete	set			
		Track Circuits & Relays	set			
		Transformers	ea			
		Electrical Points Indicator	ea			
		cabling	R/km			
		SUB-TOTAL: SIGNALLING				
PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			
	1/61.03	Access and drainage:				
1.6		(a) Access	Lump Sum			
	1/61.04	Backfill to excavations utilising:				
1.7		(a) Material from the excavation	m ³			
1.8		(b) Imported material	m ³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m ³			
1.10	1/61.06	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³ -km			
1.11	1/61.07	Overbreak in excavation in hard material	m ²			
	1/61.08	Foundation fill consisting of:				
1.12		(a) Rock fill	m ³			
1.13		(d) Mass concrete (Class 15/38)	m ³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
		Subtotal: Foundations for Structures				
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m ²			
2.2		(ii) Abutments	m ²			
2.3		(iii) Footings	m ²			
2.4		(iv)Wingwalls	m ²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m ²			
2.6		(ii) Wingwalls	m ²			

2.7	1/62.03	(iii) Deck Horizontal formwork to provide: (b) Class F3 surface finish to:	m ²			
2.8		(i) Deck	m ²			
Subtotal: Falsework, Formwork and Concrete Finish						
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
		(a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
Subtotal: Steel Reinforcement for Structures						
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				
4.1		(i) Deck (W40/19)	m ³			
4.2		(ii) Abutments (W40/19)	m ³			
4.3		(iii) Earwalls (W30/19)	m ³			
		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m ³			
4.5		(ii) Approach slabs (30/19)	m ³			
4.6		(iii) Blinding (15/19)	m ³			
4.7		(iv) End Blocks (30/19)	m ³			
4.8		(vi) Wingwalls (30/19)	m ³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
	1/66.19	DRAINAGE FOR STRUCTURES				
		Drainage pipes and weep holes:				
		(a) Drainage pipes:				
5.7		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
		(b) Weep holes:				
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures						
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer				
		(a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
Subtotal: Testing Materials and Workmanship						

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	Dismantling and storing road signs with a surface area of: (a) Up to 2 m ² (b) Exceeding 2 m ² but not 10 m ² Danger Plates (Red Class III on white Class III): (a) Type A (1 200 mm x 250 mm) (at bridges) (b) Type B (800 mm x 200 mm) (at culverts/guardrails)	No No No No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide (b) Yellow lines (broken or unbroken): (i) 150 mm wide Road studs: (i) Stimsonite C80 or similar Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km km No km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS Trimming: (a) Machine trimming (b) Hand trimming Preparing the areas for grassing: (a) Ripping (b) Scarifying for loosening topsoil (c) Topsoiling within the road reserve, where the following materials are used: (i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	m ² m ² ha ha m ³ kg ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS Finishing road and road reserve: (b) Single carriageway roads Treatment of old roads and temporary deviations	km km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks Cut and borrow to fill, including free-haul up to 0.5 km. (a) Material in compacted layer thicknesses of 200mm and less: (i) Compacted to 90% of modified AASHTO density (1) Material obtained from cut or borrow (2) Material obtained from commercial sources (iii) Eight roller passes compaction (for mine dump rock) Three roller passes compaction: (a) Vibratory roller Finishing-off cut and fill slopes, medians and interchange areas (b) Fill slopes Extra over item 33.01 for excavating material from the pavements and fills of existing roads: (a) Non-cemented material (b) Cemented material	m ³ m ³ m ³ m ² m ² m ³ m ³			



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	Overhaul	m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material Pavement layers constructed from gravel obtained from commercial sources (unlimited haul) (a) Gravel selected layer compacted to: (i) 93% of modified AASHTO density (1) 200mm thick, G9 material (2) 200mm thick, G7 material (3) 200mm thick, G6 material (h) Gravel wearing course compacted to: (ii) 95% of modified AASHTO density (150mm thick)	m ³ m ³ m ³ m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing Tack coat of 30% stable-grade emulsion Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen) (a) Continuously graded (medium)	litre t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
	SUB-TOTAL: PART F PROFESSIONAL SERVICES				
	TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G				
cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees					

Cost Estimate Loop Line Extensions at Visrivier					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
	Subtotal: Accommodation of Traffic				
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			



TCC/2023/05/0001/28813/RFP

A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
	Import & Compact:				
A.2.2.2	150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					

TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			
	Subtotal Mast Foundations				
	Steelwork				
	Masts				
	Supply and install 64kNM UC mast-9m (CEE-TMB-67)	Each			
	Supply and install 85kNM UC mast-9m (CEE-TMB-68)	Each			
	CANTILEVERS/SMALL PART STEELWORK				
	Auto Tension Construction				
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.	Each			
	Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)	Each			
	Track Switches				
	Supply & Install 4500A track switch mounted on steel mast at location PS0/07	Each			
	Supply and install section insulator 25kV AC.	Each			
	Mid Point Anchor Structures				
	Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation	No			
	Supply and install mast numbering boards				
	Subtotal Steelwork				
	Wirework				
	Conductors				
	Supply 107mm ² Cu Contact Wire	metre			
	Supply 160mm ² Tiger Wire	metre			
	Supply & Install 150mm ² Al Earth Wire	metre			

	<p>Droppers</p> <p>Supply Droppers Complete 11-16m Span Supply Droppers Complete 17-22m Span Supply Droppers Complete 23-28m Span Supply Droppers Complete 29-34m Span Supply Droppers Complete 35-40m Span Supply Droppers Complete 41-46m Span Supply Droppers Complete 47-52m Span Supply Droppers Complete 53-58m Span Supply Droppers Complete 59-64m Span Supply Droppers Complete 65-70m Span</p> <p>Jumpers</p> <p>Supply & Install Catenary, Contact Jumpers complete with clamps</p> <p>Wiring</p> <p>Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows: Tension Length No. 1 Catenary Contact Earth wire Dropper spans</p> <p>Tensioning</p> <p>Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary Splice and tension 107 contact wire Splice and tension 160 catenary wire Splice and tension 150 earth wire</p> <p>Anchors (Double Stay wires)</p> <p>Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715</p> <p>Anchors (Single Stay wires)</p> <p>Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715</p>	<p>span span span span span span span span span span</p> <p>No</p> <p>metre metre metre No.</p> <p>ea No No No</p> <p>No</p> <p>Each</p>			
	Subtotal Wirework				
	<p>Bonding and Earthing</p> <p>Supply & Install Mast to Rail Bonds (Expanded collar or WAM system) Supply & Install Switch Structure Bonding (Expanded collar or WAM system) Supply & Install lightning arrestors on cantilever structures Supply and install cross bonds</p>	<p>Each Each Each Each</p>			
	Subtotal Bonding and Earthing				
	MISCELLANEOUS				
	<p>Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12 Switching of 25kV & 6,6kV - Taking work permits & track occupations Supply & Install Height Gauge (Complete) Supply & Install Warning Boards & Signs</p>	<p>Each rate only Each Each</p>			
	Subtotal for Miscellaneous				
	Total: OHTE				
Part C	SIGNALLING				

Item		Description	Unit	Quantity	Rate	Amount
		Standard Signal Poles (Multi Aspec CLS)	ea			
		Mechanical 2 or 3 way route indicator	ea			
		Apparatus case - Complete	set			
		Track Circuits & Relays	set			
		Transformers	ea			
		Electrical Points Indicator	ea			
		cabling	R/km			
SUB-TOTAL: SIGNALLING						
PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m³			
		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth				
1.3		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m³			
1.4		(d) Extra over subitem 1/61.02(a) for excavation by hand	m³			
1.5	1/61.03	Access and drainage:				
1.6		(a) Access	Lump Sum			
1.7	1/61.04	Backfill to excavations utilising:				
		(a) Material from the excavation	m³			
1.8		(b) Imported material	m³			
		Fill within a restricted area (extra over item 61.04)				
1.9	1/61.05	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m³			
1.10	1/61.06	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m³-km			
1.11	1/61.07	Overbreak in excavation in hard material	m²			
	1/61.08	Foundation fill consisting of:				
1.12		(a) Rock fill	m³			
1.13		(d) Mass concrete (Class 15/38)	m³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m³			
Subtotal: Foundations for Structures						
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m²			
2.2		(ii) Abutments	m²			
2.3		(iii) Footings	m²			
2.4		(iv)Wingwalls	m²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m²			
2.6		(ii) Wingwalls	m²			
2.7		(iii) Deck	m²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m²			
Subtotal: Falsework, Formwork and Concrete Finish						

3	1/6300 1/63.01	STEEL REINFORCEMENT FOR STRUCTURES Steel reinforcement for: (a) The complete structure : (i) Mild-steel bars (ii) High-yield-stress steel bars	t t			
3.1						
3.2						
		Subtotal: Steel Reinforcement for Structures				
4	1/6400 1/B64.01	CONCRETE FOR STRUCTURES Cast in-situ concrete: (a) Durability Concrete (Class W): (i) Deck (W40/19) (ii) Abutments (W40/19) (iii) Earwalls (W30/19) (b) Normal Concrete (i) Foundations (30/19) (ii) Approach slabs (30/19) (iii) Blinding (15/19) (iv) End Blocks (30/19) (v) Wingwalls (30/19) Curing of concrete: (a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ³ m ³ m ³ m ³ m ³ m ³ m ³ m ³ m ³ m ²			
4.1						
4.2						
4.3						
4.4						
4.5						
4.6						
4.7						
4.8						
4.9	1/B64.07					
		Subtotal: Concrete for Structures				
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES JOINTS Expansion joints (a) Roller Filled Joints (a) 15mm closed cell joint former between abutments and approach slab PARAPETS AND RAILINGS Concrete parapets: (a) Rail "F-shape" type parapet End blocks (Rail "F-shape" type parapet) Numbers for structures (c) Numbers formed in concrete (i) Parapets (ii) Wing Walls DRAINAGE FOR STRUCTURES Drainage pipes and weep holes: (a) Drainage pipes: (ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed (b) Weep holes: (ii) PVC 50mm dia. and 650 mm of length Synthetic fibre filter fabric Kaymat U34 or similar approved	m m ² m No No No m no m ²			
5.1	1/B66.05					
5.2	1/B66.06					
5.3	1/B66.15					
5.4	1/66.17					
5.5	1/66.18					
5.6						
5.7	1/66.19					
5.8						
5.9	1/66.21					
		Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures				
6	1/8100 1/B81.02	TESTING MATERIALS AND WORKMANSHIP Other special tests requested by the engineer (a) Additional durability tests where requested by the engineer (i) Tests for water sorptivity (ii) Tests for oxygen permeability (iii) Tests for concrete cover	Prov. Sum Prov. Sum Prov. Sum			
6.1						
6.2						
6.3						
		Subtotal: Testing Materials and Workmanship				
		Total: PART C BRIDGE DECK/EXTENSIONS				

PART E ROADS					
Reference	Description	Unit	Quantity	Rate	Amount
Section 1500	ACCOMMODATION OF TRAFFIC Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition): (a) Traffic accommodation for Road Temporary traffic-control facilities: (a) Additional flagmen (c) Variable message signs (VMS) (d) Amber flicker lights (set of two) Operational Health, Safety and Environmental Officers (a) Operational Health and Safety officer (b) Environmental officer (c) Transport and equipment for operational health and safety officer	km man-day No. No. month month month			
	Subtotal: Accommodation of Traffic				
Section 1700	CLEARING AND GRUBBING Clearing and grubbing: (a) Road	ha			
	Subtotal: Clearing and Grubbing				
Section 2100	DRAINS Clearing and shaping existing open drains	m ³			
	Subtotal: Drains				
Section 5400	GUARDRAILS Guardrails on timber posts: (a) Galvanized Guardrails on steel posts: (a) Galvanized End treatments: (f) Terminal section: (i) 19,05 m length Reflective plates Nailing of gang nail plates on top of timber guardrail posts	m m No No No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from: (i) Area not exceeding 2 m ² (ii) Area exceeding 2 m ² but not 10 m ² Road sign supports (overhead road sign structures excluded): (b) Timber: (i) 75 mm diameter (iii) 150 mm diameter Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402	m ² m ² m m m ³			

	Extra-over item 56.05 for cement-treated soil backfill	m ³			
	Dismantling and storing road signs with a surface area of:				
	(a) Up to 2 m ²	No			
	(b) Exceeding 2 m ² but not 10 m ²	No			
	Danger Plates (Red Class III on white Class III):				
	(a) Type A (1 200 mm x 250 mm) (at bridges)	No			
	(b) Type B (800 mm x 200 mm) (at culverts/guardrails)	No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS				
	Retro-reflective road-marking paint:				
	(a) White lines (broken or unbroken):				
	(ii) 150 mm wide	km			
	(b) Yellow lines (broken or unbroken):				
	(i) 150 mm wide	km			
	Road studs:				
	(i) Stimsonite C80 or similar	No			
	Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS				
	Trimming:				
	(a) Machine trimming	m ²			
	(b) Hand trimming	m ²			
	Preparing the areas for grassing:				
	(a) Ripping	ha			
	(b) Scarifying for loosening topsoil	ha			
	(c) Topsoiling within the road reserve, where the following materials are used:				
	(i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance	m ³			
	Grassing:				
	(c) Hydro seeding:				
	(i) Providing an approved seed mixture for hydro seeding	kg			
	(iii) Hydro seeding	ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS				
	Finishing road and road reserve:				
	(b) Single carriageway roads	km			
	Treatment of old roads and temporary deviations	km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks				
	Cut and borrow to fill, including free-haul up to 0.5 km.				
	(a) Material in compacted layer thicknesses of 200mm and less:				
	(i) Compacted to 90% of modified AASHTO density				
	(1) Material obtained from cut or borrow	m ³			
	(2) Material obtained from commercial sources	m ³			
	(iii) Eight roller passes compaction (for mine dump rock)	m ³			
	Three roller passes compaction:				

	(a) Vibratory roller Finishing-off cut and fill slopes, medians and interchange areas	m ²			
	(b) Fill slopes Extra over item 33.01 for excavating material from the pavements and fills of existing roads:	m ²			
	(a) Non-cemented material	m ³			
	(b) Cemented material	m ³			
	Overhaul	m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material Pavement layers constructed from gravel obtained from commercial sources (unlimited haul) (a) Gravel selected layer compacted to: (i) 93% of modified AASHTO density (1) 200mm thick, G9 material (2) 200mm thick, G7 material (3) 200mm thick, G6 material (h) Gravel wearing course compacted to: (ii) 95% of modified AASHTO density (150mm thick)	m ³ m ³ m ³ m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing Tack coat of 30% stable-grade emulsion Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen) (a) Continuously graded (medium)	litre t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
	SUB-TOTAL: PART F PROFESSIONAL SERVICES				
	TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G				
cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees					

Cost Estimate Loop Line Extensions at Marlow	
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PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
	Import & Compact:				
	150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.2	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.3	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.4	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.5	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
A.2.2.6					
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
A.3.1.1	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			

	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancilliary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			
Subtotal Mast Foundations					
	Steelwork				
	Masts				
	Supply and install 64kNM UC mast-9m (CEE-TMB-67)	Each			
	Supply and install 85kNM UC mast-9m (CEE-TMB-68)	Each			
	CANTILEVERS/SMALL PART STEELWORK				
	Auto Tension Construction				
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.	Each			
	Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)	Each			
	Track Switches				
	Supply & Install 4500A track switch mounted on steel mast at location PS0/07	Each			
	Supply and install section insulator 25kV AC.	Each			
	Mid Point Anchor Structures				
	Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation	No			
	Supply and install mast numbering boards				
Subtotal Steelwork					
	Wirework				
	Conductors				

	Supply 107mm ² Cu Contact Wire	metre			
	Supply 160mm ² Tiger Wire	metre			
	Supply & Install 150mm ² Al Earth Wire	metre			
	Droppers				
	Supply Droppers Complete 11-16m Span	span			
	Supply Droppers Complete 17-22m Span	span			
	Supply Droppers Complete 23-28m Span	span			
	Supply Droppers Complete 29-34m Span	span			
	Supply Droppers Complete 35-40m Span	span			
	Supply Droppers Complete 41-46m Span	span			
	Supply Droppers Complete 47-52m Span	span			
	Supply Droppers Complete 53-58m Span	span			
	Supply Droppers Complete 59-64m Span	span			
	Supply Droppers Complete 65-70m Span	span			
	Jumpers				
	Supply & Install Catenary, Contact Jumpers complete with clamps	No			
	Wiring				
	Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:				
	Tension Length No. 1				
	Catenary	metre			
	Contact	metre			
	Earth wire	metre			
	Dropper spans	No.			
	Tensioning				
	Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary	ea			
	Splice and tension 107 contact wire	No			
	Splice and tension 160 catenary wire	No			
	Splice and tension 150 earth wire	No			
	Anchors (Double Stay wires)				
	Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715	No			
	Anchors (Single Stay wires)				
	Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	Each			
	Subtotal Wirework				
	Bonding and Earthing				
	Supply & Install Mast to Rail Bonds (Expanded collar or WAM system)	Each			
	Supply & Install Switch Structure Bonding (Expanded collar or WAM system)	Each			
	Supply & Install lightning arrestors on cantilever structures	Each			
	Supply and install cross bonds	Each			
	Subtotal Bonding and Earthing				
	MISCELLANEOUS				
	Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12	Each			
	Switching of 25kV & 6.6kV - Taking work permits & track occupations	rate only			
	Supply & Install Height Gauge (Complete)	Each			
	Supply & Install Warning Boards & Signs	Each			
	Subtotal for Miscellaneous				
	Total: OHTE				

Part C SIGNALLING						
Item		Description	Unit	Quantity	Rate	Amount
		Standard Signal Poles (Multi Aspec CLS)	ea			
		Mechanical 2 or 3 way route indicator	ea			
		Apparatus case - Complete	set			
		Track Circuits & Relays	set			
		Transformers	ea			
		Electrical Points Indicator	ea			
		cabling	R/km			
		SUB-TOTAL: SIGNALLING				
PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m³			
	1/61.03	Access and drainage:				
		(a) Access	Lump Sum			
1.6	1/61.04	Backfill to excavations utilising:				
1.7		(a) Material from the excavation	m³			
1.8		(b) Imported material	m³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m³			
		Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons				
1.10	1/61.06		m³-km			
1.11	1/61.07	Overbreak in excavation in hard material	m²			
	1/61.08	Foundation fill consisting of:				
1.12		(a) Rock fill	m³			
1.13		(d) Mass concrete (Class 15/38)	m³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m³			
		Subtotal: Foundations for Structures				
		FALSEWORK, FORMWORK AND CONCRETE FINISH				
2	1/6200					
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m²			
2.2		(ii) Abutments	m²			
2.3		(iii) Footings	m²			
2.4		(iv)Wingwalls	m²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m²			
2.6		(ii) Wingwalls	m²			
2.7		(iii) Deck	m²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m²			

		Subtotal: Falsework, Formwork and Concrete Finish				
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
3.1		(a) The complete structure :				
3.2		(i) Mild-steel bars	t			
		(ii) High-yield-stress steel bars	t			
		Subtotal: Steel Reinforcement for Structures				
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				
4.1		(i) Deck (W40/19)	m ³			
4.2		(ii) Abutments (W40/19)	m ³			
4.3		(iii) Earwalls (W30/19)	m ³			
		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m ³			
4.5		(ii) Approach slabs (30/19)	m ³			
4.6		(iii) Blinding (15/19)	m ³			
4.7		(iv) End Blocks (30/19)	m ³			
4.8		(vi) Wingwalls (30/19)	m ³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
		Subtotal: Concrete for Structures				
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes:				
		(a) Drainage pipes:				
		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed				
5.7			m			
		(b) Weep holes:				
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
		Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures				
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer				
		(a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov.			
			Sum			
6.2		(ii) Tests for oxygen permeability	Prov.			
			Sum			
6.3		(iii) Tests for concrete cover	Prov.			
			Sum			
		Subtotal: Testing Materials and Workmanship				
		Total: PART C BRIDGE DECK/EXTENSIONS				

PART E ROADS					
Reference	Description	Unit	Quantity	Rate	Amount
Section 1500	ACCOMMODATION OF TRAFFIC				
	Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):				
	(a) Traffic accommodation for Road	km			
	Temporary traffic-control facilities:				
	(a) Additional flagmen	man-day			
	(c) Variable message signs (VMS)	No.			
	(d) Amber flicker lights (set of two)	No.			
	Operational Health, Safety and Environmental Officers				
	(a) Operational Health and Safety officer	month			
	(b) Environmental officer	month			
	(c) Transport and equipment for operational health and safety officer	month			
	Subtotal: Accommodation of Traffic				
Section 1700	CLEARING AND GRUBBING				
	Clearing and grubbing:				
	(a) Road	ha			
	Subtotal: Clearing and Grubbing				
Section 2100	DRAINS				
	Clearing and shaping existing open drains	m ³			
	Subtotal: Drains				
Section 5400	GUARDRAILS				
	Guardrails on timber posts:				
	(a) Galvanized	m			
	Guardrails on steel posts:				
	(a) Galvanized	m			
	End treatments:				
	(f) Terminal section:				
	(i) 19,05 m length	No			
	Reflective plates	No			
	Nailing of gang nail plates on top of timber guardrail posts	No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS				
	Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from:				
	(i) Area not exceeding 2 m ²	m ²			
	(ii) Area exceeding 2 m ² but not 10 m ²	m ²			
	Road sign supports (overhead road sign structures excluded):				
	(b) Timber:				
	(i) 75 mm diameter	m			
	(iii) 150 mm diameter	m			
	Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402	m ³			
	Extra-over item 56.05 for cement-treated soil backfill	m ³			

	Dismantling and storing road signs with a surface area of: (a) Up to 2 m ² (b) Exceeding 2 m ² but not 10 m ² Danger Plates (Red Class III on white Class III): (a) Type A (1 200 mm x 250 mm) (at bridges) (b) Type B (800 mm x 200 mm) (at culverts/guardrails)	No No No No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide (b) Yellow lines (broken or unbroken): (i) 150 mm wide Road studs: (i) Stimsonite C80 or similar Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km km No km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS Trimming: (a) Machine trimming (b) Hand trimming Preparing the areas for grassing: (a) Ripping (b) Scarifying for loosening topsoil (c) Topsoiling within the road reserve, where the following materials are used: (i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	m ² m ² ha ha m ³ kg ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS Finishing road and road reserve: (b) Single carriageway roads Treatment of old roads and temporary deviations	km km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks Cut and borrow to fill, including free-haul up to 0.5 km. (a) Material in compacted layer thicknesses of 200mm and less: (i) Compacted to 90% of modified AASHTO density (1) Material obtained from cut or borrow (2) Material obtained from commercial sources (iii) Eight roller passes compaction (for mine dump rock) Three roller passes compaction: (a) Vibratory roller Finishing-off cut and fill slopes, medians and interchange areas (b) Fill slopes Extra over item 33.01 for excavating material from the pavements and fills of existing roads: (a) Non-cemented material	m ³ m ³ m ³ m ² m ² m ³			

	(b) Cemented material Overhaul	m³ m³-km			
	Subtotal: Mass Earthworks				
Section 3400	<p>Pavement Layers of Gravel Material</p> <p>Pavement layers constructed from gravel obtained from commercial sources (unlimited haul)</p> <p>(a) Gravel selected layer compacted to:</p> <p> (i) 93% of modified AASHTO density</p> <p> (1) 200mm thick, G9 material</p> <p> (2) 200mm thick, G7 material</p> <p> (3) 200mm thick, G6 material</p> <p>(h) Gravel wearing course compacted to:</p> <p> (ii) 95% of modified AASHTO density (150mm thick)</p>	m³ m³ m³ m³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	<p>Asphalt base and surfacing</p> <p>Tack coat of 30% stable-grade emulsion</p> <p>Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen)</p> <p>(a) Continuously graded (medium)</p>	litre t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
	SUB-TOTAL: PART F PROFESSIONAL SERVICES				
	TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G				
<p>cost % breakdown</p> <p>Part A: Perway Construction & Material</p> <p>Part B: OHTE</p> <p>Part C: Signalling</p> <p>Part D: Bridges & Concrete Structure Extensions</p> <p>Part E: Roads</p> <p>Part E: Sundries</p> <p>Part G: Professional Fees</p>					

<i>Cost Estimate Loop Line Extensions at Mortimer</i>						
PART A: CONSTRUCTION						
A.1 PRELIMINARY AND GENERAL						
Item		Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs		Sum			
A.1.2	Time Related Costs		Month			
Subtotal: Accommodation of Traffic						
A.2 EARTHWORKS						
Item		Description	Unit	Quantity	Rate	Amount

A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller) Import & Compact:	m ³			
A.2.2.2	150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					

PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			
	Subtotal Mast Foundations				
	Steelwork				
	Masts				
	Supply and install 64kNM UC mast-9m (CEE-TMB-67)	Each			
	Supply and install 85kNM UC mast-9m (CEE-TMB-68)	Each			
	CANTILEVERS/SMALL PART STEELWORK				
	Auto Tension Construction				
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.	Each			
	Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)	Each			
	Track Switches				
	Supply & Install 4500A track switch mounted on steel mast at location PS0/07	Each			
	Supply and install section insulator 25kV AC.	Each			
	Mid Point Anchor Structures				
	Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation	No			
	Supply and install mast numbering boards				
	Subtotal Steelwork				
	Wirework				
	Conductors				
	Supply 107mm2 Cu Contact Wire	metre			
	Supply 160mm2 Tiger Wire	metre			
	Supply & Install 150mm2 Al Earth Wire	metre			
	Droppers				
	Supply Droppers Complete 11-16m Span	span			
	Supply Droppers Complete 17-22m Span	span			
	Supply Droppers Complete 23-28m Span	span			
	Supply Droppers Complete 29-34m Span	span			

	Supply Droppers Complete 35-40m Span	span			
	Supply Droppers Complete 41-46m Span	span			
	Supply Droppers Complete 47-52m Span	span			
	Supply Droppers Complete 53-58m Span	span			
	Supply Droppers Complete 59-64m Span	span			
	Supply Droppers Complete 65-70m Span	span			
	Jumpers				
	Supply & Install Catenary, Contact Jumpers complete with clamps	No			
	Wiring				
	Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:				
	Tension Length No. 1				
	Catenary	metre			
	Contact	metre			
	Earth wire	metre			
	Dropper spans	No.			
	Tensioning				
	Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary	ea			
	Splice and tension 107 contact wire	No			
	Splice and tension 160 catenary wire	No			
	Splice and tension 150 earth wire	No			
	Anchors (Double Stay wires)				
	Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715	No			
	Anchors (Single Stay wires)				
	Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	Each			
	Subtotal Wirework				
	Bonding and Earthing				
	Supply & Install Mast to Rail Bonds (Expanded collar or WAM system)	Each			
	Supply & Install Switch Structure Bonding (Expanded collar or WAM system)	Each			
	Supply & Install lightning arrestors on cantilever structures	Each			
	Supply and install cross bonds	Each			
	Subtotal Bonding and Earthing				
	MISCELLANEOUS				
	Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12	Each			
	Switching of 25kV & 6,6kV - Taking work permits & track occupations	rate only			
	Supply & Install Height Gauge (Complete)	Each			
	Supply & Install Warning Boards & Signs	Each			
	Subtotal for Miscellaneous				
	Total: OHTE				
Part C	SIGNALLING				
Item	Description	Unit	Quantity	Rate	Amount
	Standard Signal Poles (Multi Aspec CLS)	ea			
	Mechanical 2 or 3 way route indicator	ea			
	Apparatus case - Complete	set			
	Track Circuits & Relays	set			
	Transformers	ea			

		Electrical Points Indicator cabling	ea R/km			
		SUB-TOTAL: SIGNALLING				
		PART D BRIDGE DECKS/EXTENSIONS				
		PART C - BRIDGES & Concrete Structure Extensions				
		BRIDGE at km xx				
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			
	1/61.03	Access and drainage:				
1.6		(a) Access	Lump Sum			
	1/61.04	Backfill to excavations utilising:				
1.7		(a) Material from the excavation	m ³			
1.8		(b) Imported material	m ³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m ³			
1.10	1/61.06	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³ -km			
1.11	1/61.07	Overbreak in excavation in hard material	m ²			
	1/61.08	Foundation fill consisting of:				
1.12		(a) Rock fill	m ³			
1.13		(d) Mass concrete (Class 15/38)	m ³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
		Subtotal: Foundations for Structures				
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m ²			
2.2		(ii) Abutments	m ²			
2.3		(iii) Footings	m ²			
2.4		(iv) Wingwalls	m ²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m ²			
2.6		(ii) Wingwalls	m ²			
2.7		(iii) Deck	m ²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m ²			
		Subtotal: Falsework, Formwork and Concrete Finish				
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
		(a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
		Subtotal: Steel Reinforcement for Structures				
4	1/6400	CONCRETE FOR STRUCTURES				

	1/B64.01	Cast in-situ concrete:				
4.1		(a) Durability Concrete (Class W):				
4.2		(i) Deck (W40/19)	m ³			
4.3		(ii) Abutments (W40/19)	m ³			
		(iii) Earwalls (W30/19)	m ³			
4.4		(b) Normal Concrete				
4.5		(i) Foundations (30/19)	m ³			
4.6		(ii) Approach slabs (30/19)	m ³			
4.7		(iii) Blinding (15/19)	m ³			
4.8		(iv) End Blocks (30/19)	m ³			
		(vi) Wingwalls (30/19)	m ³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes:				
		(a) Drainage pipes:				
		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed				
5.7			m			
		(b) Weep holes:				
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures						
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer				
		(a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
Subtotal: Testing Materials and Workmanship						
Total: PART C BRIDGE DECK/EXTENSIONS						
PART E ROADS						
	Reference	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC				
		Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):				

	(a) Traffic accommodation for Road	km			
	Temporary traffic-control facilities:				
	(a) Additional flagmen	man-day			
	(c) Variable message signs (VMS)	No.			
	(d) Amber flicker lights (set of two)	No.			
	Operational Health, Safety and Environmental Officers				
	(a) Operational Health and Safety officer	month			
	(b) Environmental officer	month			
	(c) Transport and equipment for operational health and safety officer	month			
	Subtotal: Accommodation of Traffic				
Section 1700	CLEARING AND GRUBBING				
	Clearing and grubbing:				
	(a) Road	ha			
	Subtotal: Clearing and Grubbing				
Section 2100	DRAINS				
	Clearing and shaping existing open drains	m ³			
	Subtotal: Drains				
Section 5400	GUARDRAILS				
	Guardrails on timber posts:				
	(a) Galvanized	m			
	Guardrails on steel posts:				
	(a) Galvanized	m			
	End treatments:				
	(f) Terminal section:				
	(i) 19,05 m length	No			
	Reflective plates	No			
	Nailing of gang nail plates on top of timber guardrail posts	No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS				
	Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from:				
	(i) Area not exceeding 2 m ²	m ²			
	(ii) Area exceeding 2 m ² but not 10 m ²	m ²			
	Road sign supports (overhead road sign structures excluded):				
	(b) Timber:				
	(i) 75 mm diameter	m			
	(iii) 150 mm diameter	m			
	Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402	m ³			
	Extra-over item 56.05 for cement-treated soil backfill	m ³			
	Dismantling and storing road signs with a surface area of:				
	(a) Up to 2 m ²	No			
	(b) Exceeding 2 m ² but not 10 m ²	No			
	Danger Plates (Red Class III on white Class III):				
	(a) Type A (1 200 mm x 250 mm) (at bridges)	No			
	(b) Type B (800 mm x 200 mm) (at culverts/guardrails)	No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS				

	Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide (b) Yellow lines (broken or unbroken): (i) 150 mm wide Road studs: (i) Stimsonite C80 or similar Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km km No km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS Trimming: (a) Machine trimming (b) Hand trimming Preparing the areas for grassing: (a) Ripping (b) Scarifying for loosening topsoil (c) Topsoiling within the road reserve, where the following materials are used: (i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	 m ² m ² ha ha m ³ kg ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS Finishing road and road reserve: (b) Single carriageway roads Treatment of old roads and temporary deviations	 km km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks Cut and borrow to fill, including free-haul up to 0.5 km. (a) Material in compacted layer thicknesses of 200mm and less: (i) Compacted to 90% of modified AASHTO density (1) Material obtained from cut or borrow (2) Material obtained from commercial sources (iii) Eight roller passes compaction (for mine dump rock) Three roller passes compaction: (a) Vibratory roller Finishing-off cut and fill slopes, medians and interchange areas (b) Fill slopes Extra over item 33.01 for excavating material from the pavements and fills of existing roads: (a) Non-cemented material (b) Cemented material Overhaul	 m ³ m ³ m ³ m ² m ² m ³ m ³ m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material Pavement layers constructed from gravel obtained from commercial sources (unlimited haul) (a) Gravel selected layer compacted to:				

	(i) 93% of modified AASHTO density (1) 200mm thick, G9 material (2) 200mm thick, G7 material (3) 200mm thick, G6 material (h) Gravel wearing course compacted to: (ii) 95% of modified AASHTO density (150mm thick)	m ³ m ³ m ³ m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing Tack coat of 30% stable-grade emulsion Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen) (a) Continuously graded (medium)	litre t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
	SUB-TOTAL: PART F PROFESSIONAL SERVICES				
	TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G				
cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees					

Cost Estimate Loop Line Extensions at Thorngrove					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
	Subtotal: Accommodation of Traffic				
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				

A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m³			
A.2.2.2	Import & Compact: 150 G9 to be compacted to 93% MODAASHTO from commercial source	m³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers	No			
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m³			
A.3.3.2	Distribute ballast	m³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount

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	Jumpers Supply & Install Catenary, Contact Jumpers complete with clamps Wiring Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows: Tension Length No. 1 Catenary Contact Earth wire Dropper spans Tensioning Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary Splice and tension 107 contact wire Splice and tension 160 catenary wire Splice and tension 150 earth wire Anchors (Double Stay wires) Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715 Anchors (Single Stay wires) Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	No				
	Subtotal Wirework					
	Bonding and Earthing Supply & Install Mast to Rail Bonds (Expanded collar or WAM system) Supply & Install Switch Structure Bonding (Expanded collar or WAM system) Supply & Install lightning arrestors on cantilever structures Supply and install cross bonds	Each Each Each Each				
	Subtotal Bonding and Earthing					
	MISCELLANEOUS Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12 Switching of 25kV & 6.6kV - Taking work permits & track occupations Supply & Install Height Gauge (Complete) Supply & Install Warning Boards & Signs	Each rate only Each Each				
	Subtotal for Miscellaneous					
	Total: OHTE					
Part C	SIGNALLING					
Item	Description	Unit	Quantity	Rate	Amount	
	Standard Signal Poles (Multi Aspec CLS)	ea				
	Mechanical 2 or 3 way route indicator	ea				
	Apparatus case - Complete	set				
	Track Circuits & Relays	set				
	Transformers	ea				
	Electrical Points Indicator	ea				
	cabling	R/km				
	SUB-TOTAL: SIGNALLING					

PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			
	1/61.03	Access and drainage:				
		(a) Access	Lump Sum			
1.6	1/61.04	Backfill to excavations utilising:				
1.7		(a) Material from the excavation	m ³			
1.8		(b) Imported material	m ³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m ³			
1.10	1/61.06	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³ -km			
1.11	1/61.07	Overbreak in excavation in hard material	m ²			
	1/61.08	Foundation fill consisting of:				
1.12		(a) Rock fill	m ³			
1.13		(d) Mass concrete (Class 15/38)	m ³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
Subtotal: Foundations for Structures						
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m ²			
2.2		(ii) Abutments	m ²			
2.3		(iii) Footings	m ²			
2.4		(iv) Wingwalls	m ²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m ²			
2.6		(ii) Wingwalls	m ²			
2.7		(iii) Deck	m ²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m ²			
Subtotal: Falsework, Formwork and Concrete Finish						
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
		(a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
Subtotal: Steel Reinforcement for Structures						
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				
4.1		(i) Deck (W40/19)	m ³			
4.2		(ii) Abutments (W40/19)	m ³			
4.3		(iii) Earwalls (W30/19)	m ³			
		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m ³			
4.5		(ii) Approach slabs (30/19)	m ³			
4.6		(iii) Blinding (15/19)	m ³			

4.7		(iv) End Blocks (30/19)	m ³			
4.8		(vi) Wingwalls (30/19)	m ³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes:				
		(a) Drainage pipes:				
5.7		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
5.8		(b) Weep holes:				
		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures						
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer				
		(a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
Subtotal: Testing Materials and Workmanship						
Total: PART C BRIDGE DECK/EXTENSIONS						
PART E ROADS						
	Reference	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC				
		Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):				
		(a) Traffic accommodation for Road	km			
		Temporary traffic-control facilities:				
		(a) Additional flagmen	man-day			
		(c) Variable message signs (VMS)	No.			
		(d) Amber flicker lights (set of two)	No.			
		Operational Health, Safety and Environmental Officers				
		(a) Operational Health and Safety officer	month			

	(b) Environmental officer	month			
	(c) Transport and equipment for operational health and safety officer	month			
	Subtotal: Accommodation of Traffic				
Section 1700	CLEARING AND GRUBBING				
	Clearing and grubbing:				
	(a) Road	ha			
	Subtotal: Clearing and Grubbing				
Section 2100	DRAINS				
	Clearing and shaping existing open drains	m ³			
	Subtotal: Drains				
Section 5400	GUARDRAILS				
	Guardrails on timber posts:				
	(a) Galvanized	m			
	Guardrails on steel posts:				
	(a) Galvanized	m			
	End treatments:				
	(f) Terminal section:				
	(i) 19,05 m length	No			
	Reflective plates	No			
	Nailing of gang nail plates on top of timber guardrail posts	No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS				
	Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from:				
	(i) Area not exceeding 2 m ²	m ²			
	(ii) Area exceeding 2 m ² but not 10 m ²	m ²			
	Road sign supports (overhead road sign structures excluded):				
	(b) Timber:				
	(i) 75 mm diameter	m			
	(iii) 150 mm diameter	m			
	Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402	m ³			
	Extra-over item 56.05 for cement-treated soil backfill	m ³			
	Dismantling and storing road signs with a surface area of:				
	(a) Up to 2 m ²	No			
	(b) Exceeding 2 m ² but not 10 m ²	No			
	Danger Plates (Red Class III on white Class III):				
	(a) Type A (1 200 mm x 250 mm) (at bridges)	No			
	(b) Type B (800 mm x 200 mm) (at culverts/guardrails)	No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS				
	Retro-reflective road-marking paint:				
	(a) White lines (broken or unbroken):				
	(ii) 150 mm wide	km			
	(b) Yellow lines (broken or unbroken):				
	(i) 150 mm wide	km			
	Road studs:				
	(i) Stimsonite C80 or similar	No			

	Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS				
	Trimming:				
	(a) Machine trimming	m ²			
	(b) Hand trimming	m ²			
	Preparing the areas for grassing:				
	(a) Ripping	ha			
	(b) Scarifying for loosening topsoil	ha			
	(c) Topsoiling within the road reserve, where the following materials are used:				
	(i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance	m ³			
	Grassing:				
	(c) Hydro seeding:				
	(i) Providing an approved seed mixture for hydro seeding	kg			
	(iii) Hydro seeding	ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS				
	Finishing road and road reserve:				
	(b) Single carriageway roads	km			
	Treatment of old roads and temporary deviations	km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks				
	Cut and borrow to fill, including free-haul up to 0.5 km.				
	(a) Material in compacted layer thicknesses of 200mm and less:				
	(i) Compacted to 90% of modified AASHTO density				
	(1) Material obtained from cut or borrow	m ³			
	(2) Material obtained from commercial sources	m ³			
	(iii) Eight roller passes compaction (for mine dump rock)	m ³			
	Three roller passes compaction:				
	(a) Vibratory roller	m ²			
	Finishing-off cut and fill slopes, medians and interchange areas				
	(b) Fill slopes	m ²			
	Extra over item 33.01 for excavating material from the pavements and fills of existing roads:				
	(a) Non-cemented material	m ³			
	(b) Cemented material	m ³			
	Overhaul	m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material				
	Pavement layers constructed from gravel obtained from commercial sources (unlimited haul)				
	(a) Gravel selected layer compacted to:				
	(i) 93% of modified AASHTO density				
	(1) 200mm thick, G9 material	m ³			
	(2) 200mm thick, G7 material	m ³			
	(3) 200mm thick, G6 material	m ³			
	(h) Gravel wearing course compacted to:				
	(ii) 95% of modified AASHTO density (150mm thick)	m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing				
	Tack coat of 30% stable-grade emulsion	litre			



TCC/2023/05/0001/28813/RFP

	Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen)				
	(a) Continuously graded (medium)	t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
	SUB-TOTAL: PART F PROFESSIONAL SERVICES				
	TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G				
cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees					

Cost Estimate Loop Line Extensions at Saltair					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
	Subtotal: Accommodation of Traffic				
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
	Import & Compact:				
A.2.2.2	150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
	SUB-TOTAL: EARTHWORKS				

A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			

Subtotal Mast Foundations					
Steelwork					
Masts					
Supply and install 64kNM UC mast-9m (CEE-TMB-67)	Each				
Supply and install 85kNM UC mast-9m (CEE-TMB-68)	Each				
CANTILEVERS/SMALL PART STEELWORK					
Auto Tension Construction					
Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each				
Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres	Each				
Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each				
Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.	Each				
Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)	Each	0			
Track Switches					
Supply & Install 4500A track switch mounted on steel mast at location PS0/07	Each				
Supply and install section insulator 25kV AC.	Each				
Mid Point Anchor Structures					
Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation	No				
Supply and install mast numbering boards					
Subtotal Steelwork					
Wirework					
Conductors					
Supply 107mm ² Cu Contact Wire	metre				
Supply 160mm ² Tiger Wire	metre				
Supply & Install 150mm ² Al Earth Wire	metre				
Droppers					
Supply Droppers Complete 11-16m Span	span				
Supply Droppers Complete 17-22m Span	span				
Supply Droppers Complete 23-28m Span	span				
Supply Droppers Complete 29-34m Span	span				
Supply Droppers Complete 35-40m Span	span				
Supply Droppers Complete 41-46m Span	span				
Supply Droppers Complete 47-52m Span	span				
Supply Droppers Complete 53-58m Span	span				
Supply Droppers Complete 59-64m Span	span				
Supply Droppers Complete 65-70m Span	span				
Jumpers					
Supply & Install Catenary, Contact Jumpers complete with clamps	No				
Wiring					
Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:					
Tension Length No. 1					
Catenary	metre				
Contact	metre				
Earth wire	metre				
Dropper spans	No.				
Tensioning					

		Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary	ea			
		Splice and tension 107 contact wire	No			
		Splice and tension 160 catenary wire	No			
		Splice and tension 150 earth wire	No			
		Anchors (Double Stay wires)				
		Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715	No			
		Anchors (Single Stay wires)				
		Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	Each			
		Subtotal Wirework				
		Bonding and Earthing				
		Supply & Install Mast to Rail Bonds (Expanded collar or WAM system)	Each			
		Supply & Install Switch Structure Bonding (Expanded collar or WAM system)	Each			
		Supply & Install lightning arrestors on cantilever structures	Each			
		Supply and install cross bonds	Each			
		Subtotal Bonding and Earthing				
		MISCELLANEOUS				
		Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12	Each			
		Switching of 25kV & 6,6kV - Taking work permits & track occupations	rate only			
		Supply & Install Height Gauge (Complete)	Each			
		Supply & Install Warning Boards & Signs	Each			
		Subtotal for Miscellaneous				
		Total: OHTE				
Part C SIGNALLING						
	Item	Description	Unit	Quantity	Rate	Amount
		Standard Signal Poles (Multi Aspec CLS)	ea			
		Mechanical 2 or 3 way route indicator	ea			
		Apparatus case - Complete	set			
		Track Circuits & Relays	set			
		Transformers	ea			
		Electrical Points Indicator	ea			
		cabling	R/km			
		SUB-TOTAL: SIGNALLING				
PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			

1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			
	1/61.03	Access and drainage:				
1.6		(a) Access	Lump Sum			
	1/61.04	Backfill to excavations utilising:				
1.7		(a) Material from the excavation	m ³			
1.8		(b) Imported material	m ³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m ³			
1.10	1/61.06	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³ -km			
1.11	1/61.07	Overbreak in excavation in hard material	m ²			
	1/61.08	Foundation fill consisting of:				
1.12		(a) Rock fill	m ³			
1.13		(d) Mass concrete (Class 15/38)	m ³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
Subtotal: Foundations for Structures						
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m ²			
2.2		(ii) Abutments	m ²			
2.3		(iii) Footings	m ²			
2.4		(iv) Wingwalls	m ²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m ²			
2.6		(ii) Wingwalls	m ²			
2.7		(iii) Deck	m ²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m ²			
Subtotal: Falsework, Formwork and Concrete Finish						
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
		(a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
Subtotal: Steel Reinforcement for Structures						
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				
4.1		(i) Deck (W40/19)	m ³			
4.2		(ii) Abutments (W40/19)	m ³			
4.3		(iii) Earwalls (W30/19)	m ³			
		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m ³			
4.5		(ii) Approach slabs (30/19)	m ³			
4.6		(iii) Blinding (15/19)	m ³			
4.7		(iv) End Blocks (30/19)	m ³			
4.8		(vi) Wingwalls (30/19)	m ³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				

5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
5.3	1/B66.15	PARAPETS AND RAILINGS Concrete parapets: (a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
5.5	1/66.18	Numbers for structures (c) Numbers formed in concrete				
5.6		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes: (a) Drainage pipes: (ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
5.7		(b) Weep holes: (ii) PVC 50mm dia. and 650 mm of length	no			
5.8						
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures						
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer (a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
Subtotal: Testing Materials and Workmanship						
Total: PART C BRIDGE DECK/EXTENSIONS						
PART E ROADS						
	Reference	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC				
		Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):				
		(a) Traffic accommodation for Road	km			
		Temporary traffic-control facilities:				
		(a) Additional flagmen	man-day			
		(c) Variable message signs (VMS)	No.			
		(d) Amber flicker lights (set of two)	No.			
		Operational Health, Safety and Environmental Officers				
		(a) Operational Health and Safety officer	month			
		(b) Environmental officer	month			
		(c) Transport and equipment for operational health and safety officer	month			
Subtotal: Accommodation of Traffic						
	Section 1700	CLEARING AND GRUBBING				
		Clearing and grubbing:				
		(a) Road	ha			
Subtotal: Clearing and Grubbing						
	Section 2100	DRAINS				
		Clearing and shaping existing open drains	m ³			
Subtotal: Drains						

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	(i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance	m ³			
	Grassing:				
	(c) Hydro seeding:				
	(i) Providing an approved seed mixture for hydro seeding	kg			
	(iii) Hydro seeding	ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS				
	Finishing road and road reserve:				
	(b) Single carriageway roads	km			
	Treatment of old roads and temporary deviations	km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks				
	Cut and borrow to fill, including free-haul up to 0.5 km.				
	(a) Material in compacted layer thicknesses of 200mm and less:				
	(i) Compacted to 90% of modified AASHTO density				
	(1) Material obtained from cut or borrow	m ³			
	(2) Material obtained from commercial sources	m ³			
	(iii) Eight roller passes compaction (for mine dump rock)	m ³			
	Three roller passes compaction:				
	(a) Vibratory roller	m ²			
	Finishing-off cut and fill slopes, medians and interchange areas				
	(b) Fill slopes	m ²			
	Extra over item 33.01 for excavating material from the pavements and fills of existing roads:				
	(a) Non-cemented material	m ³			
	(b) Cemented material	m ³			
	Overhaul	m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material				
	Pavement layers constructed from gravel obtained from commercial sources (unlimited haul)				
	(a) Gravel selected layer compacted to:				
	(i) 93% of modified AASHTO density				
	(1) 200mm thick, G9 material	m ³			
	(2) 200mm thick, G7 material	m ³			
	(3) 200mm thick, G6 material	m ³			
	(h) Gravel wearing course compacted to:				
	(ii) 95% of modified AASHTO density (150mm thick)	m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing				
	Tack coat of 30% stable-grade emulsion	litre			
	Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen)				
	(a) Continuously graded (medium)	t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				
PART G: PROFESSIONAL SERVICES					

F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
SUB-TOTAL: PART F PROFESSIONAL SERVICES					
TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G					
cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees					

Cost Estimate Loop Line Extensions at Alicedale					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
A.2.2.2	Import & Compact: 150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			

A.3.2.2	Lay plain turnouts a) 1:12 LH or RH b) 1:9 LH or RH c) Stopblock	No No No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box: a) Turnout 1:12 b) Turnout 1:9 c) Trackwork (by hand) d) Stopblock	No No m No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron b) 900 dia pipe culverts complete with headwalls & apron c) 1200x900 Portal culvert with wing walls, head walls & apron slab d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m m m m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS Mast Foundations (Rates assume hand pickable soil) 64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57 85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57 Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12 Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	 Each Each Each Each			
Subtotal Mast Foundations					
	Steelwork Masts Supply and install 64kNM UC mast-9m (CEE-TMB-67) Supply and install 85kNM UC mast-9m (CEE-TMB-68) CANTILEVERS/SMALL PART STEELWORK Auto Tension Construction Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	 Each Each Each			

	Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	Each			
	Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.	Each			
	Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)	Each	0		
	Track Switches				
	Supply & Install 4500A track switch mounted on steel mast at location PS0/07	Each			
	Supply and install section insulator 25kV AC.	Each			
	Mid Point Anchor Structures				
	Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation	No			
	Supply and install mast numbering boards				
	Subtotal Steelwork				
	Wirework				
	Conductors				
	Supply 107mm2 Cu Contact Wire	metre			
	Supply 160mm2 Tiger Wire	metre			
	Supply & Install 150mm2 Al Earth Wire	metre			
	Droppers				
	Supply Droppers Complete 11-16m Span	span			
	Supply Droppers Complete 17-22m Span	span			
	Supply Droppers Complete 23-28m Span	span			
	Supply Droppers Complete 29-34m Span	span			
	Supply Droppers Complete 35-40m Span	span			
	Supply Droppers Complete 41-46m Span	span			
	Supply Droppers Complete 47-52m Span	span			
	Supply Droppers Complete 53-58m Span	span			
	Supply Droppers Complete 59-64m Span	span			
	Supply Droppers Complete 65-70m Span	span			
	Jumpers				
	Supply & Install Catenary, Contact Jumpers complete with clamps	No			
	Wiring				
	Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:				
	Tension Length No. 1				
	Catenary	metre			
	Contact	metre			
	Earth wire	metre			
	Dropper spans	No.			
	Tensioning				
	Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary	ea			
	Splice and tension 107 contact wire	No			
	Splice and tension 160 catenary wire	No			
	Splice and tension 150 earth wire	No			
	Anchors (Double Stay wires)				
	Supply & Install Double Stay wire assembly for OHE anchor complete to BBB0715	No			
	Anchors (Single Stay wires)				

		Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	Each			
		Subtotal Wirework				
		Bonding and Earthing				
		Supply & Install Mast to Rail Bonds (Expanded collar or WAM system)	Each			
		Supply & Install Switch Structure Bonding (Expanded collar or WAM system)	Each			
		Supply & Install lightning arrestors on cantilever structures	Each			
		Supply and install cross bonds	Each			
		Subtotal Bonding and Earthing				
		MISCELLANEOUS				
		Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12	Each			
		Switching of 25kV & 6,6kV - Taking work permits & track occupations	rate only			
		Supply & Install Height Gauge (Complete)	Each			
		Supply & Install Warning Boards & Signs	Each			
		Subtotal for Miscellaneous				
		Total: OHTE				
Part C SIGNALLING						
	Item	Description	Unit	Quantity	Rate	Amount
		Standard Signal Poles (Multi Aspec CLS)	ea			
		Mechanical 2 or 3 way route indicator	ea			
		Apparatus case - Complete	set			
		Track Circuits & Relays	set			
		Transformers	ea			
		Electrical Points Indicator	ea			
		cabling	R/km			
		SUB-TOTAL: SIGNALLING				
PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			
	1/61.03	Access and drainage:				
1.6		(a) Access	Lump Sum			

1.7	1/61.04	Backfill to excavations utilising:				
1.8		(a) Material from the excavation	m ³			
1.9	1/61.05	(b) Imported material	m ³			
1.10	1/61.06	Fill within a restricted area (extra over item 61.04)	m ³			
1.11	1/61.07	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³ -km			
1.12	1/61.08	Overbreak in excavation in hard material	m ²			
1.13		Foundation fill consisting of:				
1.14		(a) Rock fill	m ³			
		(d) Mass concrete (Class 15/38)	m ³			
		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
Subtotal: Foundations for Structures						
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m ²			
2.2		(ii) Abutments	m ²			
2.3		(iii) Footings	m ²			
2.4		(iv) Wingwalls	m ²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m ²			
2.6		(ii) Wingwalls	m ²			
2.7		(iii) Deck	m ²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m ²			
Subtotal: Falsework, Formwork and Concrete Finish						
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
		(a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
Subtotal: Steel Reinforcement for Structures						
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				
4.1		(i) Deck (W40/19)	m ³			
4.2		(ii) Abutments (W40/19)	m ³			
4.3		(iii) Earwalls (W30/19)	m ³			
		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m ³			
4.5		(ii) Approach slabs (30/19)	m ³			
4.6		(iii) Blinding (15/19)	m ³			
4.7		(iv) End Blocks (30/19)	m ³			
4.8		(vi) Wingwalls (30/19)	m ³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				

5.5		(c) Numbers formed in concrete	No			
5.6		(i) Parapets	No			
		(ii) Wing Walls	No			
	1/66.19	DRAINAGE FOR STRUCTURES				
		Drainage pipes and weep holes:				
		(a) Drainage pipes:				
5.7		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
		(b) Weep holes:				
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
		Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures				
6	1/8100 1/B81.02	TESTING MATERIALS AND WORKMANSHIP				
		Other special tests requested by the engineer				
		(a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
		Subtotal: Testing Materials and Workmanship				
		Total: PART C BRIDGE DECK/EXTENSIONS				
PART E ROADS						
	Reference	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC				
		Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):				
		(a) Traffic accommodation for Road	km			
		Temporary traffic-control facilities:				
		(a) Additional flagmen	man-day			
		(c) Variable message signs (VMS)	No.			
		(d) Amber flicker lights (set of two)	No.			
		Operational Health, Safety and Environmental Officers				
		(a) Operational Health and Safety officer	month			
		(b) Environmental officer	month			
		(c) Transport and equipment for operational health and safety officer	month			
		Subtotal: Accommodation of Traffic				
	Section 1700	CLEARING AND GRUBBING				
		Clearing and grubbing:				
		(a) Road	ha			
		Subtotal: Clearing and Grubbing				
	Section 2100	DRAINS				
		Clearing and shaping existing open drains	m ³			
		Subtotal: Drains				
	Section 5400	GUARDRAILS				
		Guardrails on timber posts:				

	(a) Galvanized Guardrails on steel posts: (a) Galvanized End treatments: (f) Terminal section: (i) 19,05 m length Reflective plates Nailing of gang nail plates on top of timber guardrail posts	m m No No No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from: (i) Area not exceeding 2 m ² (ii) Area exceeding 2 m ² but not 10 m ² Road sign supports (overhead road sign structures excluded): (b) Timber: (i) 75 mm diameter (iii) 150 mm diameter Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402 Extra-over item 56.05 for cement-treated soil backfill Dismantling and storing road signs with a surface area of: (a) Up to 2 m ² (b) Exceeding 2 m ² but not 10 m ² Danger Plates (Red Class III on white Class III): (a) Type A (1 200 mm x 250 mm) (at bridges) (b) Type B (800 mm x 200 mm) (at culverts/guardrails)	m ² m ² m m m ³ m ³ No No No No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide (b) Yellow lines (broken or unbroken): (i) 150 mm wide Road studs: (i) Stimsonite C80 or similar Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km km No km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS Trimming: (a) Machine trimming (b) Hand trimming Preparing the areas for grassing: (a) Ripping (b) Scarifying for loosening topsoil (c) Topsoiling within the road reserve, where the following materials are used: (i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance	m ² m ² ha ha m ³			

	Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	kg ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS Finishing road and road reserve: (b) Single carriageway roads Treatment of old roads and temporary deviations	km km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks Cut and borrow to fill, including free-haul up to 0.5 km. (a) Material in compacted layer thicknesses of 200mm and less: (i) Compacted to 90% of modified AASHTO density (1) Material obtained from cut or borrow (2) Material obtained from commercial sources (iii) Eight roller passes compaction (for mine dump rock) Three roller passes compaction: (a) Vibratory roller Finishing-off cut and fill slopes, medians and interchange areas (b) Fill slopes Extra over item 33.01 for excavating material from the pavements and fills of existing roads: (a) Non-cemented material (b) Cemented material Overhaul	m ³ m ³ m ³ m ² m ² m ³ m ³ m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material Pavement layers constructed from gravel obtained from commercial sources (unlimited haul) (a) Gravel selected layer compacted to: (i) 93% of modified AASHTO density (1) 200mm thick, G9 material (2) 200mm thick, G7 material (3) 200mm thick, G6 material (h) Gravel wearing course compacted to: (ii) 95% of modified AASHTO density (150mm thick)	m ³ m ³ m ³ m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing Tack coat of 30% stable-grade emulsion Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen) (a) Continuously graded (medium)	litre t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART F	SUNDRIES				
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				



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PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
SUB-TOTAL: PART F PROFESSIONAL SERVICES					
TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G					
cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees					

Cost Estimate Loop Line Extensions at Coerney					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
A.2.2.2	Import & Compact: 150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			

A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 57kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 63mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: STORM WATER					
TOTAL: PART A: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	85KNm UC Mast Foundation - Supply & Construct TO DRG CEE-TQ-57	Each			
	Single Stay Wire Foundation - Supply & Construct (similar) TO DRG CEE-TPB-12	Each			
	Double Stay Wire Foundation - Supply & Construct TO DRG CEE-TPB-12	Each			
Subtotal Mast Foundations					
	Steelwork				
	Masts				
	Supply and install 64kNM UC mast-9m (CEE-TMB-67)	Each			
	Supply and install 85kNM UC mast-9m (CEE-TMB-68)	Each			
	CANTILEVERS/SMALL PART STEELWORK				
	Auto Tension Construction				

	<p>Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres</p> <p>Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, double hockey stick and swivel clamp\ - 3.2m track centres</p> <p>Supply and Install swing arm cantilever complete with PPO tube, pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres</p> <p>Supply & Install weight tensioning devices complete with pulleys, all brackets, balance weights and guide rod.</p> <p>Supply & Install Single Cat/Cont suspension under D/Boom (CEE-TP-172)</p> <p>Track Switches</p> <p>Supply & Install 4500A track switch mounted on steel mast at location PS0/07</p> <p>Supply and install section insulator 25kV AC.</p> <p>Mid Point Anchor Structures</p> <p>Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation</p> <p>Supply and install mast numbering boards</p>	<p>Each</p> <p>Each</p> <p>Each</p> <p>Each</p> <p>Each</p> <p>Each</p> <p>Each</p> <p>Each</p> <p>Each</p> <p>No</p>	0			
	Subtotal Steelwork					
	<p>Wirework</p> <p>Conductors</p> <p>Supply 107mm² Cu Contact Wire</p> <p>Supply 160mm² Tiger Wire</p> <p>Supply & Install 150mm² Al Earth Wire</p> <p>Droppers</p> <p>Supply Droppers Complete 11-16m Span</p> <p>Supply Droppers Complete 17-22m Span</p> <p>Supply Droppers Complete 23-28m Span</p> <p>Supply Droppers Complete 29-34m Span</p> <p>Supply Droppers Complete 35-40m Span</p> <p>Supply Droppers Complete 41-46m Span</p> <p>Supply Droppers Complete 47-52m Span</p> <p>Supply Droppers Complete 53-58m Span</p> <p>Supply Droppers Complete 59-64m Span</p> <p>Supply Droppers Complete 65-70m Span</p> <p>Jumpers</p> <p>Supply & Install Catenary, Contact Jumpers complete with clamps</p> <p>Wiring</p> <p>Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:</p> <p>Tension Length No. 1</p> <p>Catenary</p> <p>Contact</p> <p>Earth wire</p> <p>Dropper spans</p> <p>Tensioning</p> <p>Supply & Install weight tension devices OR automatic compact spring tension device for contact and catenary</p> <p>Splice and tension 107 contact wire</p> <p>Splice and tension 160 catenary wire</p> <p>Splice and tension 150 earth wire</p> <p>Anchors (Double Stay wires)</p>	<p>metre</p> <p>metre</p> <p>metre</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>span</p> <p>No</p> <p>metre</p> <p>metre</p> <p>metre</p> <p>No.</p> <p>ea</p> <p>No</p> <p>No</p> <p>No</p>				

		Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715	No			
		Anchors (Single Stay wires)				
		Supply & Install Single Stay wire assembly for OHTE anchor complete to BBB0715	Each			
		Subtotal Wirework				
		Bonding and Earthing				
		Supply & Install Mast to Rail Bonds (Expanded collar or WAM system)	Each			
		Supply & Install Switch Structure Bonding (Expanded collar or WAM system)	Each			
		Supply & Install lightning arrestors on cantilever structures	Each			
		Supply and install cross bonds	Each			
		Subtotal Bonding and Earthing				
		MISCELLANEOUS				
		Supply & Install Mast numbering using Pre-Numbered loose plates to Engineering Instruction T12	Each			
		Switching of 25kV & 6,6kV - Taking work permits & track occupations	rate only			
		Supply & Install Height Gauge (Complete)	Each			
		Supply & Install Warning Boards & Signs	Each			
		Subtotal for Miscellaneous				
		Total: OHTE				
Part C SIGNALLING						
	Item	Description	Unit	Quantity	Rate	Amount
		Standard Signal Poles (Multi Aspec CLS)	ea			
		Mechanical 2 or 3 way route indicator	ea			
		Apparatus case - Complete	set			
		Track Circuits & Relays	set			
		Transformers	ea			
		Electrical Points Indicator	ea			
		cabling	R/km			
		SUB-TOTAL: SIGNALLING				
PART D BRIDGE DECKS/EXTENSIONS						
PART C - BRIDGES & Concrete Structure Extensions						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
		Additional foundation investigations	Prov Sum			
1.1	1/61.01	Excavation:				
	1/61.02	(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			

