

TRANSNET



freight rail

A Division of Transnet SOC Limited Registration number 1990/00900/30

RFQ: KBY/52909
PEDB: KBC/13939

**ROUTINE TESTING AND OIL SAMPLING OF SEVEN 25KV
AC SUBSTATIONS BETWEEN BEACONSFIELD AND DE AAR**

Senior Buyer
Supply Chain Services
TRANSNET FREIGHT RAIL
Austen Street
KIMBERLEY
8301



TRANSNET FREIGHT RAIL, a division of

TRANSNET SOC LTD

Registration Number 1990/000900/30

[Hereinafter referred to as **Transnet**]

REQUEST FOR QUOTATION [RFQ] No 52909

**FOR THE ROUTINE TESTING AND SAMPLING OF OIL AT SEVEN TRACTION
SUBSTATIONS BETWEEN BEACONSFIELD AND DE AAR**

FOR DELIVERY TO: RAIL NETWORK

ISSUE DATE: 25 APRIL 2014

CLOSING DATE: 27 MAY 2014

CLOSING TIME: 10:00

SITE MEETING: 14 MAY 2014 AT 11:00

Section 1
NOTICE TO BIDDERS

Quotations which must be completed as indicated in Section 2 of this RFQ are to be submitted as follows:

METHOD: Hand delivery/courier
CLOSING VENUE: The Tender box, room 1, Supply Chain Services Office, Real Estate Management Building, Austen Street, Beaconsfield, Kimberley, 8315

1 Responses to RFQ

Responses to this RFQ [**Quotations**] must not include documents or reference relating to any other quotation or proposal. Any additional conditions must be embodied in an accompanying letter.

2 Broad-Based Black Economic Empowerment [B-BBEE]

Transnet fully endorses and supports the Government's Broad-Based Black Economic Empowerment Programme and it would therefore prefer to do business with local business enterprises who share these same values. Transnet will accordingly allow a "preference" to companies who provide a valid B-BBEE Verification Certificate. All procurement transactions will be evaluated accordingly.

2.1 B-BBEE Scorecard and Rating

As prescribed in terms of the Preferential Procurement Policy Framework Act (PPPFA), Act 5 of 2000 and its Regulations, Respondents are to note that the following preference point system is applicable to all bids:

- the 80/20 system for requirements with a Rand value less than R1 000 000 (all applicable taxes included).
- Bidders are to note that if the 80/20 preference point system is stipulated in this RFP and if all Bids received exceed R1 000 000.00, the RFP must be cancelled.

The value of this bid is estimated to be below R 1 000 000.00 (all applicable taxes included) and therefore the **80/20** system shall be applicable.

When Transnet invites prospective suppliers to submit Proposals for its various expenditure programmes, it requires Respondents to have their B-BBEE status verified in compliance with the Codes of Good Practice issued in terms of the Broad Based Black Economic Empowerment Act No. 53 of 2003.

The Department of Trade and Industry recently revised the Codes of Good Practice on 11 October 2013 [Government Gazette No. 36928]. The Revised Codes will replace the Black Economic Empowerment Codes of Good Practice issued on 9 February 2007. The Revised Codes provide for a one year transitional period starting 11 October 2013. During the transitional period, companies may elect to be measured in terms of the Revised Codes or the 2007 version of the Codes. After the first year of the implementation of the Revised Codes, B-BBEE compliance will be measured in terms of the Revised Codes without any discretion. Companies which are governed by Sector-specific Codes will be measured in terms of those Sector Codes.

As such, Transnet will accept B-BBEE certificates issued based on the Revised Codes. Transnet will also continue to accept B-BBEE certificates issued in terms of the 2007 version of the Codes provided it was issued before 10 October 2014. Thereafter, Transnet will only accept B-BBEE certificates issued based on the Revised Codes.

Respondents are required to complete Annexure A [the B-BBEE Preference Point Claim Form] and submit it together with proof of their B-BBEE Status as stipulated in the Claim Form in order to obtain preference points for their B-BBEE status.

Note: Failure to submit a valid and original B-BBEE certificate or a certified copy thereof at the Closing Date of this RFQ will result in a score of zero being allocated for B-BBEE.

[Refer clause 19 below for Returnable Documents required]

3 Communication

- a) Respondents are warned that a response will be liable for disqualification should any attempt be made by a Respondent either directly or indirectly to canvass any officer(s) or employee of Transnet in respect of this RFQ between the closing date and the date of the award of the business.
- b) A Respondent may, however, before the closing date and time, direct any written enquiries relating to the RFQ to the following Transnet employee:
Name: Mr Uri Deale 053 838 3380 Email: uri.deale@transnet.net
- c) Respondents may also, at any time after the closing date of the RFQ, communicate with Christopher Williams on any matter relating to its RFQ response:
Telephone 053 8383477 Email Christopher.williams@transnet.net

4 Tax Clearance

The Respondent's original and valid Tax Clearance Certificate must accompany the Quotation. Note that no business shall be awarded to any Respondent whose tax matters have not been declared by SARS to be in order.

5 VAT Registration

The valid VAT registration number must be stated here: _____ *[if applicable].*

6 Legal Compliance

The successful Respondent shall be in full and complete compliance with any and all applicable national and local laws and regulations.

7 Changes to Quotations

Changes by the Respondent to its submission will not be considered after the closing date and time.

8 Pricing

All prices must be quoted in South African Rand on a fixed price basis, excluding VAT.

9 Prices Subject to Confirmation

Prices quoted which are subject to confirmation will not be considered.

10 Negotiations

Transnet reserves the right to undertake post-tender negotiations with selected Respondents or any number of short-listed Respondents.

11 Binding Offer

Any Quotation furnished pursuant to this Request shall be deemed to be an offer. Any exceptions to this statement must be clearly and specifically indicated.

12 Disclaimers

Transnet is not committed to any course of action as a result of its issuance of this RFQ and/or its receipt of a Quotation in response to it. Please note that Transnet reserves the right to:

- modify the RFQ's goods / service(s) and request Respondents to re-bid on any changes;
- reject any Quotation which does not conform to instructions and specifications which are detailed herein;
- disqualify Quotations submitted after the stated submission deadline;
- not necessarily accept the lowest priced Quotation;
- reject all Quotations, if it so decides;
- place an order in connection with this Quotation at any time after the RFQ's closing date;
- award only a portion of the proposed goods / service/s which are reflected in the scope of this RFQ;
- split the award of the order/s between more than one Supplier/Service Provider; or
- make no award at all.

Transnet reserves the right to award business to the highest scoring bidder/s unless objective criteria justify the award to another bidder.

13 Transnet's supplier integrity pact

Transnet's Integrity Pact requires a commitment from suppliers and Transnet that they will not engage in any corrupt and fraudulent practices, anti-competitive practices; and act in bad faith towards each other. The Integrity Pact also serves to communicate Transnet's Gift Policy as well as the remedies available to Transnet where a Respondent contravenes any provision of the Integrity Pact.

Respondents are required to familiarise themselves with the contents of the Integrity Pact which is available on the Transnet Internet site [www.transnet.net/Tenders/Pages/default.aspx] or on request. Furthermore, Respondents are required to certify that they have acquainted themselves with all the documentation comprising the Transnet Integrity Pact and that they fully comply with all the terms and conditions stipulated in the Transnet Supplier Integrity Pact as follows:

YES	
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NO	
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Should a Respondent need to declare previous transgressions or a serious breach of law in the preceding 5 years as required by Annexure A to the Integrity Pact, such declaration must accompany the Respondent's bid submission.

14 Evaluation Criteria

Transnet will utilise the following criteria [not necessarily in this order] in choosing a Supplier/Service Provider, if so required:

Criterion/Criteria	Explanation
Administrative responsiveness	Completeness of response and returnable documents
Substantive responsiveness	Prequalification criteria, if any, must be met and whether the Bid materially complies with the scope and/or specification given. <ul style="list-style-type: none"> Indicate any technical prequalification criteria
Final weighted evaluation based on 80/20 preference point system as indicated in paragraph Error! Reference source not found.	<ul style="list-style-type: none"> Pricing and price basis [firm] - whilst not the sole factor for consideration, competitive pricing and overall level of unconditional discounts¹ will be critical B-BBEE status of company - Preference points will be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table indicated in Annexure A.

15 Validity Period

Transnet desires a validity period of 30 [thirty] days from the closing date of this RFQ. This RFQ is valid until _____.

16 Banking Details

BANK: _____
 BRANCH NAME / CODE: _____
 ACCOUNT HOLDER: _____
 ACCOUNT NUMBER: _____

¹ Only unconditional discounts will be taken into account during evaluation. A discount which has been offered conditionally will, despite not being taken into account for evaluation purposes, be implemented when payment is effected.

17 Company Registration

Registration number of company / C.C. _____

Registered name of company / C.C. _____

18 Disclosure of Prices Quoted

Respondents must indicate here whether Transnet may disclose their quoted prices and conditions to other Respondents:

YES NO

19 Returnable Documents

Returnable Documents means all the documents, Sections and Annexures, as listed in the tables below.

a) Respondents are required to submit with their Quotations the **Returnable Documents**, as detailed below.

Failure to provide all these Returnable Documents at the Closing Date and time of this RFQ may result in a Respondent's disqualification. Respondents are therefore urged to ensure that all these Documents are returned with their Quotations.

All Sections, as indicated in the footer of each page, must be signed, stamped and dated by the Respondent. Please confirm submission of these Returnable Documents by so indicating [Yes or No] in the table below:

Returnable Documents	Submitted [Yes or No]
SECTION 1 : Notice to Bidders	
<ul style="list-style-type: none"> - Valid and original B-BBEE Verification Certificate or certified copy thereof [Large Enterprises and QSEs] Note: failure to provide a valid B-BBEE Verification Certificate at the closing date and time of the RFQ will result in an automatic score of zero for preference 	
<ul style="list-style-type: none"> - Valid and original B-BBEE certificate/sworn affidavit or certified copy thereof from auditor, accounting officer or SANAS accredited Verification Agency [EMEs] Note: failure to provide a valid B-BBEE Verification Certificate at the closing date and time of the RFQ will result in an automatic score of zero being allocated for preference 	
<ul style="list-style-type: none"> - In the case of Joint Ventures, a copy of the Joint Venture Agreement or written confirmation of the intention to enter into a Joint Venture Agreement 	
<ul style="list-style-type: none"> - Original valid Tax Clearance Certificate [Consortia / Joint Ventures must submit a separate Tax Clearance Certificate for each party] 	
SECTION 2 : Quotation Form	
SECTION 3: Vendor Application Form	
<ul style="list-style-type: none"> • Original cancelled cheque or bank verification of banking details 	
<ul style="list-style-type: none"> • Certified copies of IDs of shareholder/directors/members [as applicable] 	

Returnable Documents	Submitted [Yes or No]
<ul style="list-style-type: none"> • Certified copies of the relevant company registration documents from Companies and Intellectual Property Commission (CIPC) 	
<ul style="list-style-type: none"> • Certified copies of the company's shareholding/director's portfolio 	
<ul style="list-style-type: none"> • Certified copy of valid Company Registration Certificate [if applicable] 	
ANNEXURE A – B-BBEE Preference Points Claim Form	

b) In addition to the requirements of paragraph a) above, Respondents are further requested to submit with their Proposals the following **additional documents** as detailed below.

Please confirm submission of these additional documents by so indicating [Yes or No] in the table below:

Additional Documents	SUBMITTED [Yes or No]
Valid Letter of Good standing from the Compensation Commissioner at the Department of Labour	

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Section 2
QUOTATION FORM

I/We _____
hereby offer to supply the goods/services at the prices quoted in the Price Schedule below, in accordance with the conditions related thereto.

I/We agree to be bound by those terms and conditions in:

- the Standard Terms and Conditions for the Supply of Goods or Services to Transnet [available on request]; and
- any other standard or special conditions mentioned and/or embodied in this Request for Quotation.

I/We accept that unless Transnet should otherwise decide and so inform me/us, this Quotation [and, if any, its covering letter and any subsequent exchange of correspondence], together with Transnet's acceptance thereof shall constitute a binding contract between Transnet and me/us.

I/We further agree that if, after I/we have been notified of the acceptance of my/our Quotation, I/we fail to deliver the said goods/service/s within the delivery lead-time quoted, Transnet may, without prejudice to any other legal remedy which it may have, cancel the order and recover from me/us any expenses incurred by Transnet in calling for Quotations afresh and/or having to accept any less favourable offer.

Price Schedule

I/We quote as follows for the goods required, on a "delivered nominated destination" basis, excluding VAT

1

Delivery Lead-Time from date of purchase order : _____ **[days/weeks]**

Notes to Pricing:

- a) All Prices must be quoted in South African Rand, exclusive of VAT
- b) To facilitate like-for-like comparison bidders must submit pricing strictly in accordance with this price schedule and not utilise a different format. Deviation from this pricing schedule could result in a bid being disqualified.
- c) Please note that should you have offered a discounted price(s), Transnet will only consider such price discount(s) in the final evaluation stage if offered on an unconditional basis.

