

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 SUPPLY, INSTALL AND COMMISSION 20 DRY-TYPE TRANSFORMERS FOR 10 X 11/0.4KV SUBSTATIONS IN THE PORT OF RICHARDS BAY

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	R
Value Added Tax @ 15% is	R
The offered total of the Prices inclusive of VAT is	
(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.

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

C1.2 Contract Data

Part one - Data provided by the *Employer*

Clause	Statement	Data
1	General The <i>conditions of contract</i> are the core clauses and the clauses for main Option	
		B: Priced contract with bill of quantities
	dispute resolution Option	W1: Dispute resolution procedure
	and secondary Options	
		X2: Changes in the law
		X5: Sectional Completion
		X7: Delay damages
		X13: Performance Bond
		X16: Retention
		X18: Limitation of liability
		Z: <i>Additional conditions of contract</i>
	of the NEC3 Engineering and Construction Contract June 2005 (amended June 2006 and April 2013)	
10.1	The <i>Employer</i> is:	Transnet SOC Ltd (Registration No. 1990/000900/30)

	Address	Registered address: Transnet Corporate Centre 138 Eloff Street, Braamfontein, JOHANNESBURG, 2000
	Having elected its Contractual Address for the purposes of this contract as:	Transnet National Ports Authority 1st Floor Bayvue Centre Ventura Road Port of Richards Bay, 3900
10.1	The <i>Project Manager</i> is: (Name)	Vuyiswa Magxala
	Address	Pioneer Center Building, Santhom Road Port of Richards Bay 3900
	Tel	035 905 4652
	e-mail	Vuyiswa.Magxala@transnet.net
10.1	The <i>Supervisor</i> is: (Name)	Nontobeko Ntshangase
	Address	Pioneer Center Building, Santhom Road Port of Richards Bay 3900
	Tel No.	011 308 4204
	e-mail	Nontobeko.Ntshangase@transnet.net
11.2(13)	The <i>works</i> are	Supply, Install and Commission 20 Dry-Type Transformers for 10 X 11/0.4kv Substations in the Port of Richards Bay
11.2(14)	The following matters will be included in the Risk Register	Risk: <ul style="list-style-type: none">- working at confined space- unknown services- working in operational areas- Traffic congestion

11.2(15)	The <i>boundaries of the site</i> are	As stated in Part C4.1."Description of the Site and it surroundings"	
11.2(16)	The Site Information is in	Part C4	
11.2(19)	The Works Information is in	Part C3	
12.2	The <i>law of the contract</i> is the law of	the Republic of South Africa subject to the jurisdiction of the Courts of South Africa.	
13.1	The <i>language of this contract</i> is	English	
13.3	The <i>period for reply</i> is	2 weeks	
2	The <i>Contractor's</i> main responsibilities	No additional data is required for this section of the <i>conditions of contract</i>.	
3	Time		
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	02 November 2023	
30.1	The <i>access dates</i> are	Access to site	24 November 2022
33.1	Access to and use of site dates are	Part of the Site	Date
		1	Harbour West
		2	Workshop substation
		3	Admin Substation
		4	Eastern Substation
		5	Liquid Pitch
		6	Sorting Yard
		7	Arrivals
		8	Office
		9	Departure Yard
		10	South Dunes
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	2 weeks of the Contract Date.	
31.2	The <i>starting date</i> is	24 November 2022	

32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	2 weeks.
35.1	The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date.	
4	Testing and Defects	
42.2	The <i>defects date</i> is	52 (fifty-two) weeks after Completion of the whole of the <i>works</i>.
43.2	The <i>defect correction period</i> is	2 weeks
5	Payment	
50.1	The <i>assessment interval</i> is monthly on the	25th (twenty-five) day of each successive month.
51.1	The <i>currency of this contract</i> is the	South African Rand.
51.2	The period within which payments are made is	Payment will be effected on or before the last day of the month following the month during which a valid Tax Invoice and Statement were received.
51.4	The <i>interest rate</i> is	the prime lending rate of Standard Bank of South Africa.
6	Compensation events	
60.1(13)	The <i>weather measurements</i> to be recorded for each calendar month are,	the cumulative rainfall (mm) the number of days with rainfall more than 10 mm the number of days with minimum air temperature less than 0 degrees Celsius the number of days with snow lying at 08:00 hours South African Time and these measurements: N/a
	The place where weather is to be recorded (on the Site) is:	The <i>Contractor's</i> Site establishment area

