

## C1.1: Form of Offer & Acceptance

### Offer

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

**The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)**

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

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

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

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

Signature(s)

Name(s)

Capacity

**For the tenderer:**

(Insert name and address of organisation)

Name & signature of witness

Date

Tenderer's CIDB registration number:

## Acceptance

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

The terms of the contract, are contained in:

Part C1	Agreements and Contract Data, (which includes this Form of Offer and Acceptance)
Part C2	Pricing Data
Part C3	Scope of Work: Works Information
Part C4	Site Information

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

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

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

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



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

Signature(s)

Name(s)

Capacity

**for the  
Employer**

Transnet SOC Ltd

*(Insert name and address of organisation)*

Name &  
signature of  
witness

Date



**Schedule of Deviations**

Note:

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

No.	Subject	Details
1		
2		
3		
4		

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

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

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



## C1.2 Contract Data

### Part one - Data provided by the *Employer*

Clause	Statement	Data
<b>1</b>	<b>General</b>	
	The <i>conditions of contract</i> are the core clauses and the clauses for main Option	
		<b>Engineering and Construction Contract (ECC) Option B: Priced contract with bill of quantities</b>
	dispute resolution Option and secondary Options	<b>W1: Dispute resolution procedure</b>
		<b>X2: Changes in the law</b>
		<b>X5: Sectional Completion</b>
		<b>X7: Delay damages</b>
		<b>X13: Performance bond</b>
		<b>X16: Retention</b>
		<b>X18: Limitation of liability</b>
		<b>Z: Additional conditions of contract</b>
		<b>Z1: Intellectual property</b>
		<b>Z2: Assignment and Waiver</b>
		<b>Z3: Right Reserved by Transnet to Conduct State Security Agency (SSA) Vetting</b>
		<b>Z4: Additional Clause Relating to Collusion</b>
		<b>Z5: Protection of Personal Information Act</b>
		<b>Z6: Additional clause relating to Performance Bonds and/or Guarantees</b>
		<b>Z7: Obligations in respect of Joint Venture Agreements</b>
		<b>Z8: Compensation events</b>
		<b>Z9: Obligations In Respect Of The CSDG Goals</b>



	of the NEC3 Engineering and Construction Contract April 2013 <sup>1</sup>	
10.1	The <i>Employer</i> is:	<b>Transnet SOC Ltd (Reg no. 1990/000900/30)</b>
	Address	<b>Johannesburg</b>
	Having elected its Contractual Address for the purposes of this contract as:	<b>Transnet Pipelines 202 Anton Lembede Street Durban, South Africa 4001</b>
10.1	The <i>Project Manager</i> is: (Name)	<b>TBC</b>
	Address	<b>Transnet Pipelines 202 Anton Lembede Street Durban, South Africa 4001</b>
	Tel	<b>TBC</b>
	Fax	<b>n/a</b>
	e-mail	<b>TBC</b>
10.1	The <i>Supervisor</i> is: (Name)	<b>TBC</b>
	Address	<b>Transnet Pipelines 202 Anton Lembede Street Durban, South Africa 4001</b>
	Tel No.	<b>TBC</b>
	Fax No.	<b>n/a</b>
	e-mail	<b>TBC</b>
11.2(13)	The <i>works</i> are	<b>Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg)</b>
11.2(14)	The following matters will be included in the Risk Register	<b>1. Unknown Services on the Ground. 2. Community Unrest 3. Local Business Forums</b>
11.2(15)	The <i>boundaries of the site</i> are	<b>As prescribed in Part C3</b>

<sup>1</sup> Available from Engineering Contract Strategies Tel 011 803 3008, Fax 011 803 3009



11.2(16)	The Site Information is	<b>As prescribed in Part C3</b>	
11.2(19)	The Works Information is in	<b>Part C3</b>	
12.2	The <i>law of the contract</i> is the law of	<b>The Republic of South Africa subject to the jurisdiction of the Courts of South Africa.</b>	
13.1	The <i>language of this contract</i> is	<b>English</b>	
13.3	The <i>period for reply</i> is	<b>2 weeks</b>	
<b>2</b>	<b>The Contractor's main responsibilities</b>	<b>No additional data is required for this section of the <i>conditions of contract</i>.</b>	
<b>3</b>	<b>Time</b>		
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	<b>11 February 2025</b>	
11.2(9)	The <i>key dates</i> and the <i>conditions</i> to be met are:	<b>Condition to be met</b>	<b>key date</b>
	<b>As described in detail Part 3 Works Information</b>		
		<i>Key dates</i> will be based on the bidder's programme	
30.1	The <i>access dates</i> are	<b>Part of the Site</b>	<b>Date</b>
		<b>1 Site</b>	
		<b>Section 1 (KP 0 to 180): Assumed on appointment.</b>	<b>12 February 2024 (subject to safety file approval)</b>
		<b>Section 2 (KP 180 to 390): Assumed on appointment.</b>	<b>12 February 2024.</b>
		<b>Section 3 (KP 390 to 553): On completion of Section</b>	<b>03 July 2024.</b>
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	<b>2 weeks of the Contract Date.</b>	
31.2	The <i>starting date</i> is	<b>12 February 2024</b>	
32.2	The Contractor submit a revised programme	<b>Every 4 weeks</b>	

## 4 Testing and Defects



42.2	The <i>defects date</i> is	<b>52 weeks after Completion of the whole of the works.</b>
43.2	The <i>defect correction period</i> is	<b>2 weeks</b>
<b>5</b>	<b>Payment</b>	
50.1	The <i>assessment interval</i> is monthly on the	<b>15<sup>th</sup> (fifteenth) day of each successive month, and the final invoice to be submitted by the 20<sup>th</sup> (twentieth) day of each successive month</b>
51.1	The <i>currency of this contract</i> is the	<b>South African Rand.</b>
51.2	The period within which payments are made is	<b>30 days from date of receipt of valid Tax Invoice and month-end Statement.</b>
51.4	The <i>interest rate</i> is	<b>Prime lending rate of the Rand Merchant Bank South Africa as determined from time to time.</b>
<b>6</b>	<b>Compensation events</b>	
60.1(13)	The <i>weather measurements</i> to be recorded for each calendar month are,	<b>the cumulative rainfall (mm)</b>  <b>the number of days with rainfall more than 10 mm</b>
	The place where weather is to be recorded (on the Site) is:	<b>The site under execution</b>
	The <i>weather data</i> are the records of past <i>weather measurements</i> for each calendar month which were recorded at:	<b>The closest weather station to the site under execution</b>
	and which are available from:	<b>South African Weather Services 012 367 6000 or <a href="mailto:info4@weathersa.co.za">info4@weathersa.co.za</a>.</b>
<b>7</b>	<b>Title</b>	<b>No additional data is required for this section of the conditions of contract.</b>
<b>8</b>	<b>Risks and insurance</b>	
84.2	The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the <i>works</i> , Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i> ) caused by activity in connection with this contract for any one event is	<b>Whatever the <i>Contractor</i> requires in addition to the amount of insurance taken out by the <i>Employer</i> for the same risk.</b>
	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract for any one event is	<b>The <i>Contractor</i> must comply at a minimum with the provisions of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 as amended.</b>



84.2	<p>The insurance against loss of or damage to the works, Plant and Materials as stated in the insurance policy for contract works and public liability selected from:                  Blanket Principal Controlled Insurance (BPCI),                  Principal Controlled Insurance (PCI),                  Principal Controlled Contractors Liability Insurance,                  Principal Controlled Insurance One-off; and                  Project Specific Insurance</p>	<p>R</p> <table border="1" data-bbox="898 383 1163 629"> <tr> <td>Select one</td> <td></td> </tr> <tr> <td>BPCI</td> <td>x</td> </tr> <tr> <td>PCI</td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>PCI Liab only</td> <td></td> </tr> <tr> <td>PCI One Off</td> <td></td> </tr> <tr> <td>PSI</td> <td></td> </tr> </table>	Select one		BPCI	x	PCI				PCI Liab only		PCI One Off		PSI	
Select one																
BPCI	x															
PCI																
PCI Liab only																
PCI One Off																
PSI																
84.1	<p>The <i>Employer</i> provides these insurances from the Insurance Table</p> <p>1 Insurance against:</p> <p>Cover / indemnity:</p> <p>The deductibles are:</p> <p>2 Insurance against:</p> <p>Cover / indemnity</p> <p>The deductibles are</p>	<p><b>Loss of or damage to the works, Plant and Materials is as stated in the <b>selected</b> Insurance policy for Contract Works/ Public Liability.</b></p> <p><b>to the extent as stated in the <b>selected</b> insurance policy for Contract Works / Public Liability</b></p> <p><b>as stated in the <b>selected</b> insurance policy for Contract Works / Public Liability (Principal Controlled Insurance)</b></p> <p><b>Loss of or damage to property (except the works, plant, materials &amp; equipment) and liability for bodily injury to or death of a person (not an employee of the Contractor) arising out of or in connection with the performance of the Contract as stated in the <b>selected</b> insurance policy for Contract Works / Public Liability</b></p> <p><b>Is to the extent as stated in the <b>selected</b> insurance policy for Contract Works / Public Liability</b></p> <p><b>as stated in the <b>selected</b> insurance policy for Contract Works / Public Liability</b></p>														
84.1	<p>3 Insurance against:</p> <p>Cover / indemnity</p> <p>The deductibles are:</p> <p>4 Insurance against:</p> <p>Cover / indemnity</p>	<p><b>Loss of or damage to Equipment (Temporary Works only) as stated in the <b>selected</b> insurance policy for contract Works and Public Liability</b></p> <p><b>Is to the extent as stated in the <b>selected</b> insurance policy for Contract Works / Public Liability</b></p> <p><b>As stated in the <b>selected</b> insurance policy for Contract Works / Public Liability</b></p> <p><b>Contract Works SASRIA insurance subject to the terms, exceptions and conditions of the SASRIA coupon</b></p> <p><b>Cover / indemnity is to the extent provided by the SASRIA coupon</b></p>														



	<p>The deductibles are</p>	<p>The deductibles are in respect of each, and every theft claim 0,1% of the contract value subject to a minimum of R2 500 and a maximum of R25 000.</p>
<p>84.1</p>	<p>The <i>Contractor</i> provides these additional insurances.</p>	<ol style="list-style-type: none"> <li>1 Where the contract requires that the design of any part of the <i>works</i> shall be provided by the <i>Contractor</i>, the <i>Contractor</i> shall satisfy the <i>Employer</i> that professional indemnity insurance cover in connection therewith has been affected</li> <li>2 Where the contract involves manufacture, and/or fabrication of Plant &amp; Materials, components or other goods to be incorporated into the <i>works</i> at premises other than the site, the <i>Contractor</i> shall satisfy the <i>Employer</i> that such plant &amp; materials, components or other goods for incorporation in the <i>works</i> are adequately insured during manufacture and/or fabrication and transportation to the site.</li> <li>3 Should the <i>Employer</i> have an insurable interest in such items during manufacture of fabrication, such interest shall not be noted by endorsement to the <i>Contractor's</i> policies of insurance as well as those of any subcontractor</li> <li>4 Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R5,000,000.00</li> <li>5 The insurance coverage referred to in 1, 2, 3, and 4 above shall be obtained from an insurer(s) in terms of an insurance policy approved by the <i>Employer</i>. The <i>Contractor</i> shall arrange with the insurer to submit to the <i>Project Manager</i> the original and the duplicate original of the policy or policies of insurance and the receipts for payment of current premiums, together with a certificate from the insurer or insurance broker concerned, confirming that the policy or policies provide the full coverage as required. The original policy will be returned to the <i>Contractor</i></li> </ol>
<p>9</p>	<p><b>Termination</b></p>	<p>There is no additional Contract Data required for this section of the conditions of contract.</p>



<b>10</b>	<b>Data for main Option clause</b>		
<b>B</b>	<b>Priced contract with Bill of Quantities</b>	<b>No additional data is required for this Option.</b>	
60.6	The <i>method of measurement</i> is	<b>Standard system of measuring builders work 7th edition and As per Pricing instruction of the works.</b>	
<b>11</b>	<b>Data for Option W1</b>		
W1.1	The <i>Adjudicator</i> is	<b>Both parties will agree as and when a dispute arises. If the parties cannot reach an agreement on the <i>Adjudicator</i>, the chairman of the Association of Arbitrators will appoint an <i>Adjudicator</i>.</b>	
W1.2(3)	The <i>Adjudicator nominating body</i> is:  If no <i>Adjudicator nominating body</i> is entered, it is:	<b>The Chairman of the Association of Arbitrators (Southern Africa)  the Association of Arbitrators (Southern Africa)</b>	
W1.4(2)	The <i>tribunal</i> is:	<b>Arbitration</b>	
W1.4(5)	The <i>arbitration procedure</i> is  The place where arbitration is to be held is  The person or organisation who will choose an arbitrator if the Parties cannot agree a choice or if the arbitration procedure does not state who selects an arbitrator, is	<b>The Rules for the Conduct of Arbitrations of the Association of Arbitrators (Southern Africa)  Durban, KwaZulu Natal  The Chairman of the Association of Arbitrators (Southern Africa)</b>	
<b>X2</b>	<b>Changes in the law</b>	<b>No additional data is required for this Option</b>	
<b>X7 &amp; X5</b>	<b>Sectional Completion and delay Damages</b>	<b>used together</b>	
<b>X5.1</b>	<b>Sectional Completion</b>	<b>Section</b>	<b>Description</b>
<b>X7.1</b>			<b>Completion Date</b>
		1	Section 1: Completion of Section KP 0 to 180
		2	Section 2: Completion of Section KP 180 to 390
		3	Section 3: Completion of Section KP 390 to 553
			03 July 2024
			17 October 2024
			31 January 2025



X7.1 X5.1	<b>Delay Damages for late Completion of each section of services are</b>	<u>Section</u>	<u>Description</u>	<u>Amount per day</u>
		1	Section 1: <b>Completion of Section KP 0 to 180</b>	R 25 000,00
		2	Section 2: <b>Completion of Section KP 180 to 390</b>	R 25 000,00
		3	Section 3: <b>Completion of Section KP 390 to 553</b>	R 25 000,00
				<b>Note: The Delay Damages is capped at 10% per section</b>
X7.1	Delay damages for Completion of the whole of the <i>works</i> are		<b>R 25 000,00 per day excl. VAT to maximum of 10% of the prices.</b>	
			<b>The parties agree that this constitutes a genuine pre-estimate of the damages.</b>	
<b>X13</b>	<b>Performance Bond</b>			
X13.1	The amount of the Performance Bond is		<b>5% of the total of the Price at the contract date (excluding V.A.T.) Refer to Clause Z7.</b>	
			<b>By an issuer reasonably acceptable to Transnet SOC Ltd</b>	
<b>X16</b>	<b>Retention</b>			
<b>X16.1</b>	The <i>retention free amount</i> is		0% of the Total of the Prices.	
	The <i>retention percentage</i> is		10% of the Total of the Prices.	
<b>X18</b>	<b>Limitation of liability</b>			
X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:		<b>Nil</b>	
X18.2	The <i>Contractor's</i> liability to the <i>Employer</i> for Defects that are not found until after the <i>defects date</i> is limited to:		<b>The Total of the Prices</b>	
X18.3	The <i>end of liability date</i> is		<b>5 (Five) years after Completion of the whole of the services</b>	