Section 3
VENDOR APPLICATION FORM

Respondents are to furnish the following documentation and complete the Vendor Application Form below:

1. **Original** 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 copies** of the relevant company registration documents from Companies and Intellectual Property Commission (CIPC)
4. **Certified copies** of the company's shareholding/director's portfolio
5. A letter on the company's letterhead confirm physical and postal addresses
6. **Original** valid SARS Tax Clearance Certificate
7. **Certified copy** of VAT Registration Certificate
8. **A valid and original** B-BBEE Verification Certificate / sworn affidavit **or certified copy** thereof meeting the requirements for B-BBEE compliance as per the B-BBEE Codes of Good Practice
9. **Certified copy** of valid Company Registration Certificate [if applicable]

Schedule of Quantities / Project Specification / Price List for Testing of 25kV AC Substations

<i>Item</i>	<i>Substation Name</i>	<i>km from:- Beaconsfield</i>	<i>Work description / ITEM</i>	<i>QTY</i>	<i>TOTAL COST</i>
1	SPYTFONTEIN	11.646	TESTING PER SUBSTATION AS PER ATTACHED TEST SHEET (WHERE APPLICABLE)	1	
			OIL SAMPLING AS PER ATTACHED SHEET	1	
			P & G's (INCLUDING ACCOMODATION AND TRAVEL)	1	
				COST (EX VAT)	
				VAT	
				TOTAL COST (INC. VAT)	
2	KLOK FONTEIN	46.987	TESTING PER SUBSTATION AS PER ATTACHED TEST SHEET (WHERE APPLICABLE)	1	
			OIL SAMPLING AS PER ATTACHED SHEET	1	
			P & G's (INCLUDING ACCOMODATION AND TRAVEL)	1	
				COST (EX VAT)	
				VAT	
				TOTAL COST (INC. VAT)	

Per 08/13/939
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Schedule of Quantities / Project Specification / Price List for Testing of 25kV AC Substations

<i>Item</i>	<i>Substation Name</i>	<i>km from:- Beaconsfield</i>	<i>Work description / ITEM</i>	<i>QTY</i>	<i>TOTAL COST</i>
3	GRASPAN	75.447	TESTING PER SUBSTATION AS PER ATTACHED TEST SHEET (WHERE APPLICABLE)	1	
			OIL SAMPLING AS PER ATTACHED SHEET	1	
			P & G's (INCLUDING ACCOMODATION AND TRAVEL)	1	
				COST (EX VAT)	
				VAT	
				TOTAL COST (INC. VAT)	
4	WIGTON	108.009	TESTING PER SUBSTATION AS PER ATTACHED TEST SHEET (WHERE APPLICABLE)	1	
			OIL SAMPLING AS PER ATTACHED SHEET	1	
			P & G's (INCLUDING ACCOMODATION AND TRAVEL)	1	
				COST (EX VAT)	
				VAT	
				TOTAL COST (INC. VAT)	

Ref B939

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Schedule of Quantities / Project Specification / Price List for Testing of 25kV AC Substations

<i>Item</i>	<i>Substation Name</i>	<i>km from:- Beaconsfield</i>	<i>Work description / ITEM</i>	<i>QTY</i>	<i>TOTAL COST</i>
5	KAREEBOSHPAN	140.008	TESTING PER SUBSTATION AS PER ATTACHED TEST SHEET (WHERE APPLICABLE)	1	
			OIL SAMPLING AS PER ATTACHED SHEET	1	
			P & G's (INCLUDING ACCOMODATION AND TRAVEL)	1	
				COST (EX VAT)	
				VAT	
				TOTAL COST (INC. VAT)	
6	KALKBULT	174.008	TESTING PER SUBSTATION AS PER ATTACHED TEST SHEET (WHERE APPLICABLE)	1	
			OIL SAMPLING AS PER ATTACHED SHEET	1	
			P & G's (INCLUDING ACCOMODATION AND TRAVEL)	1	
				COST (EX VAT)	
				VAT	
				TOTAL COST (INC. VAT)	

Revised 15/9/39
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Schedule of Quantities / Project Specification / Price List for Testing of 25kV AC Substations

<i>Item</i>	<i>Substation Name</i>	<i>km from:- Beaconsfield</i>	<i>Work description / ITEM</i>	<i>QTY</i>	<i>TOTAL COST</i>
7	BERHSHOEK	207.508	TESTING PER SUBSTATION AS PER ATTACHED TEST SHEET (WHERE APPLICABLE)	1	
			OIL SAMPLING AS PER ATTACHED SHEET	1	
			P & G's (INCLUDING ACCOMODATION AND TRAVEL)	1	
				COST (EX VAT)	
				VAT	
				TOTAL COST (INC. VAT)	

Total Cost of SUBSTATION TESTS 1, 2,3,4,5 6 & 7	
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Supplier Declaration Form

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.			

**RFQ FOR ROUTINE TESTING AND OIL SAMPLING OF SEVEN TRACTION SUBSTATIONS BETWEEN
BEACONSFIELD AND DE AAR**

ANNEXURE A : B-BBEE PREFERENCE POINTS CLAIM FORM

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

1. INTRODUCTION

- 1.1 A total of 20 preference points shall be awarded for B-BBEE Status Level of Contribution.
- 1.2 Failure on the part of a Bidder to fill in and/or to sign this form and submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System [SANAS] or a Registered Auditor approved by the Independent Regulatory Board of Auditors [IRBA] or an Accounting Officer as contemplated in the Close Corporation Act [CCA] together with the bid will be interpreted to mean that preference points for B-BBEE Status Level of Contribution are not claimed.
- 1.3 Transnet reserves the right to require of a Bidder, either before a Bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by Transnet.

2. GENERAL DEFINITIONS

- 2.1 "**all applicable taxes**" include value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies;
- 2.2 "**B-BBEE**" means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;
- 2.3 "**B-BBEE status 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;
- 2.4 "**Bid**" means a written offer in a prescribed or stipulated form in response to an invitation by Transnet for the provision of goods, works or services;
- 2.5 "**Broad-Based Black Economic Empowerment Act**" means the Broad-Based Black Economic Empowerment Act, 2003 [Act No. 53 of 2003];
- 2.6 "**comparative price**" means the price after the factors of a non-firm price and all unconditional discounts that can be utilised have been taken into consideration;
- 2.7 "**consortium or joint venture**" means an association of persons for the purpose of combining their expertise, property, capital, efforts, skills and knowledge in an activity for the execution of a contract;
- 2.8 "**contract**" means the agreement that results from the acceptance of a bid by Transnet;
- 2.9 "**EME**" means any enterprise with an annual total revenue of R5 [five] million or less as per the

2007 version of the B-BBEE Codes of Good Practice and means any enterprise with an annual total revenue of R10 [ten] million or less as per the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928;

- 2.10 **"firm price"** means the price that is only subject to adjustments in accordance with the actual increase or decrease resulting from the change, imposition, or abolition of customs and excise duty and any other duty, levy, or tax, which, in terms of the law or regulation, is binding on the contractor and demonstrably has an influence on the price of any supplies, or the rendering costs of any service, for the execution of the contract;
- 2.11 **"functionality"** means the measurement according to predetermined norms, as set out in the bid documents, of a service or commodity that is designed to be practical and useful, working or operating, taking into account, among other factors, the quality, reliability, viability and durability of a service and the technical capacity and ability of a bidder;
- 2.12 **"non-firm prices"** means all prices other than "firm" prices;
- 2.13 **"person"** includes reference to a juristic person;
- 2.14 **"QSE"** means any enterprise with an annual total revenue between R5 [five] million and R35 [thirty five] million as per the 2007 version of the B-BBEE Codes of Good Practice and means any enterprise with an annual total revenue of between R10 [ten] million and R50 [fifty] million as per the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928
- 2.15 **"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;
- 2.16 **"subcontract"** means the primary contractor's assigning or leasing or making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract;
- 2.17 **"total revenue"** bears the same meaning assigned to this expression in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Empowerment Act and promulgated in the Government Gazette on 9 February 2007;
- 2.18 **"trust"** means the arrangement through which the property of one person is made over or bequeathed to a trustee to administer such property for the benefit of another person; and
- 2.19 **"trustee"** means any person, including the founder of a trust, to whom property is bequeathed in order for such property to be administered for the benefit of another person.

3. ADJUDICATION USING A POINT SYSTEM

- 3.1 The Bidder obtaining the highest number of total points for the evaluation criteria as enumerated in Section 2 of the RFP will be awarded the contract, unless objective criteria justifies the award to another bidder.
- 3.2 Preference points shall be calculated after prices have been brought to a comparative basis taking into account all factors of non-firm prices and all unconditional discounts.
- 3.3 Points scored will be rounded off to 2 [two] decimal places.
- 3.4 In the event of equal points scored, the Bid will be awarded to the Bidder scoring the highest

number of preference points for B-BBEE.

- 3.5 However, when functionality is part of the evaluation process and two or more Bids have scored equal points including equal preference points for B-BBEE, the successful Bid will be the one scoring the highest score for functionality.
- 3.6 Should two or more Bids be equal in all respect, the award shall be decided by the drawing of lots.

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

- 4.1 In terms of the Preferential Procurement Regulations, 2011, preference points shall be awarded to a Bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

[delete either column "Maximum 10" or "Maximum 20"]

B-BBEE Status Level of Contributor	Number of Points [Maximum 20]
1	20
2	18
3	16
4	12
5	8
6	6
7	4
8	2
Non-compliant contributor	0

- 4.2 Bidders who qualify as EMEs in terms of the 2007 version of the Codes of Good Practice must submit a certificate issued by an Accounting Officer as contemplated in the CCA or a Verification Agency accredited by SANAS or a Registered Auditor. Registered auditors do not need to meet the prerequisite for IRBA's approval for the purpose of conducting verification and issuing EME's with B-BBEE Status Level Certificates.
- 4.3 Bidders who qualify as EMEs in terms of the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928 are only required to obtain a sworn affidavit on an annual basis confirming that the entity has an Annual Total Revenue of R10 million or less and the entity's Level of Black ownership.
- 4.4 In terms of the 2007 version of the Codes of Good Practice, Bidders other than EMEs must submit their original and valid B-BBEE status level verification certificate or a certified copy thereof, substantiating their B-BBEE rating issued by a Registered Auditor approved by IRBA or a Verification Agency accredited by SANAS.
- 4.5 In terms of the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928, Bidders who qualify as QSEs are only required to obtain a sworn affidavit on an annual basis confirming that the entity has an Annual Total Revenue of R50 million or less and the entity's Level of Black ownership. Large enterprises must submit their original and valid B-BBEE status level verification certificate or a certified copy thereof, substantiating their B-BBEE rating issued by a Registered Auditor approved by IRBA or a Verification Agency accredited by SANAS.
- 4.6 A trust, consortium or joint venture will qualify for points for its B-BBEE status level as a legal entity, provided that the entity submits its B-BBEE status level certificate.
- 4.7 A trust, consortium or joint venture will qualify for points for their B-BBEE status level as an unincorporated entity, provided that 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.

- 4.8 Tertiary institutions and public entities will be required to submit their B-BBEE status level certificates in terms of the specialised scorecard contained in the B-BBEE Codes of Good Practice.
- 4.9 A person will not be awarded points for B-BBEE status level if it is indicated in the Bid documents that such a Bidder intends subcontracting more than 25% [twenty-five per cent] of the value of the contract to any other enterprise that does not qualify for at least the same number of points that such a Bidder qualifies for, unless the intended subcontractor is an EME that has the capability and ability to execute the subcontract.
- 4.10 A person awarded a contract may not subcontract more than 25% [twenty-five per cent] 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 subcontracted to an EME that has the capability and ability to execute the subcontract.
- 4.11 Bidders are to note that in terms of paragraph 2.6 of Statement 000 of the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928, any representation made by an entity about its B-BBEE compliance must be supported by suitable evidence or documentation. As such, Transnet reserves the right to request such evidence or documentation from Bidders in order to verify any B-BBEE recognition claimed.

5. B-BBEE STATUS AND SUBCONTRACTING

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

B-BBEE Status Level of Contributor _____ = _____ [maximum of 20 points]

Note: Points claimed in respect of this paragraph 5.1 must be in accordance with the table reflected in paragraph 4.1 above and must be substantiated by means of a B-BBEE certificate issued by a Verification Agency accredited by SANAS or a Registered Auditor approved by IRBA or a sworn affidavit in the case of an EME or QSE.

5.2 Subcontracting:

Will any portion of the contract be subcontracted? YES/NO [delete which is not applicable]

If YES, indicate:

- (i) What percentage of the contract will be subcontracted?
- (ii) The name of the subcontractor
- (iii) The B-BBEE status level of the subcontractor
- (iv) Is the subcontractor an EME? YES/NO

5.3 Declaration with regard to Company/Firm

- (i) Name of Company/Firm.....
- (ii) VAT registration number.....
- (iii) Company registration number.....
- (iv) Type of Company / Firm [TICK APPLICABLE BOX]

- Partnership/Joint Venture/Consortium
- One person business/sole propriety
- Close Corporations
- Company (Pty) Ltd

- (v) Describe Principal Business Activities

.....