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

Richards Bay, Kwazulu Natal

and which are available from: **South African Weather Service 012 367 6023 or info3@weathersa.co.za.**

7	Title	No additional data is required for this section of the conditions of contract.
8	Risks and insurance	
80.1	These are additional <i>Employer's</i> risks	None
84.1	The <i>Employer</i> provides these insurances from the Insurance Table	
1	Insurance against:	Loss of or damage to the <i>works</i>, Plant and Materials is as stated in the Insurance policy for Contract Works/ Public Liability.
	Cover / indemnity:	to the extent as stated in the insurance policy for Contract Works / Public Liability
	The deductibles are:	as stated in the insurance policy for Contract Works / Public Liability
2	Insurance against:	Loss of or damage to property (except the <i>works</i>, Plant and Materials & Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) arising out of or in connection with the performance of the Contract as stated in the insurance policy for Contract Works / Public Liability
	Cover / indemnity	Is to the extent as stated in the insurance policy for Contract Works / Public Liability
	The deductibles are	as stated in the insurance policy for Contract Works / Public Liability

3	Insurance against:	Loss of or damage to Equipment (Temporary Works only) as stated in the insurance policy for contract Works and Public Liability
	Cover / indemnity	Is to the extent as stated in the insurance policy for Contract Works / Public Liability
	The deductibles are:	As stated in the insurance policy for Contract Works / Public Liability
4	Insurance against:	Contract Works SASRIA insurance subject to the terms, exceptions and conditions of the SASRIA coupon
	Cover / indemnity	Cover / indemnity is to the extent provided by the SASRIA coupon
	The deductibles are	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.
	Note:	The deductibles for the insurance as stated above are listed in the document titled "Certificate of Insurance: Transnet (SOC) Limited Principal Controlled Insurance."
84.1	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	
	The <i>Contractor</i> provides these additional Insurances	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. 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

- 2** Where the contract involves manufacture, and/or fabrication of Plant & Materials, components or other goods to be incorporated into the *works* at premises other than the site, the *Contractor* shall satisfy the *Employer* that such plant & materials, components or other goods for incorporation in the *works* are adequately insured during manufacture and/or fabrication and transportation to the site.
 - 3** Should the *Employer* have an insurable interest in such items during manufacture, and/or fabrication, such interest shall be noted by endorsement to the *Contractor's* policies of insurance as well as those of any sub-contractor
 - 4** Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R 5 000 000.
 - 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 *Employer*. The *Contractor* shall arrange with the insurer to submit to the *Project Manager* the original and the duplicate original of the policy or policies of insurance and the receipts for payment of current premiums, together with a certificate from the insurer or insurance broker concerned, confirming that the policy or policies provide the full coverage as required. The original policy will be returned to the *Contractor*.
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84.2	The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the works, Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) caused by activity in connection with this contract for any one event is	Whatever the <i>Contractor</i> requires in addition to the amount of insurance taken out by the <i>Employer</i> for the same risk.
84.2	The insurance against loss of or damage to the works, Plant and Materials as stated in the insurance policy for contract works and public liability selected from:	Principal Controlled Insurance (PCI) – Sankofa Insurance Brokers.
9	Termination	Additional Conditions of Contract Clause Z5
10	Data for main Option clause	
B	Priced contract with Bill of Quantities	No additional data is required for this Option.
60.6	The <i>method of measurement</i> is:	The Bill of Quantities have been measured in accordance with SANS 1200 unless indicated otherwise.
11	Data for Option W1	
W1.1	The <i>Adjudicator</i> is:	Both parties will agree as and when a dispute arises. If the parties cannot reach an agreement on the <i>Adjudicator</i>, the Chairman of the Association of Arbitrators will appoint an <i>Adjudicator</i>.
W1.2(3)	The <i>Adjudicator nominating body</i> is: If no <i>Adjudicator nominating body</i> is entered, it is:	The Chairman of the Association of Arbitrators (Southern Africa) the Association of Arbitrators (Southern Africa)
W1.4(2)	The <i>tribunal</i> is:	Arbitration