<b>Z</b>	<b><i>Additional conditions of contract</i></b>
<b>Z 1</b>	The <i>additional conditions of contract</i> are:
<b>Z 1.1</b>	Intellectual property rights (including patents, copyright, trademarks etc.) rest with the party owning them.
<b>Z 1.2</b>	The Employer indemnifies the Contractor against any claim or action (including costs) caused by or arising from the failure as the Employer to obtain such consent and the contractor indemnifies the Employer against any claim or action (including costs) caused by or arising from the failure of the Contractor to obtain such consent.
<b>Z 2</b>	<b>Assignment and Waiver</b>
<b>Z 2.1</b>	No rights, duties or liabilities under this contract may be ceded, assigned, transferred, conveyed or otherwise disposed of by either Party ( <i>Employer or Contractor</i> ) without the prior written consent of the other Party ( <i>Employer or Contractor</i> ), which consent shall not be unreasonably withheld.
<b>Z 2.2</b>	No grant by the <i>Contractor</i> or the <i>Employer</i> to the other of any concession, waiver, condonation or allowance is, in respect of any specific event or circumstance other than of which the grant was made, to constitute a waiver of the rights of the grantor in terms of the Contract or an <i>estoppel</i> of the grantor's right to enforce the provisions of the Contract.
<b>Z 3</b>	<p><b>RIGHT RESERVED BY TRANSNET TO CONDUCT VETTING THROUGH STATE SECURITY AGENCY (SSA):</b></p> <p>Transnet reserves the right to conduct vetting through State Security Agency (SSA) for security clearances of any Contractor who has access to National Key Points for the following without limitations:</p> <ol style="list-style-type: none"> <li>1. Confidential – this clearance is based on any information which may be used by malicious, opposing or hostile elements to harm the objectives and functions of an organ of state.</li> <li>2. Secret – clearance is based on any information which may be used by malicious, opposing or hostile elements to disrupt the objectives and functions of an organ of state.</li> <li>3. Top Secret – this clearance is based on information which may be used by malicious, opposing or hostile elements to neutralise the objectives and functions of an organ of state.</li> </ol>
<b>Z 4</b>	<p><b>ADDITIONAL CLAUSE RELATING TO COLLUSION IN THE CONSTRUCTION INDUSTRY</b></p> <p>The Contract award is made without prejudice to any rights Transnet may have to take appropriate action later with regard to any declared bid rigging including blacklisting</p>
<b>Z 5</b>	<p><b>PROTECTION OF PERSONAL INFORMATION ACT:</b></p> <p>The <i>Employer</i> and the <i>Contractor</i> are required to process information obtained for the duration of the Agreement in a manner that is aligned to the Protection of Personal Information Act</p>



## **Z 6 ADDITIONAL CLAUSE RELATING TO PERFORMANCE BONDS AND/OR GUARANTEES**

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

Failure to comply with this obligation by the *Contractor* will entitle the *Employer* to terminate the *Contractor's* obligation to Provide the remainder of the Works without any further entitlement to the *Contractor* for any payment or consideration with regards to the provision of the remainder of the work contracted for.

## **Z 7 OBLIGATIONS IN RESPECT OF JOINT VENTURE AGREEMENTS:**

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

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

- A brief description of the Contract and the Deliverables.
- The name, physical address, communications addresses and domicilium citandi et executandi of each of the constituents and of the Joint Venture.
- The constituents' interests.
- A schedule of the insurance policies, sureties, indemnities and guarantees which must be taken out by the Joint Venture and by the individual constituents.
- Details of an internal dispute resolution procedure.

Written confirmation by all of the constituents:

- i. of their joint and several liability to the *Employer* to Provide the *works*.
- ii. proof of separate bank account/s in the name of the joint venture.
- iii. identification of the lead in the joint venture confirming the authority of the lead to bind the joint venture through the *Contractor's* representative.
- iv. Identification of the roles and responsibilities of the constituents to provide the *works*.

Financial requirements for the Joint Venture:

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

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

## **Z8 COMPENSATION EVENTS**

### **Z8.1 Add to clause 60.1(13) and clause 60.1(19):**

Only the effect of time is taken into account in assessing this compensation event. The Prices are not to be changed.



<b>Z8.2</b>	<p>Amend the provisions of Clause 60.1(4) to read as follows:</p> <p>(4) The <i>Employer</i> gives an Instruction to stop or not to start any work or to change a Key Date. Any instructions issued by the <i>Employer</i> in terms whereof the <i>Contractor</i> will be required to stop work and comply with any Health and Safety requirement, policy, specification, or regulation, including conducting of Emergency exercises or any safety stand downs, or safety related matters shall not constitute a compensation event and will not result in a change to the Prices.</p>
<b>Z8.3</b>	<p>Add to clause 60.1(3):</p> <p>The <i>Contractor</i> indicates on his Programme when he plans to establish as each work area. The <i>Employer</i> requires at least 10 days notification prior to establishment to arrange access.</p>
<b>Z9</b>	<b>OBLIGATIONS IN RESPECT OF THE CSDG GOALS:</b>
<b>Z9.1</b>	It is a fundamental condition of contract that the tenderer meet the required CSDG goals as stated in the RFP
<b>Z9.1.1</b>	<p>Compliance with requirements</p> <p>The contractor shall:</p> <p>a) within 30 days of the contract coming into effect or the issuing of an order, submit to the employer's representative a contract compliance baseline training plan, taking into account the skills mix and type of workers that are to be engaged.</p> <p>b) at intervals not exceeding three (3) months, submit to the employer's representative interim contract compliance training reports; and</p> <p>c) shall within 30 days of reaching completion, end of the service, the delivery date for all work required or practical completion in the case of professional service, design and construct contracts, and engineering and construction works contracts, respectively, submit to the employer's representative a final contract compliance training report</p>
<b>Z9.1.2</b>	It is the responsibility of the Contractor to ensure that all CSDG goals and compliance requirements are satisfied.
<b>Z9.1.3</b>	It is the responsibility of the Contractor to notify the Employer of any changes to agreed upon CSDG goals
<b>Z9.1.4</b>	In the event that the contractor fails to provide reasonable explanation to the employer for any failure to achieve the contract participation goal, the sanctions as agreed in the contract shall apply
<b>Z9.1.5</b>	The employer has the right to withhold payment in respect of the main offer, should the contractor default on the implementation of achieving the CSDG goals. In such an instance the value of the payment withheld, shall be no less than the value of the CSDG requirement where non-performance has occurred
<b>Z9.1.6</b>	The Employer has the right to terminate the contract should the Contractor default on the CSDG condition of tender



# C1.2 Contract Data

## Part two - Data provided by the Contractor

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



Transnet Pipelines

Tender Number: TPL/2023/08/0004/39137/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

<b>B</b>	<b>Priced contract with Bill of Quantities</b>		
11.2(21)	The Bill of Quantities is in	<b>Part C2 Pricing Data</b>	
11.2(31)	The tendered total of the Prices is	<b>(in figures)</b> <b>(in words), excluding VAT</b>	
	<b>Data for Schedules of Cost Components</b>	<i>Note "SCC" means Schedule of Cost Components starting on page 56 of ECC, and "SSCC" means Shorter Schedule of Cost Components starting on page 59 of ECC.</i>	
<b>B</b>	<b>Priced contract with Bills of Quantities</b>	<b>Data for the Shorter Schedule of Cost Components</b>	
41 in SSCC	The percentage for people overheads is:	.....	
21 in SSCC	The published list of Equipment is the last edition of the list published by	.....	
	The percentage for adjustment for Equipment in the published list is	.....	
22 in SSCC	The rates of other Equipment are:	<b>Equipment</b>	<b>Size or Rate capacity</b>
61 in SSCC	The hourly rates for Defined Cost of design outside the Working Areas are	<b>Category of employee</b>	<b>Hourly rate</b>
62 in SSCC	The percentage for design overheads is	.....	

## C1.3 Forms of Securities

### **Pro forma Performance Guarantee**

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

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

Option X13: Performance bond

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

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

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

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

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

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

Transnet SOC Ltd  
C/o Transnet Pipelines  
Transnet Corporate Centre  
138 Eloff Street  
Braamfontein  
Johannesburg  
2000

Date:

Dear Sirs,

### Performance Bond for Contract No. TPL/2023/08/0005/39141/RFP

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

**Transnet SOC Limited, Registration No. 1990/000900/30** (the *Employer*) and

{Insert registered name and address of the *Contractor*} (the *Contractor*), for

{Insert details of the *works* from the Contract Data} (the *works*).

I/We the undersigned

on behalf of the  
Guarantor

of physical address

and duly authorised thereto do hereby bind ourselves as Guarantor and co-principal debtors in solidum for the due and faithful performance of all the terms and conditions of the Contract by the *Contractor* and for all losses, damages and expenses that may be suffered or incurred by the *Employer* as a result of non-performance of the Contract by the *Contractor*, subject to the following conditions:

1. The terms *Employer*, *Contractor*, *Project Manager*, *works* and Completion Certificate have the meaning as assigned to them by the *conditions of contract* stated in the Contract Data for the aforesaid Contract.
2. We renounce all benefits from the legal exceptions "Benefit of Excussion and Division", "No value received" and all other exceptions which might or could be pleaded against the validity of this bond, with the meaning and effect of which exceptions we declare ourselves to be fully acquainted.
3. The *Employer* has the absolute right to arrange his affairs with the *Contractor* in any manner which the *Employer* deems fit and without being advised thereof the Guarantor shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the Guarantor. Without derogating from the foregoing compromise, extension of the construction period, indulgence,



release or variation of the *Contractor's* obligation shall not affect the validity of this performance bond.

4. This bond will lapse on the earlier of
  - the date that the Guarantor receives a notice from the *Project Manager* stating that the Completion Certificate for the whole of the *works* has been issued, that all amounts due from the *Contractor* as certified in terms of the contract have been received by the *Employer* and that the *Contractor* has fulfilled all his obligations under the Contract, or
  - the date that the Surety issues a replacement Performance Bond for such lesser or higher amount as may be required by the *Project Manager*.
5. Always provided that this bond will not lapse in the event the Guarantor is notified by the *Project Manager*, (before the dates above), of the *Employer's* intention to institute claims and the particulars thereof, in which event this bond shall remain in force until all such claims are paid and settled.
6. The amount of the bond shall be payable to the *Employer* upon the *Employer's* demand and no later than 7 days following the submission to the Guarantor of a certificate signed by the *Project Manager* stating the amount of the *Employer's* losses, damages and expenses incurred as a result of the non-performance aforesaid. The signed certificate shall be deemed to be conclusive proof of the extent of the *Employer's* loss, damage and expense.
7. Our total liability hereunder shall not exceed the sum of:  
  
(say) \_\_\_\_\_  
  
R \_\_\_\_\_
8. This Performance Bond is neither negotiable nor transferable and is governed by the laws of the Republic of South Africa, subject to the jurisdiction of the courts of the Republic of South Africa

Signed at \_\_\_\_\_ on this \_\_\_\_\_ day of \_\_\_\_\_ 201\_

Signature(s)	_____
Name(s) (printed)	_____
Position in Guarantor company	_____
Signature of Witness(s)	_____
Name(s) (printed)	_____

## PART C2: PRICING DATA

Document reference	Title	No of pages
C2.1	Pricing instructions: Option B	4
C2.2	The <i>bill of quantities</i>	1

## C2.1 Pricing instructions: Option B

### 1. The *conditions of contract*

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

Clause 11 in NEC3 Engineering and Construction Contract, April 2013 (ECC3) Option B states:

<b>Identified and defined terms</b>	11	
	11.2	(21) The Bill of Quantities is the <i>bill of quantities</i> as changed in accordance with this contract to accommodate implemented compensation events and for accepted quotations for acceleration. (22) Defined Cost is the cost of the components in the Shorter Schedule of Cost Components whether work is subcontracted or not excluding the cost of preparing quotations for compensation events. (28) The Price for Work Done to Date is the total of <ul style="list-style-type: none"><li>• the quantity of the work which the <i>Contractor</i> has completed for each item in the Bill of Quantities multiplied by the rate and</li><li>• a proportion of each lump sum which is the proportion of the work covered by the item which the <i>Contractor</i> has completed.</li></ul> <p>Completed work is work without Defects which would either delay or be covered by immediately following work.</p> <p>(31) The Prices are the lump sums and the amounts obtained by multiplying the rates by the quantities for the items in the Bill of Quantities.</p>

This confirms that Option B is a re-measurement contract and the bill comprises only items measured using quantities and rates or stated as lump sums. Value related items are not used. Time related items are items measured using rates where the rate is a unit of time.

#### 1.2 Function of the Bill of Quantities

Clause 55.1 in Option B states, “Information in the Bill of Quantities is not Works Information or Site Information”. This confirms that instructions to do work or how it is to be done are not included in the Bill, but in the Works Information. This is further confirmed by Clause 20.1 which states, “The *Contractor* Provides the Works in accordance with the Works Information”. Hence the *Contractor* does **not** Provide the Works in accordance with the Bill of Quantities. The Bill of Quantities is only a pricing document.

#### 1.3 Guidance before pricing and measuring

Employers preparing tenders or contract documents, and tendering contractors are advised to consult the sections dealing with the bill of quantities in the NEC3 Engineering and Construction Contract (June 2005) Guidance Notes before preparing the *bill of quantities* or before entering rates and lump sums into the *bill*.

Historically bill of quantities-based contracts in South Africa have been influenced by the different approaches of the civil engineering and building sectors of the industry through their respective discipline based standard forms of contract and methods of measurement. This is particularly apparent in the approach to the Preliminary and General

bill. On the other hand, because ECC3 caters for a number of disciplines in the same contract, including electrical works, a different approach not currently found in local methods of measurement to the Preliminary & General bill items may have been used.

The NEC approach to the P & G bill assumes use will be made of method related charges for Equipment applied to Providing the Works based on durations shown in the Accepted Programme, fixed charges for the use of Equipment that is required throughout the construction phase, time related charges for people working in a supervisory capacity for the period required, and lump sum charges for other facilities or services not directly related to performing work items typically included in other parts of the bill.

## **1.4 General assumptions**

- 1.4.1 Unless otherwise stated, items are measured in accordance with the drawings, and no allowance has been made in the quantities for waste.
- 1.4.2 The Prices and rates stated for each item in the Bill of Quantities shall be treated as being fully inclusive of all work, risks, liabilities, obligations, overheads, profit and everything necessary as incurred or required by the Contractor in carrying out or providing that item.
- 1.4.3 Clause 63.13 in Option B provides that these rates and Prices may be used as a basis for assessment of compensation events instead of Defined Cost.
- 1.4.4 Where this Contract requires detailed drawings, designs or other information to be provided, and no rates or prices are included in the bill specifically for such matters, then the Contractor is deemed to have allowed for all costs associated with such requirements within the tendered rates and Prices in the Bill of Quantities.
- 1.4.5 An item against which no Price is entered will be treated as covered by other Prices or rates in the bill of quantities. If a number of items are grouped together for pricing purposes, this will be treated as a single lump sum.
- 1.4.6 The quantities contained in the Bill of Quantities may not be final and do not necessarily represent the actual amount of work to be done. The quantities of work assessed and certified for payment by the Project Manager at each assessment date will be used for determining payments due and not the quantities given in the Bill of Quantities.
- 1.4.7 The short descriptions of the items of payment given in the bill of quantities are only for the purposes of identifying the items. More detail regarding the extent of the work entailed under each item is provided in the Works Information (WI).

## **1.5 Amplification of or assumptions about measurement items**

For the avoidance of doubt the following is provided to assist in the interpretation of descriptions given in the *method of measurement*. In the event of any ambiguity or inconsistency between the statements in the *method of measurement* and this section, the interpretation given in this section shall be used.