.....

.....

- (vi) Company Classification [TICK APPLICABLE BOX]

- Manufacturer
- Supplier
- Professional Service Provider
- Other Service Providers, e.g Transporter, etc

- (vii) Total number of years the company/firm has been in business.....

"PREVIEW COPY ONLY"

BID DECLARATION

I/we, the undersigned, who warrants that he/she is duly authorised to do so on behalf of the company/firm, certify that points claimed, based on the B-BBEE status level of contribution indicated in paragraph 4 above, qualifies the company/firm for the preference(s) shown and I / we acknowledge that:

- (i) The information furnished is true and correct.
- (ii) In the event of a contract being awarded as a result of points claimed as shown in paragraph 6 above, the contractor may be required to furnish documentary proof to the satisfaction of Transnet that the claims are correct.
- (iii) If the B-BBEE status level of contribution has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, Transnet 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) restrict the Bidder or contractor, its shareholders and directors, and/or associated entities, or only the shareholders and directors who acted in a fraudulent manner, from obtaining business from Transnet for a period not exceeding 10 years, after the *audi alteram partem* [hear the other side] rule has been applied; and/or
 - (e) forward the matter for criminal prosecution.

WITNESSES:

- 1.
- 2.

SIGNATURE OF BIDDER

DATE:.....

COMPANY NAME:

ADDRESS:

Transnet Freight Rail

INFRASTRUCTURE MAINTENANCE SPECIFICATION

**ROUTINE TESTING OF 7 x 25kV AC SUBSTATIONS AND OIL
SAMPLING IN THE SECTION BEACONFIELD TO DE AAR,
UNDER CONTROL OF DEPOT ENGINEERING MANAGER
KIMBERLEY SOUTH**

INDEX

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	CONTRACT DATA
1.0	SCOPE
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6.0	ROUTINE TESTS
7.0	TENDERING PROCEDURE
8.0	SCHEDULE OF QUANTITIES

"PREVIEW COPY ONLY"

SCOPE

- 1.1 This project specification covers the requirements for the testing and calibration of all protection devices and oil sampling in the traction substations.
- 1.2 Details of the specific substation locations and electrical equipment to be tested will be provided by the depot for the specific site before work commences. The testing and calibration procedure shall comply with the required standards.
- 1.3 The quantities for equipment to be tested will be verified or agreed upon on site between the successful Test Officer and the Project Manager or his representative.

WORKS INFORMATION

2.0 Specifications

2.1 South African National Standards:

- 2.1.1 Occupational Health and Safety Act No. 85 of 1993 (Available at depot for referral)

2.2 Transnet Freight Rail Specifications:

- 2.2.2 CEE-TBD-0007 Earthing arrangement for traction substations.

Relevant Electrical Test Report Sheets:

- 2.2.3 BBB0342 VER 2 Alternatively BBF 8999 VER 2 and BBF 9000 VER 2
- 2.2.4 BBB0343 VER 2 Alternatively BBF 9001 VER 2 and BBF 9295 VER 2
- 2.2.5 BBB0345 VER 2 Alternatively BBF 9296 VER 2
- 2.2.6 BBB0346 VER 2 Alternatively BBF 9296 VER 2 and BBF 9297 VER 2
- 2.2.7 BBB0347 VER 2
- 2.2.8 BBB0348 VER 2
- 2.2.9 BBC9921 VER 1 In accordance with Engineering Instruction G.018

3.0 Constraints on how the *Contractor* Provides the Works

- 3.1 The constraints shall be as specified in the specifications of the particular equipment.

4.0 Requirements for the programme

- 4.1 Programme of work : To be submitted by successful Contractor
- 4.2 Format : Bar chart
- 4.3 Information : How work is going to be executed and commissioned
- 4.4 All tests and work done to be performed strictly in accordance with manufacturers maintenance instructions.
- 4.5 Test person: Must be in possession of at least a Diploma in Electrical Engineering and proof his/her knowledge of H.V. equipment and skill to perform the necessary test. Must be in possession of a valid competency certificate (TFR).
- 4.6 The contractor's team performing the tests could be required to attend a Transnet Electrical Safety Awareness Course and be authorised to supervise the contractor's staff whilst working in the substations on this contract. This is for the contractors account.
- 4.7 Only utilise test equipment and instruments of an acceptable standard with valid calibration certificates. Contactor to supply his own test equipment.

5.0 Services and other things provided by the Employer

- 5.1 Transnet Freight Rail shall have an electrician/technical assistant available for Isolation and the erection of barriers to live electrical equipment and issuing of work permits.
- 5.2 Upon successful completion of the works to the satisfaction of Transnet Freight Rail, Transnet Freight Rail shall perform necessary protection tests and commission the equipment.

6.0

- 6.1 **Routine tests:** The Contractor shall test all electrical protection equipment at all existing 25 kV Traction Sub as follows:

6.2.1 Current transformers: Magnetisation curve to be tested at a minimum of two points at kneepoint voltage as depicted on previous routine or commissioning test reports. If not according to commissioning values a full magnetisation curve must be done. If not within tolerances a ratio test must be performed to prove the integrity of the current transformer.

6.2.2 Protection relays: Current Injection Tests at 200 and 600/800 percent indicated on relevant test sheets of secondary rated current noting tripping times and indications.

6.2.3 AC / DC Earth and Frame Leakage systems: Insulation values to earth and between separate systems/zones by suitable earth and insulation meggers .Tripping current values by Primary injection for relevant zone/systems to be noted to give required tripping, indications and lockout. Systems shall be tested for possible parallel paths as well.

6.2.4 Transformer protection: Buchholtz relays to be tested by air injection/test trip noting trip level to give lockout and indication.

Oil and Winding Temperature Gauges to be tested by dial indication to give trip, indication and lockout as applicable. Where required a calibration test is to be done by heat simulation.

Pressure Relief Devices tested by test trip noting trip, lockout and indication.

6.2.5 Indicating meters: By secondary injection of Current and Voltage applicable at full scale deflection.

6.2.6 Insulation levels: Pressure test not required.

6.2.7 Main and auxiliary supplies failures: Phase/AC fail relays to be tested and Battery undervoltage relay to be calibrated to trip and lockout all circuit breakers.

6.2.8 Primary Circuit Breaker: To be tested strictly according to relevant routine sheet regarding speed and contact resistance.

- 6.3** The Contractor shall supply latest copy of calibration certificate of testing equipment.
- 6.4** The Contractor shall do testing for minor repair work and re-testing where faulty equipment is identified during the above testing period. (Transnet will supply all material required for these repairs).
- 6.5** The Contractor shall complete the test sheet as applicable and defects report as applicable for Routine Testing and Commissioning.
- 6.6** The technician/electrician who will assist during the contract as based in the relevant maintenance depot from where he will depart and accompany the contractor every morning.
- 6.7** A technician/electrician from Transnet will provide access to the substations and will issue applicable work/test permits to isolate and earth all equipment before handing it over for testing purposes. The contractor shall confirm the isolation and earthing applied as well as the work limits. No work shall be done in any substation without the presence of a Transnet representative.
- 6.8** The Contractor shall supply the Project Manager with test sheets and defects report per substation tested.
- 6.9** Transnet shall provide security where necessary for the duration of the contract.
- 6.10** See applicable attached test sheet.
- 6.10** Bottom Insulating oil test samples to be taken for Gas Analyses at each Transformer. (contractor to supply own containers)

7.0 TENDERING PROCEDURE

- 7.1 Tenderers shall indicate compliance with the specification. Equipment type test certificates shall be submitted with the tender. These shall be in English or certified translation.
- 7.2 The contractor shall supply a site diary (three fold). This book shall be used to record any unusual events during the period of the work. Any delays to the work shall also be recorded such as delays caused by poor weather conditions, delays caused by permits being cancelled etc. Such delays must be countersigned by the appointed Technical Officer. Other delays such as non-availability of equipment from 3rd party suppliers must be communicated to the Project Manager in writing.
- 7.3 The contractor shall supply a site instruction book. This book shall be used to record any instructions to the contractor regarding problems encountered on site for example the quality of work or the placement of equipment. This book will be filled in by the Technical Officer or Project Manager and must be countersigned by the Contractor.
- 7.4 Both books mentioned in 7.2 and 7.3 shall be the property of TFR and shall be handed over to the Technical Officer or Project Manager on the day of completion.
- 7.5 Note, that no Site Access will be give before the training certificates are on the safety file.
- 7.6 The safety file or a copy thereof will be on site and must be available at all times. The safety file must be submitted for approval before contract start.
- 7.7 Tenders are required to compile a schedule per Substation to be tested. Schedule to include all tasks as per specification, time to complete and complete price.
- 7.8 P's and G's Schedule must include total accommodation and travelling costs per substation. Prices to exclude VAT.
- 7.9 No payment will be made to Contractor without the full report of tests and defects. The Contractor must submit the invoice for the completed substations at Kimberley South Depot for payment.
- 7.10 The Electricians who will assist during the contract are based in Beaconsfield and De Aar Depots respectively from where they will depart and escort the contractor every morning. Any uncertainties will be discussed at the site meeting.

Electrical Test Laboratory
SUB DEFECT REPORT



TRANSNER
freight rail

GRADE: SENIOR ENGINEERING TECHNICIAN
ADDRESS:

TO: MAINTENANCE MANAGER

DEPOT:

DATE:

OUR REF.:

PROTECTION DEFECT REPORT

The following DEFECTS were found during commissioning / routine testing:

At : E.L.&P. /TRACT. Sub-, Tie station:

Table with 10 empty rows for defect details.

TESTED BY : _____

SIGNATURE : _____

Please attend to these defects and complete bottom portion of this form within two months after receiving report and send back to TEST LAB.

TO: SENIOR ENGINEERING TECHNICIAN

FROM : MAINTENANCE MANAGER

DEPOT:

YOUR REF:

CORRECTION ACTION REPORT

The following REPAIRS were done for :

At : E.L.&P. / TRACT. Sub-, Tie-station :

Table with 6 empty rows for repair details.

These defects were repaired by :

Technician : _____
And reported to TECHNICAL MANAGER/SUPT.

Technical Supt. : _____

Date : _____

Checked by
Chief Eng. Technician : _____

*If any assistance is needed to solve or repair a defect and re-testing is necessary, please contact Senior Engineering Technician. Before the Final correction report is sent through.
THANK YOU FOR YOUR CO-OPERATION.*

**Electrical Test Laboratory
Traction / E L & P Substation
Test Sheet**



TRANSNET
freight rail

SUBSTATION: _____ **DATE:** _____

TRANSFORMER: _____

MAKE: _____ **KVA :** _____

SERIAL NO.: _____ **VOLTAGE:** _____

DATE OF MANUFACTURE: _____ **VECTOR:** _____

INSULATION RESISTANCE TEST: 2 500 V MEGGER (2 mΩ/kV = Good norm)

EARTH TO HT: _____ **HT TO LT1:** _____

EARTH TO LT1: _____ **HT TO LT2:** _____

EARTH TO LT2: _____ **HT TO AUX.:** _____

EARTH TO AUX.: _____ **LT1 TO LT2:** _____

LT2 TO AUX.: _____ **LT1 TO AUX.:** _____

VOLTAGE RATIO TEST: 3 PHASE GENERATOR

SUPPLY VOLTAGE (3 phase) _____ **V**

	Primary	Secondary	TAP 1	TAP 2	TAP 3	TAP 4	TAP 5
LT1:			V	V	V	V	V
			V	V	V	V	V
			V	V	V	V	V
LT2:			V	V	V	V	V
			V	V	V	V	V
			V	V	V	V	V
AUXILIARY:			V	V	V	V	V
			V	V	V	V	V
			V	V	V	V	V

AT TAP No. 3: CALCULATED RATIO = HT/LT = _____ / _____ = _____

MEASURED VOLTAGE = SUPPLY V / RATIO = _____ / _____ = _____ V

TESTED BY: _____ **DATE:** _____

APPROVED BY: _____ **DATE:** _____

**Electrical Test Laboratory
TEST CERTIFICATE**



TRANSNET
freight rail

SUBSTATION: _____

DATE: _____

OIL TEST REPORT

	DESCRIPTION
SUBSTATION	
TRANSFORMER	
MAKE	
DATE OF MANUFACTURE	
SERIAL No.	
KVA RATING	
VOLTAGE HV/LV	
DATE OF SAMPLE	
OIL VOLUME GAL/LITRE	

	TEST RESULTS	ACTION REQUIRED
	BOTTOM SAMPLE	
OIL TEMPERATURE DEG. C		
WATER CONTENT/KARL FISCHER (ppm)		
APPEARANCE/COLOUR OF OIL		
N.N. ACIDITY mg KOH/g OIL		
DIELECTRIC BREAKDOWN STRENGTH AVR. (kV)		
RECOMMENDATION		

- A THE SAMPLE COMPLIES WITH THE REQUIREMENTS.**
- B THE OIL MUST BE FILTERED IN ORDER TO IMPROVE ITS DIELECTRIC BREAKDOWN STRENGTH.**
- C THE OIL MUST BE FILTERED WITH HEAT AND VACUUM IN ORDER TO REMOVE THE EXCESS MOISTURE.**
- D OIL MUST BE REGENERATED/REPLACED AND A SAMPLE SUBMITTED AFTER 6 MONTHS. (SHOULD THE ACIDITY HAVE INCREASE BY MORE THAN 0,03mg KOH/g OIL, THE TRANSFORMER SHALL BE DE-SLUDGED).**
- E A SLUDGE TEST MUST BE CARRIED OUT. PLEASE SUBMIT SAMPLE FOR TEST.**

TESTED BY: _____

Rail Network Maintenance

BBF8995 Version 2

25 kV AC Traction Substations Test Sheet Current transformers:Ratio and Magnetisation Curves
Main Xformer Protection: Main Overload- and Restricted Earth Fault Protection.
Buchholtz, Overtemperature & PRD. Battery Undervoltage Relay. Earth Resistance measurement.