W1.4(5) The *arbitration procedure* is: **The Rules for the Conduct of Arbitrations of the Association of Arbitrators (Southern Africa)**

The place where arbitration is to be held is: **Durban, Kwazulu Natal, South Africa, South Africa**

The person or organisation who will choose an arbitrator

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

The Chairman of the Association of Arbitrators (Southern Africa)

12 Data for secondary Option clauses

X2 Changes in the law No additional data is required for this Option

X2.1 The *law* of the contract is: **The Republic of South Africa subject to the jurisdiction of the courts of South Africa**

X5 Sectional Completion

X5.1	The <i>completion date</i> for each <i>section</i> of the <i>works</i> is:	<i>Section</i>	Description	<i>Completion date</i>
		1	Harbour West	03 March 2023
		2	Workshop substation	28 March 2023
		3	Admin Substation	13 April 2023
		4	Eastern Substation	08 May 2023
		5	Liquid Pitch	26 May 2023
		6	Sorting Yard	15 June 2023
		7	Arrivals	06 July 2023
		8	Office	26 July 2023
		9	Departure Yard	16 August 2023
		10	South Dunes	05 September 2023

X5 & X7 Sectional Completion and Delay damages used together

X7.1	Delay damages for late			
X5.1	Completion of the <i>sections</i> of the <i>works</i> are:	Section	Description	Amount per day
		1	Harbour West	R1 500 per day
		2	Workshop substation	R1 500 per day
		3	Admin Substation	R1 500 per day
		4	Eastern Substation	R1 500 per day
		5	Liquid Pitch	R1 500 per day
		6	Sorting Yard	R1 500 per day
		7	Arrivals	R1 500 per day
		8	Office	R1 500 per day
		9	Departure Yard	R1 500 per day
		10	South Dunes	R1 500 per day

X13 Performance bond

X13.1 The amount of the **5% of the total of the Prices** performance bond is

X16 Retention

X16.1 The retention free amount is **Nil**

The retention percentage is **10% on all payments certified.**

X18 Limitation of liability

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

Z ***Additional conditions of
contract are:***

Z1 **Local Production and
Content Obligations**

Z1.1

In terms of Local Production and Content (SBD 6.2), Annexure A and Annexure C of the Returnable Schedule T2.2-05 Eligibility Criteria Schedule: Declaration Certificate of Local Production and Content, the Contractor has undertaken to fulfil its obligations of the Local Production and Content for the following designated sectors:

Local Production and Content Designated Sectors:	Minimum Threshold (%)
Transformer Class:	
• Class 0	90%
• Class 1	80%
Electrical Cable Products:	
• Low Voltage Cable	90%
• Medium & High Voltage Cable	90%
• Copper Cable	90%
Steel Value-added Products:	
• Fasteners (bolts, nuts, rivets and nails)	100%

Z1.2

The *Contractor* is required to note that the *Employer*, the Department of Trade and Industry [DTI] and/or the body appointed by the DTI as the verification authority for local content may conduct compliance audits with regard to the Local Production and Content requirements as prescribed in Regulation 8 of the Preferential Procurement Regulations, 2017 issued in terms of the Preferential Procurement Policy Framework Act no. 5 of 2000.

Z1.3	<p>The <i>Contractor</i> is required to continuously update Declarations C, D and E of the Local Production and Content Declaration commitments with the actual local content values for the duration of the contract.</p> <p>The <i>Contractor</i> shall report to the <i>Employer</i> on a monthly basis during the term of the Contract, the amounts spend on Local Production and Content for the designated sectors for the duration of the contract.</p>
Z1.4	<p>The <i>Contractor</i> must refer to Schedule A attached to the Returnable Schedule T2.2-05 Eligibility Criteria Schedule: Declaration Certificate of Local Production and Content concerning non-compliance penalties applicable to Local Production and Content.</p>
Z1.5	<p>Breach of Local Production and Content commitments provides the <i>Employer</i> cause to terminate the contract.</p>
Z2	<p>Additional clause relating to Performance Bonds and/or Guarantees</p>
Z2.1	<p>The Performance Guarantee under X13 above shall be an irrevocable, on-demand performance guarantee, to be issued exactly in the form of the Pro Forma documents provided for this purpose under C1.3 (Forms of Securities), in favour of the <i>Employer</i> by a financial institution reasonably acceptable to the <i>Employer</i>.</p>