## 1.6 Measurement and payment

### 1.6.1 Symbols

The units of measurement described in the Bill of Quantities are metric units abbreviated as follows:

Abbreviation	Unit
%	percent
h	hour
ha	hectare
kg	kilogram
kl	kilolitre
km	kilometre
km-pass	kilometre-pass
kPa	kilopascal
kW	kilowatt
l	litre
m	metre
mm	millimetre
m <sup>2</sup>	square metre
m <sup>2</sup> -pass	square metre pass
m <sup>3</sup>	cubic metre
m <sup>3</sup> -km	cubic metre-kilometre
MN	meganewton
MN.m	meganewton-metre
MPa	megapascal
No.	number
Prov sum <sup>1</sup>	provisional sum
PC-sum	prime cost sum
R/only	Rate only
sum	Lump sum
t	ton (1000kg)
W/day	Workday

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<sup>1</sup> Provisional Sums should not be used unless absolutely unavoidable. Rather include specifications and associated bill items for the most likely scope of work, and then change later using the compensation event procedure if necessary. This is because tenderers cannot programme effectively for unknown scopes of work

# C2.2 the *bill of quantities*

## Summary

Transnet Pipelines		
Tender Number: TPL/2023/08/0004/39137/RFP		
Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)		
BILL	DESCRIPTION	TOTAL
1	<b>Section 1: KP0 to KP180</b>	
	PRELIMINARIES KP0 to KP180	R
	ALTERATIONS KP0 to KP180	R
	EARTHWORKS KP0 to KP180	R
	ELECTRICAL WORKS KP0 to KP180	R
2	<b>Section 2: KP180 to KP390</b>	
	PRELIMINARIES KP180 to KP390	R
	ALTERATIONS KP180 to KP390	R
	EARTHWORKS KP180 to KP390	R
	ELECTRICAL WORKS KP180 to KP390	R
3	<b>Section 3: KP390 to KP553</b>	
	PRELIMINARIES KP390 to KP553	R
	ALTERATIONS KP390 to KP553	R
	EARTHWORKS KP390 to KP553	R
	ELECTRICAL WORKS KP390 to KP553	R
<b>TOTAL CARRIED TO THE FORM OF OFFER</b>		R

Transnet Pipelines

Tender Number: TPL/2023/08/0004/39137/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

Code	Description	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 1</b>				
	<b>PRELIMINARIES KP0 to KP180</b>				
	The NEC 3 Option B shall be the applicable building agreement, amended as hereinafter described				
	<b>PREAMBLES FOR TRADES</b>				
	The General Preambles for Trades 2017 published by the Association of South African Quantity Surveyors ("ASAQS") shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said General Preambles will be entertained.				
	Supplementary preambles and/or specifications are incorporated in these bills of quantities to satisfy the requirements of this project. Such supplementary preambles and/or specifications shall take precedence over the provisions of the General Preambles				
	The contractor's prices for all items throughout these bills of quantities shall take account of and include where applicable for all of the obligations, requirements and specifications given in the General Preambles and in any supplementary preambles and/or specifications, drawings (including details and all notes on drawings)				
	No claims arising from the brevity of descriptions will be considered				
	<b>PRICING OF PRELIMINARIES</b>				
1.1	<b>FIXED CHARGE ITEMS</b>				
1.1.1	Fixed related preliminaries and general (Contractor to provide detailed breakdown along with Tender Document Returnables)	Item	1	R	R
1.1.2	Training of Transnet Cathodic Protection technicians with TRU OEM (Electrical Manufacturing), 2 training sessions	Item	1	R	R
1.2	<b>TIME RELATED ITEMS</b>				
1.2.1	Time related preliminaries and general (Contractor to provide detailed breakdown along with Tender Document Returnables)	Weeks	18	R	R
	<b>TOTAL CARRIED FORWARD TO SUMMARY</b>				R

Transnet Pipelines

Tender Number: TPL/2023/08/0004/39137/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

Code	Description	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 2</b>				
	<b>PRELIMINARIES KP180 to KP390</b>				
	The NEC 3 Option B shall be the applicable building agreement, amended as hereinafter described				
	<b>PREAMBLES FOR TRADES</b>				
	The General Preambles for Trades 2017 published by the Association of South African Quantity Surveyors ("ASAQS") shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said General Preambles will be entertained.				
	Supplementary preambles and/or specifications are incorporated in these bills of quantities to satisfy the requirements of this project. Such supplementary preambles and/or specifications shall take precedence over the provisions of the General Preambles				
	The contractor's prices for all items throughout these bills of quantities shall take account of and include where applicable for all of the obligations, requirements and specifications given in the General Preambles and in any supplementary preambles and/or specifications, drawings (including details and all notes on drawings)				
	No claims arising from the brevity of descriptions will be considered				
	<b>PRICING OF PRELIMINARIES</b>				
2.1	<b>FIXED CHARGE ITEMS</b>				
2.1.1	Fixed related preliminaries and general (Contractor to provide detailed breakdown along with Tender Document Returnables)	Item	1	R	R
2.1.2	Training of Transnet Cathodic Protection technicians with TRU OEM (Electrical Manufacturing), 2 training sessions	Item	1	R	R
2.2	<b>TIME RELATED ITEMS</b>				
2.2.1	Time related preliminaries and general (Contractor to provide detailed breakdown along with Tender Document Returnables)	Weeks	12	R	R
	<b>TOTAL CARRIED FORWARD TO SUMMARY</b>				R

Transnet Pipelines

Tender Number: TPL/2023/08/0004/39137/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

Code	Description	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 3</b>				
	<b>PRELIMINARIES KP390 to KP553</b>				
	The NEC 3 Option B shall be the applicable building agreement, amended as hereinafter described				
	<b>PREAMBLES FOR TRADES</b>				
	The General Preambles for Trades 2017 published by the Association of South African Quantity Surveyors ("ASAQS") shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said General Preambles will be entertained.				
	Supplementary preambles and/or specifications are incorporated in these bills of quantities to satisfy the requirements of this project. Such supplementary preambles and/or specifications shall take precedence over the provisions of the General Preambles				
	The contractor's prices for all items throughout these bills of quantities shall take account of and include where applicable for all of the obligations, requirements and specifications given in the General Preambles and in any supplementary preambles and/or specifications, drawings (including details and all notes on drawings)				
	No claims arising from the brevity of descriptions will be considered				
	<b>PRICING OF PRELIMINARIES</b>				
3.1	<b>FIXED CHARGE ITEMS</b>				
3.1.1	Fixed related preliminaries and general (Contractor to provide detailed breakdown along with Tender Document Returnables)	Item	1	R	R
3.1.2	Training of Transnet Cathodic Protection technicians with TRU OEM (Electrical Manufacturing), 2 training sessions	Item	1	R	R
3.2	<b>TIME RELATED ITEMS</b>				
3.2.1	Time related preliminaries and general (Contractor to provide detailed breakdown along with Tender Document Returnables)	Weeks	23	R	R
	<b>TOTAL CARRIED FORWARD TO SUMMARY</b>				R

Transnet Pipelines

Tender Number: TPL/2023/08/0004/39137/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 4</b>				
	<b>ALTERATIONS WORKS KP0 to KP180</b>				
	<u>Explosives</u>				
	No explosives whatsoever may be used for alteration purposes unless otherwise stated				
	With regard to building up of openings in existing walls, cement screeds and pavings, granolithic, tops of walls, etc, shall be levelled and prepared for raising of brickwork				
	Making good of finishes shall include making good of the brick and concrete surfaces onto which the new finishes are applied, where necessary				
	<u>Cathodic Protection</u>				
4.1	<b>REMOVAL AND DISPOSAL OF EXISTING EQUIPMENT</b>				
4.1.1	Vandalised underground test post facility - (Refer to item 3.3 Scope of Works specification)	No.	28	R	R
4.1.2	Rocla external hinges - (Refer to item 3.12 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 013)	No.	22	R	R
	<b>TOTAL CARRIED FORWARD TO SUMMARY</b>				R

Transnet Pipelines

Tender Number: TPL/2023/08/0004/39137/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 5</b>				
	<b>ALTERATIONS WORKS KP180 to KP390</b>				
	<u>Explosives</u>				
	No explosives whatsoever may be used for alteration purposes unless otherwise stated				
	With regard to building up of openings in existing walls, cement screeds and pavings, granolithic, tops of walls, etc, shall be levelled and prepared for raising of brickwork				
	Making good of finishes shall include making good of the brick and concrete surfaces onto which the new finishes are applied, where necessary				
	<u>Cathodic Protection</u>				
5.1	<b>REMOVAL AND DISPOSAL OF EXISTING EQUIPMENT</b>				
5.1.1	Vandalised underground test post facility - (Refer to item 3.3 Scope of Works specification)	No.	1	R	R
5.1.2	Rocla external hinges - (Refer to item 3.12 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 013)	No.	9	R	R
	<b>TOTAL CARRIED FORWARD TO SUMMARY</b>				R

Transnet Pipelines

Tender Number: TPL/2023/08/0004/39137/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 6</b>				
	<b>ALTERATIONS WORKS KP390 to KP553</b>				
	<u>Explosives</u>				
	No explosives whatsoever may be used for alteration purposes unless otherwise stated				
	With regard to building up of openings in existing walls, cement screeds and pavings, granolithic, tops of walls, etc, shall be levelled and prepared for raising of brickwork				
	Making good of finishes shall include making good of the brick and concrete surfaces onto which the new finishes are applied, where necessary				
	<u>Cathodic Protection</u>				
6.1	<b>REMOVAL AND DISPOSAL OF EXISTING EQUIPMENT</b>				
6.1.1	Vandalised underground test post facility - (Refer to item 3.3 Scope of Works specification)	No.	0	R	R
6.1.2	Rocla external hinges - (Refer to item 3.12 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 013)	No.	17	R	R
	<b>TOTAL CARRIED FORWARD TO SUMMARY</b>				R

Transnet Pipelines

Tender Number: TPL/2023/08/0004/39137/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 7:</b>				
	<b>EARTHWORKS KP0 to KP180</b>				
	Carting away of excavated material				
	Descriptions of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations or, alternatively, from stock piles situated on the building site				
	Filling and layer work materials				
	Prices for filling are to include for all necessary density and other tests				
7.1	SUPPLY				
7.1.1	Plaster Sand or Washed Umgeni River Sand or Suitably leached mine sand	m <sup>3</sup>	163	R	R
7.2	Site clearance				
7.2.1	Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth	m <sup>2</sup>	330	R	R
7.3	EXCAVATIONS AND BACKFILLING				
7.3.1	Digging Holes, Compaction and Backfilling	m <sup>3</sup>	3624	R	R
7.4	Risk of collapse of excavations				
7.4.1	Sides of trench and hole excavations not exceeding 1,5m deep	m <sup>2</sup>	5436	R	R
7.4.2	Sides of trench and hole excavations exceeding 1,5m deep	m <sup>2</sup>	725	R	R
7.5	Keeping excavations free of water				
7.5.1	Keeping excavations free of all water other than subterranean water	Item	1	R	R
<b>TOTAL CARRIED FORWARD TO SUMMARY</b>					R -

Transnet Pipelines

Tender Number: TPL/2023/08/0004/39137/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 8:</b>				
	<b>EARTHWORKS KP 180 to KP390</b>				
	Carting away of excavated material				
	Descriptions of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations or, alternatively, from stock piles situated on the building site				
	Filling and layer work materials				
	Prices for filling are to include for all necessary density and other tests				
8.1	SUPPLY				
8.1.1	Plaster Sand or Washed Umgeni River Sand or Suitably leached mine sand	m <sup>3</sup>	117	R	R
8.2	Site clearance				
8.2.1	Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth	m <sup>2</sup>	340	R	R
8.3	EXCAVATIONS AND BACKFILLING				
8.3.1	Digging Holes, Compaction and Backfilling	m <sup>3</sup>	2600	R	R
8.4	Risk of collapse of excavations				
8.4.1	Sides of trench and hole excavations not exceeding 1,5m deep	m <sup>2</sup>	3900	R	R
8.4.2	Sides of trench and hole excavations exceeding 1,5m deep	m <sup>2</sup>	520	R	R
8.5	Keeping excavations free of water				
8.5.1	Keeping excavations free of all water other than subterranean water	Item	1	R	R
<b>TOTAL CARRIED FORWARD TO SUMMARY</b>					R -

Transnet Pipelines

Tender Number: TPL/2029/08/0004/99197/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL	
	<b>BILL NO. 9:</b>					
	<b>EARTHWORKS KP390 to KP553</b>					
	Carting away of excavated material					
	Descriptions of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations or, alternatively, from stock piles situated on the building site					
	Filling and layer work materials					
	Prices for filling are to include for all necessary density and other tests					
9.1	SUPPLY					
9.1.1	Plaster Sand or Washed Umgeni River Sand or Suitably leached mine sand	m <sup>3</sup>	693	R	R	
9.2	Site clearance					
9.2.1	Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth	m <sup>2</sup>	990	R	R	
9.3	EXCAVATIONS AND BACKFILLING					
9.3.1	Digging Holes, Compaction and Backfilling	m <sup>2</sup>	1712	R	R	
9.4	Risk of collapse of excavations					
9.4.1	Sides of trench and hole excavations not exceeding 1,5m deep	m <sup>2</sup>	2568	R	R	
9.4.2	Sides of trench and hole excavations exceeding 1,5m deep	m <sup>2</sup>	342	R	R	
9.5	Keeping excavations free of water					
9.5.1	Keeping excavations free of all water other than subterranean water	Item	1	R	R	
<b>TOTAL CARRIED FORWARD TO SUMMARY</b>					R	-

## Transnet Pipelines

Tender Number: TPL/2023/08/0004/39137/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 10</b>				
	<b>ELECTRICAL WORKS KP0 to KP180</b>				
	<b>ELECTRICAL, ELECTRONICAL INSTALLATIONS</b>				
	<u>Specifications, drawings, etc</u>				
	Tenderers are referred to the specification and drawings annexed to these bills of quantities for the electrical work, for the full descriptions of the following items which are to be read and priced in conjunction with the said specification and drawings				
	<b>Cathodic Protection</b>				
10.1	<b>Supply</b>				
10.1.1	Underground test post facility - (Refer to item 3.3 Scope of Works specification)	No.	27	R	R
10.1.2	Bluetooth LE Smart Key (Long) with carry case kit - (Refer to item 3.3.1 Scope of Works)	No.	5	R	R
10.1.3	<b>Cable Extension at each Test Post</b>				
10.1.3.1	Type A Cable Extension at each Test Post - Refer to item 3.5.1 & 3.6.1 (Scope of Works)				
a	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	12	R	R
b	16mm <sup>2</sup> PVC/PVC Black Cable (Pipe)	m	24	R	R
c	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	12	R	R
d	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	12	R	R
e	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	15	R	R
f	Wiring Accessories for Splicing Joints	No.	15	R	R
10.1.3.2	Type B Cable Extension at each Test Post - Refer to item 3.5.2 & 3.6.2 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	12	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	12	R	R
c	16mm <sup>2</sup> PVC/PVC Black Cable (Pipe)	m	24	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	12	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	12	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	18	R	R
g	Wiring Accessories for Splicing Joints	No.	18	R	R
10.1.3.3	Type C Cable Extension at each Test Post - Refer to item 3.5.3 & 3.6.3 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	76	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	76	R	R
c	35mm <sup>2</sup> PVC Black Cable (TPL and Foreign Pipe)	m	380	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	76	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	76	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	152	R	R
g	Wiring Accessories for Splicing Joints	No.	152	R	R
10.1.3.4	Type E Cable Extension at each Test Post - Refer to item 3.5.4 & 3.6.4 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	8	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	8	R	R
c	16mm <sup>2</sup> PVC Black Cable (Ends to have correct heat shrink for identification)	m	80	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	8	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	8	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	24	R	R
g	Wiring Accessories for Splicing Joints	No.	24	R	R