1.6	1/61.03	Access and drainage: (a) Access	Lump Sum			
1.7	1/61.04	Backfill to excavations utilising: (a) Material from the excavation	m ³			
1.8		(b) Imported material	m ³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m ³			
1.10	1/61.06	Overhaul in excess of 1,0 km on excavated material	m ³ -km			
1.11	1/61.07	and on material imported for backfill, foundation fill				
	1/61.08	and fill for caissons	m ²			
1.12		Foundation fill consisting of: (a) Rock fill	m ³			
1.13		(d) Mass concrete (Class 15/38)	m ³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
Subtotal: Foundations for Structures						
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide: (a) Class F1 surface finish to: (i) Approach slabs (ii) Abutments (iii) Footings (iv) Wingwalls (b) Class F3 surface finish to: (i) Abutments (ii) Wingwalls (iii) Deck	m ² m ² m ² m ² m ² m ² m ²			
2.1						
2.2						
2.3						
2.4						
2.5						
2.6						
2.7						
	1/62.03	Horizontal formwork to provide: (b) Class F3 surface finish to: (i) Deck	m ²			
2.8						
Subtotal: Falsework, Formwork and Concrete Finish						
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for: (a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
Subtotal: Steel Reinforcement for Structures						
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete: (a) Durability Concrete (Class W): (i) Deck (W40/19) (ii) Abutments (W40/19) (iii) Earwalls (W30/19) (b) Normal Concrete (i) Foundations (30/19) (ii) Approach slabs (30/19) (iii) Blinding (15/19) (iv) End Blocks (30/19) (vi) Wingwalls (30/19) Curing of concrete: (a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ³ m ³ m ³ m ³ m ³ m ³ m ³ m ³ m ²			
4.1						
4.2						
4.3						
4.4						
4.5						
4.6						
4.7						
4.8						
	1/B64.07					
4.9						
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
	1/B66.05	JOINTS Expansion joints (a) Roller	m			
5.1						
	1/B66.06	Filled Joints (a) 15mm closed cell joint former between abutments and approach slab	m ²			
5.2						
	1/B66.15	PARAPETS AND RAILINGS Concrete parapets:				
5.3						

5.4	1/66.17 1/66.18	(a) Rail "F-shape" type parapet End blocks (Rail "F-shape" type parapet) Numbers for structures (c) Numbers formed in concrete	m No			
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes: (a) Drainage pipes: (ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
5.7		(b) Weep holes: (ii) PVC 50mm dia. and 650 mm of length	no			
5.8		Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
5.9	1/66.21					
		Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures				
6	1/8100 1/B81.02	TESTING MATERIALS AND WORKMANSHIP Other special tests requested by the engineer (a) Additional durability tests where requested by the engineer (i) Tests for water sorptivity (ii) Tests for oxygen permeability (iii) Tests for concrete cover	Prov. Sum Prov. Sum Prov. Sum			
6.1						
6.2						
6.3						
		Subtotal: Testing Materials and Workmanship				
		Total: PART C BRIDGE DECK/EXTENSIONS				
PART E ROADS						
	Reference	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition): (a) Traffic accommodation for Road Temporary traffic-control facilities: (a) Additional flagmen (c) Variable message signs (VMS) (d) Amber flicker lights (set of two) Operational Health, Safety and Environmental Officers (a) Operational Health and Safety officer (b) Environmental officer (c) Transport and equipment for operational health and safety officer	km man-day No. No. month month month			
		Subtotal: Accommodation of Traffic				
	Section 1700	CLEARING AND GRUBBING Clearing and grubbing: (a) Road	ha			
		Subtotal: Clearing and Grubbing				
	Section 2100	DRAINS Clearing and shaping existing open drains	m ³			
		Subtotal: Drains				
	Section 5400	GUARDRAILS				

	Guardrails on timber posts: (a) Galvanized	m			
	Guardrails on steel posts: (a) Galvanized	m			
	End treatments: (f) Terminal section:				
	(i) 19,05 m length	No			
	Reflective plates	No			
	Nailing of gang nail plates on top of timber guardrail posts	No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS				
	Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from:				
	(i) Area not exceeding 2 m ²	m ²			
	(ii) Area exceeding 2 m ² but not 10 m ²	m ²			
	Road sign supports (overhead road sign structures excluded):				
	(b) Timber:				
	(i) 75 mm diameter	m			
	(iii) 150 mm diameter	m			
	Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402	m ³			
	Extra-over item 56.05 for cement-treated soil backfill	m ³			
	Dismantling and storing road signs with a surface area of:				
	(a) Up to 2 m ²	No			
	(b) Exceeding 2 m ² but not 10 m ²	No			
	Danger Plates (Red Class III on white Class III):				
	(a) Type A (1 200 mm x 250 mm) (at bridges)	No			
	(b) Type B (800 mm x 200 mm) (at culverts/guardrails)	No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS				
	Retro-reflective road-marking paint:				
	(a) White lines (broken or unbroken):				
	(ii) 150 mm wide	km			
	(b) Yellow lines (broken or unbroken):				
	(i) 150 mm wide	km			
	Road studs:				
	(i) Stimsonite C80 or similar	No			
	Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS				
	Trimming:				
	(a) Machine trimming	m ²			
	(b) Hand trimming	m ²			
	Preparing the areas for grassing:				
	(a) Ripping	ha			
	(b) Scarifying for loosening topsoil	ha			
	(c) Topsoiling within the road reserve, where the following materials are used:				

	(i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	m ³ kg ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS Finishing road and road reserve: (b) Single carriageway roads Treatment of old roads and temporary deviations	km km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks Cut and borrow to fill, including free-haul up to 0.5 km. (a) Material in compacted layer thicknesses of 200mm and less: (i) Compacted to 90% of modified AASHTO density (1) Material obtained from cut or borrow (2) Material obtained from commercial sources (iii) Eight roller passes compaction (for mine dump rock) Three roller passes compaction: (a) Vibratory roller Finishing-off cut and fill slopes, medians and interchange areas (b) Fill slopes Extra over item 33.01 for excavating material from the pavements and fills of existing roads: (a) Non-cemented material (b) Cemented material Overhaul	m ³ m ³ m ³ m ² m ² m ³ m ³ m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material Pavement layers constructed from gravel obtained from commercial sources (unlimited haul) (a) Gravel selected layer compacted to: (i) 93% of modified AASHTO density (1) 200mm thick, G9 material (2) 200mm thick, G7 material (3) 200mm thick, G6 material (h) Gravel wearing course compacted to: (ii) 95% of modified AASHTO density (150mm thick)	m ³ m ³ m ³ m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing Tack coat of 30% stable-grade emulsion Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen) (a) Continuously graded (medium)	litre t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Supply and install track signs	No			
A.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			

SUB-TOTAL: PART E - SUNDRIES					
PART G: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	General consulting fees	% rate			
SUB-TOTAL: PART F PROFESSIONAL SERVICES					
TOTAL: PART A + PART B + PART C + PART D + PART E + PART F +PART G					
cost % breakdown Part A: Perway Construction & Material Part B: OHTE Part C: Signalling Part D: Bridges & Concrete Structure Extensions Part E: Roads Part E: Sundries Part G: Professional Fees					

<p align="center"><i>Cost Estimate: Port of PE at Gqeberha</i></p>					
PART A: General Terminal Works					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
SUB-TOTAL: PRELIMINARY AND GENERAL					
A.2 SITE PREPERATIONS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clearing of unwanted material (nine loading bays)	Lump sum			
SUB-TOTAL: SITE PREPERATIONS					
A.3 REMOVAL OF EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount

A.3.1	Removal of 1 80 ton bollards	Lump sum			
A.3.2	Removal of STS crane (already underway under separate contract)	Lump sum			
A.3.3	Re-position STS crane power leads	Lump sum			
SUB-TOTAL: REMOVAL OF EQUIPMENT					
A.4 FENCING					
Item	Description	Unit	Quantity	Rate	Amount
A.4.1	Tie into existing fence	Lump sum			
A.4.2	Install clearview fencing panels and posts	m			
A.4.3	Remove gate and fences	Lump sum			
SUB-TOTAL: FENCING					
A.5 MODIFY WAREHOUSE 100					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	Install 4 roller shutter doors - North wall	No.			
A.5.2	Install 4 roller shutter doors - South wall	No.			
A.5.3	Install partition to separate the Inspection lanes from the remainder of the warehouse	Lump sum			
A.5.4	Install lighting for inspection lanes	Lump sum			
A.5.5	General house keeping, repairs and painting	Lump sum			
SUB-TOTAL: MODIFY WAREHOUSE 100					
A.6 INSPECTION FACILITY					
Item	Description	Unit	Quantity	Rate	Amount
A.6.1	Extend the existing inspection building	Lump sum			
A.6.1.1	New foundations and steel portal frame structure	Lump sum			
	New foundations	m ³			
	Floor	m ³			
	Reinforcement	ton			

	Wall brickwork 15Mpa double wall	m²			
	Single wall	m²			
	Plaster	m²			
	Steel frame	ton			
A.6.1.2	Install Roof sheeting and cladding and roller shutter doors to North and South Walls	Lump sum			
A.6.1.3	Install lighting, painting and making good.	Lump sum			
	SUB-TOTAL: INSPECTION FACILITY				
PART C: Sundries Works					
C.1 ROADMARKINGS					
Item	Description	Unit	Quantity	Rate	Amount
C.1.1	FBU storage lines within the new automotive terminal area	m²			
C.1.2	Speed lanes at Berth 101	m²			
C.1.3	Speed lanes at Berth 102	m²			
C.1.4	Speed lanes at Rail siding holding area	m²			
	SUB-TOTAL:				
C.2 RELOCATION OF REEFER ELECTRIC POINTS					
Item	Description	Unit	Quantity	Rate	Amount
C.2.1	Relocate the existing reefer plug-in points, power supply and equipment to the automotive terminal (MPT terminal at Berth 103)	Lump sum			
	SUB-TOTAL:				
C.3 LIGHTING					
Item	Description	Unit	Quantity	Rate	Amount
C.3.1	Review and update existing lighting to be within standard.	No.			
	SUB-TOTAL:				
C.4 REPAIRS TO EXISTING HARDSTAND					

Item	Description	Unit	Quantity	Rate	Amount
C.4.1	Inspect and repair damage to existing concrete hardstand	Lump sum			
	SUB-TOTAL:				
C.5 TRAFFIC MANAGEMENT					
Item	Description	Unit	Quantity	Rate	Amount
C.5.1	Install new boom gates to control and manage traffic at the interface between the Container Port Gate and Blue Light Rail Handelling facility	Lump sum			
	SUB-TOTAL:				
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.3	Surveys and Investigations	Prov Sum			
	SUB-TOTAL: PART E - SUNDRIES				
PART D: PROFESSIONAL SERVICES					
D.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
D.1.1	General consulting fees	% rate			
	SUB-TOTAL: PART F PROFESSIONAL SERVICES				
	TOTAL: PART A + PART B + PART C + PART D				

Cost Estimate: Port of PE at Gqeberha - Rail Component					
PART A: General Terminal Works - Rail Siding Works					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Rate	Amount	
A.1.1	Fixed Costs	Sum			

A.1.2	Time Related Costs	Month			
SUB-TOTAL: PRELIMINARY AND GENERAL					
PART B: Rail Siding Works					
B.1 INSTALLATION OF SIDINGS					
Item	Description	Unit	Quantity	Rate	Amount
B.1.1	EARTHWORKS				
B.1.1.1	Clear Site	m ²			
	a) Hard excavation to spoil	m ³			
B.1.1.2	In-situ preparation ;				
	a) Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
B.1.1.3	Import & Compact:				
	a) 150 mm G9 to be compacted to 93% MOD AASHTO from commercial source	m ³			
	b) 150 mm G5 USSG layer 95% MOD AASHTO	m ³			
	c) 150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
B.1.2	Trackwork				
B.1.2.1	Supply and deliver turnouts 1/9 or 1/12 57kg/m concrete bearers				
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
B.1.2.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 57kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 57kg/m timber bearers complete	No			
B.1.2.3	Uplift existing main line to new rail level	m			
B.1.2.4	Uplift existing track complete to stockpile	m			
B.1.2.5	Uplift existing track complete to spoil	m			
B.1.3	Laying and Installation				
B.1.3.1	Lay plain track complete on curves and straights	m			
B.1.3.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
B.1.3.3	Destress track	m			
B.1.3.4	Thermit welds 57kg/m	No			
B.1.4	Ballasting				
B.1.4.1	Supply and deliver crushed stone ballast 63mm	m ³			
B.1.4.2	Distribute ballast	m ³			
B.1.4.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
B.1.5	REMOVE AND RE-INSTALL NEW CROSSOVER				
B.1.5.1	Lift and reinstall 1/9 LH or RH 48kg/m tangential (Relocate and reconfigure existing turnout)	No			
B.1.5.2	Lift and re-install:				
	a) Rails only 48kg/m (second-hand - 12m lengths)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
B.1.5.3	Supply, deliver, stockpile and distribute PWM:				
	c) Pandrol e-Clip	No			
	d) T11 & T17 clips	no			
	e) GPI Pads	No			
SUB-TOTAL: INSTALLATION OF SIDINGS					



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B.2 CONCRETE HARDSTAND					
Item	Description	Unit	Quantity	Rate	Amount
B.2.1	Prepare and excavate for formwork	m ²			
B.2.2	Concrete 30 MPA including shutters & floating thickness 300 mm	m ³			
B.2.3	Reinforcement	kg			
B.2.4	Preparation of concrete hardstand	m ²			
SUB-TOTAL: CONCRETE HARDSTAND					
PART F SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
A.4.3	Surveys and Investigations	Prov Sum			
SUB-TOTAL: PART E - SUNDRIES					
PART C: PROFESSIONAL SERVICES					
C.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
C.1.1	General consulting fees	% rate			
SUB-TOTAL: PART F PROFESSIONAL SERVICES					
TOTAL: PART A + PART B + PART C					

Cost Estimate Kaalfontein Yard Works					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
	Import & Compact:				
A.2.2.2	150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: SECTION 2 - EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount

A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 48kg/m concrete bearers				
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 48kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			
	d) GPI Pads	No			
	e) Stopblock 48kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 48kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 73mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: SECTION 3 - TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: SECTION 5 - STORM WATER					
PART A TOTAL: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm Concrete Mast Foundation - Supply & Construct TO DRG CEE-TQ-80/BBB 1649	No			
Subtotal Mast Foundations					

	Steelwork Masts Supply and install 64kNM Concrete mast-12m (CEE-TMB-114) Double Booms Supply & Construct Double boom structure - 9.7m (Excludes masts, verticals and wiring) Supply and install double boom/kneebrace mounting brackets (Four brackets per set) Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres Track Switches Supply & Install 4500A track switch mounted on steel mast at location PS0/07 Mid Point Anchor Structures Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation	No			
	Subtotal Steelwork				
	Wirework Conductors Supply 160mm2 Tiger Wire Supply & Install 150mm2 Al Earth Wire Droppers Supply Droppers Complete 11-16m Span Jumpers Supply & Install Catenary, Contact Jumpers complete with clips Wiring Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows: Tension Length No. 1 Catenary Contact Earth wire Dropper spans Finalise Contact stagger, Clip in & Grease - Set along track movement Anchors (Double Stay wires) Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715	metre metre span metre metre metre No. T/Len No			
	Subtotal Wirework				
	Bonding and Earthing Supply & Install Mast to Rail Bonds (Expanded collar or WAM system) Supply & Install Switch Structure Bonding (Expanded collar or WAM system) Supply & Install lightning arrestors on cantilever structures Supply and install cross bonds	No No No No			
	Subtotal Bonding and Earthing				
PART B	Total: PART B OHTE				
PART C	BRIDGE DECKS/EXTENSIONS				

PART C - BRIDGES						
BRIDGE at km xx						
	Item	Description	Unit	Quantity	Rate	Amount
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				
		(a) Excavating soft material situated within the following successive depth ranges:				
1.2		(i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			
	1/61.03	Access and drainage:				
		(a) Access	Lump Sum			
	1/61.04	Backfill to excavations utilising:				
1.7		(a) Material from the excavation	m ³			
1.8		(b) Imported material	m ³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m ³			
1.10	1/61.06	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³ -km			
1.11	1/61.07	Overbreak in excavation in hard material	m ²			
	1/61.08	Foundation fill consisting of:				
1.12		(a) Rock fill	m ³			
1.13		(d) Mass concrete (Class 15/38)	m ³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
		Subtotal: Foundations for Structures				
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide:				
		(a) Class F1 surface finish to:				
2.1		(i) Approach slabs	m ²			
2.2		(ii) Abutments	m ²			
2.3		(iii) Footings	m ²			
2.4		(iv) Wingwalls	m ²			
		(b) Class F3 surface finish to:				
2.5		(i) Abutments	m ²			
2.6		(ii) Wingwalls	m ²			
2.7		(iii) Deck	m ²			
	1/62.03	Horizontal formwork to provide:				
		(b) Class F3 surface finish to:				
2.8		(i) Deck	m ²			
		Subtotal: Falsework, Formwork and Concrete Finish				
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for:				
		(a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
		Subtotal: Steel Reinforcement for Structures				
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete:				
		(a) Durability Concrete (Class W):				

4.1		(i) Deck (W40/19)	m³			
4.2		(ii) Abutments (W40/19)	m³			
4.3		(iii) Earwalls (W30/19)	m³			
		(b) Normal Concrete				
4.4		(i) Foundations (30/19)	m³			
4.5		(ii) Approach slabs (30/19)	m³			
4.6		(iii) Blinding (15/19)	m³			
4.7		(iv) End Blocks (30/19)	m³			
4.8		(vi) Wingwalls (30/19)	m³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m²			
		Subtotal: Concrete for Structures				
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes:				
		(a) Drainage pipes:				
5.7		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed	m			
		(b) Weep holes:				
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m²			
		Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures				
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer				
		(a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
		Subtotal: Testing Materials and Workmanship				
	PART C	Total: PART C BRIDGE DECK/EXTENSIONS				
	PART D	ROADS				
	Item	Description	Unit	Quantity	Rate	Amount
	Section 1500	ACCOMMODATION OF TRAFFIC				

	Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):				
	(a) Traffic accommodation for Road	km			
	Temporary traffic-control facilities:				
	(a) Additional flagmen	man-day			
	(c) Variable message signs (VMS)	No.			
	(d) Amber flicker lights (set of two)	No.			
	Operational Health, Safety and Environmental Officers				
	(a) Operational Health and Safety officer	month			
	(b) Environmental officer	month			
	(c) Transport and equipment for operational health and safety officer	month			
	Subtotal: Accommodation of Traffic				
Section 1700	CLEARING AND GRUBBING				
	Clearing and grubbing:				
	(a) Road	ha			
	Subtotal: Clearing and Grubbing				
Section 2100	DRAINS				
	Clearing and shaping existing open drains	m ³			
	Subtotal: Drains				
Section 5400	GUARDRAILS				
	Guardrails on timber posts:				
	(a) Galvanized	m			
	Guardrails on steel posts:				
	(a) Galvanized	m			
	End treatments:				
	(f) Terminal section:				
	(i) 19,05 m length	No			
	Reflective plates	No			
	Nailing of gang nail plates on top of timber guardrail posts	No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS				
	Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from:				
	(i) Area not exceeding 2 m ²	m ²			
	(ii) Area exceeding 2 m ² but not 10 m ²	m ²			
	Road sign supports (overhead road sign structures excluded):				
	(b) Timber:				
	(i) 75 mm diameter	m			
	(iii) 150 mm diameter	m			

	Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402 Extra-over item 56.05 for cement-treated soil backfill Dismantling and storing road signs with a surface area of: (a) Up to 2 m ² (b) Exceeding 2 m ² but not 10 m ² Danger Plates (Red Class III on white Class III): (a) Type A (1 200 mm x 250 mm) (at bridges) (b) Type B (800 mm x 200 mm) (at culverts/guardrails)	m ³ m ³ No No No No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS Retro-reflective road-marking paint: (a) White lines (broken or unbroken): (ii) 150 mm wide (b) Yellow lines (broken or unbroken): (i) 150 mm wide Road studs: (i) Stimsonite C80 or similar Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	 km km No km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS Trimming: (a) Machine trimming (b) Hand trimming Preparing the areas for grassing: (a) Ripping (b) Scarifying for loosening topsoil (c) Topsoiling within the road reserve, where the following materials are used: (i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance Grassing: (c) Hydro seeding: (i) Providing an approved seed mixture for hydro seeding (iii) Hydro seeding	 m ² m ² ha ha m ³ kg ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS Finishing road and road reserve: (b) Single carriageway roads Treatment of old roads and temporary deviations	 km km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks Cut and borrow to fill, including free-haul up to 0.5 km. (a) Material in compacted layer thicknesses of 200mm and less: (i) Compacted to 90% of modified AASHTO density				

	(1) Material obtained from cut or borrow	m ³			
	(2) Material obtained from commercial sources	m ³			
	(iii) Eight roller passes compaction (for mine dump rock)	m ³			
	Three roller passes compaction:				
	(a) Vibratory roller	m ²			
	Finishing-off cut and fill slopes, medians and interchange areas				
	(b) Fill slopes	m ²			
	Extra over item 33.01 for excavating material from the pavements and fills of existing roads:				
	(a) Non-cemented material	m ³			
	(b) Cemented material	m ³			
	Overhaul	m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material				
	Pavement layers constructed from gravel obtained from commercial sources (unlimited haul)				
	(a) Gravel selected layer compacted to:				
	(i) 93% of modified AASHTO density				
	(1) 200mm thick, G9 material	m ³			
	(2) 200mm thick, G7 material	m ³			
	(3) 200mm thick, G6 material	m ³			
	(h) Gravel wearing course compacted to:				
	(ii) 95% of modified AASHTO density (150mm thick)	m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing				
	Tack coat of 30% stable-grade emulsion	litre			
	Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen)				
	(a) Continuously graded (medium)	t			
	Subtotal: Asphalt base and surfacing				
PART D	Total: PART D ROADS				
PART E SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
E4	Rail Signs and Markers				
E.4.1	Supply and install track signs	No			
E.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
E5	LIGHTING				
E5.1	Review and update existing lighting to be within standard.	No.			
E5.2	Install new lighting masts and lights	No.			
	SUB-TOTAL: PART E - SUNDRIES				
PART F: PROFESSIONAL SERVICES					
F.1 PROFESSIONAL SERVICES					
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	Over-Head Traction Equipment	sum			
F.1.2	Signalling Equipment	sum			
F.1.3	Rail/Road bridge	No			

F.1.4	Weighbridge	sum			
F.1.5	Geotechnical Engineer	sum			
F.1.6	Surveyor	sum			
F.1.7	Rail Consultant (Design & Rail regulator approval)	sum			
F.1.8	OHE Consultant	sum			
F.1.9	Signalling Consultant	sum			
F.1.10	Trains Operating Consultant	sum			
SUB-TOTAL: PART F PROFESSIONAL SERVICES					
TOTAL: PART A + PART B + PART C + PART D + PART E + PART F					

Cost Estimate Waltloo Yard Works					
PART A: CONSTRUCTION					
A.1 PRELIMINARY AND GENERAL					
Item	Description	Unit	Quantity	Rate	Amount
A.1.1	Fixed Costs	Sum			
A.1.2	Time Related Costs	Month			
Subtotal: Accommodation of Traffic					
A.2 EARTHWORKS					
Item	Description	Unit	Quantity	Rate	Amount
A.2.1	Clear Site	m ²			
A.2.1.1	a) Cut to spoil 0.0-1.5m turf layer incl. freehaul	m ³			
A.2.1.2	b) Cut to fill	m ³			
A.2.1.3	c) Hard excavation to spoil	m ³			
A.2.2	In-situ preparation ;				
A.2.2.1	Rip & Recompact 150 layer (Grid roller & vibratory roller)	m ³			
A.2.2.2	Import & Compact: 150 G9 to be compacted to 93% MODAASHTO from commercial source	m ³			
A.2.2.3	500 Dump Rock layer (x8 passes with vibratory roller)	m ³			
A.2.2.4	200 G7 LSSG layer 93% MODAASHTO	m ³			
A.2.2.5	150 G5 USSG layer 95% MODAASHTO	m ³			
A.2.2.6	150 C3 Sub-ballast stabilised layer 2% OPC	m ³			
SUB-TOTAL: SECTION 2 - EARTHWORKS					
A.3 TRACKS					
Item	Description	Unit	Quantity	Rate	Amount
A.3.1	Trackwork				
A.3.1.1	Supply and deliver turnouts 1/9 or 1/12 48kg/m concrete bearers				
	b) 1/12 LH or RH (New Complete)	No			
	c) 1/9 LH or RH (New Complete)	No			
A.3.1.2	Supply, deliver, stockpile and distribute PWM:				
	a) Rails only 48kg/m (second-hand)	t			
	b) Sleepers concrete galvanized P2 @700 crs	No			
	c) Pandrol e Clip	No			

	d) GPI Pads	No			
	e) Stopblock 48kg/m timber bearers complete	No			
A.3.1.3	Uplift existing main line to new rail level	m			
A.3.1.4	Uplift existing track complete to stockpile	m			
A.3.1.5	Uplift existing track complete to spoil	m			
A.3.2	Laying and Installation				
A.3.2.1	Lay plain track complete on curves and straights	m			
A.3.2.2	Lay plain turnouts				
	a) 1:12 LH or RH	No			
	b) 1:9 LH or RH	No			
	c) Stopblock	No			
A.3.2.3	Destress track	m			
A.3.2.4	Thermit welds 48kg/m	No			
A.3.3	Ballasting				
A.3.3.1	Supply and deliver crushed stone ballast 73mm	m ³			
A.3.3.2	Distribute ballast	m ³			
A.3.3.3	Lift pack and box:				
	a) Turnout 1:12	No			
	b) Turnout 1:9	No			
	c) Trackwork (by hand)	m			
	d) Stopblock	No			
SUB-TOTAL: SECTION 3 - TRACKS					
A.5 STORM WATER CULVERTS					
Item	Description	Unit	Quantity	Rate	Amount
A.5.1	a) 600 dia pipe culverts complete with headwalls & apron	m			
	b) 900 dia pipe culverts complete with headwalls & apron	m			
	c) 1200x900 Portal culvert with wing walls, head walls & apron slab	m			
	d) 1200x1200 Portal culvert with wing walls, head walls & apron slab	m			
A.5.2	Manholes/catchpits	No			
A.5.3	Ancillary protection works	sum			
A.5.4	Standard earth side drains	m			
SUB-TOTAL: SECTION 5 - STORM WATER					
TOTAL: CONSTRUCTION					
PART B OVERHEAD TRACK EQUIPMENT					
Item	Description	Unit	Quantity	Rate	Amount
	CONSTRUCTION WORKS				
	Mast Foundations (Rates assume hand pickable soil)				
	64KNm Concrete Mast Foundation - Supply & Construct TO DRG CEE-TQ-80/BBB 1649	No			
Subtotal Mast Foundations					
	Steelwork				
	Masts				
	Supply and install 64kNM Concrete mast-12m (CEE-TMB-114)	No			
	Double Booms				
	Supply & Construct Double boom structure - 9.7m (Excludes masts, verticals and wiring)	No			

		Supply and install double boom/kneebrace mounting brackets (Four brackets per set)	No			
		Supply and Install swing arm cantilever complete with pivot fittings, insulators, registration tube, hockey stick and swivel clamp\ - 3.2m track centres	No			
		Track Switches				
		Supply & Install 4500A track switch mounted on steel mast at location PS0/07	No			
		Mid Point Anchor Structures				
		Supply & Erect Mid Point make-off to CEE-TPB-13 including make-off wires excl stay wire and stay foundation	No			
		Subtotal Steelwork				
		Wirework				
		Conductors				
		Supply 160mm2 Tiger Wire	metre			
		Supply & Install 150mm2 Al Earth Wire	metre			
		Droppers				
		Supply Droppers Complete 11-16m Span	span			
		Jumpers				
		Supply & Install Catenary, Contact Jumpers complete with clips				
		Wiring				
		Runout, suspend, install droppers, tension and stagger the feeder, catenary & contact as follows:				
		Tension Length No. 1				
		Catenary	metre			
		Contact	metre			
		Earth wire	metre			
		Dropper spans	No.			
		Finalise Contact stagger, Clip in & Grease - Set along track movement	T/Len			
		Anchors (Double Stay wires)				
		Supply & Install Double Stay wire assembly for OHTE anchor complete to BBB0715	No			
		Subtotal Wirework				
		Bonding and Earthing				
		Supply & Install Mast to Rail Bonds (Expanded collar or WAM system)	No			
		Supply & Install Switch Structure Bonding (Expanded collar or WAM system)	No			
		Supply & Install lightning arrestors on cantilever structures	No			
		Supply and install cross bonds	No			
		Subtotal Bonding and Earthing				
		Total: PART B OHTE				
		PART C BRIDGE DECKS/EXTENSIONS				
		PART C - BRIDGES				
		BRIDGE at km xx				
		Item Description Unit Quantity Rate Amount				
1	1/6100	FOUNDATIONS FOR STRUCTURES				
1.1	1/61.01	Additional foundation investigations	Prov Sum			
	1/61.02	Excavation:				

1.2		(a) Excavating soft material situated within the following successive depth ranges: (i) 0m up to 2m	m ³			
1.3		(b) Extra over sub item 1/61.02(a) for excavation in hard material irrespective of depth	m ³			
1.4		(c) Extra over subitem 1/61.02(a) of addition excavation required by the engineer after the excavation has been completed	m ³			
1.5		(d) Extra over subitem 1/61.02(a) for excavation by hand	m ³			
1.6	1/61.03	Access and drainage: (a) Access	Lump Sum			
1.7	1/61.04	Backfill to excavations utilising: (a) Material from the excavation	m ³			
1.8		(b) Imported material	m ³			
1.9	1/61.05	Fill within a restricted area (extra over item 61.04)	m ³			
1.10	1/61.06	Overhaul in excess of 1,0 km on excavated material and on material imported for backfill, foundation fill and fill for caissons	m ³ -km			
1.11	1/61.07	Overbreak in excavation in hard material	m ²			
1.12	1/61.08	Foundation fill consisting of: (a) Rock fill	m ³			
1.13		(d) Mass concrete (Class 15/38)	m ³			
1.14		(e) Concrete screed (75mm thick, Class 15/19)	m ³			
Subtotal: Foundations for Structures						
2	1/6200	FALSEWORK, FORMWORK AND CONCRETE FINISH				
	1/62.02	Vertical formwork to provide: (a) Class F1 surface finish to: (i) Approach slabs (ii) Abutments (iii) Footings (iv)Wingwalls (b) Class F3 surface finish to: (i) Abutments (ii) Wingwalls (iii) Deck	m ² m ² m ² m ² m ² m ² m ²			
2.1						
2.2						
2.3						
2.4						
2.5						
2.6						
2.7						
	1/62.03	Horizontal formwork to provide: (b) Class F3 surface finish to: (i) Deck	m ²			
2.8						
Subtotal: Falsework, Formwork and Concrete Finish						
3	1/6300	STEEL REINFORCEMENT FOR STRUCTURES				
	1/63.01	Steel reinforcement for: (a) The complete structure :				
3.1		(i) Mild-steel bars	t			
3.2		(ii) High-yield-stress steel bars	t			
Subtotal: Steel Reinforcement for Structures						
4	1/6400	CONCRETE FOR STRUCTURES				
	1/B64.01	Cast in-situ concrete: (a) Durability Concrete (Class W): (i) Deck (W40/19) (ii) Abutments (W40/19) (iii) Earwalls (W30/19) (b) Normal Concrete (i) Foundations (30/19) (ii) Approach slabs (30/19) (iii) Blinding (15/19)	m ³ m ³ m ³ m ³ m ³ m ³ m ³			
4.1						
4.2						
4.3						
4.4						
4.5						
4.6						