**Z3 Additional clauses relating
to Joint Venture**

Z3.1

Insert the additional core clause 27.5

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

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

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

- iv. the working capital requirements for the Joint Venture and the extent to which and manner whereby this will be provided and/or guaranteed by the constituents from time to time;
- v. the names of the auditors and others, if any, who will provide auditing and accounting services to the Joint Venture.

Z3.2

Insert additional core clause 27.6

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

Z4 Additional obligations in respect of Termination

Z4.1

The following will be included under core clause 91.1:

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

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

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

Z4.2 Termination Table

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

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

Z4.3

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

Z5 Right Reserved by the *Employer* to Conduct Vetting through SSA

Z5.1

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

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

Z6 **Additional Clause Relating
to Collusion in the
Construction Industry**

Z6.1

The contract award is made without prejudice to any rights the *Employer* may have to take appropriate action later with regard to any declared tender rigging including blacklisting.

Z7 **Protection of Personal
Information Act**

Z7.1

The *Employer* and the *Contractor* 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.

The *Employer* and the *Contractor* 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.

In the event the *Consultant* is not loaded on the Employers data base, the Project Manager's first assessment of the amount due will be done once the Contractor has been successfully loaded as a vendor on the Employers data base following submitting all valid updated documents. Therefore on NEC ECC Clause 50.1 the following text is removed in its entirety "and is no later than the assessment interval after the starting date"

C1.2 Contract Data

Part two - Data provided by the *Contractor*

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

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

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

	Experience:			
		CV's (and further key persons data including CVs) are appended to Tender Schedule entitled .		
11.2(14)	The following matters will be included in the Risk Register			
31.1	The programme identified in the Contract Data is			
B	Priced contract with bill of quantities			
11.2(21)	The <i>bill of quantities</i> is in			
11.2(31)	The tendered total of the Prices is	(in figures) (in words), excluding VAT		
41 in SSCC	The percentage for people overheads is:	%		
21 in SSCC	The published list of Equipment is the last edition of the list published by			
	The percentage for adjustment for Equipment in the published list is	% (state plus or minus)		
22 in SSCC	The rates of other Equipment are:	Equipment	Size or capacity	Rate
61 in SSCC	The hourly rates for Defined Cost of design outside the Working Areas are	Category of employee		Hourly rate

62 SSCC	in	The percentage for design overheads is	%
63 SSCC	in	The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:	

Annex C

Standard Conditions of Tender

C.1 General

C.1.1 Actions

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

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

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

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

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

C.1.2 Tender Documents

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

C.1.3 Interpretation

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

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

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

a) **conflict of interest** means any situation in which:

- i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfill his or her duties impartially;
- ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
- iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.

b) **comparative offer** means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration;

- c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process;
- d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels;

C.1.4 Communication and employer's agent

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

C.1.5 Cancellation and Re-Invitation of Tenders

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

- a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation;
- b) funds are no longer available to cover the total envisaged expenditure; or
- c) no acceptable tenders are received.
- d) there is a material irregularity in the tender process.