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 10</b>				
	<b>ELECTRICAL WORKS KP0 to KP180</b>				
10.1.4	Buried Permanent Reference Electrode (PRE)- (Refer to Annexure H) / (Refer to item 3.9 Scope of Works)	No.	425	R	R
10.1.5	DC Coupon- (Refer to Annexure H) - (Refer to item 3.8 Scope of Works specification)	No.	402	R	R
10.1.6	AC Coupon-(Refer to Annexure H) - (Refer to item 3.8 Scope of Works specification)	No.	288	R	R
10.1.7	Link Panel-(Refer to Annexure H) - (Refer to item 3.3.2 Scope of Works specification)	No.	88	R	R
10.1.8	MOV- (Refer to Annexure H) - (Refer to item 3.14 Scope of Works specification)	No.	288	R	R
10.1.9	DC Decoupler - (Refer to Annexure H) - (Refer to item 3.13 Scope of Works specification)	No.	60	R	R
10.1.10	TPL Resistive Bond Link Panel - Type 1 (UG) - (Refer to Annexure H) - (Refer to item 3.5.3 Scope of Works specification)	No.	19	R	R
10.1.11	TPL Resistive Bond Link Panel - Type 2 (Bunker) - (Refer to Annexure H) - (Refer to item 3.6.3. Scope of Works specification)	No.	52	R	R
10.1.12	Calibration Tube Cover - (Refer to Annexure H) - (Refer to item 3 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 018)	No.	0	R	R
10.1.13	Replace Buried Calibration Tube - (Refer to Annexure H) - (Refer to item 3 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 018)	No.	0	R	R
10.1.14	ER Probe - (Refer to Annexure H) - (Refer to item 3.10 Scope of Works specification)	No.	2	R	R
10.1.15	Rocla Internal Steel Lining - (Refer to item 3.12 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 013)	No.	22	R	R
10.1.16	Rocla Internal Hinges - (Refer to item 3.12 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 013)	No.	22	R	R
10.1.17	NDU-VT - (Refer to Annexure H) - (Refer to item 3.11 Scope of Works specification)	No.	0	R	R
10.2	<b>Install and Commission</b>				
10.2.1	Underground test post facility - (Refer to item 3.3 Scope of Works specification)	No.	27	R	R
10.2.2	<b>Cable Extension at each Test Post</b>				
10.2.2.1	Type A Cable Extension at each Test Post - Refer to item 3.5.1 & 3.6.1 (Scope of Works)				
a	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	12	R	R
b	16mm <sup>2</sup> PVC/PVC Black Cable (Pipe)	m	24	R	R
c	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	12	R	R
d	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	12	R	R
e	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	15	R	R
f	Wiring Accessories for Splicing Joints	No.	15	R	R
10.2.2.2	Type B Cable Extension at each Test Post - Refer to item 3.5.2 & 3.6.2 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	12	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	12	R	R
c	16mm <sup>2</sup> PVC/PVC Black Cable (Pipe)	m	24	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	12	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	12	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	18	R	R
g	Wiring Accessories for Splicing Joints	No.	18	R	R
10.2.2.3	Type C Cable Extension at each Test Post - Refer to item 3.5.3 & 3.6.3 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	76	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	76	R	R
c	35mm <sup>2</sup> PVC Black Cable (TPL and Foreign Pipe)	m	380	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	76	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	76	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	152	R	R
g	Wiring Accessories for Splicing Joints	No.	152	R	R
10.2.2.4	Type E Cable Extension at each Test Post - Refer to item 3.5.4 & 3.6.4 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	8	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	8	R	R
c	16mm <sup>2</sup> PVC Black Cable (Ends to have correct heat shrink for identification)	m	80	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	8	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	8	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	24	R	R
g	Wiring Accessories for Splicing Joints	No.	24	R	R

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 10</b>				
	<b>ELECTRICAL WORKS KP0 to KP180</b>				
10.2.3	Buried Permanent Reference Electrode (PRE)- (Refer to Annexure H) / (Refer to item 3.9 Scope of Works)	No.	425	R	R
10.2.4	DC Coupon - (Refer to Annexure H) - (Refer to item 3.8 Scope of Works specification)	No.	402	R	R
10.2.5	AC Coupon - (Refer to Annexure H) - (Refer to item 3.8 Scope of Works specification)	No.	288	R	R
10.2.6	Link Panel - (Refer to Annexure H) - (Refer to item 3.3.2 Scope of Works specification)	No.	88	R	R
10.2.7	MOV- (Refer to Annexure H) - (Refer to item 3.14 Scope of Works specification)	No.	288	R	R
10.2.8	DC Decoupler - (Refer to Annexure H) - (Refer to item 3.13 Scope of Works specification)	No.	60	R	R
10.2.9	TPL Resistive Bond Link Panel - Type 1 (UG) - (Refer to Annexure H) - (Refer to item 3.5.3 Scope of Works specification)	No.	19	R	R
10.2.10	TPL Resistive Bond Link Panel - Type 2 (Bunker) - (Refer to Annexure H) - (Refer to item 3.6.3. Scope of Works specification)	No.	52	R	R
10.2.11	Calibration Tube Cover - (Refer to Annexure H) - (Refer to item 3 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 018)	No.	0	R	R
10.2.12	Replace Buried Calibration Tube - (Refer to Annexure H) - (Refer to item 3 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 018)	No.	0	R	R
10.2.13	ER Probe - (Refer to Annexure H) - (Refer to item 3.10 Scope of Works specification)	No.	2	R	R
10.2.14	Rocla Internal Steel Lining - (Refer to item 3.2 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 013)	No.	22	R	R
10.2.15	Rocla Internal Hinges - (Refer to item 3.2 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 013)	No.	22	R	R
10.2.16	NDU-VT - (Refer to Annexure H) - (Refer to item 3.11 Scope of Works specification)	No.	0	R	R
10.3	<b>Project Handover Documentation</b>				
10.3.1	Project Commissioning				
10.3.2	Factory acceptance testing (FAT)	Item	1	R	R
10.3.3	On-site commissioning and testing (SAT)	Item	1	R	R
10.3.4	Commissioning report and handover report	Item	1	R	R
10.3.5	As Built drawings	item	1	R	R
	<b>TOTAL CARRIED FORWARD TO SUMMARY</b>				<b>R</b>

## Transnet Pipelines

Tender Number: TPL/2023/08/00011/39137/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 11</b>				
	<b>ELECTRICAL WORKS KP180 to KP390</b>				
	<b>ELECTRICAL, ELECTRONICAL INSTALLATIONS</b>				
	<u>Specifications, drawings, etc</u>				
	Tenderers are referred to the specification and drawings annexed to these bills of quantities for the electrical work, for the full descriptions of the following items which are to be read and priced in conjunction with the said specification and drawings				
	<b>Cathodic Protection</b>				
11.1	<b>Supply</b>				
11.1.1	Underground test post facility - (Refer to item 3.3 Scope of Works specification)	No.	2	R	R
11.1.2	Bluetooth LE Smart Key (Long) with carry case kit - (Refer to item 3.3.1 Scope of Works)	No.	0	R	R
11.1.3	<b>Cable Extension at each Test Post</b>				
11.1.3.1	Type A Cable Extension at each Test Post - Refer to item 3.5.1 & 3.6.1 (Scope of Works)				
a	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	4	R	R
b	16mm <sup>2</sup> PVC/PVC Black Cable (Pipe)	m	8	R	R
c	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	4	R	R
d	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	4	R	R
e	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 11mm <sup>2</sup> Cable)	No.	5	R	R
f	Wiring Accessories for Splicing Joints	No.	5	R	R
11.1.3.2	Type B Cable Extension at each Test Post - Refer to item 3.5.2 & 3.6.2 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	0	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	0	R	R
c	16mm <sup>2</sup> PVC/PVC Black Cable (Pipe)	m	0	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	0	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	0	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 11mm <sup>2</sup> Cable)	No.	0	R	R
g	Wiring Accessories for Splicing Joints	No.	0	R	R
11.1.3.3	Type C Cable Extension at each Test Post - Refer to item 3.5.3 & 3.6.3 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	0	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	0	R	R
c	35mm <sup>2</sup> PVC Black Cable (TPL and Foreign Pipe)	m	0	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	0	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	0	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 11mm <sup>2</sup> Cable)	No.	0	R	R
g	Wiring Accessories for Splicing Joints	No.	0	R	R
11.1.3.4	Type E Cable Extension at each Test Post - Refer to item 3.5.11 & 3.6.11 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	4	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	4	R	R
c	16mm <sup>2</sup> PVC Black Cable (Ends to have correct heat shrink for identification)	m	40	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	4	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	4	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 11mm <sup>2</sup> Cable)	No.	12	R	R
g	Wiring Accessories for Splicing Joints	No.	12	R	R

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 11</b>				
	<b>ELECTRICAL WORKS KP180 to KP390</b>				
11.1.4	Buried Permanent Reference Electrode (PRE)- (Refer to Annexure H) / (Refer to item 3.9 Scope of Works)	No.	324	R	R
11.1.5	DC Coupon- (Refer to Annexure H) - (Refer to item 3.8 Scope of Works specification)	No.	310	R	R
11.1.6	AC Coupon-(Refer to Annexure H) - (Refer to item 3.8 Scope of Works specification)	No.	63	R	R
11.1.7	Link Panel-(Refer to Annexure H) - (Refer to item 3.3.2 Scope of Works specification)	No.	58	R	R
11.1.8	MOV- (Refer to Annexure H) - (Refer to item 3.111 Scope of Works specification)	No.	63	R	R
11.1.9	DC Decoupler - (Refer to Annexure H) - (Refer to item 3.13 Scope of Works specification)	No.	57	R	R
11.1.10	TPL Resistive Bond Link Panel - Type 1 (UG) - (Refer to Annexure H) - (Refer to item 3.5.3 Scope of Works specification)	No.	0	R	R
11.1.11	TPL Resistive Bond Link Panel - Type 2 (Bunker) - (Refer to Annexure H) - (Refer to item 3.6.3. Scope of Works specification)	No.	1	R	R
11.1.12	Calibration Tube Cover - (Refer to Annexure H) - (Refer to item 3 Scope of Works specification) (Drawing No. 26811358 - C- PLO - CP - DD - 018)	No.	5	R	R
11.1.13	Replace Buried Calibration Tube - (Refer to Annexure H) - (Refer to item 3 Scope of Works specification) (Drawing No. 26811358 - C- PLO - CP - DD - 018)	No.	5	R	R
11.1.14	ER Probe - (Refer to Annexure H) - (Refer to item 3.10 Scope of Works specification)	No.	1	R	R
11.1.15	Rocla Internal Steel Lining - (Refer to item 3.12 Scope of Works specification) (Drawing No. 26811358 - C- PLO - CP - DD - 013)	No.	9	R	R
11.1.16	Rocla Internal Hinges - (Refer to item 3.12 Scope of Works specification) (Drawing No. 26811358 - C- PLO - CP - DD - 013)	No.	9	R	R
11.1.17	NDU-VT - (Refer to Annexure H) - (Refer to item 3.11 Scope of Works specification)	No.	0	R	R
11.2	<b>Install and Commission</b>				
11.2.1	Underground test post facility - (Refer to item 3.3 Scope of Works specification)	No.	2	R	R
11.2.2	<b>Cable Extension at each Test Post</b>				
11.2.2.1	Type A Cable Extension at each Test Post - Refer to item 3.5.1 & 3.6.1 (Scope of Works)				
a	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	4	R	R
b	16mm <sup>2</sup> PVC/PVC Black Cable (Pipe)	m	8	R	R
c	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	4	R	R
d	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	4	R	R
e	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 11mm <sup>2</sup> Cable)	No.	5	R	R
f	Wiring Accessories for Splicing Joints	No.	5	R	R
11.2.2.2	Type B Cable Extension at each Test Post - Refer to item 3.5.2 & 3.6.2 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	0	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	0	R	R
c	16mm <sup>2</sup> PVC/PVC Black Cable (Pipe)	m	0	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	0	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	0	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 11mm <sup>2</sup> Cable)	No.	0	R	R
g	Wiring Accessories for Splicing Joints	No.	0	R	R
11.2.2.3	Type C Cable Extension at each Test Post - Refer to item 3.5.3 & 3.6.3 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	0	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	0	R	R
c	35mm <sup>2</sup> PVC Black Cable (TPL and Foreign Pipe)	m	0	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	0	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	0	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 11mm <sup>2</sup> Cable)	No.	0	R	R
g	Wiring Accessories for Splicing Joints	No.	0	R	R
11.2.2.4	Type E Cable Extension at each Test Post - Refer to item 3.5.11 & 3.6.11 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	4	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	4	R	R
c	16mm <sup>2</sup> PVC Black Cable (Ends to have correct heat shrink for identification)	m	40	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	4	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	4	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 11mm <sup>2</sup> Cable)	No.	12	R	R
g	Wiring Accessories for Splicing Joints	No.	12	R	R

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 11</b>				
	<b>ELECTRICAL WORKS KP180 to KP390</b>				
11.2.3	Buried Permanent Reference Electrode (PRE)- (Refer to Annexure H) / (Refer to item 3.9 Scope of Works)	No.	324	R	R
11.2.4	DC Coupon - (Refer to Annexure H) - (Refer to item 3.8 Scope of Works specification)	No.	310	R	R
11.2.5	AC Coupon - (Refer to Annexure H) - (Refer to item 3.8 Scope of Works specification)	No.	63	R	R
11.2.6	Link Panel - (Refer to Annexure H) - (Refer to item 3.3.2 Scope of Works specification)	No.	58	R	R
11.2.7	MOV- (Refer to Annexure H) - (Refer to item 3.111 Scope of Works specification)	No.	63	R	R
11.2.8	DC Decoupler - (Refer to Annexure H) - (Refer to item 3.13 Scope of Works specification)	No.	57	R	R
11.2.9	TPL Resistive Bond Link Panel - Type 1 (UG) - (Refer to Annexure H) - (Refer to item 3.5.3 Scope of Works specification)	No.	0	R	R
11.2.10	TPL Resistive Bond Link Panel - Type 2 (Bunker) - (Refer to Annexure H) - (Refer to item 3.6.3. Scope of Works specification)	No.	1	R	R
11.2.11	Calibration Tube Cover - (Refer to Annexure H) - (Refer to item 3 Scope of Works specification) (Drawing No. 26811358 - C- PLO - CP -DD - 018)	No.	5	R	R
11.2.12	Replace Buried Calibration Tube - (Refer to Annexure H) - (Refer to item 3 Scope of Works specification) (Drawing No. 26811358 - C- PLO - CP -DD - 018)	No.	5	R	R
11.2.13	ER Probe - (Refer to Annexure H) - (Refer to item 3.10 Scope of Works specification)	No.	1	R	R
11.2.14	Rocla Internal Steel Lining - (Refer to item 3.2 Scope of Works specification) (Drawing No. 26811358 - C- PLO - CP -DD - 013)	No.	9	R	R
11.2.15	Rocla Internal Hinges - (Refer to item 3.2 Scope of Works specification) (Drawing No. 26811358 - C- PLO - CP -DD - 013)	No.	9	R	R
11.2.16	NDU-VT - (Refer to Annexure H) - (Refer to item 3.11 Scope of Works specification)	No.	0	R	R
11.3	<b>Project Handover Documentation</b>				
11.3.1	Project Commissioning				
11.3.2	Factory acceptance testing (FAT)	Item	1	R	R
11.3.3	On-site commissioning and testing (SAT)	Item	1	R	R
11.3.4	Commissioning report and handover report	Item	1	R	R
11.3.5	As Built drawings	item	1	R	R
	<b>TOTAL CARRIED FORWARD TO SUMMARY</b>				<b>R</b>

## Transnet Pipelines

Tender Number: TPL/2023/08/0004/39137/RFP

Description of the Works: The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1)