4.7		(iv) End Blocks (30/19)	m ³			
4.8		(vi) Wingwalls (30/19)	m ³			
	1/B64.07	Curing of concrete:				
4.9		(a) All concrete using a water based low viscosity clear wax emulsion curing compound	m ²			
Subtotal: Concrete for Structures						
5	1/6600	NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURES				
		JOINTS				
	1/B66.05	Expansion joints				
5.1		(a) Roller	m			
	1/B66.06	Filled Joints				
5.2		(a) 15mm closed cell joint former between abutments and approach slab	m ²			
		PARAPETS AND RAILINGS				
5.3	1/B66.15	Concrete parapets:				
		(a) Rail "F-shape" type parapet	m			
5.4	1/66.17	End blocks (Rail "F-shape" type parapet)	No			
	1/66.18	Numbers for structures				
		(c) Numbers formed in concrete				
5.5		(i) Parapets	No			
5.6		(ii) Wing Walls	No			
		DRAINAGE FOR STRUCTURES				
	1/66.19	Drainage pipes and weep holes:				
		(a) Drainage pipes:				
		(ii) Netlon M65 perforated pipe, or similar approved, complete with 300mm x 50mm mortar bed				
5.7		(b) Weep holes:	m			
5.8		(ii) PVC 50mm dia. and 650 mm of length	no			
5.9	1/66.21	Synthetic fibre filter fabric Kaymat U34 or similar approved	m ²			
Subtotal: No-Fines Concrete, Joints, Bearings, Bolt Groups for Electrification, Parapets and Drainage for Structures						
6	1/8100	TESTING MATERIALS AND WORKMANSHIP				
	1/B81.02	Other special tests requested by the engineer				
		(a) Additional durability tests where requested by the engineer				
6.1		(i) Tests for water sorptivity	Prov. Sum			
6.2		(ii) Tests for oxygen permeability	Prov. Sum			
6.3		(iii) Tests for concrete cover	Prov. Sum			
Subtotal: Testing Materials and Workmanship						
Total: PART C BRIDGE DECK/EXTENSIONS						
PART D ROADS						
Reference	Description		Unit	Quantity	Rate	Amount
Section 1500	ACCOMMODATION OF TRAFFIC					
	Accommodating traffic and maintaining temporary deviations (refer to SADC RTSM Volume 2, Chapter 13 of the June 1999 edition):					
	(a) Traffic accommodation for Road		km			
	Temporary traffic-control facilities:					

	(a) Additional flagmen (c) Variable message signs (VMS) (d) Amber flicker lights (set of two) Operational Health, Safety and Environmental Officers (a) Operational Health and Safety officer (b) Environmental officer (c) Transport and equipment for operational health and safety officer	man-day No. No. month month month			
	Subtotal: Accommodation of Traffic				
Section 1700	CLEARING AND GRUBBING				
	Clearing and grubbing:				
	(a) Road	ha			
	Subtotal: Clearing and Grubbing				
Section 2100	DRAINS				
	Clearing and shaping existing open drains	m ³			
	Subtotal: Drains				
Section 5400	GUARDRAILS				
	Guardrails on timber posts:				
	(a) Galvanized	m			
	Guardrails on steel posts:				
	(a) Galvanized	m			
	End treatments:				
	(f) Terminal section:				
	(i) 19,05 m length	No			
	Reflective plates	No			
	Nailing of gang nail plates on top of timber guardrail posts	No			
	Subtotal: Guardrails				
Section 5600	ROAD SIGNS				
	Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class 1 retro-reflective material, where the sign board is constructed from:				
	(i) Area not exceeding 2 m ²	m ²			
	(ii) Area exceeding 2 m ² but not 10 m ²	m ²			
	Road sign supports (overhead road sign structures excluded):				
	(b) Timber:				
	(i) 75 mm diameter	m			
	(iii) 150 mm diameter	m			
	Excavation and backfilling for road sign supports (not applicable to kilometre posts) and chevron warning signs E401 and W402	m ³			
	Extra-over item 56.05 for cement-treated soil backfill	m ³			
	Dismantling and storing road signs with a surface area of:				
	(a) Up to 2 m ²	No			
	(b) Exceeding 2 m ² but not 10 m ²	No			
	Danger Plates (Red Class III on white Class III):				

	(a) Type A (1 200 mm x 250 mm) (at bridges)	No			
	(b) Type B (800 mm x 200 mm) (at culverts/guardrails)	No			
	Subtotal: Road Signs				
Section 5700	ROAD MARKINGS				
	Retro-reflective road-marking paint:				
	(a) White lines (broken or unbroken):				
	(ii) 150 mm wide	km			
	(b) Yellow lines (broken or unbroken):				
	(i) 150 mm wide	km			
	Road studs:				
	(i) Stimsonite C80 or similar	No			
	Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km			
	Subtotal: Road Markings				
Section 5800	LANDSCAPING AND PLANTING PLANTS				
	Trimming:				
	(a) Machine trimming	m ²			
	(b) Hand trimming	m ²			
	Preparing the areas for grassing:				
	(a) Ripping	ha			
	(b) Scarifying for loosening topsoil	ha			
	(c) Topsoiling within the road reserve, where the following materials are used:				
	(i) Topsoil obtained from within the road reserve or borrow areas including unlimited free-haul distance	m ³			
	Grassing:				
	(c) Hydro seeding:				
	(i) Providing an approved seed mixture for hydro seeding	kg			
	(iii) Hydro seeding	ha			
	Subtotal: Landscaping and Planting Plants				
Section 5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS				
	Finishing road and road reserve:				
	(b) Single carriageway roads	km			
	Treatment of old roads and temporary deviations	km			
	Subtotal: Finishing the Road and Road Reserve and Treating old roads				
Section 3300	Mass Earthworks				
	Cut and borrow to fill, including free-haul up to 0.5 km.				
	(a) Material in compacted layer thicknesses of 200mm and less:				
	(i) Compacted to 90% of modified AASHTO density				
	(1) Material obtained from cut or borrow	m ³			
	(2) Material obtained from commercial sources	m ³			
	(iii) Eight roller passes compaction (for mine dump rock)	m ³			
	Three roller passes compaction:				
	(a) Vibratory roller	m ²			
	Finishing-off cut and fill slopes, medians and interchange areas				

	(b) Fill slopes Extra over item 33.01 for excavating material from the pavements and fills of existing roads:	m ²			
	(a) Non-cemented material	m ³			
	(b) Cemented material	m ³			
	Overhaul	m ³ -km			
	Subtotal: Mass Earthworks				
Section 3400	Pavement Layers of Gravel Material Pavement layers constructed from gravel obtained from commercial sources (unlimited haul) (a) Gravel selected layer compacted to: (i) 93% of modified AASHTO density (1) 200mm thick, G9 material (2) 200mm thick, G7 material (3) 200mm thick, G6 material (h) Gravel wearing course compacted to: (ii) 95% of modified AASHTO density (150mm thick)	m ³ m ³ m ³ m ³			
	Subtotal: Pavement Layers Gravel Material				
Section 4200	Asphalt base and surfacing Tack coat of 30% stable-grade emulsion Asphalt surfacing on bridge decks (50mm thick with 70/100 penetration grade bitumen) (a) Continuously graded (medium)	litre t			
	Subtotal: Asphalt base and surfacing				
	Total: PART D ROADS				
PART E SUNDRIES					
Item	Description	Unit	Quantity	Rate	Amount
E4	Rail Signs and Markers				
E.4.1	Supply and install track signs	No			
E.4.2	Supply and install clearance markers	No			
A.4.3	Surveys and Investigations	Prov Sum			
E5	LIGHTING Review and update existing lighting to be within standard.	No.			
E5.2	Install new lighting masts and lights	No.			
	SUB-TOTAL: PART E - SUNDRIES				
PART F: PROFESSIONAL SERVICES					
F.1	PROFESSIONAL SERVICES				
Item	Description	Unit	Quantity	Rate	Amount
F.1.1	Over-Head Traction Equipment	sum			
F.1.2	Signalling Equipment	sum			
F.1.3	Rail/Road bridge	No			
F.1.4	Weighbridge	sum			
F.1.5	Geotechnical Engineer	sum			
F.1.6	Surveyor	sum			
F.1.7	Rail Consultant (Design & Rail regulator approval)	sum			
F.1.8	OHTE Consultant	sum			
F.1.9	Signalling Consultant	sum			
F.1.10	Trains Operating Consultant	sum			

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		SUB-TOTAL: PART F PROFESSIONAL SERVICES	
		TOTAL: PART A + PART B + PART C + PART D + PART E + PART F	

Part C3: Scope of Work

C3.1: SCOPE OF WORKS

Glossary

The definitions listed below apply to this document.

Abbreviations	Definition
AC	Alternating Current
BSCS	British Soil Classification System
CAD	Computer Aided Drawing
CAS	Condition Assessment Systems
CS90	Control System 90 (Remote Control)
CTC	Centralised Traffic Control
DED	Dragging Equipment Detector
DBSA	Development Bank of Southern Africa
DC	Direct Current / Design Criteria
DFI	Development Funding Institutes
DTIc	Department of Trade, Industry & Competition
EAPASA	Environmental Assessment Practitioners Association of South Africa
EIA	Environmental Impact Analysis
ECP	Enterprise Change Proposal
ECSA	Engineering Council of South Africa
EMC	Electromagnetic Compatibility
EPC	Engineering, Procurement, Construction,
FAT	Factory Acceptance Testing
FSDT	Fail Safe Data Transfer
FBU	Fully Built-up Units
FMCSA	Ford Motor Company of Southern Africa
GDP	Gross Domestic Product
IDC	Industrial Development Corporation
ITP	Inspection and test plan

MOTS	Motor Operated Track Switches
MSA	Moving South Africa
NatCor	Natal Corridor
NMB	Nelson Mandela Bay
OHTE	Overhead Track Equipment
ORS	Owner Requirement Specification
PEP	Project Execution Plan
PFMA	Public Finance Management Act
PON	Port of Ngqura
PoPE	Port of Port Elizabeth
RBO	Reliability Based Optimisation
RN	TFR Rail Network
RNC	TFR Rail Network Construction (Previously known as RME)
RSR	Railway Safety Regulator of South Africa
RTO	Radio Train Order
SAICE	South African Institution of Civil Engineering
SANS	South African National Standards
SAT	Site Acceptance Testing
SouthCor	South Corridor
TASEZ	Tshwane Automotive Special Economic Zone
TCO	Train Control Officer
TM	TFR Technology Management
TMS	Train Management System
TSS	Track sectioning switches
TFR	Transnet Freight Rail
v	Volts
VDSS	Vendor Document Submittal Schedule
VDU	Visual Display Unit
TAS	Train Authorization Systems
TWS	Track Warrant Systems
WULA	Water Use License Application

1. General description of the works

1.1 Employer's objectives

The *Employer's* objective is to enter into a contract with an EPC *Contractor* to provide a Turnkey service for the Engineering, Procurement, Construction, Commissioning and Close-out including an EIA study for the: Ukuvuselela Automotive Project (Gauteng – Eastern Cape High-Capacity Rail Corridor for Automotive (FMCSA) volumes) which would be supported by the following comprehensive multidisciplinary services which include but are not limited to:

- a) Engineering management and execution, Procurement management and execution and construction execution planning which also includes but is not limited to Scheduling & planning, Cost engineering & Quantity surveying, Documentation management, Quality Management, Safety management, Risk management and planning, and procurement packaging, execution and management planning.
- b) Plan and execute a comprehensive geotechnical investigation along the proposed rail corridor (at the discretion of the *Contractor* to support his design). Provide geotechnical investigation input/design recommendations for all elements related to the development of the rail corridor. Provide detailed designs for construction of all required geotechnical elements related to the proposed developments.
- c) Comprehensive Environmental Management and Authorisation including all stakeholder engagements, applications, specialist studies, record of decisions and development of the execution stage management and monitoring plan (14 sites x Water Use Licenses, 15 x sites fall within sensitive areas, 5 x sites require biodiversity permits, all sites require heritage exemption). Public participation and stakeholder management and social management. This also includes all the engagements with the DFFE
- d) Comprehensive multidisciplinary Railway engineering and design to 100% Approved For Construction (except where otherwise stated) for elements forming the scope of the project (Perway, Formation, Civil, bridges and structures, OHTE, Traction Substations, Signalling (Train Authorisation Systems, Condition Assessment Systems, Telecontrol, Telecoms), level crossing upgrades, etc.) including any detailed designs needing to be done by the execution *Sub-Contractors* and/or *Contractor*. The Power simulation study needs to be conducted for traction substations and OHTE that will be supplying the extended sections.
- e) Comprehensive Civil, Structural and Bridge engineering designs to 100% Approved for Construction for elements forming the scope of the project and the undertaking of the construction. Comprehensive tacheometric, cadastral and sub surface (as required) survey of all key rail infrastructure and all other elements forming the scope of the project.
- f) Stakeholder Management which includes identification, analysis and engagements to ultimately support the project outcomes and to solicit the necessary town planning and other related approvals.
- g) Benefits identification, analysis & quantification which include social, economic, financial, etc.
- h) Optimisation, Quantification, Specification and determination of the optimal fleet size of Locomotives (tractive effort) and wagons to support the logistic solution.

- i) Validate, confirm and own the outputs and outcomes of the Prefeasibility Study that serves as an input to this phase of the works
- j) Comprehensive integrated Design Report for all engineering and design.
- k) Procurement planning, packaging and execution
- l) Construction planning and execution
- m) Quality inspections of manufacturing, fabrication and construction works.
- n) Designer inspections of construction works and assurance.
- o) Training and technology transfer.
- p) A fully commissioned system, using TFR approved test/certification engineers, including all required arrangements and equipment for occupations.
- q) Close out, including handover, correction of defects, signed-off as-built drawings, manuals, completion certificates and other documentation.
- r) Undertake a simulation analysis to establish if the VW back haul from Kaalfontein can be despatched via the FMCSA rail yard in Waltloo on the return leg so as to prevent any road haulage of FBUs from Waltloo to Kaalfontein. The outcomes of this analysis must be integrated and engineered into the final solution which would include any infrastructure expansion, enhancement on the rail network and Waltloo yard.

This also includes all other relevant services of the *Employer's* Framework for project delivery of the Engineering, Procurement, Construction works, Commissioning and Closeout; and all related supporting services and documentation including the relevant Bankable Business Cases and Financial Models to ensure compliance to the generally acceptable standard of project lifecycle process (PLP) followed for a project of this magnitude.

The business goal:

Transnet's key requirement from the proposed project and subsequent transaction is to maximize the contribution to Transnet's bottom line and minimize the losses made from automotive logistics. This can be achieved by either reducing the cost (and financial losses) or increasing the net income that Transnet is experiencing in the logistics of fully built automotive units.

Although the focus of this project is on improving the security of supply for the automotive logistical flows between the hinterland and the coastal ports by providing adequate rail (SouthCor rail) and port (Port of Port Elizabeth) capacity, the financial viability and long-term sustainability of automotive logistics through the formation of an Automotive Operating Company (AOC) for the provision of the rolling stock and the haulage service is a key component. The intent is also for the anticipated transaction to have a positive financial contribution to the larger Transnet system and South Africa through increased rail-bound automotive volumes (road to rail migration). There is an expectation that this project and transaction will unlock additional unrealized value, both within the terminal, rail corridors and in the broader value chain.

Lastly, the proposed transaction is focused on improving the logistics for the automotive sector in South Africa. The intent is to contribute to the reduction in the cost of doing

business in South Africa by being the enabler of smooth-flowing logistics supply chains.

Therefore, the objectives of this project can be summed up as:

The Ukuvuselela project objective is to deliver the Ford Motor Company Southern Africa (FMCSA) volume forecast demands for future Fully Built-up Units (FBUs) and to deliver the required rail capacity via the SouthCor from Waltloo and Kaalfontein in Gauteng to the Port of Port Elizabeth (PoPE) in Gqeberha by 2026.

The drive to increase rail traffic for automotive volumes along the SouthCor route is a direct result of the expansion plans of FMCSA. FMCSA is in the process of increasing their exports from 58,150 FBU's in 2021/22 to 136,290 FBU's in 2023/24, then to a total of 151,141 FBU's by 2025/26. This is a near three-fold increase from the current volumes for Ford. This will increase from 1 train with 40 wagons a day to 3 trains with 50 wagons per day by 2026.

Project goal: To Engineer, Procure, Construct, Commission and Close-out the rail infrastructure works for the Ukuvuselela Automotive Project. The ultimate outcome is to achieve functional fit for purpose asset(s) and commission the asset(s) for use by Transnet end-users.

The key objective of this project is to enable a two-port strategy for Automotive Exports & Imports with rail connectivity to the hinterland. In doing so the project seeks to address the following:

- Overcome Ongoing Congestion and Performance issues with the Port of Durban,
- Create rail capacity to service the proposed ramp up of Automotive Volumes between the Hinterland and the PoPE (for FMCSA),
- Distribute the risk, security of supply and have a business continuity plan,
- Optimize the cost,
- Reduce road haulage movement and help to reduce Carbon footprint; and,
- Help in sustainable job creation in the Gqeberha Area & overall socioeconomic development of the region.

Project objectives

- To provide end to end rail infrastructure capacity to support the freight logistics of fully built automotive units from Tshwane to Gqeberha for the import and export automotive programme.
- To provide adequate Rolling Stock which includes locomotives and specialised automotive wagons to support and enable the freight logistics of fully built automotive units.
- To provide a sustainable and competitive commercial contracting model through third party access philosophies to support the freight logistics of the fully built automotive units import and export programme.
- To provide adequate Port and Terminal infrastructure to support and enable the freight logistics of fully built automotive units through the Port of Port Elizabeth.

These relevant objectives indicate the need for Government and TFR to leverage private

sector funding so that rail can aggressively exploit its competitive advantages; to attract, encourage, and regulate private sector participation in investment, operations and maintenance; and to allow concessionaires and lessees long-term participation in the sector to sufficiently amortize their investments for automotive rail logistics.

The service required will be the procurement of a Turnkey EPC *Contractor* to undertake engineering, design, procurement, construction and commissioning, to drive the infrastructure construction, commercial and financial outcomes of the project.

For the development of the project, all the inputs will be provided by the Employer and specified in the attached Agencies:

In the delivery of each Phase deliverable, the *Contractor* shall execute the works as specified in terms of the relevant disciplines' requirements. The *Contractor* shall undertake the services with the clear understanding that they are acting as an *Employer's* representative and agent and therefore be fully aware of and knowledgeable with regards to Transnet business requirements policies and procedures. The *Contractor* shall comply with the relevant policies and procedures applicable to Transnet Freight Rail (TFR) as updated from time to time.

The *Contractor* ensures that they are familiar with the *Employer's* project and construction methodology and that the deliverables required as part of this contract are fully aligned and compliant therewith.

The overall estimated project duration after EPC tender award is 24 months (Engineering, Procurement, Construction, Commissioning, Hand over and Close-out including an EIA-ROD).

For this contract the project scope will be limited only to Design, Procure, Construct, Commission and close-out of the infrastructure works including an EIA.

2. Executive overview

Transnet has embarked on a novel strategy planning process that will provide inputs into the Corporate Plan. As part of this process, eight segment strategies have been crafted, due to their importance to the economy, importance to Transnet as well as Transnet's role in ensuring security of supply to its customers. The segment strategies are fortified through a commercial analytical lens and articulate an appropriate sustainable positioning for each of the segment strategies in achieving the mandate of the Shareholder.

At the State of the Nation Address, our Honourable President, Mr. Cyril Ramaphosa, pledged the three spheres of governments' support, commitment, and involvement in the establishment of new opportunities to stimulate the development of a high-capacity rail infrastructure corridor between Gauteng and the Eastern Cape, to assist with transporting finished vehicles for export through the Port of Port Elizabeth.

Given Transnet's significant financial constraints, and limited capability in some instances to fund and finance this Project, an opportunity for Transnet to mitigate such resource constraints was to register the High-Capacity Corridor for Automotive Volumes via SouthCor and Port of Port Elizabeth as a Special Strategic Infrastructure Project (SSIP) with Investment and Infrastructure South Africa.

As such, at the core of Transnet's strategy is the need to forge partnerships to create new avenues of capital funding, and to introduce private and public sector participants in the provision of freight rail services and port terminal operations.

The Automotive Industry's needs include but are not limited to the rerouting of some of their existing logistic supply chain to and from the Port of Durban via the Container Corridor to Gauteng (Silverton Manufacturing Plant) to that of Gauteng to the Port of Elizabeth via the South Corridor. This is to include all import and export volumes of fully built units for 100% rail logistics.

Core to South Africa's ambitions to drive growth and employment through the scaling of high-growth sectors (including through special economic zones) is optimising the cost of moving goods between major processing nodes (particularly Gauteng) and to and from key coastal ports for international transport. This is a key factor, for example, in the success and expansion of the Tshwane Automotive Special Economic Zone and the Coega Special Economic Zones. The cost of doing business across South Africa, a critical factor in implementing and scaling the interventions promulgated under the Economic Response and Recovery plan announced by the President on 15th October 2020, is significantly impacted by the cost of freight - particularly with respect to investment attraction and retention and maximising multiplier effects that justify money spent and revenue foregone on key incentives such as the special economic zones.

However, not only has rail freight failed to act as a spur to growth in the South African economy, but under-investment and poor interoperability with freight infrastructure across the legacy Spoornet network (now operated under Transnet Freight Rail or TFR) has resulted in an estimated 100 million tonnes per annum of freight demand moving from rail to road over the last 2 decades. This is a long-term systemic problem. As far back as 1998, the Moving South Africa (MSA) study identified two massive weaknesses in the freight system.

- Lack of support for export competitiveness; and
- Low levels of system sustainability.

The MSA defined three strategic actions:

- Build density in the transport system through focusing freight flows on select corridors by supporting and reinforcing current trends to build the backbone of the system, at the same time as reducing complexity and investment requirements;
- Build economies of scale within the different modes by focusing the role of the modes, maximising scale economies within each mode and offering differentiated services where economically sustainable; and
- Improve firm level competitiveness by removing obstacles, improving integration, ensuring sufficient reinvestment to maintain quality infrastructure and operations, restoring price and value signals between customers and service providers, and building an industry platform which drives differentiation and innovation.

The opportune focal point for this was, and remains the rail freight, which, when delivered efficiently, moves goods at between 30% and 50% of the cost of road freight. Rail freight networks are also directly integrated with Port Networks, another critical feature of the system. TFR, to harness this opportunity, must radically improve predictability and quality of service, availability of rolling stock and condition of the rail network.

Background

The catalytic investment by the Ford Motor Company in the Tshwane Automotive Special Economic Zone, and parallel proposed enabling of expanded port capacity in Gqeberha (specifically the port of Port Elizabeth) provides the opportunity to create the first major component of a fully competitive rail freight network for the next phase of South Africa's industrial development. The proposal at hand is to establish a high-capacity freight rail corridor linking the Coega Special Economic Zone to the Tshwane Automotive Special Economic Zone (TASEZ), allowing for both rapid, affordable transportation of vehicles produced at the TASEZ to port, and rapid loading upon arrival, as well as for predictable, affordable importation schedules of specialist components moving from the port to the TASEZ. The investment targeting will include significantly expanding capacity at the Port of Port Elizabeth as well as upgrading of tracks, wagons and supporting systems to ensure required volumes of trains moving on a predictable, competitively priced timetable in each direction.

The exact configuration of rail corridor utilisation to establish the corridor will be determined based on optimisation and timeframes to attain these goals. The TASEZ will begin production at scale in 2022, setting a very compressed timeframe to execute at least the first stages of the required upgrades and investments. Given that no new track is proposed to be built (upgrades to existing track are what is foreseen) and the port infrastructure at Gqeberha is similarly not a green-fields development, this is within the envelope of possibility.

While this initiative draws its commercial investment logic from servicing Ford Motor Company as an initial client in both Gauteng and the Eastern Cape, the establishment of the high-capacity corridor will be a sustained capability boost to the economies of both leading provinces (as well as those provinces through which the corridor will pass) and freight rail as a network industry nationally.

The following list of systemic issues that, as per their analysis, contribute to the uncompetitive profile of the current South African freight rail offering with respect to the automotive sector, creating major bottlenecks to investment in a sector explicitly targeted at a policy level for export-led growth and expansion:

- Insufficient rail capacity and equipment to support Ford business
- Limited rail service between Silverton and port of Port Elizabeth
- Silverton rail service continuously impacted by PRASA
- Constant delays with the arrival of trains in Silverton & Kaalfontein and ports
- Constant delays due to derailments, theft & vandalism.
- Insufficient tracking of trains
- Poor train/slot planning leading to delays and inconsistent performance
- Poor rail security leading to vandalism of trains and damage to freight and other operational disruptions.
- 24x7 service needs to be developed for rail at the ports
- Rail ramps need to be upgraded at the various ports
- Commercial claims take months to resolve

These flagged issues are particularly pertinent to the question of rail freight competitiveness given the significant and expanding scale of FMCSA 's role in the South African economy:

- FMCSA transitioned from being a low volume multiple platform vehicle manufacturer, to a high-volume single platform manufacturer, and currently contributes 1.3% of South Africa's GDP per annum
- Over the last decade total investment totalled \$784 million (R11 Billion) to realise an annual production capacity of 168,000 vehicles (2019) projected to rise to 200,000 by 2023, with additional substantial investment announced in Feb 2021 for the new Ranger 2022 program

A user of FMCSA's scale is therefore well positioned to both scope the opportunity represented by the Rail Freight network as an enabler of large scale, export-driven industrial production in South Africa, and to analyse how effectively the freight rail system is indeed evolving into a platform for such opportunity.

The proposed Gauteng Eastern Cape High-Capacity Rail Corridor to service high growth sectors is a critical national intervention to ensure the viability of a major national project with significant sovereign risk implications – the Tshwane Automotive Special Economic Zone. In so doing, it will create key industrial capacity along the corridor in question, linking a new, uncongested port to the national and continental commercial hub.

The proposed Gauteng Eastern Cape High-Capacity Rail Corridor is also a key first step in developing the kind of dedicated freight capacity that can support industrialisation across the board, particularly if all 8 port systems were ultimately to be the target of similar strategic initiatives, converging in Gauteng as an import-export nerve centre and gateway to continental Africa (particularly relevant as the African Continental Free Trade Agreement comes online).

As a result of competition with manganese exports on the South Corridor, the corridor is running at full capacity. The rail network between Noupoot and the Port of Port Elizabeth (PoPE) and the Port of Ngqura (PoN) would be shared amongst all commodities, a corridor expansion approach would have to be adopted. The automotive trains from the north enter SouthCor at Noupoot, via Bloemfontein and Springfontein, implying that the rail capacity between Noupoot and the Nelson Mandela Bay (NMB) Ports will have to accommodate the additional automotive trains in addition to the other trains on SouthCor.

FMCSA's needs include but are not limited to the rerouting of their existing logistic supply chain to and from the Port of Durban via the Container Corridor to Gauteng (Silverton Manufacturing Plant) to that of Gauteng to the Port of Port Elizabeth via the South Corridor. This is to include all import and export volumes of fully built Ford units for 100% rail logistics.

The high level "single go forward" solution is the provision of two daily 50 wagon train sets from the Waltloo rail yard to the Port of Port Elizabeth (PoPE) via the South Corridor and one daily 50 wagon train set from the Kaalfontein rail terminal optimising density and capacity on the VW back haul to the Port of Port Elizabeth (PoPE). The latter is to be further analysed as part of this scope for the VW back haul to return via the Ford siding in Waltloo and to engineer, integrate and construct the solution as part of the works.

Additional handling capacity at the Port of Port Elizabeth (PoPE), Charl Malan Quay was unlocked in reducing the container handling footprint to allow the automotive handling to be expanded seamlessly. In addition, the berth 102 has been repurposed for automotive handling.

Figure 1 below depicts the Automotive rail links to PE and Durban but this EPC Turnkey contract will focus on the SouthCor route from Gauteng to Port of Port Elizabeth (PoPE) via Bloemfontein – Noupoot.

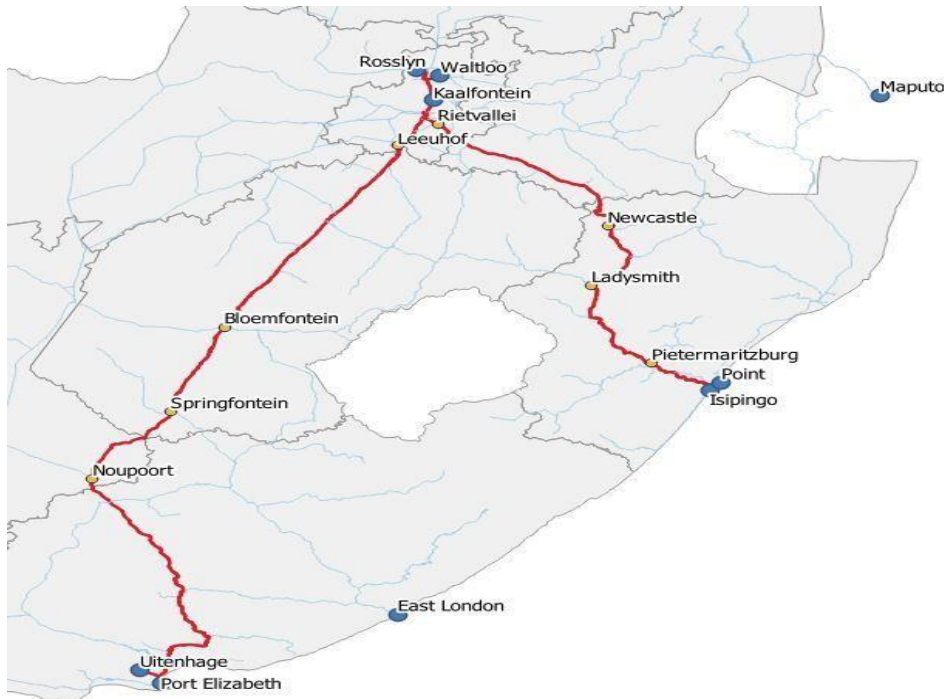


Figure 1: Automotive Rail links to PE and Durban (Source: Transnet)

PROJECT UKUVUSELELA SOLUTION: PREFEASIBILITY STUDY OUTCOMES

At a high-level, the solution is the provision of two daily 50 wagon train sets from the Waltloo rail yard to the Port of Port Elizabeth via the South Corridor and one daily 50 wagon train set from the Kaalfontein rail terminal optimising density and capacity on the VW back haul to the port of Port Elizabeth. There are minor yard upgrades required at the Waltloo and Kaalfontein rail yards to facilitate 24-hour operations, faster loading rates and quicker shunting operations.