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

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

C.1.6 Procurement procedures

C.1.6.1 General

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

C.1.6.2 Competitive negotiation procedure

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

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

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

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

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

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

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

C.1.6.3.2 Option 2

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

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

C.2 Tenderer's obligations

C.2.1 Eligibility

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

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

C.2.2 Cost of tendering

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

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

C.2.3 Check documents

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

C.2.4 Confidentiality and copyright of documents

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

C.2.5 Reference documents

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

C.2.6 Acknowledge addenda

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

C.2.7 Clarification meeting

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

C.2.8 Seek clarification

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

C.2.9 Insurance

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

C.2.10 Pricing the tender offer

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

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

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

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

C.2.11 Alterations to documents

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

C.2.12 Alternative tender offers

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

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

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

C.2.13 Submitting a tender offer

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

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

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

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

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

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

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

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

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

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

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

C.2.15 Closing time

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

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

C.2.16 Tender offer validity

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

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

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

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

C.2.17 Clarification of tender offer after submission

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

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

C.2.18 Provide other material

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

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

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

C.2.19 Inspections, tests and analysis

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

C.2.20 Submit securities, bonds and policies

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

C.2.21 Check final draft

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

C.2.22 Return of other tender documents

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

C.2.23 Certificates

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

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

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

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

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

C.3.2 Issue Addenda

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

C.3.3 Return late tender offers

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

C.3.4 Opening of tender submissions

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

C.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where

applicable, the total of his prices, number of points claimed for its BBBEE status level and time for completion for the main tender offer only.

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

C.3.5 Two-envelope system

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

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

C.3.6 Non-disclosure

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

C.3.7 Grounds for rejection and disqualification

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

C.3.8 Test for responsiveness

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

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

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

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

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

C.3.9 Arithmetical errors, omissions and discrepancies

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

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

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

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

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

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

C.3.10 Clarification of a tender offer

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

C.3.11 Evaluation of tender offers

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

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

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

Cost effective	The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and least resources to effectively manage and control procurement processes.
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The activities associated with evaluating tender offers are as follows:

- a) Open and record tender offers received
- b) Determine whether or not tender offers are complete
- c) Determine whether or not tender offers are responsive
- d) Evaluate tender offers
- e) Determine if there are any grounds for disqualification
- f) Determine acceptability of preferred tenderer
- g) Prepare a tender evaluation report
- h) Confirm the recommendation contained in the tender evaluation report

C.3.11.1 General

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

C.3.12 Insurance provided by the employer

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

C.3.13 Acceptance of tender offer

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

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

C.3.14 Prepare contract documents

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

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

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

C.3.15 Complete adjudicator's contract

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

C.3.16 Registration of the award

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

C.3.17 Provide copies of the contracts

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

C.3.18 Provide written reasons for actions taken

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

Annex D

Standard Conditions for the calling for Expressions of Interest

D.1 General

D.1.1 Actions

D.1.1.1 The employer and each respondent submitting an expression of interest shall comply with these conditions for calling for expressions of interest. In their dealings with each other, they shall discharge their duties and obligations as set out in D.2 and D.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anti-competitive practices.

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

Note:

- 1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.
- 2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.

D.1.1.3 The respondent shall not make a submission without having a firm intention and the capacity to proceed with the next stage of the procurement process.

D.1.2 Supporting documents

The documents issued by the employer for the purpose of obtaining expressions of interest are listed in the submission data.

D.1.3 Interpretation

D.1.3.1 The submission data and additional requirements contained in the submission schedules that are included in the returnable documents are deemed to be part of these conditions for the calling for expressions of interest.

D.1.3.2 For the purposes of these conditions for the calling for expressions of interest, the following definitions apply:

- a) **conflict of interest** means any situation in which:
 - i. someone in a position of trust has competing professional or personal interests which make it difficult to fulfill his or her duties impartially.
 - ii. an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit.
 - iii. incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.
- b) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process; and

- c) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels

D.1.4 Communication and employer's agent

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

D.2 Respondent's obligations

D.2.1 Eligibility

Submit an expression of interest only if the respondent complies with the criteria stated in the submission data and the respondent, or any of his/her principals, is not under any restriction to do business with the employer.

D.2.2 Cost of submissions

Accept that the employer will not compensate the respondent for any costs incurred in the preparation and delivery of a submission.

D.2.3 Check documents

Check the submission documents on receipt, including pages within them, and notify the employer of any discrepancy or omission.

D.2.4 Acknowledge addenda

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

D.2.5 Clarification meeting

Attend the clarification meeting(s) at which respondents may familiarize themselves with the proposed work, services or supply (and location, etc.) and raise questions. Details of the meeting(s) are stated in the submission data.

D.2.6 Seek clarification

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

D.2.7 Making a submission

D.2.7.1 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

D.2.7.2 Seal the original and each copy of the submission as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the submission data, as well as the respondent's name and contact address.