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 12</b>				
	<b>ELECTRICAL WORKS KP390 to KP553</b>				
	<b>ELECTRICAL, ELECTRONICAL INSTALLATIONS</b>				
	<u>Specifications, drawings, etc</u>				
	Tenderers are referred to the specification and drawings annexed to these bills of quantities for the electrical work, for the full descriptions of the following items which are to be read and priced in conjunction with the said specification and drawings				
	<b>Cathodic Protection</b>				
12.1	<b>Supply</b>				
12.1.1	Underground test post facility - (Refer to item 3.3 Scope of Works specification)	No.	0	R	R
12.1.2	Bluetooth LE Smart Key (Long) with carry case kit - (Refer to item 3.3.1 Scope of Works)	No.	0	R	R
12.1.3	<b>Cable Extension at each Test Post</b>				
12.1.3.1	Type A Cable Extension at each Test Post - Refer to item 3.5.1 & 3.6.1 (Scope of Works)				
a	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	0	R	R
b	16mm <sup>2</sup> PVC/PVC Black Cable (Pipe)	m	0	R	R
c	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	0	R	R
d	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	0	R	R
e	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	0	R	R
f	Wiring Accessories for Splicing Joints	No.	0	R	R
12.1.3.2	Type B Cable Extension at each Test Post - Refer to item 3.5.2 & 3.6.2 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	0	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	0	R	R
c	16mm <sup>2</sup> PVC/PVC Black Cable (Pipe)	m	0	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	0	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	0	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	0	R	R
g	Wiring Accessories for Splicing Joints	No.	0	R	R
12.1.3.3	Type C Cable Extension at each Test Post - Refer to item 3.5.3 & 3.6.3 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	0	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	0	R	R
c	35mm <sup>2</sup> PVC Black Cable (TPL and Foreign Pipe)	m	0	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	0	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	0	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	0	R	R
g	Wiring Accessories for Splicing Joints	No.	0	R	R
12.1.3.4	Type E Cable Extension at each Test Post - Refer to item 3.5.4 & 3.6.4 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	0	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	0	R	R
c	16mm <sup>2</sup> PVC Black Cable (Ends to have correct heat shrink for identification)	m	0	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	0	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	0	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	0	R	R
g	Wiring Accessories for Splicing Joints	No.	0	R	R

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 12</b>				
	<b>ELECTRICAL WORKS KP390 to KP553</b>				
12.1.4	Buried Permanent Reference Electrode (PRE)- (Refer to Annexure H) / (Refer to item 3.9 Scope of Works)	No.	214	R	R
12.1.5	DC Coupon- (Refer to Annexure H) - (Refer to item 3.8 Scope of Works specification)	No.	200	R	R
12.1.6	AC Coupon-(Refer to Annexure H) - (Refer to item 3.8 Scope of Works specification)	No.	22	R	R
12.1.7	Link Panel-(Refer to Annexure H) - (Refer to item 3.3.2 Scope of Works specification)	No.	10	R	R
12.1.8	MOV- (Refer to Annexure H) - (Refer to item 3.14 Scope of Works specification)	No.	22	R	R
12.1.9	DC Decoupler - (Refer to Annexure H) - (Refer to item 3.13 Scope of Works specification)	No.	10	R	R
12.1.10	TPL Resistive Bond Link Panel - Type 1 (UG) - (Refer to Annexure H) - (Refer to item 3.5.3 Scope of Works specification)	No.	0	R	R
12.1.11	TPL Resistive Bond Link Panel - Type 2 (Bunker) - (Refer to Annexure H) - (Refer to item 3.6.3. Scope of Works specification)	No.	1	R	R
12.1.12	Calibration Tube Cover - (Refer to Annexure H) - (Refer to item 3 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 018)	No.	2	R	R
12.1.13	Replace Buried Calibration Tube - (Refer to Annexure H) - (Refer to item 3 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 018)	No.	2	R	R
12.1.14	ER Probe - (Refer to Annexure H) - (Refer to item 3.10 Scope of Works specification)	No.	1	R	R
12.1.15	Rocla Internal Steel Lining - (Refer to item 3.12 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 013)	No.	17	R	R
12.1.16	Rocla Internal Hinges - (Refer to item 3.12 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 013)	No.	17	R	R
12.1.17	NDU-VT - (Refer to Annexure H) - (Refer to item 3.11 Scope of Works specification)	No.	1	R	R
12.2	<b>Install and Commission</b>				
12.2.1	Underground test post facility - (Refer to item 3.3 Scope of Works specification)	No.	0	R	R
12.2.2	<b>Cable Extension at each Test Post</b>				
12.2.2.1	Type A Cable Extension at each Test Post - Refer to item 3.5.1 & 3.6.1 (Scope of Works)				
a	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	0	R	R
b	16mm <sup>2</sup> PVC/PVC Black Cable (Pipe)	m	0	R	R
c	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	0	R	R
d	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	0	R	R
e	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	0	R	R
f	Wiring Accessories for Splicing Joints	No.	0	R	R
12.2.2.2	Type B Cable Extension at each Test Post - Refer to item 3.5.2 & 3.6.2 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	0	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	0	R	R
c	16mm <sup>2</sup> PVC/PVC Black Cable (Pipe)	m	0	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	0	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	0	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	0	R	R
g	Wiring Accessories for Splicing Joints	No.	0	R	R
12.2.2.3	Type C Cable Extension at each Test Post - Refer to item 3.5.3 & 3.6.3 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	0	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	0	R	R
c	35mm <sup>2</sup> PVC Black Cable (TPL and Foreign Pipe)	m	0	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	0	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	0	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	0	R	R
g	Wiring Accessories for Splicing Joints	No.	0	R	R
12.2.2.4	Type E Cable Extension at each Test Post - Refer to item 3.5.4 & 3.6.4 (Scope of Works)				
a	2.5mm <sup>2</sup> PVC/PVC Yellow Cable (Reference Electrode)	m	0	R	R
b	10mm <sup>2</sup> PVC/PVC Black Cable (Monitor)	m	0	R	R
c	16mm <sup>2</sup> PVC Black Cable (Ends to have correct heat shrink for identification)	m	0	R	R
d	25mm <sup>2</sup> PVC Y/G Cable (Earth/Zinc Ribbon)	m	0	R	R
e	2.5mm <sup>2</sup> 2 Core Cabtyre Black Cable (Coupon)	m	0	R	R
f	MX1 Straight Cable Joint Kit Size 0 (1.5mm <sup>2</sup> - 4mm <sup>2</sup> Cable)	No.	0	R	R
g	Wiring Accessories for Splicing Joints	No.	0	R	R

CODE	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
	<b>BILL NO. 12</b>				
	<b>ELECTRICAL WORKS KP390 to KP553</b>				
12.2.3	Buried Permanent Reference Electrode (PRE)- (Refer to Annexure H) / (Refer to item 3.9 Scope of Works)	No.	214	R	R
12.2.4	DC Coupon - (Refer to Annexure H) - (Refer to item 3.8 Scope of Works specification)	No.	200	R	R
12.2.5	AC Coupon - (Refer to Annexure H) - (Refer to item 3.8 Scope of Works specification)	No.	22	R	R
12.2.6	Link Panel - (Refer to Annexure H) - (Refer to item 3.3.2 Scope of Works specification)	No.	10	R	R
12.2.7	MOV- (Refer to Annexure H) - (Refer to item 3.14 Scope of Works specification)	No.	22	R	R
12.2.8	DC Decoupler - (Refer to Annexure H) - (Refer to item 3.13 Scope of Works specification)	No.	10	R	R
12.2.9	TPL Resistive Bond Link Panel - Type 1 (UG) - (Refer to Annexure H) - (Refer to item 3.5.3 Scope of Works specification)	No.	0	R	R
12.2.10	TPL Resistive Bond Link Panel - Type 2 (Bunker) - (Refer to Annexure H) - (Refer to item 3.6.3. Scope of Works specification)	No.	1	R	R
12.2.11	Calibration Tube Cover - (Refer to Annexure H) - (Refer to item 3 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 018)	No.	2	R	R
12.2.12	Replace Buried Calibration Tube - (Refer to Annexure H) - (Refer to item 3 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 018)	No.	2	R	R
12.2.13	ER Probe - (Refer to Annexure H) - (Refer to item 3.10 Scope of Works specification)	No.	1	R	R
12.2.14	Rocla Internal Steel Lining - (Refer to item 3.2 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 013)	No.	17	R	R
12.2.15	Rocla Internal Hinges - (Refer to item 3.2 Scope of Works specification) (Drawing No. 2684358 - C- PLO - CP -DD - 013)	No.	17	R	R
12.2.16	NDU-VT - (Refer to Annexure H) - (Refer to item 3.11 Scope of Works specification)	No.	1	R	R
12.3	<b>Project Handover Documentation</b>				
12.3.1	Project Commissioning				
12.3.2	Factory acceptance testing (FAT)	Item	1	R	R
12.3.3	On-site commissioning and testing (SAT)	Item	1	R	R
12.3.4	Commissioning report and handover report	Item	1	R	R
12.3.5	As Built drawings	item	1	R	R
<b>TOTAL CARRIED FORWARD TO SUMMARY</b>					<b>R</b>

Document Title:

**WORKS INFORMATION**

Project Title:

**The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1).**

**REVISION: 06**

**DOCUMENT PREPARATION**

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**DOCUMENT APPROVAL**

#	Name	Title	Signature	Date
Approved by	Shanil Rugbeer	Principal Engineer: Electrical		10/11/2023

TRANSNET PIPELINES	The Provision of Cathodic Protection Contractor expertise for Transnet Pipelines Multi-Products Pipeline Cathodic Protection Optimisation Project for the section of the pipeline from Island View (Durban) to Jameson Park (Johannesburg) (PL1).	TECHNICAL MAINTENANCE
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## 1. List of Abbreviations

%IR	Overline / remote earth defect intensity measurement
A	Amps (current)
AC	Alternating Current
ACM	AC Mitigation
APP	Application
BOQ	Bill of Quantities
COC	Certificate of Compliance
CP	Cathodic Protection
CSE	Copper Sulphate Reference Electrode
Cu/CuSO4	Copper / Copper Sulphate Reference Electrode
CIPS	Close Interval Potential Survey
DC	Direct Current
DCVG	Direct Current Voltage Gradient
DGPS	Differential Global Positioning System
ECDA	External Corrosion Direct Assessment
ER	Electrical Resistance
FAT	Factory Acceptance Test
FDU	Forced Drainage Unit
FIC	Field Inspection Checks
GLAM	Grid Lock Access Management
GPS	Global Positioning System
ICCP	Impressed Current Cathodic Protection
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
MPP	Multi Product Pipeline
NACE	NACE International, USA
NCR	Non Conformance Report
NDU	Natural Drainage Unit
NEC	New Engineering Contract
PL	Pipeline

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PQP	Project Quality Plan
PRE	Permanent Reference Electrode
PS	Pump Station
PVC	Polyvinyl chloride
QCP	Quality Control Plan
O&M	Operation and Maintenance
SABS	South African Bureau of Standards
SACP	Sacrificial Anode Cathodic Protection
SANS	South African National Standards
SAT	Site Acceptance Test
SHE	Safety, Health and Environmental
SMU	Switchmode Rectifier Unit
SRE	Stationary Reference Electrode
SRB	Sulphate Reducing Bacteria
TPL	Transnet Pipelines
TRU	Transformer Rectifier Unit
UDC	Underground distribution chamber
V	Volts (voltage)
VLD	Low Voltage Device

## 2. General

### 2.1. Introduction

Transnet Pipelines (TPL) a petroleum pipeline operator has initiated a project to optimise the Cathodic Protection (CP) system installed for the protection of the Multi-Product Pipeline (MPP) and its associated branch lines. The main pipeline runs from Island View (Durban) to Jameson Park (Heidelberg) which is approximately 556 km. The associated pipelines connect Gauteng province to both Mpumalanga and North West province (PL2 – Jameson Park to Alrode is 41 km, PL3 – Alrode to Langlaagte is 31 km and PL4 – Kendal to Watloo is 89 km). This Contract covers PL1, the section from Island View to Jameson Park only.

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The primary objective and high-level scope of work is for employing a CP *Contractor* to supply, handle, transport, deliver, unload and install the required material for the maintenance, optimisation and balancing of the MPP functional CP system whilst following the required best practice standards.

2.2. General requirements

2.2.1. All works described in this specification represent works on an existing pipeline that will be in operation during the course of the contract. The *Contractor* needs to ensure that all necessary precautions are taken to ensure the pipeline’s operation is not disrupted in any way. The *Contractor* is thus required to note that access to the sites will be limited as the pipeline servitude also passes along private-owned property. The *Contractor* will therefore be required to cooperate responsibly with the project team and to stick to the schedule in order to achieve early completion of the project.

2.2.2. The *Contractor* shall supply adequate and competent labour, supervision, tools, equipment, services, testing devices for all item necessary to complete the WORK. Transnet Pipelines reserves the right to terminate the contract at any point if it is found that the *Contractor’s* performance, supervision, tools, equipment, services, testing devices and material do not comply with specified requirements. The *Contractor* will only be allowed to claim for WORK completed to the specified acceptable standard.

2.2.3. *Contractors* are to note that the responsibility for the installation and commissioning of all elements of equipment as specified in the design document shall remain with the *Contractor*. In this regard the *Contractor* is required to satisfy himself that all tools provided will comply with all specifications as included in the Tender Documents. Failure to meet specification shall render the successful *Contractor* liable to rectify the problem at no cost to Transnet Pipelines.

2.2.4. The *Contractor* shall be required to bear all costs that may arise as a result of damage that may have been caused to equipment, property or services or that may arise because of his operation on the respective sites.

2.2.5. The *Contractor* shall only utilise testing devices and measuring equipment that are certified and carry a valid calibration certificate as issued by an approved calibration authority. Documentation reflecting the type, name and calibration certificate of the test equipment that will be utilised to complete the work and shall be available at the request of the *Project Manager*.

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2.2.6. Where control equipment, peripherals or instrumentation from various suppliers or manufacturers are offered for controlling the various sub-systems or portions of a sub-system, it shall be the responsibility of the *Contractor* to ensure the various portions are fully integrated into a single coherent system. Where specific project development is required, TPL shall first approve these.

2.3. Health and Safety Requirements

2.3.1. As part of commitment to safety, the *Contractor* must comply with OHS Act 85 of 1993, the Construction Regulations and any other occupational health and safety regulations as amended. The *Contractor* is required to conform to the Transnet Contractor Management Procedure (TRN-IMS-PROC-014) as attached in Annexure C.

2.3.2. The SHE Compliance File is required once a *Contractor* has been appointed. Site access will only be granted once the SHE Compliance File has been reviewed and approved by Transnet Pipelines. The *Contractor* will be subjected to the Transnet Pipelines permit-to-work process related to the on-site risks identified as well as changing conditions. The successful bidder will be subjected to compulsory TPL Inductions which can take 1 to 2 hours. These inductions are to be conducted at a location determined by TPL.

2.4. Environmental Requirements

The appointed *Contractor* must comply with the Transnet Minimum Requirements for Construction Environmental Management document (009-TCC-CLO-SUS-11385) as attached in Annexure D. All excavation work in wetland areas will require method statements prior to commencement with work.

The CP *Contractor* shall comply with the statutes that prohibit pollution of any kind. These statutes are enacted in the following legislation:

- The National Environmental Management Act, 107/1998
- The Environmental Conservation Act, 73/1989; and
- The National Water Act, 36/1998

2.5. Notes to *Contractors*

2.5.1. The *Contractor* shall furnish proof of actual experience in the class of work for which they have tendered and must submit with the tender on the relevant form attached to the tender

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documents, a statement of works recently carried out. The list shall include the value of previous contracts, completion dates, contact names and telephone numbers.

- 2.5.2. The *Contractor* shall ensure that they have the requisite insurances in place prior to commencement of the project.
  - 2.5.3. Access to sites and excavations permits will be arranged by the *Employer*, however it is the *Contractor's* responsibility to ensure that there are competent people to conduct and supervise the excavation work.
  - 2.5.4. The *Contractor* will be responsible for providing power and water supply required for site establishment.
  - 2.5.5. It is expected that the *Contractor* will have multiple Site Establishments throughout the project in line with the tender programme. The *Contractor* needs to allow for this in their pricing for the duration of the project. On completion of each section, the *Contractor* must reinstate the site to the state it was in before work commenced.
  - 2.5.6. Where infrastructure is exposed, the *Contractor* is to provide security.
- 2.6. Project Time Schedule
- 2.6.1. The project will be executed using a sectional completion approach. There are three sections, each with its own completion and handover date. These sections are:
    - Section 1: KP0 to KP180
    - Section 2: KP180 to KP390
    - Section 3: KP390 to KP553
  - 2.6.2. The *Contractor* will be required to submit a level 3 detail programme for the tendering. The successful *Contractor* will be required to revise the programme into a level 4 detail programme upon appointment.
  - 2.6.3. The programme shall be used to monitor progress. The programme shall remain in force but the resources to achieve the programme shall be updated at each site meeting and the *Contractor* shall report progress to date and what steps shall be taken to ensure adherence to programme.
  - 2.6.4. Should the successful *Contractor* at any time during the contract fall behind the approved programme, then the *Project Manager* may require the *Contractor* to adjust his manner of working and/or employ additional staff, at NO additional cost to TPL, in order that the approved programme can be achieved.