Substation: _____ **Single / A / B Unit** **Routine :** _____ **Commissioning:** _____

CT Ratios				Main Transformer IFL				Primary:	A	Secondary	A
HV Overcurrent	LV Overcurrent	HV REF/Duo Bias Ph 1	HV REF/Duo Bias Ph 2	LV REF/Duo Bias Ph 1	LV REF/Duo Bias Ph 2	Winding Overtemp					

Magnetization curves													
HV Overcurrent		LV Overcurrent		HV Restr. E/Fault Ph 1		HV Restr. E/Fault Ph 2		LV Restr. E/F Ph 1		LV Restr. E/F Ph 2		Winding Overtemp	
Volts	m Amps	Volts	m Amps	Volts	m Amps	Volts	mAmps	Volts	mAmps	Volts	mAmps	Volts	Amps

Overcurrent Relay elements				Relay makes and types:.				Overcurrent:				Restricted E/F:				Duo Biased:			
HV IDMTL (NI)		Iset=	xIn	Tset=	HV Instantaneous		Iset=	xIn	T set= 0	Restricted Earth Fault V/I set =									
Operating time in seconds	Multiple	Amps	Specified	Actual	Operating time in seconds	Multiple	Amps	Specified	Actual	Operating voltage/current		Phase to N							
		1.25 x Iset						4.00 x Iset				HV Secondary voltage/current							
		2.00 X Iset						6.00 x Iset				LV Secondary voltage/ current							
LV IDMTL (NI)		Iset=	xIn	Tset=	LV Instantaneous		Iset=	xIn	T set=	Duo Biased Fault HV set = LV set=									
Operating time in seconds	Multiple	Amps	Specified	Actual	Operating time in seconds	Multiple	Amps	Specified	Actual	Operating current				Phase to N					
		1.25 x Iset					4.00 x Iset				HV secondary injected current								
		2.00 X Iset					6.00 x Iset				LV secondary injected current								
Trip PCB giving indication:				Yes/No	Trip PCB giving indication:				Yes/No	Trip PCB to lockout & indication:				Yes/No					

Main Transformer Protection

Buchholtz: Relay trips PCB giving Lockout & Indication with _____ cc of air . **Pressure Relief Device:** Simulation trips PCB giving Lockout & Indication. Yes/No

Oil Over temp: Relay trips PCB giving Indication at _____ °C dail setting. **Winding Over temp:** Relay trips PCB giving Lockout & Indication at _____ °C dail setting.

Battery undervoltage protection: Relay tested to pickup at _____ and dropout at _____ Volts tripping PCB with indication and Lockout

Phase Fail Protection: Relay tested to trip PCB giving lockout and indication on simulation phase fail. Yes / No

Earth resistance test: Resistance between spikes= _____ ohms Resistance from spikes to main earth= _____ ohms

Tested by: Name: _____ Signature: _____ Witnessed by: Name: _____ Signature: _____ Date: _____

Rail Network Maintenance

BBF 8996 Version 2

25 kV AC Traction Substations Test Sheet Incomer and Track Feeder VCB's: Current
 Transformer Ratio and Mag. curves.
 IDMTL / Reverse power / Thermal Overload and Distance Protection Relays Battery
 Undervoltage Relays.



Substation: Single / A / B Unit Routine : Commissioning:

Panel No										
Designation	Incomer									
CT Winding	P1/1S		P1/1S Dist. Prot		P1/2S Therm O/load		P1/1S Dist. Prot		P1/2S Therm O/load	
CT Ratio Marked	1200/1		1200/1		1200/1		1200/1		1200/1	
CT Ratio Measured										

Magnetisation curves		Volts	Amps		Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps

Time delay Overcurrent Protection Relays	IDMTL Relay:				Thermal Relay:				Thermal Relay :			
	(NI) I _{>set=} xIn		t set =		I _{th>set=} xIn		T set =		I _{th>set=} xIn		T set =	
	Multiple	Amps	Specified	Actual	Multiple	Amps	Specified	Actual	Multiple	Amps	Specified	Actual
Operating time in seconds to trip VCB's with indication.	2 x Iset				2.00 x Iset				2.00 x Iset			

Instantaneous Overcurrent Protection Relays:	IDMT Relay:				(1)IDMT				(1)IDMT			
	(2)Backup Relay:				(2)Backup Relay:				(2)Backup Relay:			
	(NI) I _{instset=} xIn		t set =		(1)I _{IDMTset=} xIn		t set =		(1)I _{IDMTset=} xIn		t set =	
Operating time in seconds to trip VCB's with indication.	Multiple	Amps	Specified	Actual	Multiple	Amps	Specified	Actual	Multiple	Amps	Specified	Actual
	4 x Iset				(1)2 x Iset				(1)2 x Iset			
					(2)4 x Iset				(2)4 x Iset			

Reverse power and Distance Protection Relays: Make & Type:	Reverse power:				Distance Protection:				Distance Protection:				
	Current direction		Tripping Amps		Zone	R	X	Specified	Operating@	Zone	R	X	Specified

Operating values to trip VCB's with indication.	Forward				1					1				
	Reverse				2					2				
	Voltage applied				3					3				
					4					4				
					5					5				

Battery undervoltage protection relays	Set to pickup at _____ and dropout at _____ volts tripping VCB to lockout				Set to pickup at _____ and dropout at _____ volts tripping VCB to lockout				Set to pickup at _____ and dropout at _____ volts tripping VCB to lockout			
--	---	--	--	--	---	--	--	--	---	--	--	--

Tested by: Name:	Signature:	Witnessed by: Name:	Signature:	Date:
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Rail Network Maintenance

BBF9296 Version2

Signal and Distribution Substations Test Sheet
Bus coupler VCB Frame Leakage Protection.
Insulation Resistance Tests. Battery Undervoltage Protection. Earth Resistance Measurement

Substation



Routine :		Commissioning:			Panel No:		Designation			
Current Transformers		Zone 1	Zone 2	Zone 3	Frame Leakage		Make/Type of relay: _____ / _____ Tested by Pri/Sec/TW			
CT Ratio	Marked				Zones			Parallel paths test	Zone 1 to Zone 2	
	Measured				I set =				Zone 1 to Zone 3	
Mag curves	Volts	Amps	Amps	Amps	I trip (amps)			at Iset amps	Zone 2 to Zone 3	
SIT					Intertripping tests			Insulation Resistance	Zone 1 to Main Earth	
					Zone 1 tripping	Zone 1	Zone 2		Zone 3	Zone 2 to Main Earth
					Zone 2 tripping	Zone 1	Zone 2		Zone 3	Zone 3 to Main Earth
					Zone 3 tripping	Zone 1	Zone 2		Zone 3	Zone 1 to Zone 2
										Zone 1 to Zone 3
										Zone 2 to Zone 3

Insulation Resistance Tests

Megger tests at 2500 volts

Red	Earth		Red	White	
White	Earth		White	Blue	
Blue	Earth		Blue	Red	

HiPot test @ 16 kV for 60 sec(VT's out)

VT and KV Meter reading at 11kV

Red	White+Blue+Earth	mA	Red	White+Blue+Earth	
White	Red+Blue+Earth	mA	White	Red+Blue+Earth	
Blue	White+Red+Earth	mA	Blue	White+Red+Earth	

Battery undervoltage protection: Relay tested to pickup at _____ and dropout at _____ Volts tripping all VCB's with indication and Lockout

Phase fail/rotation protection: Relays tested to trip on phase fail giving indication and lockout. Incomer No: _____ Incomer No: _____

Earth Resistance test: Resistance between spikes: _____ ohms Resistance between spikes and Substation Earth _____ ohms

General Remarks

Tested by: Name _____ Signature: _____ Witnessed by: Name: _____ Signature: _____ Date: _____

Signal and Distibution Substations Test Sheet
Ring, Transmission Line and Transformer Feeder VCB's
Current Xformers, Overload, Earth fault, Cable & Transformer Protection



Routine :		Commissioning:			Panel No:			Designation					
Current Transformers		Protection Class 10P10			Metering Class 0.5			SOLKOR/TRANSLAY Class X			LED Configuration		
		Red	White	Blue	Red	White	Blue	Red	White	Blue			
CT Ratio	Marked				Marked				Marked			LED 1	
	Measured				Measured				Measured			LED 2	
Mag curves	Volts	Red A	White A	Blue A	Volts	Red A	White A	Blue A	Volts	Red A	White A	Blue A	LED 3
													LED 4
													LED 6
													LED 7
													LED 8
													LED 9
Polarities													

Protection Relays: Make/Type: _____ / _____

Overcurrent Elements		Tested by Pri/Sec/TW				Tested by Pri/Sec/TW				Output relay Configuration			
IDMT (NI)		I set=		T set=		Instantaneous		I set =		T set =		B01	
Operating time in seconds	Multiple	Amps	R to W	R to B	B to W	Operating times in seconds	Multiple	Amps	R to W	R to B	B to W	B02	
	1.25 x Iset						4.00 x Iset					B03	
	2.00 x Iset						6.00 x Iset					B04	

Earth Fault Elements		Tested by Pri/Sec/TW				Tested by Pri/Sec/TW				Tested by Pri/Sec/TW							
IDMT (NI)		I set=		T set=		Instantaneous		I set=		T set=		Sensitive Earth Fault		I set=		T set=	
Operating time in seconds	Multiple	Amps	R to E	W to E	B to E	Operating times in seconds	Multiple	Amps	R to E	W to E	B to E	Operating times in seconds	Multiple	Amps	R to E	W to E	B to E
	1.25 x Iset						4.00 x Iset						1.00 x Iset				
	2.00 x Iset						6.00 x Iset						1.25 x Iset				

Feeder Protection		Solkor:Overall Fault setting			Tested by Pri/Sec/TW			Translay:Overall Fault setting			Tested by Pri/Sec/TW		
Pilot Cable		Phases	Expected %	Local sub Trip Amps	Local sub. m Amps	Distant sub. Trip Amps	Distant sub. m Amps	Fault	Current	Relay Output		Pilot mAmps	
Loop Resistance		T1+T2	Ohm	R-E	22			R-E					
Insulation Resistance		T1-E	MOhm	W-E	27.5			W-E					
		T2-E	MOhm	B-E	37			B-E					
		T1-T2	MOhm	R-W	110			R-W					
				W-B	110			W-B					
				B-R	55			B-R					
Stability test by Primary injection Red to White in Local sub with Short circuit in Distant sub													
Current injected: _____ Amps					mAmps in pilot wire confirmed to be zero			Yes	No				

Transformer Protection

Transformer No: _____ Bucchoitz: Relay trips VCB giving Lockout & Indication with _____ cc of air

Oil Over temperature: Relay trips VCB giving Trip & Indication at _____ °C dail setting.

Winding Over temperature: Relay trips VCB giving Lockout & Indication at _____ °C dail setting.

Tested by: Name _____ Signature: _____ Witnessed by: Name: _____ Signature: _____ Date: _____

Rail Network Maintenance

KBY AC 0001

25 kV AC Traction Substations Test Sheet

Main Xformer Protection: Instantaneous Overcurrent, Biased Differential and REF Protection.
 Buchholtz, Overtemperature & PRD.
 Battery Undervoltage Relay. Earth Resistance.