D.2.7.3 Accept that the employer shall not assume any responsibility for the misplacement or premature opening of the submission if the outer package is not sealed and marked as stated.

D.2.8 Information and data to be completed in all respects

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

D.2.9 Closing time

Ensure that the employer receives the submissions at the address specified in the submission data not later than the closing time stated in the submission data. Proof of posting shall not be accepted as proof of delivery. The employer shall not accept submissions submitted by telegraph, telex, facsimile or e-mail, unless stated otherwise in the submission data.

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

D.2.10 Clarification of submission

Provide clarification of a submission in response to a request to do so from the employer during the evaluation of submissions.

D.3 Employer's undertakings

D.3.1 Respond to clarification

Respond to a request for clarification received up to five (5) working days before the submission closing time stated in the submission data and notify all respondents who attended the clarification meetings, if any, of those responses.

D.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the submission documents to each respondent during the period from the date of the calling for expressions of interest until seven (7) working days before the closing time for submissions stated in the submission data. If, as a result, a respondent applies for an extension to the closing time stated in the submission data, the employer may grant such extension and, shall then notify it to all respondents.

D.3.3 Late submissions

Unless otherwise stated in the submission data, return submissions received after the closing time stated in the submission data, unopened, (unless it is necessary to open a submission to obtain a forwarding address), to the respondent concerned.

D.3.4 Opening of submissions

D.3.4.1 Record the name of each respondent whose submission is opened and acknowledge receipt of each submission.

D.3.4.2 Make available the names of the respondents that made submissions prior to the closing time for submissions to all interested persons upon request.

D.3.5 Non-disclosure

Not disclose to respondents, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of submissions until after the evaluation process is complete.

D.3.6 Grounds for rejection and disqualification

Determine whether there has been any effort by a respondent to influence the processing of submissions and instantly disqualify a respondent if it is established that he/she engaged in corrupt or fraudulent practices.

D.3.7 Test for responsiveness

Determine, on opening and before detailed evaluation, whether each submission received:

- a) meets the requirements of these conditions for the calling for expressions of interest;
- b) has all the substantive provisions properly and fully completed and signed, and
- c) is responsive to the other requirements of the call for expressions of interest.

D.3.8 Non-responsive submissions

Reject all non-responsive submissions.

D.3.9 Evaluation of responsive submissions

D.3.9.1 Appoint an evaluation panel of not less than three persons. Evaluate submissions using the evaluation criteria established in the submission data.

D.3.9.2 Notify the respondents of the outcome of the evaluation process within two (2) weeks of the evaluation report being accepted by the employer.

D.3.10 Provide written reasons for actions taken

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

Annex E**Standard Notice and Invitation to submit an Expression of Interest**

	Guidance
Expressions of interest are invited for the provision of	<i>Describe briefly what is to be procured, and if appropriate, over what time period.</i>
The Employer is	
.....	<i>Describe objective selection criteria and provide any other pertinent information.</i>
The physical address for collection of documentation is: Documents may be collected during working hours after on	
Queries relating to the issues of these documents may be addressed to Mr/Ms , Tel No. , Fax No. E-mail	

Annex F**Record of Addenda to Tender Documents**

The undersigned confirm that the following communications received from the employer before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer:

	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Attach additional pages if more space is required.

Signed		Date	
Name		Position	
Tenderer			

Annex G**Compulsory Enterprise questionnaire**

The following particulars must be furnished. In the case of a joint venture, separate enterprise questionnaires in respect of each partner must be completed and submitted.