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## 2.7. Reference Documentation

- 2.7.1. The requirements of the materials, design, installation, commissioning, examination, inspection and testing of equipment and facilities onsite shall be in accordance with the relevant sections of the codes mentioned below.
- 2.7.2. Where Government, Local authorities and other statutory body's regulations, laws and requirements are more stringent than those specified hereunder, the regulations, laws and requirements shall take precedence.
- 2.7.3. Where no specific rules, regulations, codes, or requirements are contained in this specification nor covered by the below mentioned codes, the *Contractor* shall, in consultation with TPL, adhere to internationally accepted engineering practices or original manufacturers specification.
- 2.7.4. The TPL issued drawings will be for information, ascertainment and/or construction and does not relieve the *Contractor* of any responsibility to submit to TPL, prior to construction, all corrected and accepted drawings for TPL acceptance and obtaining a TPL signature of acceptance prior to any construction.
- 2.7.5. To understanding these Standards, the following abbreviations apply.
- SANS - South African National Standards
  - SABS - South African Bureau of Standards
  - BS - British Standards
  - IEC - International Electro technical Commission
  - NEC - New Engineering Contract

<b>Title</b>	<b>Standard</b>
Code of Practice for Wiring of premises and incorporated standards	SANS 10142
The Installation and Maintenance of Electrical Equipment used in Explosive Atmospheres	SANS 10086-1
Protection against lightning	SANS 10313
Mitigation of Alternating Current and Lightning Effects of Metallic Structures and Corrosion Control Systems	NACE SP0177
Alternating current Corrosion on Cathodically Protected Pipelines: Risk Assessment, Mitigation and Monitoring.	NACE SP21424-2018

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Title	Standard
Technical report on the Application and Interpretation of Data from External Coupons Used in the evaluation of Cathodically protected metallic structures	35201 NACE Publication
Control of External Corrosion on Underground or Submerged Metallic Piping Systems	NACE SP0169
The Use of Coupons for Cathodic Protection Monitoring Applications	NACE SP0104
Conditions of Contract	NEC3
Petroleum, Petrochemical, and natural gas industries – Cathodic Protection of pipeline systems – Part 1 On-land Pipelines	ISO 15589-1 2015
Corrosion of Metals and Alloys – Determination of AC Corrosion – Protection Criterion.	ISO 18086-2020
Assessment of the effectiveness of cathodic protection based on coupon measurement	ISO 22426-2020(E)

2.7.6. The latest revision of the following TPL standard specifications, where applicable, shall apply. It is a requirement that *Contractors* comply with all applicable clauses of the specifications in the execution of the work they undertake.

- PL652 Rectifier Specification
- PL121418 Resistance Panel A4
- PL400H Holiday Detector Specification
- PL415G Steel Insulation Flange Specification
- PL727 Specification for Cable, Racking, Trenching & Earthing Reticulation
- PL711 Specification for Equipment Cabinets to House Electronic Equipment
- PL804 General welding specification
- EA08729A01 Rev A Transnet Equipment Shelter GA (Rocla enclosure Specification)
- EA08768A01 Rev A Transnet Equipment Shelter Inner Grid (Rocla Specification)
- EA08768A03 Rev A Transnet Equipment Shelter Outer Grid (Rocla Specification)
- Drawing number 2684358-C-PL1-CP-DD-181.
- Drawing number 2684358-C-CP-DD-180.
- CP design for the terminals & pump stations
- Cathodic Protection (CP) specification for the trunk line (PL1)
- Cathodic Protection & AC Mitigation procedure

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- TPL MPP CP Assessment Criteria

#### TPL Documents

- PL1 DCVG vs CP protection
- PL2 DCVG vs CP protection
- PL3 DCVG vs CP protection
- PL4 DCVG vs CP protection
- DCVG Survey on Sections of Pipeline PL4- Comparison with PCM Survey results
- Cathodic Protection design for KP0-KP22
- NMPP Status Report Cathodic protection and AC mitigation
- Dry underground chamber testing facility for Cathodic Protection

#### TPL MPP Drawings

<b>Title</b>	<b>Drawing Document Reference No.</b>
CP Coupon Detail	HO1340-DWG-001
Test Post Terminal Mounting Detail	HO1340-DWG-001
Cable Termination - Type A	HO1340-DWG-003
Cable Termination - Type B	HO1340-DWG-004
Cable Termination - Type C TPL One Pipeline	HO1340-DWG-005
Type F Link Panel with Solid State Decoupler	HO1340-DWG-006
Cable Termination - Type C Foreign Pipeline	HO1340-DWG-007
Cable Termination - Type C TPL Two Pipelines	HO1340-DWG-008
Cable Termination - Type E	HO1340-DWG-009
Cable Termination - Type F-A	HO1340-DWG-010
Cable Termination - Type F-B	HO1340-DWG-011
Cable Termination - Type F-C TPL Two Pipelines	HO1340-DWG-012
Cable Termination - Type F-C Foreign Pipelines	HO1340-DWG-013
Cable Termination - Type F-C TPL One Pipelines	HO1340-DWG-014
Cable Termination - Type F-E	HO1340-DWG-015
Rocla TRU Enclosure Detail	2684358-C-PLO-CP-DD-013
Potential Monitoring Test Post Type 'B'	2684358-C-PLO-CP-DD-018

### 3. Scope of Work Specification

#### 3.1 TPL MPP CP Assessment Criteria

TPL has developed and adopted a new and revised Cathodic Protection Assessment Criteria in line with various international standards. The specification and scope of works are to be carried out in accordance with the following criteria:

- i. IR Free Corrosion Potential less than -0.85 VCSE
- ii. DC Current Density Magnitude and Direction
- iii. AC Current Density
- iv. AC DC Corrosion Risk Relationships
- v. Corrosion Rate Less Than 0.1mm per Year

#### 3.2 Security and Vandalism (Access Control on Existing Equipment)

The following equipment is described below and will be installed at various locations:

- i. **Asset Tracker** – This device will be attached to the required asset. Once the tracker is put into the armed state, the tracker will continuously monitor the asset for any movement. If the motion is detected, the tracker will send a movement alert message immediately and start finding a GPS location fix in the shortest time possible. The tracker will continue to transmit location data based on a set interval and for one hour. If no motion is detected after one hour, the tracker will go back into motion monitoring mode to conserve battery life.
- ii. **Safe Door Remote Lock** – The Remote lock is electronic Lock is a fully encapsulated (i.e. solid state) mechatronic dead lock. It requires no power or physical communication connection to operate. It is certified to be water, dust and grit proof. It is maintenance free and resistant to a wide range of chemicals, making it suitable to be deployed in harsh and remotely located applications.
- iii. **Buried Cable Theft Detection (Motion Detection Sensor)**. The 3 Axis accelerometer has an ultra-low power state yet still wake up immediately on detection of movement. This will enable customers to use the device to monitor motion or tilt on any assets that should be stationary. The rugged sensor allows for real-time monitoring and incorporates Bluetooth Low Energy (BLE) functionality, enabling the device to be wirelessly configured, set up and commissioned.

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These devices will need to communicate to TPL’s Security Control Centre. Once installed on site TPL Security will activate the devices for operation. The Items below is the list of equipment required at various installation location.

Existing Transformer Rectifier Unit (TRU) Installation in a Rocla Enclosure. All equipment will need to be retrofit.

- i. Asset Tracker – Installed on the TRU to track its location and track it if removed.
- ii. Safe Door Lock (Smart Key connected via an APP) – Rocla Enclosures have a large walk-through safe door. Access control currently via a key. We need to replace this with a Smart locking solution.
- iii. Buried Cable Theft Detection – Buried Cables are often excavated and removed. A sensor would be buried 500mm below Ground Level around the unit and needs to detect Excavation and removal of the device.
- iv. Asset Tracker and Motion Detection Sensor – AC Supply Transformer, Transformer Masts and vertical cable installed on the Mast.

Transformer Rectifier Unit (TRU) Installation in the Rhi-node (1500m deep) or Similar.

- i. Smartlock Rhi-node (1500m deep) with Electronic Manhole Lock and Smart Sensor – The unit requires access control. The TRU is to be fitted inside an IP 66 Enclosure which will be installed inside the manhole enclosure.
- ii. Smartlock Rhi-node 1000 with Electronic Manhole Lock and Smart Sensor – The unit requires access control. An AC Distribution Board is to be fitted inside an IP 66 Enclosure which will be installed inside the manhole enclosure.
- iii. Asset Tracker – Installed on the TRU to track its location and track it if removed.
- iv. Safe Door Lock (Smart Key connected via an APP) – Rocla Enclosures have a large walk-through safe door. Access control currently via a key. We need to replace this with a Smart locking solution.
- v. Buried Cable Theft Detection – Buried Cables are often excavated and removed. A sensor would be buried 500mm below Ground Level around the unit and needs to detect Excavation and removal of the device.
- vi. Asset Tracker and Motion Detection Sensor – AC Supply Transformer, Transformer Masts and vertical cable installed on the Mast.

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The *Employer* shall arrange for the provision of power supply to all rectifiers with the relevant power supply authorities for commissioning purposes.

### 3.3 Underground Test Post Facility

The Cathodic Protection system for Transnet Pipeline network is being monitored on above-ground testing facilities and due to the on-going problems with vandalism and theft, a new vandal-proof enclosure is required to mitigate the risk.

Below are guidelines for establishing the minimum requirements to supply and install underground chamber testing facilities for testing the cathodic protection along the pipelines.

The primary function of the underground chamber testing facilities is to mitigate the risk of vandalism and theft of cathodic protection components.

The *Contractor* is required to remove and dispose existing test post, test post connections, and test post facility and install new test post as per the guidelines described in the subsections below.

#### 3.3.1 Technical Specification

The Supplier is required to supply the underground testing facility which complies to the following minimum specifications as shown in the table below.

SECTION	REQUIREMENTS	REQUIREMENTS MET		SIGNATURE	COMMENTS
		YES	NO		
1	<b>Technical Specifications for 4.3 Underground Test Post Facility</b>				
1.1	Chamber Size – 500x500 to 1000x1150				
1.2	Free Depth – 1.3m with 650mm daylight opening				
1.3	Retractable S/Steel Frame				
1.4	Load and impact Strength SANS 558:2009 HD ROADWAY (13.5 TON) SANS558: EN -124 B125 (125 KN)				
1.5	IP Rating - 68				
1.6	Chamber Material – SMC or similar				
1.7	Colour – light grey or similar				

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1.8	Lid - Composite, Non-Metallic				
1.9	Remote Access Controlled Lid with Custom Key				
1.10	UV Stabilised				
1.11	UL94 Flammability Compliant				
1.12	Cable access – multiple 110mm entry knockouts				
1.13	Metal Components and fasteners – 304 Stainless Steel				
1.14	ISO 9001 Quality Assurance Compliant				
1.15	The inner dimensions of the underground test post frame shall be suitable for the installation of a standard bunker chassis (dimension 500mm x 300mm) and TPL type link panels, with noncorrosive material, and the inner depth should be 1000mm.				
1.16	All underground cables attached to moving components must be flexible and terminated to the termination box that allows for single and multiple core cable attachments.				
1.17	Capability to monitor DC, AC and instant off CP potentials remotely using TPL communication protocols				

### 3.3.2 Installation Requirements

The Installation of the underground chamber testing facility shall be in accordance with but not limited to the following requirements.

Transnet shall determine all cable routes and verify servitudes prior to the *Contractor* commencing with the required works.

The determined installation area should be considered a high-risk area and as such security for personnel and materials will be required during the duration of the installation works.

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Transnet Pipelines prescribes to the highest SHE standards and accordingly, the safety and health of all personnel on work sites is paramount and the preservation of the environment shall be the responsibility of the *Contractor*.

The installation of the underground chamber testing facility shall have a reinforced concrete surround – 1500x1500x300mm with a minimum strength of 35Mpa. Cube Test results to be provided for each test post location.

*Contractors* shall be required to excavate to pipe depth and expose the pipeline circumferentially to allow for:

- Negative cable attachment (2 off 2.5mm<sup>2</sup>, black PVC/PVC) Test Post only
- Negative cable attachment (2 off 35mm<sup>2</sup>, black PVC/PVC) Cross Bond Only (Type C)
- Negative cable Loop Cable to foreign Service (2 off 35mm<sup>2</sup>, Red PVC/PVC) Cross Bond Only (Type C)
- Monitoring cable attachment (2 off 2.5mm<sup>2</sup> blue PVC/PVC)
- Suitable gland plates to maintain the IP rating of 68 of the Underground Test Post Facility.
- Shall be located within the pipeline servitude and as close as possible to the pipe attachment.
- Depth of Installation of the chamber.
- The cables shall be looped around the bottom of the pipeline and attached to the pipeline at the 12 o'clock position by means of pin brazing
- Supply and install a permanent reference electrode (PRE) (Cu/CuSO<sub>4</sub>) and monitoring coupon. The coupon and SRE shall be installed approximately 300mm away from the pipeline.
- The SRE cable tails shall be 2.5mm<sup>2</sup>, yellow cable, PVC.
- The 1cm<sup>2</sup> AC Coupon cable tails shall be 10m X 2.5mm<sup>2</sup> 2 core Cabtyre, White.
- The 10cm<sup>2</sup> DC Coupon cable tails shall be 10m X 2.5mm<sup>2</sup> 2 core Cabtyre, Black.
- The PRE and coupon shall be encased in the native soil surrounding the pipe at the installation location. The recessed face of the coupons is to be filled with the native soiled prior to installation.

All AC mitigation installations shall have appropriate earthing, as per approved TPL drawings.

- Cable trenches are to be a minimum of 1.5m deep.
- Identify exposed and vandalized cables on the pipeline route - cap, seal, encase in concrete and bury the cables.

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- Remove the vandalized concrete units and discard appropriately.
- All cable runs are to be encased in 30MPa concrete, to a height of 200mm. Concrete Cube Testing required by a third party at each installation location.
- Supply and install link panels for the various types of link panels required for the sites.

3.3.3 Test Post Link Panels

All new test post link panels will be installed within an IP66 polyester enclosure. The IP66 polyester enclosures will be installed within the Underground Test Post Facility.

3.3.4 Test Post Replacement Locations

Please refer to Annexure F.

3.4 Cable and Cable attachment

All cables used for Test Stations will be copper cored and will be doubly insulated PVC/PVC. Cables will be bonded to the pipeline via pin brazing.

Welds will be made at the 12 o'clock position and with sufficient slack allowed to accommodate any settlement so that no strain is placed on the cable connection to the pipe.

3.5 Test Post Descriptions – Underground Test Posts

All new test post link panels will be installed within an IP66 polyester enclosure. The IP66 polyester enclosures will be installed within the Underground Test Post Facility with the appropriate link panel fitted into it. Please refer to the Test Post descriptions for Underground Test Posts.

3.5.1 Type A – Monitoring Test Post

This standard monitoring test post comprises two off 2.5mm<sup>2</sup> blue PVC/PVC (Monitor) cables and 2 off two off 2.5mm<sup>2</sup> black PVC/PVC (Negative) cables which are connected to the pipeline via pin brazing to the pipeline. Each Type A test post will have a coupon located 300 mm away from the pipeline, to allow for more accurate readings. The DC coupon will have one 2 core 2.5 mm<sup>2</sup> Cabtyre PVC/PVC cable.