Substation:	Routine :	Commissioning:
Main Transformer Full Load Current	HV (Amps)	LV (Amps)

CT Ratio's	Main Overloads		Biased Differential				Restricted Earth Fault			
	HV Prim.	HV Sec.	HV Prim.	HV Sec.	LV Prim.	LV Sec.	HV CT Phase 1	HV CT Phase 2	LV CT Phase 1	LV CT Phase 1
Marked										
Measured										

Magnetisation curves:

Volts	HV Prim.	HV Sec.	HV Prim.	HV Sec.	LV Prim.	LV Sec.	HV CT Phase 1	HV CT Phase 2	LV CT Phase 1	LV CT Phase 1

Instantaneous Overload Relay	Duo Biased Differential Relay
Relay Make and Type: KCGG 122	Relay Make and Type:
IDMT Overcurrent setting:	Duo Biased current setting:
IDMT Time Multiplier setting:	Duo Biased time setting:
Multiple of Plug setting: 2 4	Sec. Injected I at settings (amps):
Operating time specified (sec):	Operating time (sec):
Sec. Injected I at setting (amps):	
Operating times (sec):	

Restricted Earth Fault protection	Ammeter
Relay Make and Type:	Indication Actual % Error
Primary (HV) Secondary (LV)	50
Current Setting:	100
Voltage setting:	150
Tripping Voltage:	200
Operating time: Instantaneous Instantaneous	

All operations trip Primary Circuit Breaker giving indication and lockout Yes No

Main Xformer Buchholtz: Relay trips PCB giving Lockout & Indication with _____ cc of air in relay.

Main Xformer Oil Over temperature: Relay trips PCB giving Lockout & Indication at _____ °C dail setting.

Main Xformer Winding Over temperature: Relay trips PCB giving Lockout & Indication at _____ °C dail setting.

Main Xformer Pressure relief device: Relay trips PCB giving Lockout & Indication. Yes/No

Battery undervoltage protection:

Relay tested to pickup at _____ and dropout at _____ Volts tripping PCB with indication and Lockout

Earth resistance test:

Resistance between spikes= _____ ohms Resistance from spikes to main earth= _____ ohms

Tested by: Name: _____ Signature: _____ Date: _____

Witnessed by: Name: _____ Signature: *36* Date: _____

Rail Network Maintenance

KBY AC 0002

25 kV AC Traction Substations Test Sheet
Current Transformer Ratio and Mag. curves.
Incomer VCB Overload Protection
Line Feeder VCB's Instaneous , Thermal Overload & Optimho Distance Protection. Volt & Ammeters



Substation: _____ **Routine :** _____ **Commissioning:** _____

Panel No. / Designation						
CT Ratio Marked						
CT Ratio Measured						
Magnetisation curves	Volts	mAmps	Volts	mAmps	Volts	mAmps

IDMT: Instantaneous and Thermal Overload Protection

Relay Make & Type:	KCG122 (Inst)	KCG122 (Thermal)	KCG122 (Thermal)
Current setting			
Time setting			
% Test current			
Operating tripping times (sec)			

Distance Protection

Relay Make & Type:	<p>Note: Complete test results from distance protection zone tests to be provided by contractor.</p>	Optimho		Optimho	
Relay Settings		KZN1		KZN1	
		KZN2		KZN2	
		KZN3		KZN3	
		∅	70°	∅	70°
Relay rated current (amps)		1		1	
Operating current					
Auto reclose relay: Operating time to reclose					
DC Voltage to run to lockout					

All operations trip VCB's giving indication	Yes	No	Yes	No	Yes	No
---	-----	----	-----	----	-----	----

Battery undervoltage protection:

Relay tested to pickup at _____ and dropout at _____ Volts tripping VCB with indication and Lockout	Yes	No	Yes	No	Yes	No
---	-----	----	-----	----	-----	----

Indicating instruments

Voltmeter @ Full Scale deflection		
Ammeters @ Full Scale deflection		
Max Demand Indicators		

Tested by: Name: _____ Signature _____ Date: _____

Witnessed by: Name: 31 Signature _____ Date: _____

TRANSNET SOC LIMITED

(Registration no. 1990/000900//30)

**SAFETY ARRANGEMENTS AND PROCEDURAL COMPLIANCE
WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT
(ACT 85 OF 1993) AND APPLICABLE REGULATIONS****1. General**

- 1.1 The Contractor and Transnet Limited (hereinafter referred to as "Transnet") are individual employers, each in its own right, with their respective duties and obligations set out in the Occupational Health and Safety Act, Act 85 of 1993 (the Act) and applicable Regulations.
- 1.2 The Contractor accepts, in terms of the General Conditions of Contract and in terms of the Act, his obligations as an employer in respect of all persons in his employ, other persons on the premises or the Site or place of work or on the work to be executed by him, and under his control. He shall, before commencement with the execution of the contract work, comply with the provisions set out in the Act, and shall implement and maintain a Health and Safety Plan as described in the Construction Regulations, 2003 and as approved by Transnet, on the Site and place of work for the duration of the Contract.
- 1.3 The Contractor accepts his obligation to complying fully with the Act and applicable Regulations notwithstanding the omission of some of the provisions of the Act and the Regulations from this document.
- 1.4 Transnet accepts, in terms of the Act, its obligations as an employer of its own employees working on or associated with the site or place of work, and the Contractor and Technical Officer or his deputy shall at all times, co-operate in respect of the health and safety management of the site, and shall agree on the practical arrangements and procedures to be implemented and maintained during execution of the Works.
- 1.5 In the event of any discrepancies between any legislation and this specification, the applicable legislation will take precedence.

2. Definitions

- 2.1 In this Specification any word or expression to which a meaning has been assigned in the Construction Regulations, shall have the meaning so assigned to it, unless the context otherwise indicates: -
- 2.2 The work included in this Contract shall for the purposes of compliance with the Act be deemed to be "**Construction Work**", which, in terms of the Construction Regulations, 2003 means any work in connection with: -
- (a) the erection, maintenance, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure;

- (b) the installation, erection, dismantling or maintenance of fixed plant where such work includes the risk of a person falling;
 - (c) the construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or
 - (d) the moving of earth, clearing of land, the making of an excavation, piling, or any similar type of work;
- 2.3 **“competent person”** in relation to construction work, means any person having the knowledge, training and experience specific to the work or task being performed: Provided that where appropriate qualifications and training are registered as per the South African Qualifications Authority Act, 1995 these qualifications and training shall be deemed to be the required qualifications and training;
- 2.4 **“contractor”** means principal contractor and **“subcontractor”** means contractor as defined by the Construction Regulations, 2003.
- 2.5 **“fall protection plan”** means a documented plan, of all risks relating to working from an elevated position, considering the nature of work undertaken, and setting out the procedures and methods applied to eliminate the risk;
- 2.6 **“health and safety file”** means a file, or other record in permanent form, containing the information required to be kept on site in accordance with the Act and applicable Regulations;
- 2.7 **“Health and Safety Plan ”** means a documented plan which addresses the hazards identified and include safe work procedures to mitigate, reduce or control the hazards identified;
- 2.8 **“Risk Assessment”** means a programme to determine any risk associated with any hazard at a construction site, in order to identify the steps needed to be taken to remove, reduce or control such hazard;
- 2.9 **“the Act”** means the Occupational Health and Safety Act No. 85 of 1993.

3. Procedural Compliance

- 3.1 The Contractor who intends to carry out any construction work shall, before carrying out such work, notify the Provincial Director in writing if the construction work:-
- (a) includes the demolition of a structure exceeding a height of 3 metres; or
 - (b) includes the use of explosives to perform construction work; or
 - (c) includes the dismantling of fixed plant at a height greater than 3m,
- and shall also notify the Provincial Director in writing when the construction work exceeds 30 days or will involve more than 300 person days of construction work and if the construction work:-
- (a) includes excavation work deeper than 1m; or

- (b) includes working at a height greater than 3 metres above ground or a landing.
- 3.2 The notification to the Provincial Director shall be on a form similar to Annexure A of the Construction Regulations, 2003, also shown in Annexure 1 of this Specification. The Contractor shall ensure that a copy of the completed notification form is kept on site for inspection by an inspector, Technical Officer or employee.
- 3.3 The Contractor shall, in accordance with the Act and applicable Regulations, make all the necessary appointments of competent persons in writing on a form similar to Annexure 2 of this Specification and deliver copies thereof to the Technical Officer. Copies should also be retained on the health and safety file.
- 3.4 Subcontractors shall also make the above written appointments and the Contractor shall deliver copies thereof to the Technical Officer.
- 3.5 In the case of a self-employed Contractor or any subcontractor who has the appropriate competencies and supervises the work himself, the appointment of a construction supervisor in terms of regulation 6.1 of the Construction Regulations, 2003 will not be necessary. The Contractor shall in such a case execute and sign a declaration, as in Annexure 3, by which he personally undertakes the duties and obligations of the "Chief Executive Officer" in terms of section 16(1) of the Act.
- 3.6 The Contractor shall, before commencing any work, obtain from the Technical Officer an access certificate as in Annexure 4 executed and signed by him, permitting and limiting access to the designated site or place of work by the Contractor and any subcontractors under his control.
- 3.7 Procedural compliance with Act and Regulations, as above, shall also apply to any subcontractors as employers in their own right. The Contractor shall furnish the Technical Officer with full particulars of such subcontractors and shall ensure that they comply with the Act and Regulations and Transnet's safety requirements and procedures.

4. **Special Permits**

Where special permits are required before work may be carried out such as for hotwork, isolation permits, work permits and occupations, the Contractor shall apply to the Technical Officer or the relevant authority for such permits to be issued. The Contractor shall strictly comply with the conditions and requirements pertaining to the issue of such permits.

5. **Health and Safety Programme**

- 5.1 The Tenderer shall, with his tender, submit a Health and Safety Programme setting out the practical arrangements and procedures to be implemented by him to ensure compliance by him with the Act and Regulations and particularly in respect of: -
- (i) The provision, as far as is reasonably practical, of a working environment that is safe and without risk to the health of his employees and subcontractors in terms of section 8 of the Act;

- (ii) the execution of the contract work in such a manner as to ensure in terms of section 9 of the Act that persons other than those in the Contractor's employment, who may be directly affected by the contract work are not thereby exposed to hazards to their health and safety;
 - (iii) ensuring, as far as is reasonably practical, in terms of section 37 of the Act that no employee or subcontractor of the Contractor does or omits to do any act which would be an offence for the Contractor to do or omit to do.
- 5.2 The Contractor's Health and Safety Programme shall be based on a risk assessment in respect of the hazards to health and safety of his employees and other persons under his control that are associated with or directly affected by the Contractor's activities in performing the contract work and shall establish precautionary measures as are reasonable and practical in protecting the safety and health of such employees and persons.
- 5.3 The Contractor shall cause a risk assessment contemplated in clause 5.2 above to be performed by a competent person, appointed in writing, before commencement of any Construction Work and reviewed during construction. The Risk Assessments shall form part of the Health and Safety programme to be applied on the site and shall include at least the following:
- (a) The identification of the risks and hazards that persons may be exposed to;
 - (b) the analysis and evaluation of the hazards identified;
 - (c) a documented Health and Safety Plan, including safe work procedures to mitigate, reduce or control the risks identified;
 - (d) a monitoring and review plan.
- 5.4 The Health and Safety Plan shall include full particulars in respect of: -
- (a) The safety management structure to be instituted on site or place of work and the names of the Contractor's health and safety representatives and members of safety committees where applicable;
 - (b) the safe working methods and procedures to be implemented to ensure the work is performed in compliance with the Act and Regulations;
 - (c) the safety equipment, devices and clothing to be made available by the Contractor to his employees;
 - (d) the site access control measures pertaining to health and safety to be implemented;
 - (e) the arrangements in respect of communication of health and safety related matters and incidents between the Contractor, his employees, subcontractors and the Technical Officer with particular reference to the reporting of incidents in compliance with Section 24 and General Administrative Regulation 8 of the Act and with the pertinent clause of the General Conditions of Contract forming part of the Contract and

- (f) the introduction of control measures for ensuring that the Safety Plan is maintained and monitored for the duration of the Contract.
- 5.4 The Health and Safety programme shall be subject to the Technical Officer's approval and he may, in consultation with the Contractor, order that additional and/or supplementary practical arrangements and procedures be implemented and maintained by the Contractor or that different working methods or safety equipment be used or safety clothes be issued which, in the Technical Officer's opinion, are necessary to ensure full compliance by the Contractor with his obligations as an employer in terms of the Act and Regulations. The Technical Officer or his deputy shall be allowed to attend meetings of the Contractor's safety committee as an observer.
- 5.5 The Contractor shall take reasonable steps to ensure that each subcontractor's Health and Safety Plan is implemented and maintained on the construction site: Provided that the steps taken, shall include periodic audits at intervals mutually agreed to between them, but at least once every month.
- 5.6 The Contractor shall stop any subcontractor from executing any construction work, which is not in accordance with the Contractor's, and/or subcontractor's Health and Safety Plan for the site or which poses a threat to the health and safety of persons.
- 5.7 The Contractor shall ensure that a copy of the Health and Safety Plan is available on site for inspection by an inspector, Technical Officer, agent, subcontractor, employee, registered employee organisation, health and safety representative or any member of the health and safety committee.
- 5.8 The Contractor shall consult with the health and safety committee or, if no health and safety committee exists, with a representative group of employees, on the development, monitoring and review of the Risk Assessment.
- 5.9 The Contractor shall ensure that all employees under his control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the Risk Assessment.
- 5.10 The Contractor shall ensure that all subcontractors are informed regarding any hazard as stipulated in the Risk Assessment before any work commences, and thereafter at such times as may be determined in the Risk Assessment.
- 5.11 The Contractor shall ensure that all visitors to a construction site undergoes health and safety induction pertaining to the hazards prevalent on the site and shall be provided with the necessary personal protective equipment.
- 6. Fall Protection Plan**
- 6.1 In the event of the risk and hazard identification, as required in terms of clause 5.3 of this Specification, revealing risks relating to working from an elevated position the contractor shall cause the designation of a competent person, responsible for the preparation of a fall protection plan;

- 6.2 The Contractor shall implement, maintain and monitor the fall protection plan for the duration of Contract. The Contractor shall also take such steps to ensure the continued adherence to the fall protection plan.
- 6.3 The fall protection plan shall include:-
- (a) A Risk Assessment of all work carried out from an elevated position;
 - (b) the procedures and methods to address all the identified risks per location;
 - (c) the evaluation of the employees physical and psychological fitness necessary to work at elevated positions;
 - (d) the training of employees working from elevated positions; and
 - (e) the procedure addressing the inspection, testing and maintenance of all fall protection equipment.