Section 1: Name of enterprise:

Section 2: VAT registration number, if any:

Section 3: cidb registration number, if any:

Section 4: CSD number:

Section 5: Particulars of sole proprietors and partners in partnerships:

Name*	Identity number*	Personal income tax number*

* Complete only if sole proprietor or partnership and attach separate page if more than 3 partners

Section 6: Particulars of companies and close corporations

Company registration number:

Close corporation number:

Tax reference number:

Section 7: SBD4 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 8: SBD 6 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 9: SBD8 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 10: SBD9 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise:

- authorizes the employer to verify the tenderers tax clearance status from the South African Revenue Services that it is in order;
- confirms that neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;
- confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;
- confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and
- confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed		Date	
Name		Position	
Enterprise name			

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 National Ports Authority
138 Eloff Street,
Braamfontein,
JOHANNESBURG,
2000

Date:

Dear Sirs,

Performance Bond for Contract No. TNPA/2022/05/0438/4322/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

{SUPPLY, INSTALL AND COMMISSION 20 DRY-TYPE TRANSFORMERS FOR 10 X 11/0.4KV SUBSTATIONS IN THE PORT OF RICHARDS BAY} (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 2: PRICING DATA

Document reference	Title	No of pages
C2.1	Pricing instructions: Option B	5
C2.2	The bill of quantities	16

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, June 2005 and 2013 (ECC) Option B states:

**Identified
and defined
terms**

11

11.2

(21) The Bill of Quantities is the *bill of quantities* 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

- the quantity of the work which the *Contractor* has completed for each item in the Bill of Quantities multiplied by the rate and
- a proportion of each lump sum which is the proportion of the work covered by the item which the *Contractor* has completed.

Completed work is work without Defects which would either delay or be covered by immediately following work.

(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.

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 ECC 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.

2. Measurement and payment

2.1. 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 ²	square metre
m ² -pass	square metre pass
m ³	cubic metre
m ³ -km	cubic metre-kilometre
MN	meganewton
MN.m	meganewton-metre

MPa	megapascal
No.	number
Prov sum ¹	provisional sum
PC-sum	prime cost sum
R/only	Rate only
sum	Lump sum
t	ton (1000kg)
W/day	Work day

2.2. General assumptions

- 2.2.1. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance has been made in the quantities for waste.
- 2.2.2. 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.
- 2.2.3. 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.
- 2.2.4. 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 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

- 2.2.5. 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.
- 2.2.6. 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.
- 2.2.7. 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.

2.3. Departures from the *method of measurement*

2.4. 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 use.



PART C2.2 - PRICED BILL OF QUANTITIES

Item No.	Payment Ref.	Description	Unit	Qty	Rate	Price
	SANS 1200A	BILL NO: 1 PRELIMINARIES & GENERAL <u>Preambles</u> <p>Fixed preliminary items will be valued and paid on a proven cost basis up to the total value</p> <p>Time related preliminary items will be paid on the proportion of: Value of the price of work done to date per the Project Manager's assessment (excluding activities directly related to materials, escalation and compensation events) over the contract value excluding preliminaries costs</p> <p>The tenderer is expected to understand the site, restrictions, and scope of work and price only the relevant items within the Preliminaries. All items priced will be assessed in relevance to the contract prior to any payments being made.</p>				
1.1		Fixed Charge Items				
1.1.1	8.3.1	<u>Contractual Requirements</u>				
1.1.1.1	a	Provision of Performance Bond	sum	1		
1.1.1.2	b	Provision of Insurances	sum	1		
1.1.1.3	c	All other Contractual and legal requirements including, permitting and licencing, etc.	sum	1		
1.1.2	8.3.2	<u>Establishment of Facilities on Site</u>				
1.1.2.1	8.3.2.1	<u>Facilities for Engineer</u>				
1.1.2.1.1	a	Furnished offices	sum	1		
1.1.2.1.2	b	Telephone	sum	1		
1.1.2.1.3	c	Nameboards	sum	1		
	8.3.2.2	<u>Facilities for the Contractor</u>				
1.1.2.2.1	a	Office & storage sheds	sum	1		
1.1.2.2.2	b	Workshops	sum	1		
1.1.2.2.4	d	Living Accommodation	sum	1		
1.1.2.2.5	e	Ablution & Latrine facilities	sum	1		
1.1.2.2.6	f	Tools & equipment	sum	1		
1.1.2.2.7	g	Water supplies, electric power and communications	sum	1		
1.1.2.2.9	h	Access	sum	1		
1.1.2.2.10	j	<u>Plant</u>				
1.1.2.2.10.1	(i)	Crane Truck	sum	1		
<i>Total carried forward to next page</i>						