3.5.2 Type B – IR Free Test Post

These test posts will be used to measure “IR-free” potential readings. These test posts will contain two off 2.5mm<sup>2</sup> blue PVC/PVC (Monitor) cables and 2 off two off 2.5mm<sup>2</sup> black PVC/PVC (Negative) cables which are connected to the pipeline via pin brazing to the pipeline. A separate buried

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permanent reference electrode (PRE) and a separate steel DC coupon will be installed. The PRE will be connected to the test post with 2.5mm<sup>2</sup> yellow cable and the DC coupon will have one 2 core 2.5 mm<sup>2</sup> Cabtyre PVC/PVC cable.

3.5.3 Type C – Bonding Test Post

These test posts will be used to bond the NMPP Pipeline to other “foreign” pipelines. Usually there will only be one pipeline that will be bonded to, but the size of the test stations allows bonding to many “foreign” pipelines. Bonding cables will be 35 mm<sup>2</sup> PVC/PVC.

If the test post is being connected to a “foreign” Pipeline then a Variable Resistor with a 50A50mV shunt is to be installed inside the test post.

3.5.4 Type E – 4-Wire Current Span Test Post

These test stations will be used to measure the magnitude and direction of current flow at selected locations along the route, but more frequently in stray current-affected areas.

Four 16 mm<sup>2</sup> PVC/PVC cables will be used for each test station. The first cable will be connected to the pipeline 1 m downstream of the test station (black heatshrink), the second cable will be located 1 m away from the first cable (blue heatshrink), in the upstream direction, the third cable will be located 125 m away from the second cable (yellow heatshrink), in the upstream direction and the last cable (red heatshrink) will be 1 m away from the third, in the upstream direction.

A separate buried permanent reference electrode (PRE) and a separate steel DC coupon will be installed. The PRE will be connected to the test post with 2.5mm<sup>2</sup> yellow cable and the DC coupon will have one 2 core 2.5 mm<sup>2</sup> Cabtyre PVC/PVC cable.

3.5.5 Type “x” – Gradient Control Mat (Equipotential) Test Post

These test post will be used in AC Mitigation areas. Zinc ribbon gradient control mats (equipotential mats) shall be installed where necessary at test stations for step and touch protection. The mats will have a minimum radius of 2m for test stations. The test posts will be designated its type and the x will denote whether it has a zinc ribbon gradient control mat. A VLD (MOV) will need to be fitted on the respective test post link panel between the pipe connection cable and the Zinc ribbon gradient control mat. A separate buried permanent reference electrode (PRE) and a separate steel AC coupon will be installed at the designated Type “X” test Posts.

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3.5.6 Type F – AC Mitigation Test Post

These test posts will be used in AC Mitigation areas. Zinc ribbon gradient control mats (equipotential mats) shall be installed where necessary at test stations for step and touch protection. The mats will have a minimum radius of 2m for test stations.

This test post comprises of the follow cables:

1. Two off 2.5mm<sup>2</sup> blue PVC/PVC (Monitor) cables welded to the pipeline.
2. Two off 25mm<sup>2</sup> black PVC/PVC cables welded to the pipeline.
3. Two off 25mm<sup>2</sup> Yellow/Green PVC/PVC cables connected to the zinc ribbon gradient control wires.
4. Two off 25mm<sup>2</sup> Yellow/Green PVC/PVC cables connected to the zinc ribbon gradient control Matt.
5. An DC coupon with one 2 core 2.5 mm<sup>2</sup> Cabtyre PVC/PVC cable tail.
6. An AC coupon with one 2 core 2.5 mm<sup>2</sup> Cabtyre PVC/PVC cable tail.

Each Type F Test post is fitted with a Solid-State Decoupling Device and VLD.

3.6 Test Post Descriptions – Existing Galvanised Test Stations and Concrete Bunkers

3.6.1 Type A – Monitoring Test Post

This standard monitoring test post comprises two 16 mm<sup>2</sup> black PVC/PVC cables exothermically welded to the pipeline. Each Type A test post will have a coupon located 300 mm away from the pipeline, to allow for more accurate readings. The coupon will have one 2 core 2.5 mm<sup>2</sup> Cabtyre PVC/PVC cable tail.

**NOTE:** As per the Scope of Works certain Existing Type A test posts will be converted to a Type B test post. No Change will need to be made to the link panel in order to affect this change.

3.6.2 Type B – IR Free Test Post

These test posts will be used to measure “IR-free” potential readings. These test posts will contain two 16 mm<sup>2</sup> black PVC/PVC cables as well as a separate buried permanent reference electrode (PRE) and a separate steel coupon. The PRE will be connected to the test post with 2.5mm<sup>2</sup> yellow cable and the coupon will have two 6 mm<sup>2</sup> blue PVC/PVC cables.

3.6.3 Type C – Bonding Test Post

These test posts will be used to bond the NMPP Pipeline to other “foreign” pipelines. Usually there will only be one pipeline that will be bonded to, but the size of the test stations allows bonding to many “foreign” pipelines. Bonding cables will be 35 mm<sup>2</sup> PVC/PVC.

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### 3.6.4 Type E – 4-Wire Current Span Test Post

These test stations will be used to measure the magnitude and direction of current flow at selected locations along the route, but more frequently in stray current-affected areas.

Four 16 mm<sup>2</sup> PVC/PVC cables will be used for each test station. The first cable will be connected to the pipeline 1 m downstream of the test station (black), the second cable will be located 1 m away from the first cable (blue), in the upstream direction, the third cable will be located 125 m away from the second cable (yellow), in the upstream direction and the last cable (red) will be 1 m away from the third, in the upstream direction.

### 3.6.5 Type "x" – Gradient Control Mat (Equipotential) Test Post

These test post will be used in AC Mitigation areas. Zinc ribbon gradient control mats (equipotential mats) shall be installed where necessary at test stations for step and touch protection. The mats will have a minimum radius of 2m for test stations. The test posts will be designated its type and the x will denote whether it has a zinc ribbon gradient control mat.

### 3.6.6 Type F – AC Mitigation Test Post

These Concrete Bunker type test post will be used in AC Mitigation areas. Zinc ribbon gradient control mats (equipotential mats) shall be installed where necessary at test stations for step and touch protection. The mats will have a minimum radius of 2m for test stations.

This test post comprises of the follow cables:

- One off 16mm<sup>2</sup> black PVC/PVC cables welded to the pipeline (Pipe Monitor).
- Two off 25mm<sup>2</sup> black PVC/PVC cables welded to the pipeline
- Two off 25mm<sup>2</sup> Yellow/Green PVC/PVC cables connected to the zinc ribbon gradient control wires.
- Two off 25mm<sup>2</sup> Yellow/Green PVC/PVC cables connected to the zinc ribbon gradient control Matt.
- An AC coupon with one 2 core 2.5 mm<sup>2</sup> Cabtyre PVC/PVC cable tail.
- Each Type F Test post is fitted with a Solid-State Decoupling Device and VLD.

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### 3.7 Transnet Permanent Loggers installations

TPL has developed new loggers that will be deployed at critical and selective Test Posts. TPL will highlight specific locations that require urgent installation of the replacement test posts and or modifications to existing Test Posts to house the new loggers.

### 3.8 AC and DC Coupons Specifications

Logging equipment utilised to measure and log the coupon current (and associated coupon current density), is to be utilised to manage and optimise the CP current supplied to the MPP from within the Test Post Facilities. Please refer to drawing HO1340-DWG-001 for reference.

- All coupons to have two 2.5mm<sup>2</sup> conductors connected at the same location on the coupon on the non-exposed portion of the coupon. One coupon shall be utilized to carry applied Cathodic Protection current (Coupon feed) and the other to remain non-current carrying and utilised for monitoring purposes (Coupon Mez).
- After installation and before connecting the coupon to the structure the coupon the Ecorr potential of the coupon is to be determined and recorded along with the location. (Hold Point)
- The surface area of the coupon should approximate the largest anticipated coating holiday size in the area where the coupon is deployed when determining Cathodic Protection current. The MPP pipeline requires a 10cm<sup>2</sup> (35,6mm diameter coupon with vertical side walls which height "Z" is equivalent to the final coating thickness of 0.7mm.
- Where AC is present on the pipeline a 1cm<sup>2</sup> correctional area coupon must be deployed of similar final construction geometry to the DC Coupon.

### 3.9 Permanent Reference Electrode (PRE) Specifications

Permanent Reference Electrodes are to be supplied by the *Contractor* and should meet the following Criteria:

- i. Application type – Buried
- ii. Minimum Service Life – 30 Years
- iii. The SRE must have a Chloride Ion Trap
- iv. Housing – Porous ceramic
- v. Cable Tail – single core copper 2.5mm<sup>2</sup> HMWPE to a 10mm<sup>2</sup> extension cable where necessary
- vi. Stability – +/- 5mV (3 micro-amp load)

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- vii. Temperature range 0°C to 55°C

Brochure of the SRE must be submitted with the tender document for review.

### 3.10 ER Probe Installation

NACE SP0104-2020 provides the following definition of an ER Probe: A probe that measures the metal loss of an alloy having a composition similar to the pipe or structure material, and the device is suited to estimate corrosion rates of the pipe or structure in environments having either poor or non-uniform electrolytes such as soil.

A total number of 10 ER Probes and 1 Reader are to be procured and installed. It is recommended that a Cosasco ER Probes (HD 620 Model) or similar approved by the Engineer to be procure by the *Contractor*.

Please refer to Annexure F for the installation locations.

### 3.11 NDU-VT

The NDU element and its associated heat sink is to be replaced with a single “Puck” thyristor complete with an associated firing circuit that will result in the modified NDU unit only turning on above 10VDC in the forward biased condition. (Pipeline toward Rail) The Commutation of the Thyristor must automatically occur when either the pipe potential has returned to less than 10V or the current has fallen below the Thyristor’s natural holding current. The Firing circuit must be capable of operating without external power for a period of no less than 14 years. Where suppliers utilize batteries to power the equipment to affect the control and or automatic commutation circuits, the schematic thereof must be submitted to TPL for evaluation and approval at tender stage. The selected thyristor must have a minimum continuous forward current of 900 Ampere and a minimum PIV of 1600V. The use of snubber circuits to retard transients and improve rise time characteristics is not permissible the thyristor must be capable to withstand the rigors of the application on its own. Forward and reverse bias leakage current (IE Thyristor OFF) to be less than 5mA. A forward volt drop across the input terminal and output terminal shall not be more than 2.4V.

The NDU-VT upgrade must incorporate an external firing threshold adjustment which is not accessible to general workers or operation personnel and must be capable of setting the “turning On” threshold in 1 Volt steps from 8 volts through to 15V. Adjustment via a potentiometer is not

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permissible and adjustment must be via twin pin dual in line jumper or dual in line DIP switch clearly marked and inaccessible to operations personnel.

The NDU-VT upgrade must utilize the existing chassis plate and existing diode stack mounting holes. The new thyristor stack assembly must be removable from the front of the frame without loosening or removal of the chassis plate.

The heat sink of the Thyristor shall be sized such that the heatsink shall be less than 80°C at full current at its most accessible touch point. Existing fuses installed in the NDU must be verified to suit the new stack and justification and motivation to be submitted to TPL for approval.

3.12 Vandal Proofing of TRU, NDU and FDU Rocla Enclosures

Transnet Pipeline requires that all the TRU Rocla Enclosures be fitted with a steal lining as well as removing all external hinges and replacing them with internal hinges.

TPL require that the *Contractor* upgrade and reinforce the TRU Rocla Enclosures. Drawings for existing Rocla's. (2684358-C-PL0-CP-DD-013) The requirements are as follows:

- i. Move hinges to the inside.
- ii. Weld a 5mm mild steel sheets inside the existing Rocla structure, the steel should be welded flush to all internal walls and internal roof. Welding to be carry out by a skilled welder. All welds to be neat and tidy. Untidy Work will be rejected. A weld & weld inspection procedure is required.
- iii. The steel should be bolted to the spinet using bold and the studs.
- iv. All levels and dimensions to be checked by the *Contractor* on site prior to construction.

Refer to Annexure F – Schedule of TRU, NDU and FDU works.

3.13 Solid State Decoupler Replacement

SS DCD will be installed at frequent locations along the AC-affected portions of the pipelines through which the zinc anodes will be connected to the pipelines.

DC decoupling devices will be solid state, non-spark producing type, suitably rated for the specific application and location.

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The device shall be certified by a suitably accredited test laboratory to meet the specifications given in the table below:

Specification/Test	Level/ Requirement	Comment
1) Class I impulse current rating	10 kA, 10/350 $\mu$ sec	to SANS 61643-1 requirement
2) Front of wave spark-over voltage	$\leq$ 500 V, 1.2/50 $\mu$ sec	to SANS 61643-1 requirement
3) Rated AC short circuit	3.7kA r.m.s., 1 sec, 50 Hz	to SANS 61643-1 requirement
4) Rated AC load current	45 A r.m.s., 50 Hz, max temp incr. 40°C	at maximum DC blocking voltage, to SANS 61643-1 requirement
5) AC impedance	$\leq$ 0.04 Ohm	at rated load current
6) DC blocking voltage	<b>-10V/+1V</b>	
7) DC leakage (blocked)	$\leq$ 1 mA	at AC load thermal limit
8) DC current withstand	60A for 15 mins	without overheating, test in both directions
9) Housing dielectric to withstand voltage	5.8 kV	to SANS 61643-1 requirement
10) Environmental, enclosure	IP68	Allows for submerged chambers
10) Ambient temperature range	-15°C to 60°C	-
11) Air clearance and creepage distances	10 mm, 15 mm min resp.	to SANS 61643-1 requirement
12) Protection against direct contact	no direct contact	using IEC60529 test finger

The decoupling device shall comprise a suitably rate diode stack capable of blocking direct current in both directions at the specified voltages.

Once the blocking voltage is exceeded, the diode stack shall be capable of conducting the steady state DC up to 60A (1 hour rating) without overheating.

The device shall exhibit a progressive, smooth transition from blocking to conduction and vice versa without commutating.

A bypass capacitor (network) shall be connected in parallel with the diode stack to conduct 50Hz AC up to the blocking voltage of the diode stack.

The capacitor and diode network shall be protected by a suitably rated spark gap for high voltage and lightning induced transients. This will include the appropriate inductance required to decouple the spark gap from the diode stack in terms of lightning protection zone standard practice.

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The decoupling device shall preferably be of open frame construction to permit maintenance / replacement of component parts. The frame shall be sized to fit on the standard chassis plate of the AC mitigation concrete bunker.

Component parts shall be of reputable manufacture with proven performance record and certificated test data.

The decoupling device shall be provided with two M10 terminals at each pole for the connection of 25mm<sup>2</sup> single core cables.

### 3.14 Low Voltage Device (VLD/MOV)

A low-voltage device, solid-state surge protection device shall be used for this purpose. The device shall be certified by a suitably accredited test laboratory to meet the specifications given in table below:

Specification/Test	Level/ Requirement	Comment
1) Class I impulse current rating	10 kA, 10/350 µsec	to SANS 61643-1 requirement
2) Front of wave spark-over voltage	≤ 500 V, 1.2/50 µsec	to SANS 61643-1 requirement
3) Response time	≤ 25 nsec	
4) Short circuit withstand	10 kA r.m.s., 1 sec, 50 Hz	to SANS 61643-1 requirement
5) Housing dielectric withstand voltage	5.8 kV	to SANS 61643-1 requirement
6) AC clamping voltage	75 V r.m.s (+/- 10%)	
7) DC breakdown voltage	100V (+/- 10%)	
8) DC leakage (blocked)	≤ 1 mA	
9) Environmental, enclosure	IP68	
10) Ambient temperature range	-15°C to 60°C	-
11) Air clearance and creepage distances	10 mm, 40 mm min resp.	to SANS 61643-1 requirement
12) Protection against direct contact	no direct contact	using IEC60529 test finger

The test post ground mats are provided for personnel safety during short term (transient) voltage spikes which may occur due to powerline faults or lightning. They are not required for steady state AC mitigation.