7. Hazards and Potential Hazardous Situations

The Contractor and the Technical Officer shall immediately notify one another of any hazardous or potentially hazardous situations which may arise during performance of the Contract by the Contractor or any subcontractor and, in particular, of such hazards as may be caused by the design, execution and/or location and any other aspect pertaining to the contract work.

8. Health and Safety File

- 8.1 The Contractor shall ensure that a health and safety file is opened and kept on site and shall include all documentation required as per the Act and applicable regulations, and made available to an inspector, the Technical Officer, or subcontractor upon request.
- 8.2 The Contractor shall ensure that a copy of the both his Health and Safety Plan as well as any subcontractor's Health and Safety Plan is available on request to an employee, inspector, contractor or the Technical Officer.
- 8.3 The Contractor shall hand over a consolidated health and safety file to the Technical Officer upon completion of the Construction Work and shall in addition to documentation mentioned in the Act and applicable Regulations include a record of all drawings, designs, materials used and other similar information concerning the completed structure.

ANNEXURE 1**OCCUPATIONAL HEALTH AND SAFETY ACT, 1993****Regulation 3(1) of the Construction Regulations****NOTIFICATION OF CONSTRUCTION WORK**

-
-
- 1(a) Name and postal address of principal contractor:

- (b) Name and tel. no of principal contractor's contact person:

2. Principal contractor's compensation registration number: _____
- 3.(a) Name and postal address of client:

- (b) Name and tel no of client's contact person or agent:

- 4.(a) Name and postal address of designer(s) for the project:

- (b) Name and tel. no of designer(s) contact person:

5. Name and telephone number of principal contractor's construction supervisor on site appointed in terms of regulation 6(1).

6. Name/s of principal contractor's construction sub-ordinate supervisors on site appointed in terms of regulation 6(2).

7. Exact physical address of the construction site or site office:

8. Nature of the construction work:

9. Expected commencement date: _____
10. Expected completion date: _____

11. Estimated maximum number of persons on the construction site: _____

12. Planned number of contractors on the construction site accountable to the principle contractor:

13. Name(s) of contractors already chosen.

Principal Contractor

Date

Client

Date

* THIS DOCUMENT IS TO BE FORWARDED TO THE OFFICE OF THE DEPARTMENT OF LABOUR **PRIOR TO COMMENCEMENT** OF WORK ON SITE.

* **ALL PRINCIPAL CONTRACTORS** THAT QUALIFY TO NOTIFY MUST DO SO EVEN IF ANOTHER PRINCIPAL CONTRACTOR ON THE SAME SITE HAD DONE SO PRIOR TO THE COMMENCEMENT OF WORK.

"PREVENTED COPY ONLY"

ANNEXURE 2

(COMPANY LETTER HEAD)

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993) :

SECTION/REGULATION: _____

REQUIRED COMPETENCY: _____

In terms of _____ I, _____

representing the Employer) do hereby appoint _____

As the Competent Person on the premises at _____

(physical address) to assist in compliance with the Act and the applicable Regulations.

Your designated area/s is/are as follows :-

Date : _____

Signature :- _____

Designation :- _____

ACCEPTANCE OF DESIGNATION

I, _____ do hereby accept this Designation and acknowledge that I understand the requirements of this appointment.

Date : _____

Signature :- _____

Designation :- _____

ANNEXURE 3**(COMPANY LETTER HEAD)****OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993) :****DECLARATION**

In terms of the above Act I, _____ am personally assuming the duties and obligations as Chief Executive Officer, defined in Section 1 of the Act and in terms of Section 16(1), I will, as far as is reasonably practicable, ensure that the duties and obligations of the Employer as contemplated in the above Act are properly discharged.

Signature :- _____

Date : _____

"PREVIEW COPY ONLY"

ANNEXURE 4**(LETTER HEAD OF BUSINESS DIVISION OR UNIT OF TRANSNET LIMITED)****SITE ACCESS CERTIFICATE**

Access to : _____ (Area)
 Name of Contractor/Builder :- _____
 Contract/Order No.: _____

The contract works site/area described above are made available to you for the carrying out of associated works

In terms of your contract/order with
 (company) _____

Kindly note that you are at all times responsible for the control and safety of the Works Site, and for persons under your control having access to the site.

As from the date hereof you will be responsible for compliance with the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended, and all conditions of the Contract pertaining to the site of the works as defined and demarcated in the contract documents including the plans of the site or work areas forming part thereof.

Signed : _____ Date : _____
TECHNICAL OFFICER

ACKNOWLEDGEMENT OF RECEIPT

Name of Contractor/Builder :- _____ I,
 _____ do hereby acknowledge and accept the duties
 and obligations in respect of the Safety of the site/area of Work in terms of the Occupational Health and
 Safety Act; Act 85 of 1993.

Name : _____ Designation : _____

Signature : _____ Date : _____

E7/1 (July 1998)

SPECIFICATION FOR WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND
NEAR HIGH VOLTAGE EQUIPMENT

(This Specification shall be used in Transnet Contracts)

"PREVIEW COPY ONLY"

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DEFINITIONS

The following definitions shall apply :

Authorised Person. A person whether an employee of Transnet or not, who has been specially authorised to undertake specific duties in terms of Transnet's publication SAFETY INSTRUCTIONS: HIGH-VOLTAGE ELECTRICAL EQUIPMENT, and who holds a certificate or letter of authority to that effect.

Barrier. Any device designed to restrict access to "live" high-voltage electrical equipment.

Bond. A short conductor installed to provide electrical continuity.

Contractor. Any person or organisation appointed by Transnet to carry out work on its behalf.

Dead. Isolated and earthed.

Electrical Officer (Contracts). The person appointed in writing by the responsible Electrical Engineer in Transnet as the person who shall be consulted by the Contractor in all electrical matters to ensure that adequate safety precautions are taken by the Contractor.

Executive Officer. The person appointed by Transnet from time to time as the Executive Officer to act according to the rights and powers held by and obligations placed upon him in terms of the Contract.

High-Voltage. A voltage normally exceeding 1 000 volts.

Live. A conductor is said to be "live" when it is at a potential different from that of the earth or any other conductor of the system of which it forms a part.

Near. To be in such a position that a person's body or the tools he is using or any equipment he is handling may come within 3 metres of live exposed high-voltage electrical equipment.

Occupation. An authorisation granted by Transnet for work to be carried out under specified conditions on, over under or adjacent to railway lines.

Occupation Between Trains. An occupation during an interval between successive trains.

Project Manager. The person or juristic person appointed by Transnet from time to time as the Project Manager, to administer the Contract according to the powers and rights held by and obligations placed upon him in terms of the Contract.

Responsible Representative. The responsible person in charge, appointed by a contractor, who has undergone specific training (and holds a certificate) to supervise staff under his control to work on, over, under or adjacent to railway lines and in the vicinity of high-voltage electrical equipment.

Technical Officer. The person or juristic person appointed by Transnet from time to time as the Technical Officer, to administer the Contractor's performance and execution of the Works according to the powers and rights held by and obligations placed upon the Technical Officer in terms of the Contract.

Total Occupation. An occupation for a period when trains are not to traverse the section of line covered by the occupation.

Work on. Work undertaken on or so close to the equipment that the specified working clearances to the live equipment cannot be maintained.

Work Permit. A combined written application and authority to proceed with work on or near dead electrical equipment.

PART A - GENERAL SPECIFICATION

2. AUTHORITY OF OFFICERS OF TRANSNET

2.1 The Contractor shall co-operate with the officers of Transnet and shall comply with all instructions issued and restrictions imposed with respect to the Works which bear on the existence and operation of Transnet's railway lines and high-voltage equipment.

2.2 Without limiting the generality of the provisions of 2.1, any duly authorised representative of Transnet, having identified himself, may stop the work if, in his opinion, the safe passage of trains or the safety of Transnet assets or any person is affected. **CONSIDERATIONS OF SAFETY SHALL TAKE PRECEDENCE OVER ALL OTHER CONSIDERATIONS.**

3. CONTRACTOR'S REPRESENTATIVES

3.1 The Contractor shall nominate Responsible Representatives of whom at least one shall be available at any hour for call-out in cases of emergency. The Contractor shall provide the Technical Officer with the names, addresses and telephone numbers of the representatives.

3.2 The Contractor guarantees that he has satisfied himself that the Responsible Representative is fully conversant with this specification and that he shall comply with all his obligations in respect thereof.

4. OCCUPATIONS AND WORK PERMITS

4.1 Work to be done during total occupation or during an occupation between trains or under a work permit shall be done in a manner decided by the Technical Officer and at times to suit Transnet requirements.

4.2 The Contractor shall organise the Works in a manner, which will minimise the number and duration of occupations and work permits required.

4.3 Transnet will not be liable for any financial or other loss suffered by the Contractor arising from his failure to complete any work scheduled during the period of an occupation or work permit.

4.4 The Contractor shall submit to the Technical Officer, in writing, requests for occupations or work permits together with details of the work to be undertaken, at least 14 days before they are required. Transnet does not undertake to grant an occupation or work permit for any particular date, time or duration.

4.5 Transnet reserves the right to cancel any occupation or work permit at any time before or during the period of occupation or work permit. If, due to cancellation or change in date or time, the Contractor is not permitted to start work under conditions of total occupation or work permit at the time arranged, all costs caused by the cancellation shall be born by the Contractor except as provided for in clauses 4.6 to 4.8.

- 4.6 When the Contractor is notified less than 2 hours before the scheduled starting time that the occupation or work permit is cancelled, he may claim reimbursement of his direct financial losses caused by the loss of working time up to the time his labour and plant are employed on other work, but not exceeding the period of the cancelled occupation or work permit.
- 4.7 When the Contractor is notified less than 2 hours before the schedule starting time, or during an occupation or work permit, that the duration of the occupation or work permit is reduced, he may claim reimbursement of his direct financial losses caused by the loss of working time due to the reduced duration of the occupation or work permit.
- 4.8 Reimbursement the Contractor for any loss of working time in terms of 4.6 and 4.7, shall be subject to his claims being submitted within 14 days of the event with full details of labour and plant involved, and provided that the Technical Officer certifies that no other work on which the labour and plant could be employed was immediately available.
- 4.9 Before starting any work for which an occupation has been arranged, the Contractor shall obtain from the Technical Officer written confirmation of the date, time and duration of the occupation.
- 4.10 Before starting any work for which a work permit has been arranged, the Responsible Representative shall read and sign portion C of form No. T.1276 signifying that he is aware of the limits within which work may be undertaken. After the work for which the permit was granted has been completed, or when the work permit is due to be terminated, or if the permit is cancelled after the start, the same person who signed portion C shall sign portion D of the T.1276 form, thereby acknowledging that he is aware that the electrical equipment is to be made "live". The Contractor shall advise all his workmen accordingly.

5. SPEED RESTRICTIONS AND PROTECTION

- 5.1 When speed restrictions are imposed by Transnet because of the Contractor's activities, the Contractor shall organise and carry out his work so as to permit the removal of the restrictions as soon as possible.
- 5.2 When the Technical Officer considers protection to be necessary the Contractor shall, unless otherwise agreed, provide all protection including flagmen, other personnel and all equipment for the protection of Transnet's and the Contractor's personnel and assets, the public and including trains. Transnet will provide training free of charge of the Contractor's flagmen and other personnel performing protection duties. The Contractor shall consult with the Technical Officer, whenever he considers that protection will be necessary, taking into account the minimum permissible clearances set out in appendixes 1 to 4.
- 5.3 The Contractor shall appoint a Responsible Representative to receive and transmit any instruction, which may be given by Transnet personnel providing protection.

6. ROADS ON TRANSNET PROPERTY

The provision of clause 25 of the E.5, General Conditions of Contract, or clause 23 of the E.5 (MW), General Conditions of Contract for Maintenance Works, shall apply to the use of existing roads on Transnet's property.