The capacity increase on the SouthCor via Bloemfontein, Noupoot to the port of Port Elizabeth consists of 17 loop extensions at key constraints along the main line accumulatively amounting to 13 kms of rail loop extensions to accommodate the crossing of 50 wagon automotive train composites. This solution is built on top of the 16mtpa Manganese rail expansion project. The automotive expansion project is hence dependent on the manganese project, but the manganese project will exist and proceed independently. There is a high level of dependency between the two projects and must be adequately managed for time optimum and timeous completion of all construction work

Additional handling capacity at the Port of Port Elizabeth's Charl Malan Quay will be unlocked by reducing the container handling footprint to allow the automotive handling to be expanded seamlessly to accommodate an additional 5000 parking bays. The operation process flow has been amended to incorporate additional lanes, superstructure extensions, an additional rail line

and concrete infill of the rail yard at Blue Light rail terminal for optimized loading and offloading of trains arriving and departing the terminal. In addition, berth 102 will be repurposed for automotive handling. The port terminal related expansion work will be undertaken by Transnet Port Terminals outside of this contract. The scope of works includes all the rail related infrastructure expansion and enhancements occurring within the Port of Port Elizabeth.

The SCL-19 Single Deck Automotive Wagon (x 660) option was selected with haulage provided by a fleet of 44 x Class 45-000 diesel-electric locomotives and 2 x Class 34-600 diesel-electric locomotives dedicated to shunting operations at the Waltloo and Blue Light rail yards respectively. The scope of work includes the optimisation and refinement of the base rolling stock requirements. This will include the calculation of the required tractive effort, sizing of the fleet including the wagons and spare capacity fleet size based on the designed train turnaround times that would be optimised as part of the technical solution.

A comprehensive programme of operational enhancements and a programme of capacity infrastructure investments was developed along the logistic supply chain to establish the definition in terms of scope, time, and cost of this project. The Turnkey contractor to develop operating model, manuals and training interventions to facilitate the operational change philosophy,

The environmental assessment indicated no fatal flaws; however, a full-blown environmental impact analysis is required with 14 sites requiring water use licenses, 15 sites falling within sensitive areas, 5 sites requiring biodiversity permits and all sites requiring heritage exemptions.

The high level conceptual operating model is shown in the below **Figure 2**.

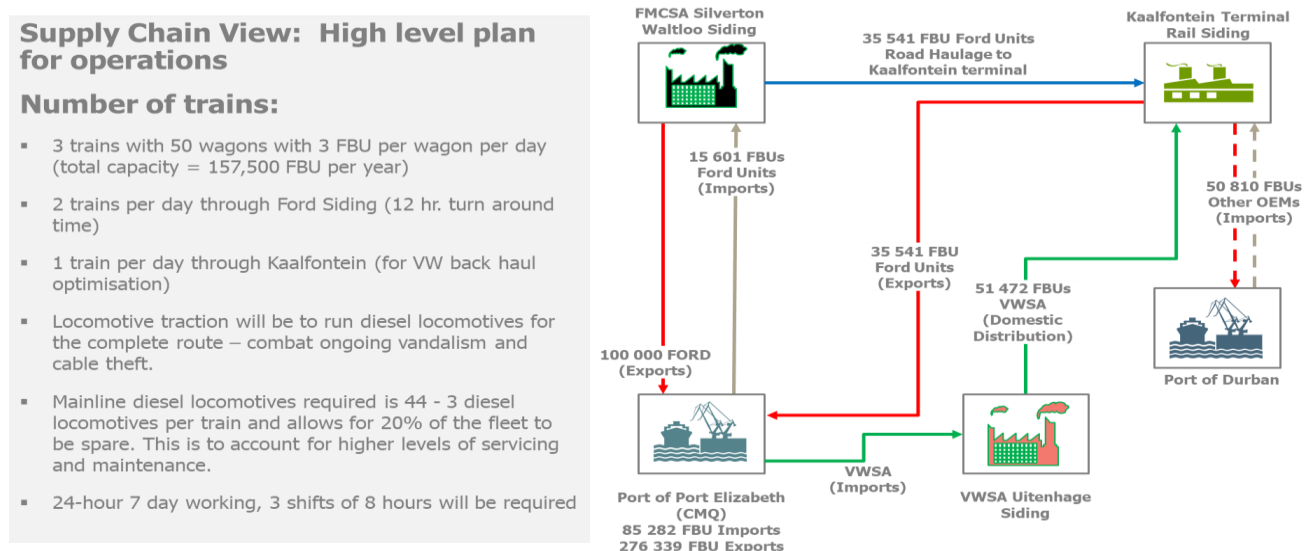


Figure 2. Proposed High-level Conceptual Operating Model (Source: Transnet)

Table 1 indicates the locations of all the affected rail loops that were identified as part of the prefeasibility study (Appendix A) that would require extension to accommodate the 50-wagon automotive train sets. The proposed loop extensions presented are relevant for the further development of this project and are shown below. The table below also shows loop extensions that are proposed to be engineered and constructed as part of the *Manganese 16mtpa rail expansion project*.

The table articulates the loop station names and their current lengths and then proposes the incremental loop extension lengths and the direction of the extensions.

Table 1. List of crossing loops to be extended between Bloemfontein and Gqeberha

LOOP STATION NAME	CURRENT LOOP LENGTH (M)	PROPOSED LOOP EXTENSION (M)	PROPOSED TOTAL LOOP LENGTH (M)	DIRECTION OF EXTENSION
Hamilton	TBC by contractor	1000	1000	Extend towards Riflerange
Hertzberg	2837	3900	6737	Extend towards Edenburg
Landmeter	691	1000	1691	Extend towards Merinorand
Lofter	742	510	1252	Extend towards Waterplas
Priors	645	645	1290	Extend towards Besembos
Norvalspont	956	400	1356	Extend towards Agtertang
Colesberg	776	500	1276	Extend towards Haredale
Carlton	579	700	1279	Extend both sides
Flonker	645	825	1470	Extend towards Evendowns
<i>*Rosmead</i>	<i>1241</i>	<i>3000</i>	<i>3000</i>	<i>16 mtpa Manganese Project</i>
Tafelberg	658	600	1258	Extend towards Conway
Visrivier	766	500	1266	Extend towards Genoegsaam
<i>*Knutsford</i>	<i>594</i>	<i>1953</i>	<i>2547</i>	<i>16 mtpa Manganese Project</i>
Marlow	603	650	1253	Extend towards Cradock
Mortimer	770	500	1270	Extend towards Scanlen
<i>*Drennan</i>	<i>1190</i>	<i>1315</i>	<i>2505</i>	<i>16 mtpa Manganese Project</i>
Thorngrove	1157	100	1257	Extend towards Cookhouse
<i>*Sheldon</i>	<i>1196</i>	<i>1454</i>	<i>2650</i>	<i>16 mtpa Manganese Project</i>
Saltaire	936	320	1256	Extend towards Kommadagga
Alicedale	1195	100	1295	Extend towards Blinkhoff
<i>*Verby</i>	<i>555</i>	<i>1943</i>	<i>2498</i>	<i>16 mtpa Manganese Project</i>
Coerney	592	660	1252	Extend towards Addo

LOOP STATION NAME	CURRENT LOOP LENGTH (M)	PROPOSED LOOP EXTENSION (M)	PROPOSED TOTAL LOOP LENGTH (M)	DIRECTION OF EXTENSION
<i>*Total Manganese Loop Extensions (m)</i>		9665		
Total Automotive Loop Extensions (m)		12910		
Total Loop Extensions (m)		22575		

* Represents Loops to be engineered and constructed as part of the Manganese 16mtpa rail expansion project.

3. Description of the Works

In fulfilling the *Employer's* requirements, the *Contractor* is required to declare and state all limitations and challenges that are not identified by the Scope of Work.

The *Contractor* is required to undertake the works as listed in the deliverables schedule (Appendix B) to achieve the required gate approval for acceptance by the *Employer's Agent*.

Based on the scope, the *Contractor* is required to develop a program to be submitted for review and approval by the *Employer's Agent* (*Employer's Team Representatives*).

Prior to the commencement with the project scope, the *Contractor* is required to obtain the approval of the *Employer*.

The *Contractor* produces a body of work for the engineering, procurement (materials, specialist services, sub-contractors and plant and equipment), construction and commissioning work which complies with the *Employer's* requirements. The success of the design deliverables shall be measured through the successful outcome of the Design Review process; the deliverables of which shall be set up with the *Employer* during the early stages of the project. A multi-disciplinary basic engineering and design is required as an input to the EIA and WULA; the *Contractor* takes accountability to drive forward the Environmental management and permitting process with DFFE.

For this project the *Contractor* generates an organogram showing appropriate disciplines and their roles, including battery limits for each discipline.

The *Contractor* complies with the relevant Transnet specifications, drawings standards, templates (where they exist), typical designs, Technology Management product approvals, guidelines, policies and procedures. The *Employer* provides relevant Transnet documentation upon request (Form BBB0322 to be submitted to the *Project Manager*).

The *Contractor* sources all relevant government regulations, international standards and national standards from the relevant authorities.

The *Contractor* complies with the ECSA Code of Conduct.

4. Work Breakdown Structure

4.1 Scope definition

The work breakdown structure organizes the work per section for all disciplines required to allow FMCSA to deliver their forecast demands for future Fully Built-up Units (FBU) and to deliver the required rail capacity via the SouthCor from Waltloo and Kaalfontein in Gauteng to the Port of Port Elizabeth (PoPE) in Gqeberha by 2026.

The EPC scope of work and EIA by the *Contractor* will focus on the below battery limits per discipline which is further explained under scope development:

- Waltloo Yard
- Kaalfontein Yard
- Main line loop extensions to accommodate a 50-wagon automotive train.
 - It is important to note that each loop extension design must be checked against train handling requirements and signed off by TFR's Train Technology Design Department. This design validation includes a full evaluation of the safe train handling of the most critical train that will be using each loop, in terms of stopping and departing outside of the respective extended loop as well as within the extended loop.
- Port of Port Elizabeth rail siding
- Affected CTC centres and electrical control centres.

The table below shows the infrastructure requirements from Waltloo Yard and Kaalfontein Yard in Gauteng to the Port of Port Elizabeth (PoPE) via the Bloemfontein – Noupoot route.

Table 2. Work Breakdown Structure

Location	Work Package	Discipline
Gauteng Works	Waltloo Yard	Civil, Perway, OHTE, Electrical & Signalling
	Kaalfontein Yard	Civil, Perway, OHTE, Electrical & Signalling
Main Line 7 x Loops Extension (Bloemfontein to Noupoot)	Hamilton Loop	Civil, Perway, Signalling & Structures
	Hertzberg Loop	Civil, Perway, Signalling & Structures
	Landmeter Loop	Civil, Perway, Signalling & Structures
	Lofter Loop	Civil, Perway, Signalling & Structures
	Priors Loop	Civil, Perway, Signalling & Structures
	Norvalspont Loop	Civil, Perway, Signalling & Structures
	Colesberg Loop	Civil, Perway, Structures & Signalling
	Carlton Loop	Civil, Perway, Structures, OHTE & Signalling
Main Line 10 x Loops Extension (Noupoot to Gqeberha)	Flonker Loop	Civil, Perway, Structures, OHTE & Signalling

Location	Work Package	Discipline
	Tafelberg Loop	Civil, Perway, Structures, OHTE & Signalling
	Visrivier Loop	Civil, Perway, Structures, OHTE & Signalling
	Marlow Loop	Civil, Perway, Structures, OHTE & Signalling
	Mortimer Loop	Civil, Perway, Structures, OHTE & Signalling
	Thorngrove Loop	Civil, Perway, Structures, OHTE & Signalling
	Saltaire Loop	Civil, Perway, Structures, OHTE & Signalling
	Alicedale Loop	Civil, Perway, Structures, OHTE & Signalling
	Coerney Loop	Civil, Perway, Structures, OHTE & Signalling
Port of PE (Gqeberha)	Port Rail Siding	Civil, Perway, Structures & Signalling

5. Project Scope Development

The *Contractor* must adhere to the below battery limits for the Ukuvuselela Automotive Project:

5.1. Waltloo Rail Yard

Waltloo is required to accommodate two 50 wagon automotive trains per day. These two trains are spaced at a minimum of 8 hours apart from each other. As such, it is expected that there will be up to 2 trains at Waltloo at any one time. The proposed works are to bring into service the West Shunt Spur which follows the main line between Waltloo and Eersterus stations.

The shunt spur will be used to allow the automotive train to exit from the main line and clear the signal points. The works at Waltloo Rail Yard will be able to bring back into use the Western Shunt Spur as well as the TFR Yard lines which are seldom used in the current operation but are integral to the proposed operation for managing the arrival and departure of the Automotive trains from the Waltloo Yard.

The general upgrading of the yard includes electrifying the western shunt spur and the lighting that is fit for purpose.

The *Contractor* must undertake a further simulation analysis to establish if the VW back haul from Kaalfontein can be despatched via the FMCSA rail yard in Waltloo on the return leg so as to prevent any road haulage of FBU from Waltloo to Kaalfontein. The outcomes of this analysis must be integrated and engineered into the final solution which would include any infrastructure expansion operating changes, enhancement on the rail network and Waltloo yard

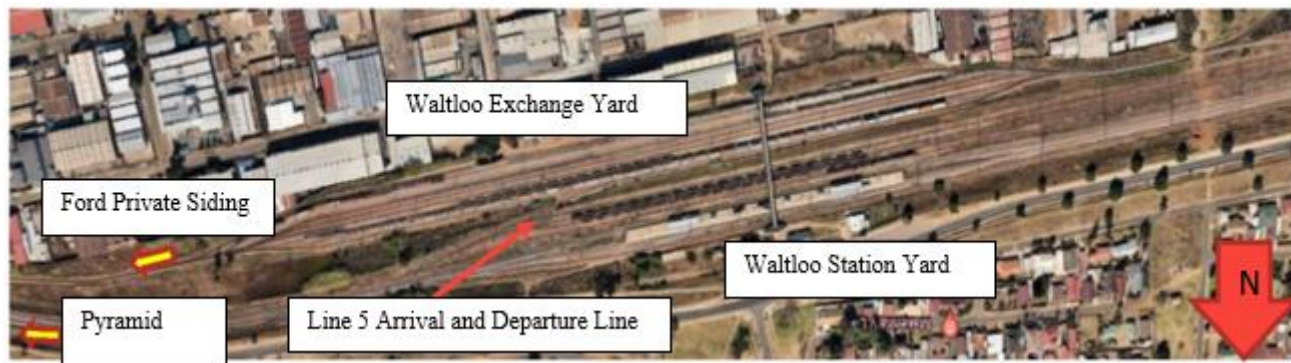


Figure 3. Satellite View of Waltloo Yard (Source: WSP Prefeasibility Report)

5.2 Kaalfontein Rail Yard

Kaalfontein currently receives up to one train per day from VW in Uitenhage and two trains per day from the Port of Durban. The proposed project objective is to use the backhaul from the VW train for Ford FBU's to the Port of PE and to increase the overall number of wagons from 40 to 50 wagons per train. Kaalfontein is already capable of handling trains of 50 wagons which arrives from Durban. The planned number of trains per day is still expected to remain at one train per day for the SouthCor automotive corridor. The number of trains per day for the NatCor automotive corridor is expected to remain as per the current levels and forecasts.

As the future capacity required is within the existing service capacity at Kaalfontein, there is little infrastructure upgrades required. The proposed improvements are related to the extension of the hardstand over the rail on lines 1 and 2 to include line 3. This will provide additional flexibility to the yard. In addition, the lighting is to be reviewed and upgraded as required. The general upgrading of the yard includes the lighting facilities that is fit for purpose. **Figure 4** below shows the satellite view of the Kaalfontein Automotive siding.



Figure 4. Satellite View of Kaalfontein Rail Yard (Source: WSP Prefeasibility Report)

5.3 Main line loop extensions

5.3.1 Bloemfontein to Noupoot loops

Most of the line from Waltloo or Kaalfontein to Bloemfontein is double line and there are no expectations from the simulations that any additional infrastructure will be required along this section of the route. The trains will halt at Bloemfontein for a crew change and to refuel diesel trains. The line from Bloemfontein to Noupoot is a single line and most of the available passing loops are less than the 1.2 km required for the 50 wagon automotive trains. As such, the following loops are required to be extended:

Hamilton is to be extended by 1000 m towards Riflerange. There are three existing culverts that will need to be extended to accommodate this loop extension. This line is not electrified therefore, there is no requirement for additional OHTE. There was a previous rail line that extended below the bridge which will be used as the route for the new loop extension.

Hertzberg is to be extended by 3900 m towards Edenburg. The long length of the loop will ensure that the runtimes are more even between the different crossing loops and provide a more balanced timetable. There are four existing culverts that need to be extended and a new underpass to replace a level crossing. This line is not electrified therefore, there is no requirement for additional OHTE.

Landmeter is to be extended by 1000 m towards Merinorand. One existing culvert will need to be extended. This line is not electrified therefore, there is no requirement for additional OHTE.

Lofter is to be extended by 510 m towards Waterplas. There is one culvert to be extended and one level crossing to be replaced with an underpass. This line is not electrified therefore, there is no requirement for additional OHTE.

Priors is to be extended by 645 m towards Besembos. There is one bridge that will need to be widened. This line is not electrified therefore, there is no requirement for additional OHTE.

Norvalspont station would require to be extended by 400 m towards Agtertang to ensure uniform runtimes in the network. This line is not electrified therefore, there is no requirement for additional OHTE.

Colesberg is the last loop that needs to be extended in this corridor. The loop must be extended by 500 m towards Haredale. There is one culvert that will need to be extended. This line is not electrified therefore, there is no requirement for additional OHTE.

5.3.2 Noupoot to Port of PE (Gqeberha) loops

From Noupoot to Gqeberha, the automotive trains join with the 104 wagon Manganese trains (and the future 208 wagon Manganese trains) coming from De Aar. This has an impact on loop lengths and runtimes. The automotive loops are imposed between the proposed Manganese project loops to be lengthened for the 208 wagon trains. The mountainous and undulating corridor descends to the coast and passes through agricultural land, past large rivers. These will need to be considered and engineered when executing the EPC scope of work for this contract for the whole corridor.

The corridor is electrified and controlled by colour light signalling as well. Even though the project proposed that diesel traction will be used, the loops will have the current OHTE extended along the length of the loop extension. All loops must have cross bonds installed at both ends and at the centre or at intervals not exceeding 500m.

Carlton is to be extended by 125 m towards Noupoot and 575 m towards Flonker. There may be some regrading required to soften the gradient over the loop extension. Further details from the Feasibility & Bankable Feasibility study will confirm the requirements. There are 6 existing culvert structures to be extended.

Flonker loop would be extended to accommodate the automotive trains. The loop extends from the station southwards following the curved track. The extension is 825 m long and ends at the straight portion of the line before the tunnel. There are 5 existing culverts that will need to be extended and new underpass to replace an existing level crossing.

Tafelberg loop will be extended by 600 m towards Conway. One existing culvert is to be extended.

Visrivier is to be extended by 500 m towards Genoegsaam. There are no structures within the length of the loop extension that have been identified.

Marlow will be extended by 650 m towards Cradock. There are two existing culverts that are to be extended for this loop.

Mortimer loop extension will be 500 m towards Scanlen. The satellite imagery shows that the loop will go through an agricultural area where the terrain is relatively flat therefore, no major earthworks are anticipated. There are three box culverts that will need to be extended.

Thorngrove is to be extended by 100 m towards Cookhouse. Following a detailed survey, the need for the loop extension may be value engineered out if the existing loop is long enough for the required automotive train. There is one box culvert to be extended for this loop.

Saltaire will require extension up to the tunnel towards Groenheuwels station. The terrain is mountainous and significant earthworks along with two large box culvert structures will be required.

Alicedale loop will be extended 100 m towards Blinkhof. Following a detailed survey, the need for the loop extension may be value engineered out if the existing loop is long enough for the required automotive train.

Coerney is in flat farmlands and is required to be extended by 660 m towards Addo. There are no structures along this loop extension.

All structures such as culverts, underpass, bridges and hard-stands to be confirmed by the survey and condition assessment.

Figure 5. below illustrates an overview of the location of each loop extension along the Bloemfontein – Noupoot to Port of Port Elizabeth (Gqeberha) route, with the exception of the Hamilton Loop at Bloemfontein.



Figure 5. Location of Loop Extensions (Source: WSP Prefeasibility Report)

5.4. Port of Port Elizabeth (Gqeberha) Rail Siding

The rail activities at the port are expected to increase significantly at the automotive terminal. Currently, less than one train per week loaded with Ford FBU's calls at the port. In the future, there will be three trains per day. There is sufficient rail capacity within the port to support this expansion. To achieve three trains per day, the Blue Light rail transfer area would have to be used for handling all the of the automotive trains.

This has the advantage of allowing fewer shunting moves per train and making use of the larger Green Street Marshalling yard. This existing yard was primarily used for the Charl Malan Quay container terminal which has reduced its operations following the establishment of the Ngqura Container Terminal to the north.

To enable the continued use of the Blue Light transfer area for container rail traffic, a third rail line will be required along with a cross over between the existing two lines. This requirement is subject to the continued use of the Port Elizabeth Container Terminal or the need to retain a rail service at the terminal for container trains.

Install new 1500 m² hardstand over the rails to the west end of the automotive rail siding at the Blue Light siding for the unloading of ramps and for the FBU's to turn onto or from the wagon loading ramp.

Any changes to the agreed scope shall be reported to the *Employer* by the *Contractor* immediately to avoid project delays and incorrect outcomes. Scope changes shall be reported and managed as per the Transnet Change control procedures.

6. Detailed Project Scope

In line with the *Employer's* requirements the *Contractor* shall define and develop the scope for the completion of this project – full turnkey solution for the infrastructure component.

Each project deliverable will be evaluated and measured by the *Employer's* Agent (Owners Team Representatives) as per the defined quality and deliverables.

6.1. General Instructions:

- 6.1.1. Validate, confirm and own the outputs and outcomes of the Prefeasibility Study that serves as an input to this phase of the works by means of a gap analysis.
- 6.1.2. The Contractor to produce basic engineering designs with reasonable assumptions for the purpose of applying for an EIA and Water Use License. The quality of the designs and drawing must have sufficient detail as necessary for the early engagement of the Department (DFFE). This is to be provided as part of their bid pack and would be used by TFR to initiate the early environmental management discussions with the department (DFFE). Upon appointment the contractor would take over the full process as part of the scope of work.
- 6.1.3. Develop a detailed full suite Rail Engineering Designs documentation up to 100% design accuracy to the level of AFC drawings, final specifications and completed works information up to Construction for the rail infrastructure as described above in section 5. This must be supported by the geotechnical investigation, topographical surveys, hydrology studies and specialist foundation designs for bridges, culverts, formation and track geometry storm water reticulation
- 6.1.4. Prepare and implement a Quality Plan inclusive of sufficiently Engineering, Procurement, Construction checklists. Completed checklists to be included with each submission of drawings, reports, construction documentation etc. Full quality records to be submitted upon final hand over of the *Contractor's* work.
- 6.1.5. The *Contractor* shall propose skilled staff with relevant qualifications, experience and ECSA Professional registrations to be formally mobilized to ensure deliverables are met. Furthermore, the *Employer* (including owner's representatives) and *Contractor* shall agree on the project plan and program, risk assessments, method statement, applicable latest drawings, communication plan applicable and specific to this Design and Construction scope of work, key deliverables and project timelines.
- 6.1.6. Undertake engineering specialist studies for the related rail infrastructure which includes but **is not limited to**:
 - 6.1.6.1. Surveys or condition assessments of multiple disciplines involved

in the project.

- 6.1.6.2. Hydrology study for storm water
 - 6.1.6.3. Provide a fully detailed report with recommendations for client acceptance.
 - 6.1.6.4. Project schedule for all project stages incorporated with the project cash flow
 - 6.1.6.5. Construction methodology including the resource plan.
 - 6.1.6.6. Geotechnical investigations and borrow pit locations
 - 6.1.6.7. Environmental management and authorisation including Water Use Licence if required.
 - 6.1.6.8. Stakeholder management
 - 6.1.6.9. Simulation & Modelling
 - 6.1.6.10. Hazard and Operability Studies (HAZOP)
- 6.1.7. Prepare Works Information, Pricing Data, engineering AFC drawings and all related documentation for sub-contracted works.
- 6.1.8. The *Contractor* uses Bentley MicroStation or Descartes V8i or a later version (preferably the CONNECT Edition) to generate and update CAD drawings which have no rasters attached. The *Contractor* properly links and edits any rasters to CAD drawings using Bentley Descartes (preferably CONNECT Edition). All rasters are in TIF format. Red and yellow works on rasters are done using the TFR prescribed colour mask using packbit compression and 256 colours for the TIF. When drawings are finalised as-built, removed equipment and wiring are erased on the rasters and not hidden.
- 6.1.9. No free-issue Plant and Materials are supplied to the *Contractor*.
- 6.1.10. Provide Equipment, Plant and Materials approved by TFR Technology Management and TFR Rail Network. There are TFR approved lists of TFR railway suppliers and products, as per Appendix K. If non-TFR approved technology and products are proposed for use, then a lengthy TFR approval process is expected as per section 6.2.
- 6.1.11. Finalise the design process Work Plan.
- 6.1.12. Submit a proposed list of key critical Plant and Materials (including details of the suppliers, make/model, etc.) for acceptance by the *Project Manager* prior to procurement.
- 6.1.13. Assess the sites/facilities relevant to the project battery limits for any additional power requirements and design accordingly.
- 6.1.14. Develop a tie-in plan for civil works, track, TAS and OHTE that minimises disruptions to the current operations and maximises annual shutdown opportunities.
- 6.1.15. Develop a Business case and model with the commercial value proposition and commercial commitments to deliver the required rail capacity along the SouthCor from Waltloo and Kaalfontein in Gauteng to the Port of Port Elizabeth (PoPE) in Gqeberha.

- 6.1.16. Firm investment plans and business cases for associated logistic components within the battery limits of this project.
- 6.1.17. Facilitate and document discussion around the detailed Operating Model to deliver the required rail capacity along the SouthCor from Waltloo and Kaalfontein in Gauteng to the Port of Port Elizabeth (PoPE) in Gqeberha.

Provide inputs into Transnet's RSR submissions up until the applications arrive to a "no objection" notification.

- 6.1.18. With inputs from Level Crossings surveys, price for the designs for dealing with level crossings (in terms of the new legislation requirements), underpasses and/or bridges for both vehicles and pedestrians. *Contractor* to further prepare and see through the process of RSR approvals until the application arrives at a "no objection" notification for any Level Crossings in the scoped loop extensions of this project.
- 6.1.19. Provide inputs into the Enterprise Change Proposals (ECP's) required by TFR.
- 6.1.20. Develop a detailed financial and socio-economic modelling and benefits analysis.
- 6.1.21. Develop and manage the Change Management plan Methodology/Communication strategy.
- 6.1.22. Provide training for maintenance personnel, operating personnel and relevant members of the *Employer's* engineering team, if new technologies, operating methodologies and/or design methodologies are implemented for the first time on a specific section or depot of the railway line, including but not limited to:
 - 6.1.22.1. Sufficiently detailed training manuals as relevant for the specific category of trainee.
 - 6.1.22.2. Technology transfer to the *Employer's* engineering team before submission of designs for acceptance to enable them to review designs, inspect/test/ commission the *Works* and do future modifications (design, software data, installation inspections, testing etc.) to installations forming part of the *Works* as well as elsewhere in the TFR railway network: before submission of designs for acceptance, for at least 10 people per topic per relevant discipline.
 - 6.1.22.3. All required documentation, third party intellectual property licences, proprietary/specialised test tools and any proprietary application and diagnostic software needed for effective technology transfer.
 - 6.1.22.4. Training for maintenance personnel to do first-line maintenance: before commissioning, for at least 10 people per topic per relevant discipline at each affected depot.
 - 6.1.22.5. Training for TCOs and their supervisors for awareness in new operating methodologies, changes in station layouts and changes in CTC system configurations including "train the trainers": before commissioning, for at least 10 people per topic at each affected CTC centre.

- 6.1.23. Before commissioning, provide recommended spares holding (about 10% of affected Plant and Materials) only for major equipment using technology implemented for the first time on a specific section or depot of the railway line.
- 6.1.24. Engage TFR's RN Technical office and TFR's TM office to verify the latest technical requirements.

6.2. TFR APPROVAL PROCESS FOR NEW TECHNOLOGY/PRODUCTS

For each product, the expected approval process is as follows:

6.2.1. Stage 1: High level Design:

6.2.1.1. The *Contractor* submits the following data for the product to TFR Technology Management and the *Project Manager* for approval, alternatively "no objection":

- a. Descriptive High-level system block diagrams
- b. Descriptive Integration and interfacing diagrams and reports
- c. Digital/Software conceptualization
- d. The supplier's safety case for the product, including the risk assessment and quality management plan
- e. SIL 4 certification for safety related products (e.g., TAS components i.e. interlocking system, track vacancy detection, points machines, points interface circuits, signal interface circuits etc.)
- f. Approval certificates by internationally recognized authorities
- g. References of railway clients where the product is already installed and proven
- h. Site test results for installation where the product is installed
- i. MTBF and MTTR figures
- j. Environmental ratings, e.g. IP rating, lightning, temperature, humidity
- k. Electromagnetic Compatibility
- l. Power ratings
- m. Useful life span
- n. Diagnostic capability
- o. Guarantee periods
- p. Communications requirements/ports/protocols
- q. Space requirements
- r. Details of proposed interfacing to existing TFR systems (e.g. Spoorplan Mk1b)
- s. System overview or product manuals
- t. Installation manuals
- u. Operating and maintenance manuals

- v. Demonstration of ease-of-use of the product
- w. Indication of the minimum required spares holding, allowing for items that are not off-the- shelf.
- x. Interfacing and interoperability with existing TAS technology at adjacent stations.

6.2.1.2. Expected lead-time for checking by TFR Technology Management and the *Project Manager*: fifteen working days for each submission (not concurrent).

6.2.1.3. Outcome: Approval in principle

6.2.2. Stage 2: System Localization and Adaptation

6.2.2.1. The *Contractor* arranges workshops with TFR Technology Management and the *Project Manager* to clarify the local railways requirements, risks, rules, procedures and specifications.

6.2.2.2. The *Contractor* ascertains themselves of the local environmental conditions under which the product needs to be used.