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The groundmats are fitted only at test posts within the area of influence of high-tension AC powerlines.

Outside the area of AC influence, the test posts are fitted with a 2m standard earth spike installed adjacent to the pipeline.

It is recommended that a Dehn (Ventiel) or similar approved by the Engineer to be procure by the *Contractor*.

### 3.15 Training Technicians with TRU OEM

The *Contractor* must arrange two training sessions for CP Technicians to be trained on the TRU OEM by Electrical Manufacturing.

### 3.16 Excavations

The *Contractor* will be required to perform all necessary excavations to expose areas in which various equipment will be installed, supply padding sand, backfill, and compact the area. It is also the duty of the *Contractor* to ensure that measures are taken to protect trenches during excavation and backfilling. Backfilling will be done in layers of not more than 150mm. The pipe will be covered by 150 mm of padding sand on either side, and then with insitu material above the padding sand. Backfilling material to be compacted to 90% Mod AASHTO.

### 3.17 Information Provided by the Tenderer

#### **Drawings:**

AC Coupon

DC Coupon

NDU-VT

Stationary Reference Electrode

Solid-State Decouplers

#### **Data Sheets:**

AC Coupon

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DC Coupon

Underground Test Post Enclosure with Key

ER Probe

Transformer Rectifier Unit

Stationary Reference Electrode

Solid-State Decouplers

NDU-VT

VLD

### 3.18 Quality Requirements

The *Contractor* is responsible for all quality activities necessary to ensure the work meets the requirements specified in this scope of works and shall manage and coordinate all quality aspects of the work in accordance with the requirements of this scope

#### 3.18.1 Project Quality Plan

The PQP shall entail the following:

- Overview and understanding of scope of works and key requirements
- Organogram with positions, roles and responsibilities
- Procedures:
  - Document control – the *Contractor* shall provide a description of how documents provided by TPL will be managed e.g., management tools and databases, internal and external distribution of documents to TPL, third parties, internal review and approval routes and authorities, receipts, registrations, codes, standards, and specifications.
  - Design control – where the *Contractor* is responsible for any aspects of design related to the scope of works, they must provide procedures for the control of these design activities. This must also factor in the roles and responsibilities
- Project Schedule - As per this scope of works requirements
- Commissioning and training plan.

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### 3.18.2 Quality Control Plans

The QCPs shall be submitted before the commencement of the project.

QCPs must clearly identify all inspection, test, and verification requirements to meet this scope of works including destructive and non-destructive testing where applicable, witness and hold points. The *Contractor* prepares and submits QCPs to TPL for review in accordance with the requirements of this scope of works and PQP. The QCP shall include:

QCPs shall include reference to all tests specified in the scope of works.

#### **Inspection and Testing**

The *Contractor* is responsible for the conducting of all *Contractor* inspections and tests. This responsibility includes:

- Documenting inspection and test results in the QCPs and relevant FIC.
- Progressively inspecting the quality of the scope of works performed, including that of all *Subcontractors*.
- Inspecting to meet all scope of works requirements, in number, type and form
- Inspecting day to day activities, material receipts, issue of material for installation, in-process inspections, and final inspections.

Schedule of Inspection - The *Contractor* shall submit a schedule showing the proposed dates for inspections and tests nominated in the QCP where witness and hold points are required. The schedule shall be regularly updated with progress and issued to TPL to show the current inspection and test status.

Field Inspection Checklists - For site installation and construction activities, the *Contractor* prepares FICs to permit inspection and testing of installed equipment and constructed facilities in accordance with the respective QCPs.

Inspection Points - The QCP identifies points in the fabrication, manufacturing and/or installation process that are selected for inspection. Hold Point (H), Witness Point (W) Review Point (R), Surveillance (S).

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Welding Procedures - Where the *Contractor's* scope of works includes fabricated weldments, WPS defining the method, preparation, and sequences to be adopted to achieve a satisfactory welded joint shall be provided for all weld types required in the execution of this scope of works.

Material Traceability - Where, and to the extent that material traceability is required, the *Contractor* shall provide its procedures for the maintenance of material identification throughout all phases of manufacture.

Material Certification - Where specified in this scope of works the following certificates shall also be provided to TPL: a certificates of compliance, a certificates issued by a laboratory or test facility independent of the *Contractor's* work, any other form of certification affecting the scope of works.

**Non-Conforming Products**

The *Contractor* shall establish and maintain procedures to control material or products that do not meet the specified requirements.

All *Contractor* product and/or materials identified as not conforming to requirements shall be dealt with promptly as follows:

- If the *Contractor* discovers material or product which is not in accordance with the requirements of the scope of works e.g., a non-conformance, the *Contractor* shall immediately initiate the non-conformance procedure. If TRANSNET or its agent identifies a non-conformance, a TRANSNET NCR may be raised.

**Corrective and Preventative Action**

- If the *Contractor* proposes a disposition of any non-conforming materials or product which varies from the requirements of this scope of works, such a proposal shall be submitted in writing to TPL whose decision on the proposal shall be obtained in writing before the non-conforming material or product is covered up or incorporated into the works or is the subject of any other disposition.

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- The disposition of non-conformances which do not vary the requirements of the Contract, specification or drawings may be approved by the *Contractor* following discussion and agreement with TPL.

Inspection, Measuring and Test Equipment

Calibration - The *Contractor* shall ensure the calibration of test and measuring equipment is performed and maintained in accordance with the relevant *Contractor* procedures and/or the equipment manufacturer’s specifications.

Use of Inspection, Measuring and Test Equipment - The *Contractor* shall ensure that authorized equipment users:

- Use the equipment in accordance with manufacturer’s instructions, and accepted industry practices
- Ensure the equipment is covered by a current calibration certificate
- Conduct the measurements or tests in accordance with the equipment manufacturer’s specifications or other relevant specification
- Prior to commencement of each inspection or test activities:
  - Identify the measurements to be made
  - Determine the accuracy required
  - Select the appropriate inspection, measuring or test equipment for this scope of works.

3.18.3 Documentation

The *Contractor* shall supply the documentation listed below: -

- Two (2) complete sets of the following (in files) and one soft copy on a separate memory stick for each TPL site (Documents must be printable, drawings must also include PDF and CAD versions): -
  - Detailed as built drawings (all drawing types that are outlined on clause 4.1.1 and/or 4.1.5) the as built drawing simply details all cables and equipment installed, it does not change the approved drawings
  - Detailed as design report
  - Required spreadsheet with data logging readings
  - Comprehensive maintenance manuals

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- Detailed spares catalogues
- Electrical Certificate of Compliance (Original and a copy of the COC) (including equipment certificates).
- Factory inspection and testing documents
- Site testing, certification, commissioning, and completion documents
- Equipment warranty certificates.

3.18.4 Installation and Site Works

The *Contractor* shall prior to making any design changes to the existing equipment and proposed drawings submit drawings and detailed design report to the *Project Manager* for prior acceptance. Drawings shall include equipment schedules detailing all major components as per clause 4.1 requirements.

The *Contractor* shall ensure that all equipment arrive timeously onsite. The *Contractor* shall be responsible for any damages to equipment prior to completion and hand over. Should such a delay occur, the *Contractor* shall immediately inform the *Project Manager* in writing such that action can be taken to mitigate the delay.

The *Contractor* shall ensure that all onsite and work specific safety protocols and precautions are always followed. The *Contractor* shall also ensure that the relevant PPE is always worn.

The *Contractor* shall always ensure compliance with SHE requirements prescribed by applicable legislation and best practice standards. The *Contractor* will be responsible for the SHE requirements that TPL may require to be implemented. The *Contractor* shall ensure that no person or employees are allowed to enter any of the work sites on their behalf, unless that employee or person has undergone, SHE induction pertaining to the hazards prevalent to the site at the time of entry.

The *Contractor* shall, in the presence of the *Project Manager* and any other Transnet staff deemed necessary test and commission the upgraded installation and all associated equipment.

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3.18.5 Factory Inspection and Testing

It shall be the responsibility of the *Contractor* to compile a complete Factory Acceptance Test Schedule prior to scheduling a Factory Acceptance Testing (FAT). This schedule shall be used for FAT of the equipment supplied by the *Contractor*.

Factory Acceptance Test schedule/s shall be comprehensive and must cover all aspects of the equipment to be tested and shall be submitted to the *Project Manager* for acceptance at least two weeks prior to commencement of FAT.

The *Project Manager* reserves the right to add or delete any item or test on the Factory Acceptance Test schedule to verify that the supplied equipment complies with specification.

The *Contractor* shall perform the FAT at the supplier’s manufacturing facility under their supervision, in accordance with standard specifications.

The *Contractor* shall be responsible for providing all test equipment and facilities required for the period of the FAT such as the *Project Manager* may deem necessary, and to produce a report of the tests completed.

Should the Factory Acceptance Tests be suspended due to the failure of any test or because of equipment failure, re-scheduling of the Factory Acceptance Tests shall be at the discretion of the *Project Manager*. Failure of Factory Acceptance Tests may result in the *Contractor* being back charged for the man hours expended by the TPL representatives witnessing the tests.

The Factory Acceptance Test schedule will include as a minimum, the following checks, and tests:

Inspections

- A physical check of all equipment shall be made against the applicable drawings.
- Non-compliance will be marked in red on drawings for correction before acceptance.

3.18.6 Site Testing, Certification and Commissioning

It shall be the responsibility of the *Contractor* to compile a complete Site Acceptance Test and Commissioning Schedule to be used for site acceptance testing, certification, and commissioning of the equipment to be installed by the *Contractor*.

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The Site Acceptance Test and Commissioning schedule shall be comprehensive and shall cover all aspects of the equipment to be tested and commissioned and shall be submitted to the *Project Manager* for acceptance, prior to commencement of Site Acceptance Testing (SAT).

The *Contractor* shall be responsible for providing all test equipment and facilities required for the period of the SAT and commissioning and to produce a report of the tests completed. The following Test Equipment must be made available as a minimum during the SAT and commissioning phase.

1. Digital Multi-meter (10M-ohm and higher input impedance)
2. Clamp-on Meter (AC and DC)
3. ER Probe Meter
4. Smart lock underground Test Post Key
5. Calibrated Cu/CuSo4 Reference Electrodes.
6. Schmidt Hammer
7. Spirit Level

The *Project Manager* reserves the right to add or delete any item or test on the Site Acceptance Test and Commissioning schedule to verify that the installed equipment complies with the applicable specification.

The *Contractor* shall perform the SAT, electrical compliance certification and commissioning of the supplied/installed equipment. The *Contractor* shall at his own expense rectify all defects. Should a defect result in time delays and additional material/labour cost, such additional cost incurred shall be for the *Contractor's* account.

Site Acceptance and Handover of all items of the equipment shall be concluded once SAT, certification and commissioning of all supplied/installed equipment has been completed, all fault lists have been completed to compliance and the following documentation has been submitted to and accepted by the *Project Manager*:

- Complete FAT and SAT documentation, comprising of test schedules and commissioning report (as applicable)
- Completed Electrical Certificates of Compliance (Original and a copy of the COC) (including equipment certificates)

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- Final Contract Documentation.

Documentation format and number of copies shall be in accordance with TPL specifications.

#### 4. General Operating Conditions

##### 4.1 Site Meetings

The *Contractor* shall attend site meetings when convened by the *Project Manager*. Such meetings will be for the purpose of discussing progress, delays, materials, conditions, and specifications, as well as the co-ordination of site activities. The meetings will be chaired by the *Project Manager*, or his Deputy and the proceedings shall be noted and circulated by the *Project Manager*.

##### 4.2 House Keeping

The *Contractor* shall maintain the work sites always clean and tidy.

The *Contractor* shall take all reasonable precautions to protect existing equipment while work is in progress. Protection of existing equipment shall include protection against dust or any other harmful matter.

##### 4.3 Materials

The *Contractor* shall ensure that all metal items other than stainless steel or other non-ferrous metals are hot dipped galvanised.

The *Contractor* shall ensure that precaution is taken against electrolytic corrosion where different metals are used on items of equipment.

#### 5. General Operating Conditions

##### 5.1 Hazardous Area

All areas demarcated as "Exd" areas are to be treated as hazardous and *Contractors* shall ensure that the necessary care is taken to prevent damage and fire.

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## 5.2 Climatic Conditions

Unless otherwise specified, all control equipment, peripherals and ancillary equipment shall be capable of operating in an uncontrolled environment, and at ambient temperatures, which vary between -5 degrees Celsius and 50 degrees Celsius.

*Contractors* must state the heat, power and environment requirements for all equipment offered in the tender.

The equipment must operate satisfactorily between sea level and 2000 metres above sea level.

The equipment must be capable of operating in a relative humidity range from 5% RH to 95% RH.

Dust and vapours accumulate rapidly, and selection of equipment and installation thereof shall be given careful consideration to minimise the detrimental effects of this.

Severe lightning occurs in certain of the areas in which the equipment will operate. TPL will not regard damage to equipment resulting from a lightning strike or a power surge as unavoidable except where such a strike is a "direct strike".

## 6. Annexures

The following TPL documentation shall be read in conjunction with this scope of works.

- Annexure A: Drawings and specifications.
- Annexure B: Technical Reports
- Annexure C: Health and Safety Requirements
- Annexure D: Environmental Requirements
- Annexure E: TPL Sample QCP
- Annexure F: Work Schedules

## 7. Guarantee

Guarantee initiation shall be from the date recorded on the *Contractor's* completion certificate. The completion certificate shall for validity purposes contain the signature of both the *Contractor* and the *Project Manager*.

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All electrical components supplied under this specification shall be warranted for a minimum of 12 months from the date of completion. All TRUs and FDUs shall be warranted for a minimum of 12 months from the date of completion. Mechanical equipment shall be warranted for a minimum of 12 months from the date of completion. The defect period (including workmanship) shall be guaranteed for a period of 52 weeks. Upon receiving a notice from TPL, the *Contractor* shall at its own cost and expense and without reimbursement by TPL promptly correct, repair or replace the items, which are not in conformance with this specification. *Contractor's* warranty shall cover all costs (including, without limitation, those costs associated with parts, labour, technical support, travel, transportation, and shipping and handling). The *Contractor* is also to issue TPL all the respective equipment warranty certificates.

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## **PART 4: SITE INFORMATION**

Core clause 11.2(16) states

“Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in.”

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

### **1. Description of the Site and its surroundings**

#### **1.1. General description**

Transnet Pipelines (TPL) a petroleum pipeline operator has initiated a project to optimise the Cathodic Protection (CP) system installed for the protection of the Multi-Product Pipeline (MPP) and its associated branch lines. The main pipeline runs from Island View (Durban) to Jameson Park (Heidelberg) which is approximately 556 km. The associated pipelines connect Gauteng province to both Mpumalanga and North West province (PL2 – Jameson Park to Alrode is 41 km, PL3 – Alrode to Langlaagte is 31 km and PL4 – Kendal to Watloo is 89 km). This contract covers PL1, the section from Island View to Jameson Park only.

There pipeline crosses roads, rivers and farms which are privately owned. Access to most areas along the pipeline requires the use of an off road vehicle.

Refer to Annexure H Work Schedules for equipment information and their locations.

#### **1.2. Existing buildings, structures, and plant & machinery on the Site**

The installations will be done along the pipeline which is running from Jameson Park to Island View. There pipeline crosses roads, rivers and farms.

#### **1.3. Subsoil information**

A Geotechnical investigation of the site has not been conducted.

#### **1.4. Hidden services**

There are no drawing of the hidden services, although it must be noted that the pipeline does cross with other pipelines. Refer to Annexure H Works Schedules for the location of the Foreign Services.

#### **1.5. Other reports and publicly available information**

None.