7. **CLEARANCES**

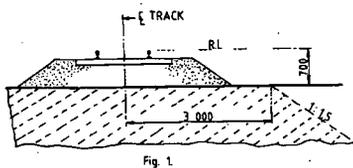
7.1 No temporary works shall encroach on the appropriate minimum clearances set out in Annexure 1 BE97-01 Sheets 1,2, 3 and 5 of 5.

8. **STACKING OF MATERIAL**

8.1 The Contractor shall not stack any material closer than 3 m from the centre line of any railway line without prior approval of the Technical Officer.

9. **EXCAVATION, SHORING, DEWATERING AND DRAINAGE**

9.1 Unless otherwise approved by the Technical Officer any excavation adjacent to a railway line shall not encroach on the hatched area shown in Figure 1.



9.2 The Contractor shall provide at his own cost any shoring, dewatering or drainage of any excavation unless otherwise stipulated elsewhere in the Contract.

9.3 Where required by the Technical Officer, drawings of shoring for any excavation under or adjacent to a railway line shall be submitted and permission to proceed obtained, before the excavation is commenced.

9.4 The Contractor shall prevent ingress of water to the excavation but where water does enter, he shall dispose of it as directed by the Technical Officer.

9.5 The Contractor shall not block, obstruct or damage any existing drains either above or below ground level unless he has made adequate prior arrangements to deal with drainage.

10. **FALSEWORK FOR STRUCTURES**

10.1 Drawings of falsework for the construction of any structure over, under or adjacent to any railway line shall be submitted to the Technical Officer and his permission to proceed obtained before the falsework is erected. Each drawing shall be given a title and a distinguishing number and shall be signed by a registered professional engineer certifying that he has checked the design of the falsework and that the drawings are correct and in accordance with the design.

10.2 After the falsework has been erected and before any load is applied, the Contractor shall submit to the Technical Officer a certificate signed by a registered professional engineer certifying that he has checked the falsework and that it has been erected in accordance with the drawings. Titles and numbers of the drawings shall be stated in the certificate. Notwithstanding permission given by the Technical Officer to proceed, the Contractor shall be entirely responsible for the safety and adequacy of the falsework.

11. **PILING**

11.1 The Technical Officer will specify the conditions under which piles may be installed on Transnet property.

12. **UNDERGROUND SERVICES**

12.1 No pegs or stakes shall be driven or any excavation made before the Contractor has established that there are no underground services, which may be damaged thereby.

12.2 Any damage shall be reported immediately to the Technical Officer, or to the official in charge at the nearest station, or to the traffic controller in the case of centralised traffic control.

13. **BLASTING**

13.1 The provisions of clause 23 of the E.5, General Conditions of Contract or clause 21 of the E.5 (MW), General Conditions of Contract for Maintenance Work, shall apply to all blasting operations undertaken in terms of the Contract.

13.2 The Contractor shall provide proof that he has complied with the provisions of clauses 10.17.1 to 10.17.4 of the Explosives Regulations (Act 26 of 1956 as amended).

13.3 Blasting within 500m of a railway line will only be permitted during intervals between trains. A person appointed by the Technical Officer, assisted by flagmen with the necessary protective equipment, will be in communication with the controlling railway station. Only this person will be authorised to give the Contractor permission to blast, and the Contractor shall obey his instructions implicitly regarding the time during which blasting may take place.

13.4 The flagmen described in 13.3, where provided by Transnet, are for the protection of trains and Transnet property only, and their presence does not relieve the Contractor in any manner of his responsibilities in terms of Explosives Act or Regulations, or any obligation in terms of this Contract.

13.5 The person described in 13.3 will record in a book provided and retained by Transnet the dates and times -

(i) when each request is made by him to the controlling station for permission to blast;

(ii) when blasting may take place;

(iii) when blasting actually takes place; and

(iv) when he advises the controlling station that the line is safe for the passage of trains.

13.6 Before each blast the Contractor shall record in the same book, the details of the blast to be carried out. The person appointed by the Technical Officer and the person who will do the blasting shall both sign the book whenever an entry described in 13.5 is made.

13.7 The terms of clause 27 hereof shall be strictly adhered to.

14. **RAIL TROLLEYS**

14.1 The use of rail trolleys or trestle trolleys on a railway line for working on high voltage equipment will be permitted only if approved by the Technical Officer and under the conditions stipulated by him.

14.2 All costs in connection with such trolley working requested by the Contractor shall, unless otherwise agreed, be borne by the Contractor, excluding the costs of any train protection services normally provided free of charge by Transnet.

15. **SIGNAL TRACK CIRCUITS**

15.1 Where signal track circuits are installed, the Contractor shall ensure that no material capable of conducting an electrical current makes contact between rails of a railway line/lines.

15.2 No signal connections on track-circuited tracks shall be severed without the Technical Officer's knowledge and consent.

16. **PENALTY FOR DELAYS TO TRAINS**

16.1 If any trains are delayed by the Contractor and the Technical Officer is satisfied that the delay was avoidable, a penalty will be imposed on the Contractor of R5 000 per hour or part thereof for the period of delay, irrespective of the number of trains delayed.

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PART B - ADDITIONAL SPECIFICATION FOR WORK NEAR HIGH-VOLTAGE ELECTRICAL EQUIPMENT

17. **GENERAL**

- 17.1 This specification is based on the contents of Transnet's publication SAFETY INSTRUCTIONS, HIGH-VOLTAGE ELECTRICAL EQUIPMENT, as amended, a copy of which will be made available on loan to the Contractor for the duration of the contract. These instructions apply to all work near live high-voltage equipment maintained and/or operated by Transnet, and the onus rests on the Contractor to ensure that he obtains a copy.
- 17.2 The Contractor's attention is drawn in particular to the contents of Part I, Sections 1 and 2 of the Safety Instructions : High-Voltage Electrical Equipment.
- 17.3 The Safety Instructions : High-Voltage Electrical Equipment cover the minimum safety precautions which must be taken to ensure safe working on or near high-voltage electrical equipment, and must be observed at all times. Should additional safety measures be considered necessary because of peculiar local conditions, these may be ordered by and at the discretion of the Electrical Officer (Contracts).
- 17.4 This specification must be read in conjunction with and not in lieu of the Safety Instructions : High-Voltage Electrical Equipment.
- 17.5 The Contractor shall obtain the approval of the Electrical Officer (Contracts) before any work is done which causes or could cause any portion of a person's body or the tools he is using or any equipment he is handling, to come within 3 metres of any live high-voltage equipment.
- 17.6 The Contractor shall regard all high-voltage equipment as live unless a work permit is in force.
- 17.7 Safety precautions taken or barriers erected shall comply with the requirements of the Electrical Officer (Contracts), and shall be approved by him before the work to be protected is undertaken by the Contractor. The Contractor shall, unless otherwise agreed, bear the cost of the provision of the barriers and other safety precautions required, including the attendance of Transnet staff where this is necessary.
- 17.8 No barrier shall be removed unless authorised by the Electrical Officer (Contracts).

18. **WORK ON BUILDINGS OR FIXED STRUCTURES**

Before any work is carried out or measurements are taken on any part of a building, fixed structure or earthworks of any kind above ground level situated within 3 metres of live high-voltage equipment, the Electrical Officer (Contracts) shall be consulted to ascertain the conditions under which the work may be carried out.

- 18.2 No barrier erected to comply with the requirements of the Electrical Officer (Contracts) shall be used as temporary staging or shuttering for any part of the Works.
- 18.3 The shuttering for bridge piers, abutments, retaining walls or parapets adjacent to or over any

track may be permitted to serve as a barrier, provided that it extends at least 2,5 metres above any working level in the case of piers, abutments and retaining walls and 1,5 metres above any working level in the case of parapets.

19. **WORK DONE ON OR OUTSIDE OF ROLLING STOCK, INCLUDING LOADING OR UNLOADING**

19.1 No person shall stand, climb or work whilst on any platform, surface or foothold higher than the normal unrestricted places of access, namely -

- (i) the floor level of trucks;
- (ii) external walkways on diesel, steam and electric locomotives, steam heat vans, etc. and
- (iii) walkways between coaches and locomotives.

When in these positions, no person may raise his hands or any equipment or material he is handling above his head.

19.2 In cases where the Contractor operates his own rail mounted equipment, he shall arrange for the walkways on this plant to be inspected by the Electrical Officer (Contracts) and approved, before commencement of work.

19.3 The handling of long lengths of material such as metal pipes, reinforcing bars, etc should be avoided, but if essential they shall be handled as nearly as possible in a horizontal position below head height.

19.4 The Responsible Representative shall warn all persons under his control of the danger of being near live high-voltage equipment, and shall ensure that the warning is fully understood.

19.5 Where the conditions in 19.1 to 19.3 cannot be observed the Electrical Officer (Contracts), shall be notified. He will arrange for suitable Safety measures to be taken. The Electrical Officer (Contracts), may in his discretion and in appropriate circumstances, arrange for a suitable employee of the Contractor to be specially trained by Transnet and at its costs, as an Authorised Person to work closer than 3 metres from live overhead conductors and under such conditions as may be imposed by the Senior responsible Electrical Engineer in Transnet.

20. **USE OF EQUIPMENT**

20.1 Measuring Tapes and Devices

20.1.1 Measuring tapes may be used near live high-voltage equipment provided that no part of any tape or a person's body comes within 3 metres of the live equipment.

20.1.2 In windy conditions the distance shall be increased to ensure that if the tape should fall it will not be blown nearer than 3 metres from the live high-voltage equipment.

- 20.1.3 Special measuring devices longer than 2 metres such as survey staves and rods may be used if these are of non-conducting material and approved by the responsible Electrical Engineer in Transnet, but these devices must not be used within 3 metres of live high-voltage equipment in rainy or wet conditions.
- 20.1.4 The assistance of the Electrical Officer (Contracts) shall be requested when measurements within the limits defined in 20.1.1 to 20.1.3 are required.
- 20.1.5 The restrictions described in 20.1.1 to 20.1.3 do not apply on a bridge deck between permanent parapets nor in other situations where a barrier effectively prevents contact with the live high-voltage equipment.
- 20.2 Portable Ladders
- 20.2.1 Any type of portable ladder longer than 2 metres may only be used near live high-voltage equipment under the direct supervision of the Responsible Representative. He shall ensure that the ladder is always used in such a manner that the distance from the base of the ladder to any live high-voltage equipment is greater than the fully extended length of the ladder plus 3 metres. Where these conditions cannot be observed, the Electrical Officer (Contracts) shall be advised, and he will arrange for suitable safety measures to be taken.

21. **CARRYING AND HANDLING MATERIAL AND EQUIPMENT**

- 21.1 Pipes, scaffolding, iron sheets, reinforcing bars and other material, which exceeds 2 metres in length, shall be carried completely below head height near live high-voltage equipment. For maximum safety two or more persons so as to maintain it as nearly as possible in a horizontal position should carry such material. The utmost care must be taken to ensure that no part of the material comes within 3 metres of any live high-voltage equipment.
- 21.2 Long lengths of wire or cable shall never be run out in conditions where a part of a wire or cable can come within 3 metres of any live high-voltage equipment unless the Electrical Officer (Contracts) has been advised and has approved appropriate safety precautions.
- 21.3 The presence of overhead power lines shall always be taken account of especially when communications lines or cables or aerial cables, stay wires, etc. are being erected above ground level.

22. **PRECAUTIONS TO BE TAKEN WHEN ERECTING OR REMOVING POLES, ANTENNAE, TREES ETC.**

- 22.1 A pole may be handled for the purpose of erection or removal near high-voltage equipment under the following conditions:
- (i) If the distance between the point at which the pole is to be erected or removed and the nearest live high-voltage equipment is more than the length of the pole plus 3 metres, the work shall be supervised by the Responsible Representative.

- (ii) If the distance described in (i) is less than the length of the pole plus 3 metres, the Electrical Officer (Contracts) shall be consulted to arrange for an Authorised Person to supervise the work and to ensure that the pole is earthed where possible. The pole shall be kept in contact with the point of erection, and adequate precautions shall be taken to prevent contact with live high-voltage equipment.

22.2 The cost of supervision by an Authorised Person and the provision of earthing shall, unless otherwise agreed, be borne by the Contractor.

22.3 The provisions of clauses 22.1 and 22.2 shall also apply to the erection or removal of columns, antennae, trees, posts, etc.

23. **USE OF WATER**

23.1 No water shall be used in the form of a jet if it can make contact with any live high-voltage equipment or with any person working on such equipment.

24. **USE OF CONSTRUCTION PLANT**

24.1 "Construction plant" entails all types of plant including cranes, piling frames, boring machines, excavators, draglines, dewatering equipment and road vehicles with or without lifting equipment.

24.2 When work is being undertaken in such a position that it is possible for construction plant or its load to come within 3 metres of live high-voltage equipment, the Electrical Officer (Contracts) shall be consulted. He will arrange for an Authorised Person to supervise the work and to ensure that the plant is adequately earthed. The Electrical Officer (Contracts) will decide whether further safety measures are necessary.