6.2.2.3. The *Contractor* adapts his product, its software and related accessories for the local railway requirements and environmental conditions.

6.2.2.4. The *Contractor* submits to the *Project Manager* and TFR Technology Management for approval revised block diagrams, software, ratings and other documentation of the adapted product.

6.2.2.5. The *Contractor* submits to the *Project Manager* and TFR Technology Management prototypes of the adapted product for approval or “no objection”.

6.2.2.6. The *Contractor* provides test facilities to test their prototypes at their manufacturing facility.

6.2.2.7. Expected lead-time for checking by TFR Technology Management and the *Project Manager*:

- a. Signalling interlocking system: sixty working days for each submission (not concurrent).
- b. Other products: thirty working days for each submission (not concurrent).

6.2.2.8. Outcome: Preliminary approval of the product.

6.2.3. Stage 3: Detail design:

6.2.3.1. The *Contractor* trains TFR Technology Management and the *Project Manager's* personnel to enable them to do a detailed design check, software validation and testing. This includes the provision of user manuals and use of configuration/diagnostic/test tools.

6.2.3.2. The *Contractor* submits to the *Project Manager* and TFR Technology Management detailed designs for use of the product in a pilot installation as agreed by all parties concerned. In the case of the TAS, this includes

(but is not limited to) the cable plans, apparatus room/case plans, equipment layouts, detailed interlocking circuits, remote control circuits, power supply system, software data and interfacing to existing systems.

6.2.3.3. Expected lead-time for checking by TFR Technology Management and the *Project Manager*:

- a. Signalling interlocking forty working days for the initial submission as well as major updates and ten working days per submission for further minor updates (not concurrent).
- b. Other products: twenty working days for the initial submission as well as major updates and ten working days per submission for further minor updates (not concurrent).

6.2.3.4. Outcome: Approval of the design, subject to testing of the installed product.

6.2.4. **Stage 4: Factory Installation/Manufacturing by *Contractor*:**

6.2.4.1. The *Contractor* installs the product in the affected pilot system for testing by the *Employer's* commissioning engineer and TFR Technology Management at the *Contractor's* manufacturing premises.

6.2.4.2. The testing includes, but is not limited to, the following:

- a. Performance, safety and functional testing for compliance to the detailed design, as well as relevant standards and specifications.
- b. FMECA

6.2.4.3. The *Contractor* provides a suitable test/simulation rig to allow testing of the product at the manufacturing facility before it goes to site.

6.2.4.4. The *Contractor* tests and debugs the pilot installation (hardware and software) before handing over to TFR Technology Management and *Employer's* commissioning engineer.

6.2.4.5. Expected lead-times for testing by TFR Technology Management and the *Employer's* commissioning engineer:

- a. Interlocking: thirty working days for the initial submission, twenty working days per submission for major updates/corrections and ten working days per submission for minor updates/corrections (not concurrent).
- b. Other products: fifteen working days for the initial submission as well as major updates and five working days per submission for further minor updates (not concurrent).
- c. Testing by TFR Technology Management and the *Employer's* commissioning engineer is not concurrent (TFR tests first in all instances).

6.2.4.6. Outcome: Fine-tuning of the product as part of the particular system.

6.2.5. Stage 5: Pilot Site Installation and Commissioning:

- 6.2.5.1. The *Contractor* installs the factory-tested product at the pilot site according to the approved design, specifications and recommendations of the TFR Technology Management and the *Employer's* commissioning engineer.
- 6.2.5.2. The *Contractor* provides training for maintenance and train operating personal in the use of the new products.
- 6.2.5.3. The *Contractor* provides a suitable test/simulation rig to allow site testing by TFR Technology Management and the *Employer's* commissioning engineer.
- 6.2.5.4. The *Contractor* tests and debugs the complete pilot site installation (hardware and software) before handing over to TFR Technology Management and *Employer's* commissioning engineer.
- 6.2.5.5. Further requirements for commissioning and hand over are included elsewhere in the scope of work.
- 6.2.5.6. Commissioning times:
 - a. TFR Technology Management site testing: for interlocking system, allow ten working days for testing by TFR and for other products, two working days per product.
 - b. *Employer's* commissioning engineer: as specified elsewhere in the scope of work.
- 6.2.5.7. Outcome: provisional approval of the product.

6.2.6. Stage 6: Piloting Period and Certification:

- 6.2.6.1. The commissioned product is exposed to environmental conditions for a minimum of one year, including at least one lightning season to confirm robustness, reliability, safety and maintainability.
- 6.2.6.2. The *Contractor* is responsible for the maintenance of the system during the approval process until the system is fully TFR approved.
- 6.2.6.3. The *Contractor* is liable for the approval of the system until it is fully approved by TFR. This includes interfacing with approved subsystems during the approval process. The *Contractor* continues providing any support to that as required by TFR for the entire duration of the piloting phase.
- 6.2.6.4. The *Contractor* has a contingency plan to account for system breakdown and unavailability during the approval process to ensure safety and minimal distractions to operation.
- 6.2.6.5. The supplier's customer service including adherence to warranty and response times to repair faulty equipment is monitored.
- 6.2.6.6. Outcome: final product approval and certification by TFR Technology Management.

6.2.7. General Information to consider:

6.2.7.1. The *Contractor's* design-house/team is based in based in the Republic of South Africa to ensure that the following (not exhaustive) are implemented timeously and updated in the design:

- a. Updating of engineering drawings
- b. System design Interfaces
- c. Design updates and approvals
- d. Systems Software and configuration
- e. Installation requirements
- f. Integration of changes resulting from design reviews.

6.2.7.2. TFR Technology Management has separate teams to evaluate different types of products, e.g.:

- a. Interlocking and FSDT systems,
- b. Points machines and related equipment (crank-handles, sirens, etc.),
- c. Signals,
- d. Track circuits,
- e. Axle counter systems
- f. Remote control systems,
- g. Communication systems,
- h. Telecontrol,
- i. Level crossing protection,
- j. Power equipment,
- k. Condition Assessment equipment (incl. LIS)
- l. EL&P equipment,
- m. OHTE
- n. Traction Substation
- o. Perway equipment
- p. Civil equipment
- q. Mechanical equipment
- r. Rolling stock
- s. Other systems.
- t. Each team will only evaluate one product from the *Contractor* at a time.

6.2.7.3. During each of the stages 1 to 4 above, the *Contractor* allows at least one re-submission to do a major update.

6.2.7.4. The *Contractor* complies with relevant sections of the National Railway Safety Regulator Act, 16 of 2002 and regulations issued by the RSR.

6.2.7.5. If items provided by the *Contractor* are not accepted, they are subject to re-submission at no additional cost.

6.2.7.6. Continued non-compliance is a breach of contract and may lead to termination.

6.3. Geotechnical Works:

The *Contractor's Geotechnical Scope of Services* is anticipated to include:

6.6.5 Engineering:

A desktop study of geological maps and/or historical geotechnical investigations (e.g., Ukuvuselela Geotechnical desktop study as per Appendix J, **but not limited to**), fieldwork (at the discretion of the *Contractor*), laboratory testing (at the discretion of the *Contractor*) and reporting (*Geotechnical Investigation and Design Report(s)*) that include the following minimum requirements (if/where applicable):

- a. General descriptions of various sites investigated (e.g., climate, general geology, etc.) and fieldwork conducted.
- b. Description of existing sub-soil and/or rock conditions/types, including possible fault lines, areas of instability, problematic soils (e.g., soils with dispersive, highly erosive, collapsible, expansive or compressible properties), etc.
- c. Data evaluation/interpretation of the field and laboratory test results.
- d. Material classification and recommended use (e.g., COLTO/COTO, TRH14, USCS, AASHTO, S410).
- e. Groundwater measurements and in-situ permeability.
- f. Recommendations for foundations of buildings, bridges and other structures, including allowable bearing pressure and assessment of settlement for all structures.
- g. Recommendations for the design and construction of surface and sub-surface drainage/stormwater control.
- h. Layer works recommendations and pavement design and construction of access roads, service roads, pavements, both internal and external slabs (including track slabs, if/where required), as well as possible upgrades and/or rehabilitation work on existing pavement infrastructure.
- i. Slope stability analysis, detailed design and construction of earth retaining structures/lateral support/slope stability measures (if/where required).
- j. Recommendations and execution of temporary works for deep excavations.
- k. Analysis of the conditions of the railway track subgrade and earthworks.
- l. Recommendations for formation layerworks/subgrade treatment of railway earthworks, including possible upgrades and/or rehabilitation work on existing formation (in terms of the S410 Specification).
- m. Recommendations and execution for excavation works.

- n. Identification of a suitable borrow pit/quarry/commercial source, in close proximity to the proposed sites, to supply suitable material for construction works (e.g., pavement layerworks, railway formation works, etc.), including licensing validation.
- o. Identification of precautionary measures to consider regarding the geotechnical conditions of the proposed developments.

6.6.5 Procurement

- a. Procurement, appointment and management of experienced geotechnical service providers, such as drilling subcontractors and civil engineering laboratories.

6.6.5 Construction

- a. Documentation for construction/implementation and construction methodology of the *Contractor's* designs, including, but not limited to: Construction drawings, Detailed *Bill of Quantities*, Technical Specifications, Design report, Design Criteria and *Works Information/Scope of Works* (detailing how the construction *Contractor* should go about executing/ implementing the designs).

6.4. Civil and Perway Works:

The *Contractor's Civil, Perway and Structures Scope of Services* is to:

6.4.1. Engineering

Develop a detailed full suite Rail Engineering Designs documentation up to 100% design accuracy to the level of AFC drawings, final specifications and completed works information up to Construction for the rail infrastructure.

6.4.1.1 Concept / Preliminary Design

- a. Site investigations and Topographical surveys
- b. Preparation of Design Criterion
- c. High level Design Calculations
- d. Preparation of Concept Drawing
- e. Coordination Meetings
- f. Presentation and Approval of Concept
- g. Estimates
- h. Design Review

6.4.1.2 Design Development/Detailed design

- a. Detailed design calculations
- b. Preparation of submission drawings
- c. Preparation of IFC Drawings
- d. Coordination of Designs
- e. Technical Design Meetings
- f. Risk Assessment Meetings

- g. Hazard and Operability Studies (HAZOP)
- h. HAZOP Review
- i. Squad Check
- j. Gate Review
- k. Client approval of Design Drawings

6.4.1.3 Technical Documentation

- a. NEC3 Works Information
- b. Equipment List
- c. Bills of Quantities
- d. Specific Technical Specifications
- e. Client approval of Design Drawings
- f. Coordination of Documentation
- g. Design Review
- h. Design Report

6.4.1.4 Issue for Construction

- a. Approval of Contractor Shop Drawings
- b. Approval of Contractor Samples
- c. Site Inspections - Walk Abouts
- d. Modification of AFC Drawings
- e. Attendance of Site Meetings

6.4.1.5 Close Out

- a. Commissioning
- b. Preparation of Commissioning reports
- c. Preparation of as-built Drawings
- d. Preparation of Maintenance Manuals and samples
- e. Hand Over Meetings

6.4.2. Procurement

- 6.4.2.1. The Procurement, appointment and management of experienced civil engineering service providers such as design consultants and subcontractors for construction execution.

6.4.3. Construction

The construction works to be carried out under this scope comprises but not limited to the following:

6.4.3.1. Establishment of general Site offices (preliminary and general)

- a. Facilities for the Engineer

- b. Facilities for the Contractor
- c. Time related Items
- d. Setting out works
- e. Dayworks

6.4.3.2. Site Clearance

- a. Site Clearance for Track & Structures

6.4.3.3. Earthwork for Track

- a. Treatment of Roadbed
- b. Cut/Undercut
- c. Fill (from stockpiles)
- d. Fill (from borrow pits)
- e. Import from commercial sources
- f. Finishing Work (Top soiling side slopes of embankments, Hydroseeding side slopes of embankments, Rounding of edges in cuttings and fills).

6.4.3.4. Service road

- a. Clear and grub
- b. Cut and Fill
- c. Import from commercial sources

6.4.3.5. Drainage

- a. Stormwater Drainage (surface drainage incl. U-drains, concrete channels and earth channels, cut-off drains and side drains, etc.)
- b. Sub-surface Drainage

6.4.3.6. Fencing and Barriers

- a. Construction and install as per designs

6.4.3.7. Trackwork – Laying of Rails

- a. Offload and distribute rails
- b. Offload and stack rails
- c. Load from stack, transport and distribute rails
- d. Lay rails in new track
- e. Fit traction and/or signaling bonds
- f. Load released and surplus rails

6.4.3.8. Trackwork – Laying of Sleepers

- a. Offload and distribute sleepers
- b. Offload and stack sleepers

- c. Load from stack, transport and distribute sleepers
- d. Offload and distribute sleeper fastenings
- e. Offload and stack sleeper fastenings
- f. Load from stack, transport and distribute sleeper fastenings
- g. Lay sleepers in new track
- h. Respacing of sleepers
- i. Load released and surplus sleepers
- j. Load released and surplus sleeper fastenings
- k. Transport released and surplus sleepers and fastenings with lorries
- l. Transport and install track transition

6.4.3.9. Trackwork – Ballast and Tamping

- a. Transport and distribute ballast with lorries
- b. Transport and distribute ballast from wagons
- c. Boxing and trimming ballast
- d. Lift and tamp track
- e. Load from stockpile, transport and distribute ballast

6.4.3.10. Trackwork – Destressing of Rails

- a. Destress track

6.4.3.11. Trackwork – Building and Replacement of sets

- a. Build sets outside track
- b. Install pre-assembled sets in track
- c. Lift and load sets and transport with lorries to new location

6.4.3.12. Trackwork – Filed Welding of Rail Joints

- a. Exothermic welding of rail joints in track
- b. Welding of test pieces
- c. Radiographic and Ultrasonic testing of welds

6.4.3.13. Trackwork - Slewing and Alignment

- a. Realign track
- b. Slewing of track
- c. Moving ballast during alignment

6.4.3.14. Trackwork – Surveying and Referencing

- a. Set out centre line of track

6.4.3.15. Trackwork – Miscellaneous

- a. Clearance markers
- b. Signposts and boards
- c. Level crossing

6.4.3.16. Project Close Out Plan

Key items that are to be included within the functional close out plans include:

- As-built drawings.
- Appropriate document management.
- Operation and Maintenance requirements.
- Documentation required for Operational Readiness, including that required for and RSR operating permit.
- Training.
- Permits for operation and maintenance.
- Hazard study action close out.
- Risk action close out.
- ORS verification.
- Certification / sign off certificates

6.4.4. Commissioning

The *Contractor* will be responsible for undertaking the testing, handover and acceptance plan.

6.5. Structures Works

The Structures *Works* includes but it is **not limited to**:

6.5.1. Engineering

- a. Conduct a condition site assessment of the existing infrastructure within the corridor not limited to culverts extension, bridge widening, underpasses, loading and offloading ramps, hardstands and OHTE structural support requirements.
- b. Develop a full detailed design not limited to culverts extension, bridge widening, underpasses, loading and offloading ramps, hardstands and OHTE structural support requirements, depending on the outcome of the condition assessment, hydrological studies and design requirements.

6.5.1.1. Part of the Design works for construction

- a. Design any temporary works that will enable construction of the design.
- b. Any temporary works that may be necessary should be approved by the Project Manager prior to construction. Any temporary work submitted is required in a format of both calculations and drawings. The temporary works shall be structurally adequate and the foundations adequate with no

settlement.

- c. The Contractor grants the Employer a non-exclusive license, in accordance with the provisions of Section 22 of the Copyright Act 1978, to copy any document/calculation compiled/done by the Contractor in connection with the Works, to make free and unrestricted use thereof for his own purposes, modify some or having it modified by a third party for any reasons, to provide copies thereof to a third party (Contractors or Consultants) of the Employer to be used by them for the purposes of tendering or consultancy.
- d. Furthermore, if any such document/calculation by any principal Contractor or Subcontractor is used for the Works, the Contractor requests such principal Contractor or Subcontractor to grant to the Employer a similar non-exclusive license for the purposes set out herein. The provisions of this clause do not apply to documents made in connection with the manufacturing process of Plant but only to the Plant itself.

6.5.2. Construction

6.5.2.1. The works to be constructed under this scope comprises of the following, depending on the outcome of the condition assessment, hydrological studies and design requirements:

- a. Culvert extension (layerworks, foundation, culvert, approach slab, wingwalls and headwalls)
- b. Bridge widening (layerworks, foundation, piers, abutments, deck and wingwalls).
- c. Underpasses (layerworks, foundation, walls, roof and wingwalls).
- d. Concrete hardstands.
- e. Structural supports for all OHTE requirements (lighting mast foundations, substation upgrading and outdoor equipment).
- f. Loading and off-loading ramps in the yards.
- g. Prepare and submit as-built drawings to Project Manager.

6.5.3. General

6.5.3.1. Professional responsibility

- a. The *Contractor* is wholly responsible for all design coordination, integration and liaison activities involving all the Works, and shall take all measures necessary and make all arrangements for activities such as meetings, inspections, endorsements, and any other activities required for the timeous completion of the Works and to the appropriate quality. When these activities require the involvement of the Employer's Professional Engineering team or any other stakeholders, the Contractor is required to make these arrangements with due consideration of the Employer's Professional Engineering team's availability and the availability of other stakeholders.

- b. The Contractor shall thus be wholly accountable and responsible for all aspects of his designs, including the implementation of all Statutory Safety, Health and Environmental Regulations of South Africa AND the particular requirements, specifications, and regulations of the Employer pertaining to Health and Safety, Environment, Quality and Engineering.
- c. The Contractor shall be wholly accountable and responsible for the implementation of the aspects of his designs including commissioning, putting into service and handover of his constructed designs to the Employer, and his duly appointed ECSA registered Engineers shall be held accountable and responsible for these aspects of the Works for the lifetime duration of the Works.

6.5.4. Review and Acceptance of documents

a. First Submission of Documentation

The first revision is revision 'A', with subsequent revisions being 'B', 'C', 'D', etc. during the pre-construction phase, thereafter the first revision during the construction phase commences at revision '0' and increments sequentially i.e. '1', '2', '3', etc.

b. Review of Documentation

Acceptance of documentation by the Project will in no way relieve the *Contractor* of their responsibility for the correctness of information, or conformance with the requirements. This responsibility rests solely with the *Contractor*.

Once documentation has been reviewed by the *Employer*, all comments are consolidated, and a review code is assigned on the review stamp to the original reviewed/marked-up drawing/document by the Project Manager.

c. Return of Reviewed Documentation

The original reviewed/marked-up drawing/document is scanned to PDF format and a copy is returned to the *Contractor* indicating the Project Manager's further instructions.

Return of the reviewed documentation is either in hard copy format, in which case the original reviewed/marked-up drawing/document is returned, or return is electronically via the DC email address.

Electronic documentation shall be returned via the DC email address.

d. Review Period

The *Contractor* shall allow the Project two (2) weeks to review and respond to the *Contractor's* submission of documentation, i.e., from time of receipt by the Project to the time of dispatch by the Project. However, work shall proceed without delay in the event of late return of the documentation by the Project with prior notification in writing by the *Contractor*.

e. Revised Documentation

On receipt of the reviewed documentation the *Contractor* shall make any modifications requested/marked-up and resubmit the revised documentation within the time specified on the Contractor Documentation Schedule (CDS). Queries regarding comments/changes should be addressed with the Project Manager prior to re-submittal.

Any re-submittals, which have not included the changes/comments identified, will be marked with the applicable **review** code and returned to the *Contractor* to be corrected and re-submitted. The *Contractor* shall re-issue the revised documentation incorporating all comments on a new revision and other specified details not included in the previous issue within 2 working days of receipt of the marked-up documentation.

All revised data shall be submitted in its entirety and shall reflect the revision control numbers and shall also indicate which documentation the revised documentation supersedes, if applicable.

In the case of drawings every sheet has its own revision number and is revised as an individual document.

In the case of documents, all sheets under cover of one document number shall be under the same revision number and be resubmitted, even if the revision is a minor one.

f. Submittal of IFC/IFU/Final/As-Built Documentation

Once the 'For Review' submission has been accepted by the Project Manager by means of assigning the review code C1 or C2 to the documentation, the *Contractor* shall submit the 'IFC/IFU' version and change the revision number from alphabetical to numerical, starting with revision '0'.

Documentation issued from revision '0' onwards must be signed off by the *Contractor*, and shall contain 'wet' signatures of the relevant authorized signatories, i.e., PR Engineer's signature, revision block signatures (i.e., 'BY, CHK'D, APP'D') as well as any other relevant signatures required in the '*Contractor*' block next to the title block decal

6.5.5. As-built drawings, operating manuals and maintenance schedules

a. The Contractor provides the following:

- In undertaking the Works (including all incidental services required), the *Contractor* shall conform and adhere to the requirements of the *Contractor* Document Submittal Requirements Standard.

- Installation, Maintenance and Operating Manuals and Data Books
- The *Contractor* prepares three (3) marked up hard copies of the latest revision of the Contractor documents/drawings to represent the As-Built/Final status.
- The mark-ups shall be in RED pencil or pen and be complete and accurate. The *Contractor* submits the same to the Project Manager under cover of a *Contractor's* Transmittal Note.
- The *Contractor* provides manuals in an A4 hard covered, red, grease and waterproof binder, using 2 ring type binders. The manuals are well indexed and user friendly and include a summarized Table of Contents.
- Drawings and charts larger than A4 are folded and those greater than A3 are enclosed in an A4 plastic pocket of adequate strength.
- The *Contractor* submits the draft Table of Contents to the Project Manager for acceptance prior to the compilation and official submittal of the manuals.
- The originals of all brochures shall be issued to the Project Manager. When a general brochure is applicable to a range of equipment, then the specific item, catalogue number or model number shall be stated, which is best achieved by introducing a separate index page, which cross-references the specific item to a tag number.
- The address, phone numbers, fax numbers and reference numbers of all Sub-Contractors is provided.
- Where manuals include drawings that still need to be revised to 'As-Built' status, and such manuals are required prior to 'As-Built' status, the manual will not be considered to be in its final form until the 'As-Built' version of each such drawing has been incorporated. The required number of copies of the manual(s) shall be as specified by the Project Manager and submitted per type or model number of equipment included in the contract, or as specified by the Project Manager. A typical example of what the binder/file(s) shall be marked with on the spine and the front cover is as follows: -

- Project No./Name
- Manual Title, e.g., Installation, Maintenance and Operating Manual
- FBS No. and Title
- Manual Numbering (e.g., Volume 1 of 2, etc.)
- Contract Number
- Contractor Name
- Unless otherwise stated in the CDS, the required number of copies of all As-Built/Final/Data Packs shall be:
 - 3 x hard copies (Full size) including 1 x copy to be laminated in plastic enclosing 2 pages back-to-back for use by maintenance staff
 - 4 x CD Roms or USB memory sticks with Adobe Acrobat (.pdf) and Native formats

b. As Built/Final Documentation

In undertaking the 'Works' (including all incidental services required), the Contractor shall conform and adhere to the requirements of the 'Contractor Document Submittal Requirements' Standard.

c. Installation, Maintenance and Operating Manuals and Data Books

In undertaking the 'Works' (including all incidental services required), the Contractor shall conform and adhere to the requirements of the 'Data Books and Manuals' Standard.

6.5.6. Completion, testing, commissioning and correction of Defects

a. The work to be done by the Completion Date

On or before the Completion Date the Contractor shall have done everything required to provide the Works before the Completion Date and in any case before the dates stated. The Project Manager cannot certify Completion until the Works have been done and is also free of Defects, which would have, in his opinion, prevented the Employer from using the works and others from doing their work.

b. The Contractor is permitted to carry out the following works after Completion:

- The rectification of minor defects identified prior to the Completion Date. Any work that affects the track standard, safety or work related to the running of trains will not be seen as a minor defect.

c. Use of the works before Completion has been certified

Not applicable

- d. The Employer uses the following part / parts of the works before Completion is certified by the Project Manager which do not constitute take over by the Employer for the reason(s) stated:

Not applicable

- e. Materials facilities and samples for tests and inspections during construction.

The *Contractor* is to provide all facilities at his own cost. Control and acceptance testing in accordance with project specifications (SANS 1200).

- f. The *Contractor* ensures that the Project Manager has a full and accurate dossier of As-built documents that represent the status of the completed works (to include Plant within the works) to present to the Employer.
- g. The *Contractor* ensures that the Project Manager has a full and accurate dossier of Maintenance and Operating Manuals for all equipment as specified at the earlier of take-over or Completion.
- h. Where the *Contractor* has presented Maintenance and Operating Manuals to the Project Manager at take-over, the *Contractor* modifies and updates As-built documents as necessary prior to Completion.
- i. Access given by the Employer for correction of Defects

In accordance with the Conditions of Contract as well as operational procedures.

- j. The *Contractor* complies with the following constraints and procedures of the Employer where the Project Manager arranges access for the *Contractor* after Completion:

In accordance with the Conditions of Contract as well as operational procedures.

6.6. OHTE and Traction Substations Works:

The OHTE and Traction Substations *Works* includes but it is **not limited to**:

6.6.5 Engineering

- a. Conduct a condition assessment for rail infrastructure within the sections between Pretoria and Port of Port Elizabeth (Gqeberha) for the existing OHTE and traction substation infrastructure and provide condition assessment report with remedial works where required. Condition assessments exclude areas that are not electrified as stated in Sections 5.3.1 and 5.3.2.
- b. Conduct a power simulation study for Traction substations and OHTE network for the section between Pretoria and Port of Port Elizabeth (Gqeberha) to be upgraded, (detailed report required for submission). Power simulations exclude areas that are not electrified as stated in Sections 5.3.1 and 5.3.2.

- c. Develop full detailed design, construction package and procurement of all required materials for OHTE and Traction substations (where it is necessary) i.e., not limited to these items: Design criteria, Design Report, Layouts, update switching diagrams, single line diagram, general arrangements, schematic diagrams, BOQ's for budget estimation, Scope of works/works information for construction, construction methodology and the full detailed construction schedule.
- d. Applicable Standards (25kV AC/3kV DC):
 - Except for documents compiled by TFR or the *Employer*, the *Contractor* is to obtain the latest version /publications of these specifications and standards from their sources at own cost.
 - Unless otherwise specified, all materials and equipment supplied is to comply with the current edition of the relevant SANS, BS and IEC publication where applicable.
 - Where reference is made to Transnet Freight Rail or Spoornet specifications, such documents are to form part of the contract document for easy reference.
- e. TFR Generic Specifications (25 KV AC/3KV DC):
 - The TFR specifications are generic in nature and may refer to other projects.
 - It is the *Contractor's* responsibility to ensure that they are in the possession of the latest version of the specifications and standards.

6.6.5 Procurement

- a. The *Contractor* is responsible for design and supplying of all materials required, installation and commissioning of the entire project scope. All works must be done in accordance with South African National Standards and Transnet, "Electrical Safety Instructions: High Voltage Electrical Equipment" document making sure all safe working procedures are adhered to during the undertaking of the work.
- b. Manufacture and perform factory acceptance testing (FAT),
- c. All factory acceptance testing is to be witnessed by the *Employer's* representatives.
- d. The *Contractor* is required to submit all relevant documentation (e.g. datasheets, workshop drawings, etc.) for approval to the *Employer* prior to manufacturing the equipment.

6.6.5 Construction

- a. The *Contractor* is required to manage and execute the construction requirements for the project from start to completion.
- b. No temporary Works has been identified by the *Employer*, but any temporary work that may be required during the implementation of this project, the *Contractor* is responsible for such works. This includes any associated engineering and design that may be required. Therefore, it

is the responsibility of the *Contractor* to identify and report such Works.

- c. Plant and Materials Workmanship and Standards for the works: Supply required materials and installation but not limited to the following:
 - Steel or Concrete masts (as per design) and associated foundations.
 - 3kV DC OHTE wiring on 3kV DC spring tension fixed cantilever type.
 - 25kV AC OHTE wiring on 25kV AC auto tension swing cantilever type.
 - Transmission line with single earth wire.
 - H-mast equipment and transformers.
 - All steel work onto the masts.
 - Bridge fittings with cross- span, drop-arms and insulators.
 - Earthing and bonding of masts to rail and rail to rail.
 - Earthing and bonding of rail turnouts.
 - Spring tension anchors.
 - Weight tension anchors.
 - Mid-point anchors.
 - Track sectioning switches (TSS).
 - Motor Operated Track Switches (MOTS).
 - Aerial Bundled Conductor at bridges and other specified locations.
 - Outriggers for the transmission line at specific locations.
 - Overlaps on tangent tracks.
 - Overlaps on curve tracks.
 - Section insulators, neutral sections and TSS's.
 - All required signage in accordance with TFR specifications.
 - Commissioning and Testing of the Works
- d. Tolerances must be in accordance with all relevant specifications and drawings.
- e. The *Contractor* must comply with all manufacturer / supplier's installation
- f. All small part steelwork must be galvanised as per drawings and SANS Specification 121.
- g. Clamping brackets (back straps / angles) shall be installed to secure all mast attachments to the galvanized and concrete masts. Bolt on

adapters “Lindapters” are prohibited.

- h. The *Contractor* is required to perform site acceptance testing (SAT), the *Employer's* representative must witness such activities.

6.6.5 Commissioning

The *Contractor* is responsible for all commissioning activities (pre-commissioning and commissioning works) for various facilities.

Testing and check sheets will be supplied to the *Contractor* by TFR, the test and check sheets are to be used as guidelines and the basis for testing and commissioning of the electric traction infrastructure. The *Contractor* will be able to use this information to develop a detailed testing and commissioning (energising) plan

a. Generic Test Sheets, Certificates and Reports:

- The information provided on the test sheets might not all be relevant to the works, but they provide the *Contractor* with an example of the type of documents required during the commissioning process. Therefore, these are only to be used for information purposes only, test sheets relevant this project shall be developed by the *Contractor*.
- The *Contractor* will be responsible for providing test sheets to the Project Manager for acceptance at the same time as providing equipment designs. Approved test sheets shall be made available before the commencement of any factory testing of equipment.
- The *Contractor* is to provide all site acceptance testing reports for sign off by the *Employer's* representatives.
- The *Contractor* is to perform generally, all works required pre-energising and provide completion certificates.

6.6.5 General

a. As-built Drawings, Operating Manuals and Maintenance Schedules:

- Language: All documentation, including reports, manuals, etc. must be in the English language.
- Manuals: The technical, training, operating and maintenance manuals are provided for each type of a functional unit. Technical manuals include all technical data as well as the technical data and leaflets of each individual component provided. Where generic manuals are provided, an addendum is provided indicating the applicable project specific components.

b. Manuals are of a good quality and cover the following as a minimum:

- Technical descriptions of the equipment and component parts
- General arrangement drawings
- Installation instructions with drawings or pictures

- Operating and maintenance instructions for all components
 - Detailed parts list (accompanied by exploded view type drawings clearly detailing the part and uniquely identifying it)
 - Spare part/list ordering instructions
 - Any special instructions pertaining to storage of spare parts or their shelf life is included in the maintenance manual. All drawings requested for component location, dismantling and re-assembly for maintenance are included in the maintenance manual. All special tools required for operating and maintenance of the equipment are presented in a form of a schedule in the operating and maintenance manual, respectively. The content of the training manual is based on the content of the technical, operating and maintenance manuals.
- c. Drawing Requirements: The *Contractor* supplies reproducible drawings according to the Vendor Document Submittal Schedule (VDSS) including all related native files.
- d. As-Built Drawings: The *Contractor's* Staff maintains a master set of red-lined as-built drawings including all related native files. The *Contractor* provides drawing mark-ups as work is completed. The Project Manager and the *Contractor* ensure that all appropriate information is transferred to the field record copy of drawings. The Project Manager and the *Contractor* check the "as-builts" for completeness and accuracy.
- e. Pre-Commissioning Tests and Procedures of Overhead Track Equipment (OHE) and traction substations: The *Contractor* is responsible for organising and testing all electrical infrastructure. All testing activities must be done together with the *Employer's* team. The testing procedures will be conducted on a per section basis after construction is completed with reference to the switching diagram.
- f. The *Contractor* is responsible for the following activities/duties to ensure the safe operation of the facilities but not limited to:
- To Walk or drive the full extent of the section being handed over
 - It is recommended that the Contractor should provide the road-rail vehicle (RRV) for inspection.
 - Confirm that all pre-commissioning punch-list items are rectified and signed off.
 - Ensure that there is no damaged equipment present on the section.
 - Verify that all heights and staggers are correctly measured, recorded and remain within the specified limits.
 - Ensure proper electrical insulation (insulators, section insulators and phase breaks) is clean and in place.
 - Verify that electrical circuitry is in accordance with the

switching diagram.

- Verify construction earths are in accordance with the construction earth register.
- The *Contractor* shall be responsible to facilitate all factory functional tests to be conducted by the manufacturers of equipment at their premises before such equipment may leave their premises.
- At the completion of the factory functional tests, the Project Manager shall either sign the test sheets (supplied by the *Contractor*) as having witnessed the satisfactory completion thereof, or hand to the *Contractor* a list of defects requiring rectification.
- Upon rectification of defects, the *Contractor* shall arrange for the Project Manager to certify satisfactory completion of factory functional tests for the switchgear and control equipment.
- Acceptance by the Project Manager of satisfactory completion of factory functional tests in no way relieves the *Contractor* of his obligation to rectify defects, which may have been overlooked or become evident at a later stage.
- The *Contractor* shall be responsible for carrying out on-site tests of all equipment supplied and installed in terms of this specification.
- The Contractor shall supply all test equipment and instruments required to do all tests.
- The *Contractor's* Test Engineer shall be responsible for the calculation of all relay settings as well as all other protection settings
- Functional on-site tests shall be conducted on all items of equipment and circuitry to prove the proper functioning and installation thereof. The *Contractor* shall be responsible to conduct functional test on all equipment and circuitry to prove the proper functioning and installation thereof. Proper operation of the protection system including the tripping and lockout functions as well as interlocking required shall be checked and ensured.
- The *Contractor* shall submit a detailed list of on-site tests for the acceptance of the Project Manager at least six weeks before tests are due to commence at the first substation.
- The Project Manager shall provide a list of all representatives that need to be present to witness the on-site tests at each substation.
- The on-site tests and subsequent commissioning will not commence until all construction work has been

completed. Construction staff, material and equipment shall be removed from site prior to the commencement of testing. Testing and commissioning of the substation equipment will not be allowed to take place in a construction site environment.

- The Project Manager shall arrange for the required *Employer* representatives to be present to witness the on-site tests.
- At the completion of the on-site tests the Project Manager and any dedicated representatives, shall either sign the test sheets (supplied by the *Contractor*) as having witnessed the satisfactory completion thereof, or hand to the *Contractor* a list of defects requiring rectification.
- Upon rectification of defects, the *Contractor* shall arrange for the Project Manager to certify satisfactory completion of on-site tests for that particular substation.
- Acceptance by Project Manager of satisfactory completion of on-site tests in no way relieves the *Contractor* of his obligation to rectify defects, which may have been overlooked or become evident at a later stage. At the completion of the on-site tests, the TFR Test Department Engineer shall either sign the test sheets (supplied by the *Contractor*) as having witnessed the satisfactory completion thereof, or hand to the *Contractor* a list of defects requiring rectification.
- Upon rectification of defects, the *Contractor* shall arrange for the TFR Test Department Engineer to certify satisfactory completion of on-site tests for the switchgear and control equipment. Acceptance by the TFR Test Department Engineer, of satisfactory completion of on-site tests in no way relieves the *Contractor* of his obligation to rectify defects, which may have been overlooked or become evident at a later stage.

g. Reports on Faults and Failures:

- The *Contractor* will inform the Project Manager of the names, addresses and telephone/cell phone numbers of his personnel to be called in emergencies. The *Contractor* will arrange that one or more of his Personnel is available within 24 hours at all times up to the end of the defects period to receive fault or failure reports.
- The *Contractor's* personnel, while on call, will inform the duty personnel in the TFR (Rail Network Division) control office of their movements so that they may be contacted without delay in case of an emergency during "live commissioning".
- The *Contractor* will keep the Project Manager and the duty personnel of the TFR CTC informed of the names of its

personnel who shall be available to receive calls during specific periods.

h. Final Hand Over

- The *Contractor* must ensure that the following documents are made available prior to-, during- and after, as may be applicable to all Parts for pre-commissioning, commissioning and hand-over for review and acceptance by the Employer:

- i. Pre-/Commissioning certificates
- ii. Pre-/Commissioning logs
- iii. Asset register
- iv. Tool list and special tools
- v. As-built drawings
- vi. Equipment manuals
- vii. System manuals:
- viii. Design principles
- ix. Maintenance procedures
- x. Standard circuit designs
- xi. Technical procedures
- xii. Certificate of practical completion
- xiii. Pre-/Commissioning work package
- xiv. Copies of inspection & test records
- xv. Certificate of acceptance
- xvi. Test certificates all equipment as may be applicable
- xvii. Maintenance philosophy
- xviii. Operational philosophy

f. The Contractor is responsible for the following activities/duties to ensure the safe operation of the facilities but not limited to:

- To Walk or drive the full extent of the section being handed over
- It is recommended a MOM be used for this inspection.
- It is recommended that the *Contractor* should provide the road-rail vehicle (RRV) for inspection.
- Confirm that all pre-commissioning punch-list items are rectified and signed off.
- Ensure that there is no damaged equipment present on the section.

- Verify that all heights and staggers are correctly measured, recorded and remain within the specified limits.
- Ensure proper electrical insulations (insulators, section insulators and phase breaks) are clean and in place.
- Verify that electrical circuitry is in accordance with the switching diagram.
- Verify construction earths are in accordance with the construction earth register.

g. Factory Functional Tests (FAT) for new equipment:

- The *Contractor* is responsible to facilitate all factory functional tests to be conducted by the manufacturers of equipment at their premises before such equipment may leave their premises.
- At the completion of the factory functional tests, the Project Manager must either sign the test sheets (supplied by the Contractor) as having witnessed the satisfactory completion thereof, or hand to the Contractor a list of defects requiring rectification.
- Upon rectification of defects, the *Contractor* shall arrange for the Project Manager to certify satisfactory completion of factory functional tests for the switchgear and control equipment.
- Acceptance by the Project Manager of satisfactory completion of factory functional tests in no way relieves the *Contractor* of his obligation to rectify defects, which may have been overlooked or become evident at a later stage.

6.7. Electrical Lighting and Power (EL & P) Works:

6.7.1. Engineering

The EL&P Works includes but it is not limited to:

- 6.7.1.1. Conduct a condition site assessment of the existing infrastructure within the corridor for the specific sections where work for this project will be done especially where the existing facilities are going to be re-used. This includes but not limited to the overhead power lines, distribution substations, building reticulations, underground power cabling, protection equipment devices, etc.
- 6.7.1.2. Develop a full detailed design and construction package for EL&P (where it is necessary) i.e., Design criteria, design report, layouts, single line diagrams, general engineering, schematic diagrams, connection diagrams, BOQ's for budget estimation, scope of works/works information for construction, construction methodology and the full detailed construction schedule.
- 6.7.1.3. The *Contractor* must consider the applicable Standards:
 - a. Except for documents compiled by TFR or the *Employer*, the *Contractor* must obtain the latest version /publications of these specifications and standards from their sources at own cost.
 - b. Unless otherwise specified all materials and equipment supplied

must comply with the current edition of the relevant SANS, BS and IEC publication where applicable.

- c. Where reference is made to Transnet Freight Rail or Spoornet specifications, such documents will form part of the contract document for easy reference.

6.7.1.4. TFR Generic Specifications:

- a. The TFR specifications are generic in nature and may refer to other projects.
- b. It is the *Contractor's* responsibility to ensure that he is in the possession of the latest version of the specifications and standards.

6.7.2. Procurement

- 6.7.2.1. The *Contractor* is responsible for design and supplying of all materials required, installation and commissioning of the entire project scope. All works must be done in accordance with South African National Standards and other related specifications.

- a. Manufacture and perform factory acceptance testing (FAT),
- b. All factory acceptance testing is to be witnessed by the *Employer's* representatives.
- c. The *Contractor* is required to submit all relevant documentation (e.g. datasheets, workshop drawings, etc.) for approval to the *Employer* prior to manufacturing the equipment.

6.7.3. Construction

- 6.7.3.1. The *Contractor* is responsible to manage and execute all related construction requirements for the project from start to completion.

- a. The Contractor must provide Plant and Materials Workmanship and Standards for the works, including Supply required materials and installation of the of all works related activities.
- b. The Contractor shall comply with all manufacturer / supplier's installation procedures and manuals for all equipment.
- c. No temporary Works has been identified by the Employer, but any temporary work that might be required during the implementation of this project, the Contractor is responsible for such works. This includes any associated engineering and design that may be required. Therefore, it is the responsibility of the Contractor to identify and report such Works.
- d. Manufacture and perform factory acceptance testing (FAT),
- e. Construct as per the approved designs.
- f. Perform site acceptance testing (SAT),

6.7.4. Commissioning

- 6.7.4.1. The *Contractor* is responsible for all commissioning activities (pre-commissioning and commissioning works) for various facilities.

6.7.4.2. Testing and check sheets will be supplied to the *Contractor* by TFR, the test and check sheets and are to be used as guidelines and the basis for testing and commissioning of the electric traction infrastructure. The *Contractor* will be able to use this information to develop a detailed testing and commissioning (energising) plan.

6.7.4.3. Generic Test Sheets, Certificates and Reports:

- a. The information provided on the test sheets might not all be relevant to the works, but they provide the *Contractor* with an example of the type of documents required during the commissioning process. Therefore, these are only to be used for information purposes only, test sheets relevant this project shall be developed by the *Contractor*.
- b. The *Contractor* will be responsible for providing test sheets to the Project Manager for acceptance at the same time as providing equipment designs. Approved test sheets shall be made available before the commencement of any factor testing of equipment.
- c. The *Contractor* is to provide all site acceptance testing reports for sign off by the *Employer's* representatives.
- d. The *Contractor* is to perform generally, all works required pre-energising and provide completion certificates.

6.7.5. General

6.7.5.1. The *Contractor* shall provide the As-built Drawings, Operating Manuals and Maintenance Schedules:

- a. Language: All documentation, including reports, manuals, etc. shall be in the English language.
- b. Manuals: The technical, training, operating and maintenance manuals are provided for each type of a functional unit. Technical manuals include all technical data as well as the technical data and leaflets of each individual component provided. Where generic manuals are provided, an addendum is provided indicating the applicable project specific components.
- c. Spare part/list ordering instructions.

6.7.5.2. Drawing Requirements: The *Contractor* supplies reproducible drawings according to the Vendor Document Submittal Schedule (VDSS).

6.7.5.3. Drawing Numbering System: The Employer supplies the proposed Project Manager with the drawing numbering system. The *Contractor* may assign his own drawing number as required to meet his document control system requirements.

6.7.5.4. As-Built Drawings: The *Contractor's* Staff maintains a master set of red-lined as-built drawings. The Contractor provides drawing mark-ups as work is completed. The Project Manager and the Contractor ensure that all appropriate information is transferred to the field record copy of drawings. The Project Manager and the Contractor check the "as-builds" for completeness and accuracy.

6.7.5.5. The *Contractor* shall provide all developed drawings as part of the

as-built status.

6.7.5.6. The *Contractor* must ensure that the following documents are made available prior to-, during- and after, as may be applicable to all Parts for pre-commissioning, commissioning and hand-over for review and acceptance by the Employer:

- a. Pre-/Commissioning certificates
- b. Pre-/Commissioning logs
- c. Asset register
- d. Tool list and special tools
- e. As-built drawings
- f. Equipment manuals
- g. System manuals:
- h. Design principles
- i. Maintenance procedures
- j. Standard circuit designs
- k. Technical procedures
- l. Certificate of practical completion
- m. Pre-/Commissioning work package
- n. Copies of inspection & test records
- o. Certificate of acceptance
- p. Test certificates all equipment as may be applicable
- q. Maintenance philosophy
- r. Operational philosophy

6.8. Signalling Works:

Provide Signalling Works which includes but is **not limited to**:

6.8.1. Engineering

6.8.1.1. Develop a full detailed design pack for Signalling, including but not limited to:

- a. Design criteria
- b. Design Report
- c. Line Plans and other layout drawings
- d. Detailed installation drawings (e.g., relay rooms, trackside, CTC centres)
- e. Signed off updated non-illuminated train control diagrams (for TCO use)
- f. Updated Train diagrams for TWS/RTO sections (for TCO use).

6.8.1.2. Conform to existing technologies and train control methods used, where

appropriate.

6.8.1.3. Use of latest TFR-approved technologies and design methodologies where possible and subject to time and budget constraints.

6.8.1.4. Prepare Signalling Line Plans in sufficient detail, showing the existing versus the proposed station layouts. This detail includes but it is not limited to:

- a. Site surveys of existing Signalling equipment positions and site constraints like curves and obstruction to visibility of proposed signals and indicators.
- b. Obtaining and verification of gradient information including any measurements on site where needed.
- c. Train dynamics calculations and simulations for correct placement of signals.
- d. Engaging TFR's Train Design department to verify equipment placements with respect to train dynamics.

6.8.1.5. Provide AC immunization of Signalling and other affected elements of the work, including verification of the suitability of existing AC immunization, with no additional time and cost.

6.8.1.6. Investigate (at no additional time and cost) whether there is a need to introduce Yard Automation systems (part of Signalling) where they do not exist: implementation of resultant recommendations and associated time and costs are subject to explicit acceptance by the *Project Manager*.

6.8.1.7. Investigate (at no additional time and cost) whether there is a need to introduce electrical points and indicators (part of Signalling) in the RTO/TWS sections where they do not exist: implementation of resultant recommendations and associated time and costs are subject to explicit acceptance by the *Project Manager*.

6.8.1.8. Prepare a document detailing the proposed train operating methodology inclusive of train control methods, operation of Signalling systems, change-over between different traction types, routing of different types of train traffic, operation of sidings/yards, control of colour light signalling for train movements from electrified to non-electrified running lines(to reduce the risk of electrified locomotives getting stuck in the non-electrified line) etc.

6.8.1.9. Engage the RN Technical office, TFR train operations, Corporate Safety, and other relevant stake holders to conduct a risk assessment specifically with reference to Signalling Line Plans and the proposed train operating methodology: risk assessment report to be submitted.

6.8.2. **Procurement**

See item 6.1.

6.8.3. **Construction**

6.8.3.1. Manufacturing off-site:

- a. Prefabricated secure concrete apparatus rooms
- b. Wired equipment racks
- c. Assembly of trackside equipment where needed

d. Other

6.8.3.2. Site establishment:

- a. Site Facilities
- b. Equipment
- c. Security
- d. Health, Safety, Environment and other Statutory requirements

6.8.3.3. Installation:

- a. Relay room building and EL&P work
- b. Apparatus room building and EL&P work
- c. Trenching and cabling (including cross-trenching, needing occupations)
- d. Any required modifications to colour light signalling installations
- e. Any required modifications at the Centralised Traffic Control (CTC) centres and Electrical Control centres
- f. Any required modifications to pre-existing Yard Automation systems
- g. Any required changes to the Radio Train Order (RTO) and Track Warrant System (TWS) installations
- h. Any changes to Condition Assessment Systems (CAS) e.g., re-positioning, new installations etc.
- i. Telecontrol
- j. Telecoms
- k. Level crossing protection
- l. Replacement of obsolete technologies, where practical

6.8.3.4. Site inspections

- a. Designer inspections
- b. Quality inspections

6.8.3.5. Temporary works

- a. Provide all required temporary works even if not identified by the *Employer*, at no additional time and cost for such temporary works.
- b. Re- route existing cabling and relocate trackside equipment affected by Civil & Perway, Geotech, and OHTE and Traction sub-station Works (part of enabling works).
- c. Provide temporary detection and indications of the points sets at the affected relay rooms and CTC centres after the Perway discipline installs a new points set but before it is introduced.

6.8.4. Testing and Commissioning

- 6.8.4.1. Work closely with the TFR test engineer (*Employer's* commissioning engineer) to confirm the resourcing and other requirements for the FAT, SAT, final integrated testing, commissioning and handover for operations and

maintenance.

6.8.4.2. Factory Acceptance Testing (FAT):

- a. Facilitate factory tests and debugging conducted by the manufacturers of interlocking and major Signalling equipment at their premises before such equipment may leave their premises.
- b. Provide a suitable test or simulation rigs to allow testing of equipment at the manufacturing facility before it goes to Site.
- c. Test and debug the factory installation (hardware and software) before handing over to the TFR test engineer for FAT.
- d. Provide suitably qualified and competent personnel to assist the TFR test engineer with FAT.
- e. Obtain the TFR test engineer sign-off of test sheets (supplied by the *Contractor*) and a list of defects requiring rectification after the completion of the FAT for a Section/component of the Works,
- f. Upon rectification of defects, arrange for the TFR test engineer to certify satisfactory completion of the FAT. (Acceptance by the TFR test engineer of satisfactory completion of the FAT in no way relieves the *Contractor* of their obligation to rectify defects, which may have been overlooked or become evident at a later stage).

6.8.4.3. Site Acceptance Testing (SAT):

- a. Do on-site tests of all Signalling Plant and Materials supplied and installed in terms of the Works Information.
- b. Submits a detailed list of on-site tests for the acceptance of the TFR test engineer at least six weeks before tests are due to commence.
- c. Obtain a list of all TFR test engineer representatives that need to be present to witness the on-site tests. (The TFR test engineer arranges for the required representatives to be present to witness the on-site tests.)
- d. Complete all construction *Works* before the on-Site tests and subsequent commissioning can commence. Testing and commissioning of the system is not allowed to take place in a construction site environment.
- e. Pre-test and correct all defects on the equipment and circuits.
- f. Install the factory-tested equipment on Site according to the approved design, specifications and recommendations of the TFR Technology Management and the TFR test engineer.
- g. Provide a suitable test or simulation rigs to allow Site testing by TFR Technology Management and TFR test engineer.
- h. Test and debug the complete Site installation (hardware and software) before handing over to TFR Technology Management and TFR test engineer.
- i. Do insulation testing for all cables for the completed portion of the *Works* as required by the TFR test engineer and submit completed insulation test sheets to the TFR test engineer before the commissioning occupation starts. The installation must comply with the Works Information and is complete in all respects, including a wire count of all locally wired terminals as well as “ringing out or buzzing” of circuits, units and all rack-to-rack

wiring.

- j. Submit the test certificates referred to herein and the updated test copies of all applicable drawings before the TFR test engineer commences with acceptance inspection.
- k. Conclude the acceptance inspection before the TFR test engineer commences with site acceptance and commissioning. Any incomplete work on wiring results in an installation being considered not ready for acceptance testing.
- l. Provide suitably qualified and competent personnel to assist the TFR test engineer with acceptance testing and commissioning of the Works. Testing personnel requirements during commissioning are at least:
 - The *Contractor's* test officer;
 - Two persons in each relay room;
 - Two persons in each CTC office; and,
 - Three trackside teams of two persons each to enable testing of signal aspect switching, etc.
- m. Determine in consultation with the TFR test engineer, the time and personnel required for the TFR test engineer's acceptance testing and commissioning of the Works. The TFR test engineer performs the following acceptance tests, amongst others: Remote control correspondence checking of all trackside functions to each relay room and respective VDU at each CTC office. This includes all route calling, signal aspect switching and route/turnout indicators as well as track and points correspondence with detection, Axle-counters: scanning the heads and checking for correspondence to each relay room.
- n. Upon rectification of defects, arrange for the TFR test engineer to certify satisfactory completion of on-Site tests.
- o. Rectify defects, which may have been overlooked or become evident at a later stage. (Acceptance by TFR test engineer of satisfactory completion of on-Site tests in no way relieves the *Contractor* of his obligation to rectify defects).
- p. Use only TFR-approved technologies for acceptance testing and commissioning (the *Contractor* is held liable for the re-commissioning of the replaced technologies and subsequently all other interfaces that may need to be tested).

6.8.4.4. Final integrated testing and commissioning:

- a. Certify that the system is safe and operational and that all the required inspection and testing proving the performance, safety and reliability of the system has been carried out and documented. The *Contractor* completes all the customized system functional performance test procedures prior to system acceptance by the *Employer* and proves that system is installed and tested in accordance with the approved Signalling designs.
- b. Test, commission and hand over the Signalling Works in accordance with specifications CSE-1155-500 category N48 and BBB3609, including but not limited to:
 - Providing all the approved Signalling designs used for construction.

- Providing the test team, test equipment and all other resources for testing and commissioning. (Only the TFR accredited test engineers are allowed to commission the TFR installations).

6.8.5. **General:**

The *Contractor* refers to existing as-built drawings for Signalling, Telecontrol and Telecoms installations to provide the *Works*. The *Employer* provides relevant Transnet as-built drawings (where available) upon request (Form BBB0322 to be submitted to the *Project Manager*). The use of said as-built drawings is subject to on-Site verification and use of other information at the *Contractor's* disposal.

As a minimum, the *Contractor* provides the following drawings, calculations and reports:

- Signalling Line Plans
- Interface drawings
- Block diagrams and other concept drawings
- Power and space requirements for modifications to TAS, CAS, Telecontrol, Telecoms and other equipment.
- EMC plan as input to RSR submission
- Installation and Commissioning drawings, including but not limited to:
 - Detailed Signalling Cable plans
 - CTC Book of Circuits
 - Relay room circuits
 - Apparatus room/case plans
 - Non-illuminated train control diagrams
 - Train diagrams for TWS/RTO sections
 - Signed as-built drawings accurately reflecting the completed *Works*.
- Software data generation, including but not limited to:
 - CS90
 - Axle Counters
 - Interlocking CPUs/PLCs etc
- Design reports

- Works information and the relevant supporting documents for sub-contracting
- Inspection and test plan (ITP)
- Factory and Site designer inspection reports
- Occupation action plans (including resourcing)
- Factory and Site quality inspection reports (including installation checklists)
- Factory and Site test reports including pre-test certificates, test sheets and soak-testing results
- Final integration testing reports
- As-built documentation inclusive of all relevant manuals, corrected Defect lists, etc.

6.8.6. **Close-out:**

- a. Provide the necessary information to enable the designer to produce “as-built” drawings. Changes are only done as per red line drawings accepted by the *Project Manager*. As-built” drawing s are provided to TFR in PDF and CAD vector formats.

6.9. Health and Safety Works:

The *Health and Safety Works* include but not limited to:

- 6.9.1. Undertake design safety reviews of all design deliverables that address the constructability of the works with the Project Manager.
- 6.9.2. Prepare and present design documents to the employer at the following review meetings as a minimum:
 - a) HAZOP review meetings
 - b) HAZCON review meetings
- 6.9.3. The EPC Contractor shall prepare a project specific Health and Safety Management Plan (HSMP) in accordance with the Construction Regulations of the Occupational Health and Safety Act.
- 6.9.4. In addition to the responsibilities outlined in the EPC Contractor Health and Safety Management Plan, the EPC Contractor also has the following general duties, responsibilities and authorities:
 - Develop, implement, monitor and review a site specific Health and Safety management plan for the project;
 - Monitor and manage subcontractor activities on site to ensure compliance with the above;
 - Report any HSE issues, incidents or non-conformances to the Owner or its representative;
 - Work with the Owner or its representative to actively manage any HSE issues that arise.

- 6.9.5. The EPC Contractor shall manage and maintain a risk management process for their employees and subcontractors when working on the project. This system and process shall be spelt out clearly and without ambiguity within the EPC Contractor's HSMP
- 6.9.6. The EPC Contractor shall assess potential subcontractors to verify their ability to perform the requested services in a healthy and a safe manner and keep records of that assessment. The EPC Contractor's plans shall also indicate how they will manage subcontractors (includes supervision, inspection and monitoring practices e.g. compliance to the EPC contractors plan) to verify they meet health and safety requirements.
- 6.9.7. All health and safety matters associated with the works will be dealt with in accordance with the client (Transnet) provided Health and Safety Specifications
- 6.9.8. The EPC Contractor shall comply with all applicable legislation, regulations issued in terms thereof and Transnet's safety rules which shall be entirely at the Contractor's cost and which shall be deemed to have been allowed for in the rates and prices.
- 6.9.9. The EPC Contractor shall, in particular, comply with the following Acts or regulatory requirements:
 - The Compensation for Occupational Injuries and Diseases Act, no. 130 of 1993. The EPC contractor shall produce proof of registration and in good standing with Compensation Commissioner in terms of the Act for submission with tender.
 - Act 85 of 1993, Occupational Health and Safety Act.
 - The Provincial Ordinances and Local Authority, by-laws and all regulations framed there under.
 - The EPC Contractor and all his employees shall have a valid safety induction when accessing the works or carrying out the works on site. Proof of such inductions shall be submitted to the Employer's Agent. The EPC shall make allowance for this induction in the pricing.
- 6.9.10. The Principal Contractor will be required to submit particulars of his Health and Safety Programme within 2 (Two) weeks of award of tender. Particular requirements of the Employer, if any, will be made known on award of the contract.
- 6.9.11. All Safety personnel appointed by the EPC Contractor and contractors shall be registered with the SACPCMP and shall have a minimum of 5 years' experience on similar projects.
- 6.9.12. At all times during the manufacture, construction, erection and commissioning of the Works, the EPC contractor will be responsible for the safety of all persons on the site and the works will be in full compliance with the requirements of the Occupational Health and Safety Act, Act 85 of 1993, and Transnet Health and Safety Specifications.

6.10. Environmental Authorizations Works:

The *Environmental Authorizations Works* include but not limited to:

- 6.10.1. The Contractor shall obtain all environmental permits and licenses required for this project, using the One Environmental System as far as practicable.

6.10.2. The *Contractor* shall be responsible for the below deliverables through a professionally registered Environmental Specialist (EAPASA or SACNASP where required) for the entire scope of the project, namely:

- a) Environmental Baseline Survey Report.
- b) Environmental Legal and Risk Register.
- c) Environmental and Social Governance Report.
- d) Sustainable Design Report
- e) Review and update the Project Execution Plan and Project Design Criteria.
- f) All documents/reports that form part of Project Permits and Licenses Applications.

6.10.3. All documents should be reviewed and approved by a TFR Environmental Specialist. All permits and licenses should be done in close consultation with the TFR Environmental Specialist.

6.11. Quality Management System:

6.11.1. The Contractor shall execute the works in accordance with the project specification QAL-STD-001 (General Quality Requirements for Contractors and Suppliers).

6.11.2. The Contractor's Quality Management System shall conform to the requirements of ISO 9001:2015 Standard.

6.11.3. The Contractor shall submit Project Quality Plan (PQP) proposal to TFR for review before commencement of work on site. Works on site may only continue once these proposals are accepted by TFR.

6.11.4. The proposal shall detail the Contractor's quality management system as it applies to all aspects of supply or service provision, including design, procurement, manufacturing, construction, installation, erection and commissioning.

6.11.5. The Contractor shall make allowance for the provision of suitably qualified quality control staff to manage and carry out inspection on all supplier/subcontractor activities in all disciplines included within the Works Information.

6.11.6. The PQP shall demonstrate the clear understanding of the scope of work. This means that the write up must be project specific.

6.11.7. The PQP includes the Contractor's statement that outlines strategy, methodology, resource allocation, QA and quality control co-ordination activities to ensure that the works meet the standards stated in the Works Information.

6.11.8. PQP is generally in narrative form detailing the Project Specific QA and QC systems and controls required by the Contractor for the specific works.

6.11.9. PQP requirements are detailed in the project standard and shall include, but not be limited to:

- a) Quality objectives
- b) Quality risks
- c) Quality management during procurement, engineering and

construction

- d) Quality roles and responsibilities of all resources involved in the quality management implementation.
- e) all quality activities relevant to the works, identifying all procedures, reviews, audits, control and records used to control and verify compliance with the specified contractual requirements
- f) listing of all special processes (e.g., welding and non-destructive testing, cube testing, etc.)
- g) List of all proposed method statements for Site-based work activities.
- h) Include a description of the Contractor's project organization. The organization structure shall indicate resources committed to implementation of PQP requirements
- i) Non-conformance management including root cause analysis.
- j) Lines of communications during contract period.

6 List of Drawings / Reports and Reporting

As part of the deliverables the *Contractor* provides all engineering surveys, drawings, designs, reports and documentation in native and pdf format (raw data and final design data) as part of the engineering deliverables. This applies for all phases of the project.

Table 3 List of reports/drawings to be supplied to Contractor

Item	Name of Report/Drawing
1.	Pre-Feasibility Report
2.	Rail Drawings
3.	Waltloo Operational Plan
4.	Port Yard Operational Plan
5.	Kaalfontein Operational Plan
6.	Rail Operation Plan
7.	Rail Yard and Port Simulation Report
8.	Pre-Feasibility Study Environmental Report
9.	Ukuvuselela Geotechnical desktop study

Each submission of drawings issued by the *Contractor* to the *Employer* is required to be soft copies (PDFs and native files) and hard copies as per TFR drawing specifications. The drawings must be signed off by a professionally registered person, Pr. Eng. or Pr.Tech.

The design process will require detailed approved drawings.

EIA report is required.

The *Employer* requires the *Contractor* to arrange and plan for scheduled monthly project meetings to give detailed project progress.

7 Applicable Regulations and Standards

All work done as part of this project must take cognisance of and incorporate relevant Transnet norms and standards.