24.3 The cost of any supervision by an Authorised Person and the provision of earthing shall, unless otherwise agreed, be borne by the Contractor.

24.4 When loads are handled by cranes, non-metallic rope hand lines shall be used, affixed to such loads so as to prevent their swinging and coming within 3 metres of live high-voltage equipment.

24.5 Clauses 24.1 to 24.4 shall apply mutatis mutandis to the use of maintenance machines of any nature.

25. **WORK PERFORMED UNDER DEAD CONDITIONS UNDER COVER OF A WORK PERMIT**

25.1 If the Responsible Representative finds that the work cannot be done in safety with the high-voltage electrical equipment live, he shall consult the Electrical Officer (Contracts) who will decide on the action to be taken.

25.2 If a work permit is issued the Responsible Representative shall -

- (i) before commencement of work ensure that the limits within which work may be carried out

have been explained to him by the Authorised Person who issued the permit to him, and that he fully understands these limits.

- (ii) sign portion C of the permit before commencement of work;
- (iii) explain to all persons under his control the limits within which work may be carried out, and ensure that they fully understand these limits;
- (iv) care for the safety of all persons under his control whilst work is in progress; and
- (v) withdraw all personnel under his control from the equipment on completion of the work before he signs portion D of the work permit.

26. **TRACTION RETURN CIRCUITS IN RAILS**

26.1 DANGEROUS CONDITIONS CAN BE CREATED BY REMOVING OR SEVERING ANY BOND.

26.2 Broken rails with an air gap between the ends, and joints, at which fishplates are removed under "broken bond" conditions, are potentially lethal. The rails on either side of an air gap between rail ends on electrified lines shall not be touched simultaneously until rendered safe by Transnet personnel.

26.3 The Contractor shall not break any permanent bonds between rails or between rails and any structure. He shall give the Technical Officer at least 7 days written notice when removal of such bonds is necessary.

26.4 No work on the track which involves interference with the traction return rail circuit either by cutting or removing the rails, or by removal of bonds shall be done unless the Electrical Officer (Contracts) is consulted. He will take such precautions as may be necessary to ensure continuity of the return circuit before permitting the work to be commenced.

27. **BLASTING**

27.1 The Contractor shall obtain the permission of the Electrical Officer (Contracts) before blasting, and shall give at least 14 days notice of his intention to blast.

27.2 No blasting shall be done in the vicinity of electrified lines unless a member of Transnet's electrical personnel is present.

27.3 The terms of clause 13 hereof shall be strictly adhered to.

28. **HIGH-VOLTAGE ELECTRICAL EQUIPMENT NOT MAINTAINED AND/OR OPERATED BY TRANSNET**

Where the work is undertaken on or near high-voltage electrical equipment which is not maintained and/or operated by Transnet, the Occupational Health and Safety Act No. 85 of 1993, and Regulations and Instructions, or the Mines Health and Safety Act (Act 29 of 1996), shall apply.

Such equipment includes: -

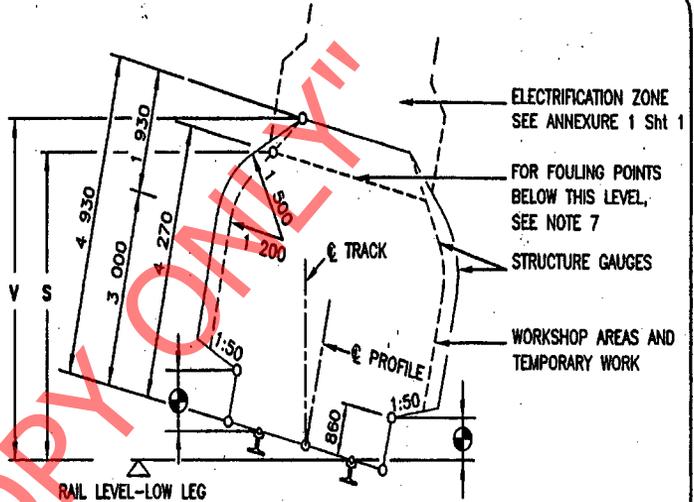
- (i) Eskom and municipal equipment;
- (ii) the Contractor's own power supplies; and
- (iii) electrical equipment being installed but not yet taken over from the Contractor.

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LOCATION	RADIUS (mm)	NOT ELECTRIFIED S (mm)	ELECTRIFIED (PRESENT OR FUTURE)	
			3kV & 25kV V (mm)	50kV V (mm)
ALL AREAS OTHER THAN THOSE INDICATED BY * BELOW	100	4 470	5 050	5 400
	300	4 410	5 020	5 370
	600	4 370	5 000	5 350
	1 000	4 350	4 990	5 340
	1 500	4 310	4 960	5 310
	2 000	4 290	4 940	5 290
	>3 000	4 270	4 930	5 280
* OVER OR NEAR POINTS AND CROSSING IF REQUIRED BY ELECTRICAL IRRESPECTIVE OF RADIUS			5 650	6 000



REMARKS:

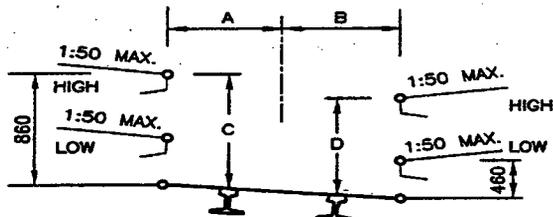
1. V IS THE REQUIRED VERTICAL CLEARANCE EXCEPT WHERE REDUCED CLEARANCE S APPLIES.
2. S IS THE MINIMUM VERTICAL CLEARANCE FOR STRUCTURES AND TEMPORARY WORK OVER NON-ELECTRIFIED LINES.
3. INTERMEDIATE VALUES MAY BE INTERPOLATED BY THE ENGINEER IN CHARGE.
4. FOR APPLICATION AT CURVES
 - 4.1 APPLY INCREASED CLEARANCES FOR CURVES TO POINTS 3m BEYOND THE ENDS OF THE CIRCULAR CURVE.
 - 4.2 REDUCE CLEARANCES AT A UNIFORM RATE OVER THE REMAINDER OF THE TRANSITION CURVE.
 - 4.3 FOR NON-TRANSITIONED CURVES REDUCE AT A UNIFORM RATE OVER A LENGTH OF 15m ALONG STRAIGHTS.
5. NEW STRUCTURES: SEE BRIDGE CODE.
6. TUNNELS: SEE DRAWING BE 82-35.
7. FOULING POINTS: SEE CLAUSE 8.1.
8. CLEARANCES ARE BASED ON 15m BOGIE CENTRES AND 21,2m VEHICLE BODY LENGTH.
9. SEE ANNEXURE 1 SHEET 3 FOR PLATFORM CLEARANCES.

ANNEXURE 1
SHEET 2 of 5
AMENDMENT

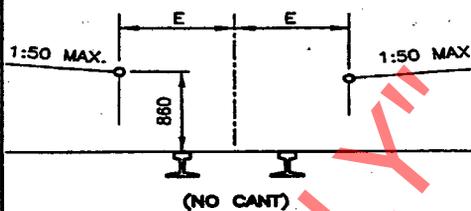
VERTICAL CLEARANCES :
1 065mm TRACK GAUGE

PLATFORMS : TRACK GAUGE 1 065mm

PASSENGERS



GOODS

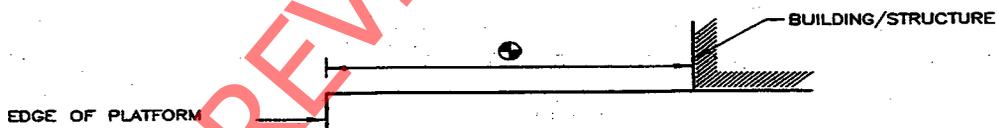


RADIUS (m)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
90	1 690	1 820	890	810	1 840
100	1 650	1 790	890	810	1 810
120	1 610	1 740	890	810	1 760
140	1 580	1 700	890	810	1 720
170	1 550	1 660	890	810	1 690
200	1 530	1 630	890	820	1 670
250	1 520	1 600	890	820	1 640
300	1 520	1 580	890	830	1 620
350	1 520	1 560	880	830	1 600
400	1 520	1 550	880	840	1 590
500	1 520	1 540	880	850	1 580
600	1 520	1 530	870	850	1 570
800	1 520	1 520	860	860	1 560
1 200	1 520	1 520	860	860	1 550
2 000	1 520	1 520	860	860	1 540
3 000	1 520	1 520	860	860	1 530
STRAIGHT	1 520	1 520	860	860	1 520

REMARKS:

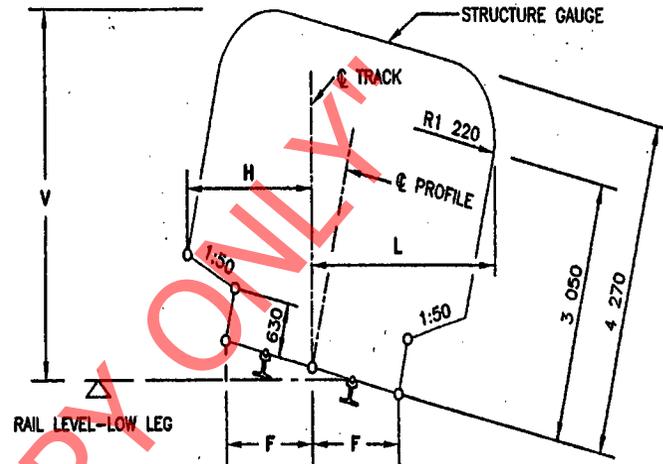
- NO CANT TO BE APPLIED EXCEPT WHEN THE GOODS PLATFORM IS ON A RUNNING LINE.
- INTERMEDIATE VALUES MAY BE INTERPOLATED BY THE ENGINEER IN CHARGE.
- 8m TO MAIN STATION-BUILDINGS AND 3m TO ALL OTHER STRUCTURES.
- TOLERANCES : SEE CLAUSE 8.0.10.

STRUCTURES ON PLATFORMS : 1 065mm AND 610mm TRACK GAUGE



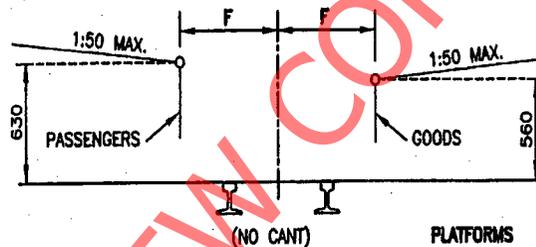
BE 97-01 SHT 5 of 5 DATE : JUNE 2000

RADIUS (m)	WITH CANT		NO CANT	V (mm)
	H (mm)	L (mm)	H & L (mm)	
50	2 370	2 490	2 400	4 320
70	2 310	2 420	2 330	4 310
100	2 260	2 370	2 280	4 310
140	2 220	2 340	2 250	4 310
200	2 200	2 300	2 220	4 300
300	2 190	2 270	2 200	4 300
500	2 180	2 230	2 190	4 290
700	2 170	2 200	2 180	4 270
1 000	2 170	2 170	2 170	4 270
>2 000	2 160	2 160	2 160	4 270



RAIL LEVEL-LOW LEG

CLEARANCES



RADIUS (m)	F (mm)
50	1 550
60	1 510
80	1 460
100	1 430
120	1 410
140	1 390
170	1 380
200	1 370
250	1 360
300	1 350
600	1 330
1 000	1 320
>2 000	1 320
STRAIGHT	1 310

REMARKS:

1. H IS THE MINIMUM HORIZONTAL CLEARANCE ON THE OUTSIDE OF THE CURVE BASED ON MINIMUM CANT.
2. L IS THE MINIMUM HORIZONTAL CLEARANCE ON THE INSIDE OF THE CURVE BASED ON MAXIMUM CANT.
3. V IS THE MINIMUM VERTICAL CLEARANCE.
4. FOR APPLICATION AT CURVES:
 - 4.1 APPLY INCREASED CLEARANCES FOR CURVES TO POINTS 2m BEYOND THE ENDS OF THE CIRCULAR CURVE.
 - 4.2 REDUCE CLEARANCES AT A UNIFORM RATE OVER THE REMAINDER OF THE TRANSITION CURVE.
 - 4.3 FOR NON-TRANSITIONED CURVES REDUCE AT A UNIFORM RATE OVER A LENGTH OF 18m ALONG STRAIGHTS.
5. INTERMEDIATE VALUES MAY BE INTERPOLATED BY THE ENGINEER IN CHARGE.
6. ALSO REFER TO REMARKS 5, 6 AND 7 OF ANNEXURE 1 SHEET 2.
7. CLEARANCES ARE BASED ON 9 700mm BOGIE CENTRES AND 13 700mm VEHICLE BODY LENGTH.
8. SEE ANNEXURE 1 SHEET 3 FOR STRUCTURES ON PLATFORMS.

ANNEXURE 1
SHEET 5 of 5
AMENDMENT

CLEARANCES : 610mm TRACK GAUGE