In line with Transnet project requirements. The *Contractor* is required to adhere to but not limited to the documents below in **Table 4** Regulations and Standards:

Table 4. Regulations and Standards

Document Title	Document	Revision – Current revision
NATIONAL or INTERNATIONAL STANDARDS		
Railway Safety Regulations		2014
Standard Method of Testing Roads	TMH1	1986
South African National Building Regulations Act (103)		1977
The National Railway Safety Regulator Act 2002 (Act 16, 2002)		2002
Construction Regulations		2014
Design of Highway Bridges and Culverts in South Africa	TMH7	1989
Railway safety management Part 2-2-1: Technical requirements for engineering and operational standards – Track, civil and electrical infrastructure – Level crossings	SANS 3000-2-2-1	2012
British Soil Classification System (BSCS)	BS 5930	1981
Guidelines for Soil and Rock Logging in Southern Africa, 2 nd Impression 2001 eds. A.B.A Brink and R.N.H. Bruin, Proceedings, Geoterminology The Scope organized by AEG, SAICE & SAIEG		2002
SANS 1200 suite of documents (where applicable)	Code of practice for use with standardised specification of civil engineering	

Document Title	Document	Revision – Current revision
Earthworks	SANS 1200D	
Earthworks (Pipe Trenches)	SANS 1200DB	
Earthworks (Roads Sub-grade)	SANS 1200DM	
Earthworks (Railway, Siding)	SANS 1200DB	
Piling	SANS 1200F	
Concrete (Structural)	SANS 1200F	*
Concrete (Small the Scope)	SANS 1200GA	*
Precast Concrete	SANS 1200GE	*
Structural Steel	SANS 1200H	*
Bedding (Pipes)	SANS 1200LB	*
Storm water Drainage	SANS 1200LE	*
Low Voltage Electrical Supply	IEC 439	*
Isolating Transformers	IEC 742	*
Electrical Plugs and Sockets	IEC 309	*
Structural Use of Concrete	SANS 10100	*
Code of Practice for Wiring of Premises	SANA 10142	*
Electricity Supply –quality of supply	NRS 048-2:2007	Issues 3
Basis of Structural Design (Loading Code)	SANS 10160	*
Structural Use of Steel	SANS 10162	*
Pre-cast concrete box culvert	SANS 986	
The design of foundations for buildings	SANS 10161	
Portland and rapid hardening Portland cement	SANS 1491	
Detailing of steel reinforcement for concrete	SANS 10144	
Welded steel fabric for reinforcement of concrete	SANS 1024	
Construction works: Structural steelwork.	SANS 2001-CS1	
Concrete works (structural).	SANS 2001-CC1	
Strip footings, pad footings and slab-on-the-ground foundations for masonry walling.	SANS 2001-CM2	
Aggregates for concrete	SANS 1083	
Application of national building regulations	SANS 10400	
Standard Specification for Roads & Bridge The Scope for State Road Authorities (COLTO)	Series 6000	*

Document Title	Document	Revision – Current revision
Transnet Freight Rail Standards Specifications and Other Documentation		
Civil Engineering, Perway and Geotechnical		
South African Transport Services Bridge Code	SATS Bridge Code	1983
SA Transport Service's Geotechnical Services Handbook		1986
South African Transport Services Engineering Survey Work	SATS E13	1985
BS 5930:1999 - <i>Code of Practice for Site Investigations</i>		1999
SAICE, January 2010 – <i>Site Investigation Code of Practice</i>		2010
SANRAL, 2010 – <i>Standards Specifications for Subsurface Investigations</i>		2010
SANRAL Drainage Manual	Sixth Edition	*
Specification for the Supply of Stone	S406	2006
Specification for Erosion and Scour Control	S411	*
Specification for Sub-surface Drainage and Get-textile Separation Layers	S412	*
Specification for Concrete Work	S420	1999
Specification for No-fines Concrete	S423	1986
Specification for Pre-Cast Drainage Channels	S432	*
South African Storm Rainfall, Department of Water Affairs and Forestry	TR102	*
Regional Maximum Flood Peaks in Southern Africa, Department of Water Affairs (replaced Report TR105)	TR137	*
Storm water Management Best Practice Guidelines	BPG 1	*
Railway Civil Engineering Handbook (Green Book)	Second Edition	1979
Specification for Rail Fastening System	BBF9273	2014
Specification for Level Crossing System	BBG1547	2014
Manual for Track Maintenance	BBB 0481	2012
Specification for Railway Track Work	E 10 1-14	August 1996
Fencing	S13	1986

Document Title	Document	Revision – Current revision
Specification for Steel Works	S309	1985
Ohte		
3kV DC electrification overhead equipment.	CEE-T-T6E-0004	
25Kv AC electrification Overhead Track Equipment	CEE.0041	1998
Earthing and Bonding Manual for 25kV & 50kA AC Electrification	CEE.0184	1987
Electrical Safety Instructions	ESI-2012	2012
25Kv & 50kA AC Electrification Maintenance Manual	CEE.0184	1987

Document Title	Document	Revision – Current revision
Single phase static UPS 3 to 10kVA	BBC5665	May 2007
3 phase static UPS 10to 125kVA	BBC5666	July 2013
Static Inverter	CSE-45D	Dec 1990
Automatic rectifier/ battery charger	CSE-45E	Apr 1988
Power supplies and distribution:requirements and installations	CSE-505/1	Dec 1987
Installation of earthing	CSE-1155-515	June 1996
General requirements for non-vital electronic hardware	CSE-1158-001	Mar 1995
Isolation transformers for signalling power applications	CSE-1163-009	Sept 1997
Stationary enclosed lead-acid cells	CSE-1163-013	Feb 2000
Signalling relay room power supply	CSE-1163-014	Oct 1994
Specification for Work on, over, under or adjacent to electrified lines	E7/1	July 1998
1:12 Set (Spoornet or VAE type): 48kg 1:12 Turnout on Concrete Sleepers with Pandrol Fastenings or Timber sleepers	E7131	Rev 0
1:12 Set (Spoornet or VAE type): 60kg 1:12 Turnout on Concrete Sleepers with Pandrol Fastenings or Timber sleepers		

Document Title	Document	Revision – Current revision
1:20 Set (Spoornet or VAE type): 60kg 1:20 Turnout on Concrete Sleepers with Pandrol Fastenings or Timber sleepers		
1:20 Set (Spoornet or VAE type): 48kg 1:9 Turnout on Concrete Sleepers with Pandrol Fastenings or Timber sleepers		
Specification for the Supply of Stone	S404	1998
Specification for Railway Earth the Scope	S410	2006
Specification for Track Welding	SSS	1997
Ballast Graduation Specification	TS 2-18	*
SIGNALLING		
SIGNALS:		
Required operational capability for LED signal lamps	BBH3104	July 2022
Engineering Instruction: Replacement of obsolete filament switching relays	BBH4880	Aug 2021
Engineering Instruction: Replacement of incandescent lamps with LED clusters	BBH4881	Aug 2021
Installation of signals	CSE-503B	Jan 1985
Power supplies and distribution: requirements and installation	CSE-505/1	Dec 1987
General requirements for non-vital electronic hardware	CSE-1158-001	Mar 1995
Signal number plate	CSE-1158-004	Oct 1995
Colour-light signal light unit	CSE-1174-005	Sept 1994
Route signal light unit	CSE-1174-006	Sep 1994
Signalling relay room power supply	CSE-1163-014	Oct 1994
POINTS:		
Trailable electric or electro-hydraulic points machine (latest standard)	BBB4628	Sep 2014
Installation of AC Points Machines	CSE-501/2	May 1985
Installation of DC Points Machines	CSE-501/6	Aug 1983
Manufacturing and ordering of points rodding	CSE-1133-051	Jan 1998
Rail mounted points lock	CSE-1162-013	Oct 1994
Crank handle box	CSE-1162-015	May 1995

Document Title	Document	Revision – Current revision
Points detections	CSE-Z-148-29F Sht 1-3	
TRACK CIRCUITS:		
Installation of track circuits	CSE-506/2	Jan 1985
Substation Bonding	CSE-1133-054	April 1996
AXLE COUNTERS:		
Numbering of Multi-Section Axle Counter Heads, Track Sections and FMs	BBB0321	Jul 1999
ROC for Axle Counter Systems	BBB1875	Aug 2022
Installation of axles counters	CSE-507/3	Jan 1985
Axle counter system	CSE-1174-010	Sept 1998
INTERLOCKING		
Preparation of drawings for TFR Infrastructure	BBB0041	Sep 2009
Required Operational Capability for TFR Signal Interlocking Systems	BBC0281	Sep 2022
PC Board High Integrity Emergency Functions (HIEF) Axle Counter Reset via CS90 Two Separate Operators (FRINGE)	BBD6287	Jun 2019
Installation of block control equipment	CSE-511/1	Jan 1985
Installation of relay and Spoorplan Interlocking systems	CSE1155-502	Oct 1994
Documentation for signals equipment	CSE-1159-001	March 1994
Isolation transformers for signalling power	CSE-1163-009	Sep 1997
Interlocking	CSE-1174-003	Sep 1994

Document Title	Document	Revision – Current revision
REMOTE CONTROL		
Centralised traffic control system, office based	CSE-1173-013	Sep 1994
Signalling Remote control system, office based	CSE-1173-014	Sep 1994
Train time recording system, VDU based	CSE-1173-025	Sep 1994
Automatic Train Routing System Office Based	CSE-1173-033	May 1997
Installation of the CS90 SYSTEM	CSE-11NA-090	Marc 1998
Guideline for CS90 installation documentation	CSE-W- 194	Feb 1998

Document Title	Document	Revision – Current revision
CABLING		
Stranded galvanised steel PVC insulated outdoor cable for track jumpering	BBH2131	Nov 2018
Trenching and outdoor cable installation	CSE-516/2	Feb 2016
The use of cables in signalling installations	CSE-1133-105	Mar 1997
PVC insulated metal protected outdoor cables	CSE-1164-001	Mar 1997
PVC insulated multi-core indoor cables	CSE-1164-002	Mar 1997
PVC insulated flame retardant indoor cables	CSE-1164-003	Mar 1997
PVC insulated single-core indoor cables	CSE-1164-005	Mar 1997
Stranded bare copper or PVC insulated outdoor or indoor cable for earth connections	CSE-1164-006	Mar 1997
PVC insulated un-armoured cable	CSE-1164-007	Nov 1994
YARD AUTOMATION		
Technical and Functional Specification for Yard Points Control System	BBC6525	Aug 2022
SIGNALING GENERAL		
Preparing of drawings for TFR infrastructure	BBB0041	Sep 2009
Non-Illuminated Train Control Diagram	BBB1454	May 2001
Dragging Equipment Detector (DEDs)	BBB1812	Aug 2020
Technology Implementation Plan for Traffic Control Systems as in 2003	BBB2952	Mar 2003
Technology Implementation Plan for Rail Bound Telecommunication Systems as in 2004	BBB3213	
Earthing and lighting protection of measuring systems	BBB3235	Sep 2002
Procedure for testing, commissioning and handing over	BBB3609	Mar 2003
Documentation for All Disciplines Relating the Design, Supply, Installation, Commissioning and Maintenance of Rail Infrastructure	BBB4237	Aug 2016
Train Working Rules	BBB9100-BBB9115	
Earthing and lighting protection of signalling	BBC1040	Aug 2006
Low-Voltage Power Supply Devices DC 12V Output, for Use in Railway Signalling Applications	BBF3705	May 2012

Document Title	Document	Revision – Current revision
Low-Voltage Power Supply Devices DC 24V Output, for Use in Railway Signalling Applications	BBF3857	May 2012
Low-Voltage Power Supply Devices, DC 48V Output, for Use in Railway Signalling Applications	BBF3858	May 2012
Low-Voltage Power Supply Devices, AC input, AC to DC Converter with 60V Output, for Use in Railway Signalling Applications	BBF3861	Jun 2012
Low-Voltage Power Supply Devices, AC to DC Converter with 110V Output, for Use in Railway Signalling Applications	BBF3862	Jun 2012
Signalling Equipment Shelter	BBH1869	Aug 2021
Guidelines: Earthing on signalling systems	BBH3950	Sep 2021
Drawings, Catalogues, Instruction manuals and Spares lists for Electrical Equipment Supplied Under Contract.	CEE-0224	Jan 2002
Palisade fencing	CEE-TDF-16	
Outdoor signaling work	CSE-504/7	Jan 1985
Manufacturing of concrete components	CSE-514/5	Jan 1985
Immunisation in an electrified area	CSE-517/2	Jan 1985
Installation of earthing	CSE-518-1	Jun 1983
Treatment and coating of signal equipment in corrosive and non-corrosive areas	CSE-1133-052	May 1996
Compilation of Rules for Guidance of Technical Staff	CSE-1133-100 Cat.E98	April 1996
Replacing Effen fuses with trip switches	CSE-1133-103	Jan 1999
Serial Numbers on PC Boards	CSE-1133-108	March 1996
Physical Characteristic of the Railway Environment in South Africa	CSE-1154-001	March 2020
Testing of signaling installations	CSE-1155-500	Sep 1994
Documentation for signals equipment	CSE-1159-001	Marc 1994
Electric siren	CSE-1163-017	Sept 1994
Shunt and siding keys	CSE-1174-004	Sept 1994
Lightning Protection	CSE-Z-148-46f Sht 1-10	*
Signalling Standards	CSE-Z-148 series	

Document Title	Document	Revision – Current revision
Typical Crossing Places with Power Signalling	CSE-Z-665	
Standard Signalling and Points Numbering System	CSE-Z-55S	
Configuration Management		
Document Registration Request	BBB0005	
Enterprise Change Proposal	BBB0006	
Configuration Management Document Request Form	BBB0322	
Enterprise Change Process	BBB0416	Aug 2018
Authorization of Changes to Technology and Installation	BBC5696	July 2011
Documentation Management Process	BBD6430	
CS90 Configuration Management	BBD7717	April 2010
Internal Control and Distribution of Technical Documentation requested by the External Organisations	BBF2520	Dec 2011
Occupational Health, Safety and Environment		
Mine Health and Safety Act (Act 29 of 1996)		1996
Occupational Health and Safety Act (Act 85 of 1993) & Construction Regulations		1993
Explosive Act (Act 26 of 1956)		1956
Mineral Act (Act 50 of 1991)		1991
National Environmental Management Act 107		1998
National Water Act 36		1998
E7/1 - SPECIFICATION FOR GENERAL AND WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR HIGH VOLTAGE EQUIPMENT	BBD8210	May 2011
Quality Management System		
Quality Management System requirements	ISO 9001:2015	2015

8 Scope exclusions

The Port of PE (Gqeberha) Terminal upgrade work is excluded from this scope, only rail infrastructure upgrade to be considered for this project.

9 Project Key Deliverables

The project deliverables will be evaluated and measured as per Appendix H for Construction and the baseline project master schedule.

The project key deliverables include but not limited to:

- Design reports
- Basic engineering designs
- Detailed engineering designs
- Procurement
- Construction
- Testing and Commissioning certificates
- As-built drawings

Environmental key deliverables but not limited to:

- Environmental Baseline Report
- Environmental Legal and Risk Register
- Environmental and Social Governance Report
- Sustainable Design Report
- Review and update the Project Execution Plan and Project Design Criteria
- All documents/reports that form part of Project Permits and Licenses Applications
- Environmental Authorisations, permits and licenses
- Environmental Monitoring Plan (construction phase)
- Environmental Audits

Health and Safety Deliverables but not limited to:

- Preliminary Risk Analysis
- HAZOP study
- Risk Assessment
- Pre-start up safety review
- Construction safety plan

In fulfilling the project objectives, timelines and scope the *Contractor* is required to ensure availability of competent and skilled personnel prior to commencing with any work.

10 Interfaces / Interdependences

For the Engineering, Procurement, Construction, Commission and Close-out for the proposed project stages:

1. Surveys.
2. Condition assessments by multiple disciplines involved in the project.
3. RSR and Department of Labour approval for Construction permit(s)
4. Geotechnical Investigations
5. Detailed design report with recommendations for client approvals.
6. Designs to be developed to 100% engineering and design (Approved For Construction).
7. Designer inspections and Quality inspections.
8. Materials procurement, equipment procurement, specialist turnkey solutions /services, procurement of plant, machinery and skilled labour.
9. Provide inputs to obtain approval of Compensation Events
10. Environmental approval (where applicable)
11. Site Access Certificates and safety briefings
12. Interaction with Transnet Corporate Safety Office for:
 - Arranging Occupations.
 - Temporary works linked to installation of points sets.
13. Interfaces between TFR Engineering and the *Contractor*.
14. Local Municipalities
15. Construction
16. RSR approval for Commissioning.
17. Testing and Commissioning.
18. Handover, correction of defects, signed as-built drawings, manuals and other as-built documentation.

There is work done by Others which may affect the *Works*, and where needed the *Contractor* co-operates and ensures alignment with those parties in Providing the *Works*, including but not limited to:

1. Interfacing to installations operated and/or maintained by PRASA
2. Interfacing with TFR - Rail Network Construction (RNC) and external contractors works on the same Site which may or may not be related to the *Works*
3. Engaging the Technology Management, Rail Network, maintenance, operating, health/safety/environmental and other relevant departments of TFR

11 LIST OF APPENDICES

This is the list of appendices issued by the *Employer* before the Contract Date and which apply to this contract.

Note: Some Appendices may contain both Scope of Work and Site Information.

APPENDIX-A	Pre-Feasibility Report
APPENDIX-B	Rail Drawings
APPENDIX-C	Waltloo Operational Plan
APPENDIX-D	Port Yard Operational Plan
APPENDIX-E	Kaalfontein Operational Plan
APPENDIX-F	Rail Operation Plan
APPENDIX-G	Rail Yard and Port Simulation Report
APPENDIX-H	Procurement, Construction, Testing and Commissioning Deliverables.
APPENDIX-I	Pre-Feasibility Study Environmental Report
APPENDIX-J	Ukuvuselela Geotechnical desktop study
APPENDIX-K	TFR Lists of approved TFR railway suppliers
APPENDIX-L	TFR (EDS) Specifications for Ukuvuselela Automotive Project
APPENDIX-M	TFR (EDS) drawings for Ukuvuselela Automotive Project

Part C4: Site Information

Part C 4.1: Site Information

1. Description of the Site and its surroundings

1.1 General description

- a. Transnet Freight Rail is implementing Project Ukuvuselela and the objective of the project is to deliver the Automotive volumes of Fully Built-up Units which include Ford Motor Company Southern Africa (FMCSA) volume forecast demands for future Fully Built-up Units (FBUs) and to deliver the required rail infrastructure and equipment capacity via the SouthCor from Waltloo and Kaalfontein in Gauteng to the Port of Port Elizabeth (PoPE) in Gqeberha by 2026.
- b. The project seeks to increase rail traffic for automotive logistic along the SouthCor route as a direct result of the production expansion plans of FMCSA. FMCSA is in the process of increasing their exports from 58 150 FBU's in 2021/22 to 136 290 FBU's in 2023/24, then to a total of 151 141 FBU's by 2025/26. This is a near three-fold increase from the current volumes for Ford. This will increase from 1 train a day to 3 daily trains with 50 wagons per day by 2026.

2. Location of the Site and access

The location of this project spans 4 Provinces: Gauteng, Free State, Northern Cape and the Eastern Cape. The Sites of the proposed works is broken down as per the following locations:

- Waltloo Yard (Gauteng)
- Kaalfontein Yard (Gauteng)
- Main line loop extensions.
 - Bloemfontein to Noupoot
 - Noupoot to Port of Port Elizabeth (Gqeberha)
- Port of Port Elizabeth Yard and Siding (Gqeberha)

2.1 Waltloo Rail Yard



Figure 4. Satellite View of Waltloo Rail Yard (Source: WSP Prefeasibility Report)

2.2 Kaalfontein Rail Yard



Figure 5. Satellite View of Kaalfontein Yard (Source: WSP Prefeasibility Report)

3. Mainline Loop Extensions - Bloemfontein to Port of PE (Gqeberha)

This Project extends over the automotive logistic supply chain for FMCSA and extends from the FMCSA rail siding in Silverton, into the Waltloo rail yard where trains are made up and moved into the Gauteng Freight Ring to Vereeniging where it enters the Cape Corridor as shown in the **Figure 6** below.

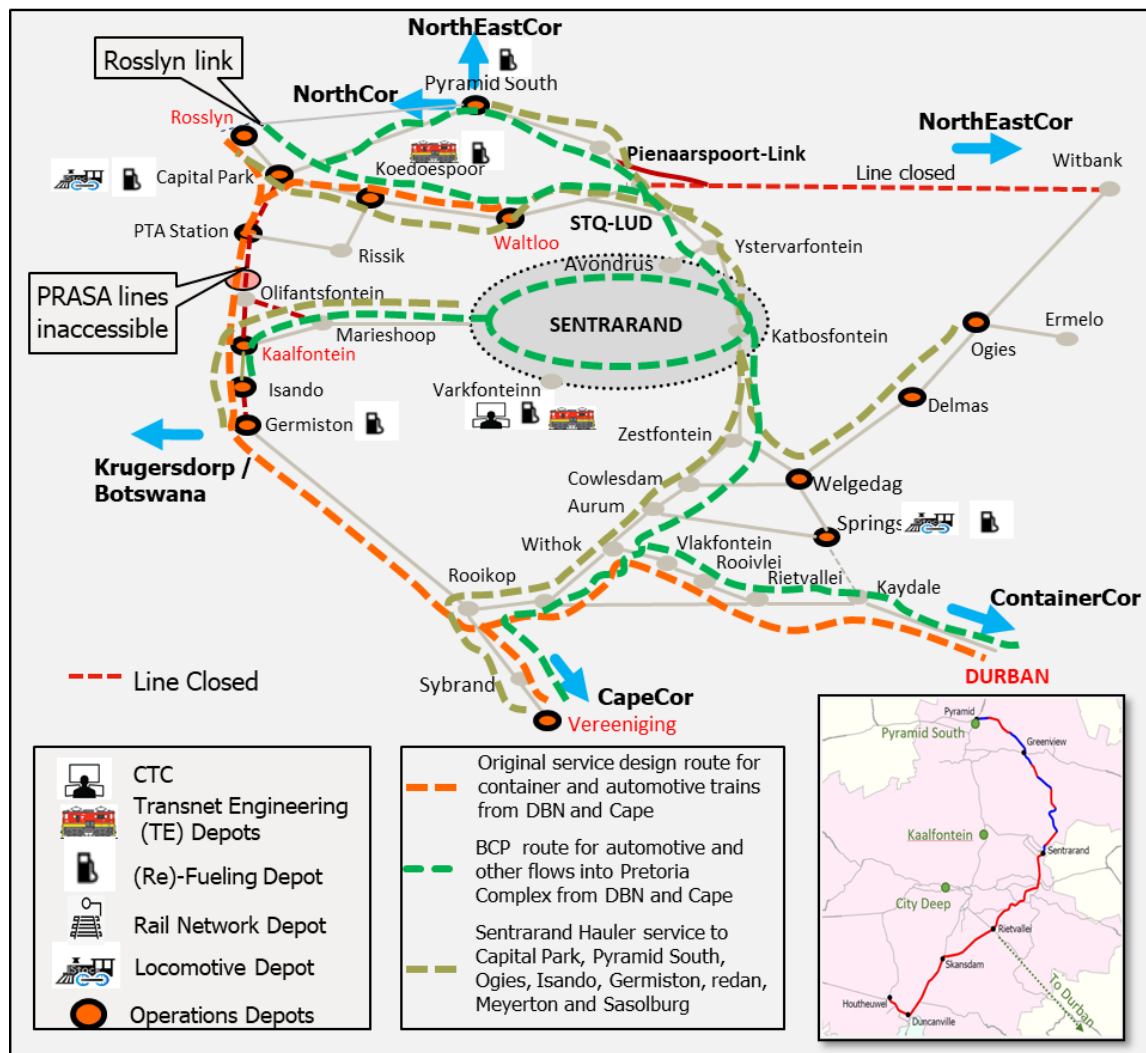


Figure 6. Gauteng Freight Ring from Waltloo Rail Yard to Vereeniging (Source: Transnet)

The Cape Corridor commences at Vereeniging and the rail route extends towards Bloemfontein until Noupoot. At Noupoot the rail line from Kimberley via De Aar connects into the Cape Corridor and then extends to the Port of Port Elizabeth and Port of Ngqura as indicated in **Figure 4** below.

The Cape Corridor Rail Network highlighting the SouthCor portion of the network that forms part of the scope of the project is shown in **Figure 7** below.

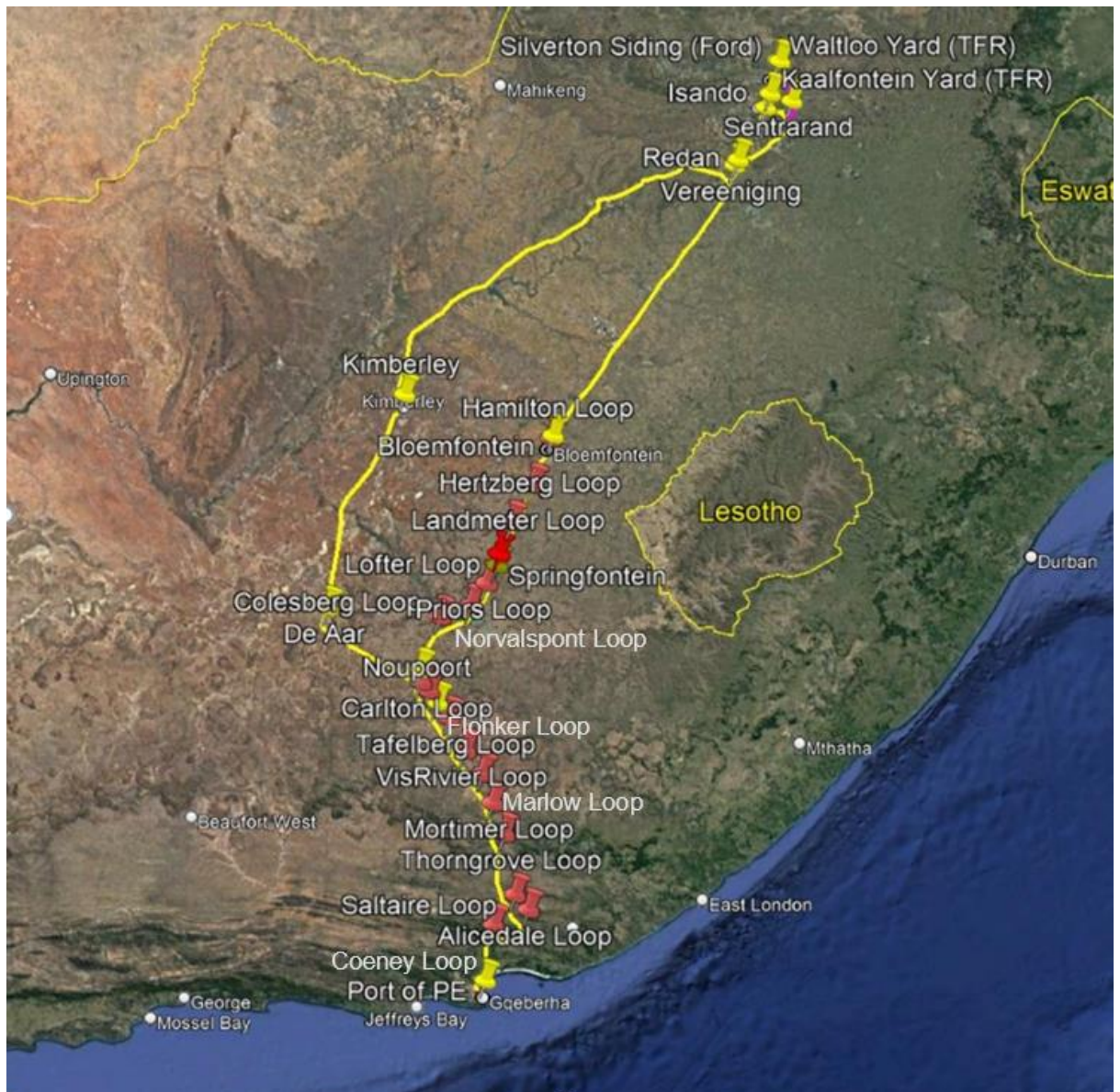


Figure 7. Location of Loop Extensions (Source: Google Earth)

4. The Port of Port Elizabeth

The Port of Port Elizabeth is a geographically well-positioned, customer-centric, multi-cargo port that prides itself on flexibility and service excellence. It is the gateway for expanding markets and is not only linked with the rest of the world, but it also has direct transport links into the heart of the African continent. Situated in Algoa Bay, on the south-eastern coast of Africa. The port has a container terminal, one of only five (Durban, East London, Ngqura, Port Elizabeth and Cape Town) in South Africa.

Being a congestion free port allows it to maintain high cargo handling rates, fast and efficient ship turnaround and unparalleled service levels. The port is equipped to handle dry bulk, bulk liquid, general cargo, automobiles and container cargo. Passenger ships usually make use of one of the fruit terminal berths when calling at Port Elizabeth.

The port's container terminal has three berths totalling 925m in length and a storage area of 22 hectares with 5400 ground slots for stacking purposes. The container terminal is equipped with the latest generation gantry container cranes and straddle carriers. The existing automotive terminal is located on the Charl Malan Quay adjacent to the Container terminal. Automotive handling occurs at Berth 100/101 and the terminal has progressively expanded into the container footprint as the demand for FBU's ramps up.

The break-bulk terminal has six berths totalling 1170m, two bulk berths totalling 360m and a tanker berth of 242m. The tug, fishery and trawler jetties measure 120m, 165m and 136m respectively.

The motor industry has long been an important industrial activity for the Eastern Cape and the port plays a leading role in this regard and boasts a large open area car terminal.

The location of Port of Port of Elizabeth is Latitude 34 ° 01' S (3357, 5 S), Longitude 25 ° 42'E (2538, 5 E).

The Southcor rail network extends from Waltloo through and via Leeuhof, Bloemfontein, Springfontein, Noupoort to the Port of Port Elizabeth. The loops that require extensions are shown below in **Table1**.

Table 5 List of loops to be extended

LOOP STATION NAME	CURRENT LOOP LENGTH (M)	PROPOSED LOOP EXTENSION (M)	PROPOSED TOTAL LOOP LENGTH (M)	DIRECTION OF EXTENSION
Hamilton		1000	1000	Extend towards Riflerange
Hertzberg	2837	3900	6737	Extend towards Edenburg
Landmeter	691	1000	1691	Extend towards Merinorand
Lofter	742	510	1252	Extend towards Waterplas
Priors	645	645	1290	Extend towards Besembos
Norvalspont	956	400	1356	Extend towards Agtertang
Colesberg	776	500	1276	Extend towards Haredale
Carlton	579	700	1279	Extend both sides
Flonker	645	825	1470	Extend towards Evendowns
Tafelberg	658	600	1258	Extend towards Conway
Visrivier	766	500	1266	Extend towards Genoegsaam
Marlow	603	650	1253	Extend towards Cradock
Mortimer	770	500	1270	Extend towards Scanlen

LOOP STATION NAME	CURRENT LOOP LENGTH (M)	PROPOSED LOOP EXTENSION (M)	PROPOSED TOTAL LOOP LENGTH (M)	DIRECTION OF EXTENSION
Thorngrove	1157	100	1257	Extend towards Cookhouse
Saltaire	936	320	1256	Extend towards Kommadagga
Alicedale	1195	100	1295	Extend towards Blinkhoff
Coerney	592	660	1252	Extend towards Addo
Total Automotive Loop Extensions (m)		12910		