		<i>Total brought forward from previous page</i>				
1.1.3	8.3.3	Other Fixed charge obligations				
1.1.3.1	a	Comply with all environmental and pollution control requirements	sum	1		
1.1.3.2	b	Compliance with Construction Regulations (2014) Health and Safety measures	sum	1		
1.1.3.3	c	Security and fencing of the Site including watching, barricading and lighting	sum	1		
1.1.3.4	d	Comply with all industrial relation requirements	sum	1		
1.1.3.5	e	Comply with all quality management requirements not included elsewhere	sum	1		
1.1.3.6	f	Provision of marked up drawings for production of as-built drawings	sum	1		
1.1.3.7	g	3 sets of Operation and maintenance manuals including As-Built drawings on hard copy and CD as specified. Refer to tender specification.	Sum	1		
1.1.3.8	h	Instructing and training the Employer's staff in operation of system and equipment prior to hand over to the Client .	Day	5		
1.1.4		<u>De-establishment</u>				
1.1.4.1	8.3.4	Removal of all items as stated above, including restoring and making good to the Project Manager's satisfaction	sum	1		
		<i>Total carried forward to next page</i>				

		<i>Total brought forward from previous page</i>				
1.2		Time Related Items				
1.2.1	8.4.1	<u>Contractual Requirements</u>				
1.2.1.1	a	All other Contractual and legal requirements including, permitting and licencing, etc.	Months	12		
1.2.2	8.4.2.2	<u>Operation and Maintenance of Facilities on Site, for duration of construction, except where otherwise stated</u>				
1.2.2.1	8.4.2.1	<u>Facilities for Engineer</u>				
1.2.2.1.1	a	Furnished offices	Months	12		
1.2.2.1.2	b	Telephone	Months	12		
1.2.2.1.3	c	Nameboards	Months	12		
1.2.2.2	8.4.2.2	<u>Facilities for Contractor</u>				
1.2.2.2.1	a	Office & storage sheds	Months	12		
1.2.2.2.2	b	Workshops	Months	12		
1.2.2.2.3	d	Living Accommodation	Months	12		
1.2.2.2.4	e	Ablution & Latrine facilities	Months	12		
1.2.2.2.5	f	Tools & equipment	Months	12		
1.2.2.2.6	g	Water supplies, electric power and communications	Months	12		
1.2.2.2.7	(i)	8 ton Crane Truck	Months	12		
		<i>Total carried forward to next page</i>				

		<i>Total brought forward from previous page</i>					
1.2.3		<u>Supervision for the duration of the contract</u>					
1.2.3.1	8.4.3	Supervision for the duration of the contract	Months	12			
1.2.3.2	8.4.4	Company & head office overhead costs for the duration of the contract	Months	12			
1.2.4	8.4.5	Other Time related obligations					
1.2.4.2	a	Compliance with Construction Regulations (2014) Health and Safety measures	Months	12			
1.2.4.3	b	Security and fencing of the Site including watching, barricading	Months	12			
1.2.4.4	c	Comply with all environmental and pollution control	Months	12			
1.2.4.5	d	Comply with all industrial relations requirements	Months	12			
1.2.4.6	e	Comply with all document management requirements not included elsewhere	Months	12			
1.2.4.7	f	Comply with all quality management requirements not included	Months	12			
1.2.4.8	g	Facilitation and co-operation with the Employer and others	Months	12			
1.2.4.9	h	Provision of marked up drawings for production of as-built	Months	12			
1.2.4.10	i	All other Time-related charge obligations not covered (to be	Months	12			
1.3		Temporary works					
1.3.1	8.8	<u>Temporary works</u>					
1.3.1.1	8.8.1	Main Access Road to Works (construct and maintain)	sum	1			
1.3.1.2	8.8.2	Protection of existing structure until construction in vicinity is complete	sum	1			
1.3.1.3	8.8.3	Protection of existing services	sum	1			
		Total Carried to the Summary Page					

Item No.	Payment Ref.	Description	Unit	Qty	Rate	Price
1		EXISTING SUBSTATION EQUIPMENT - WORKSHOP SUBSTATION				
		This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation philosophy of busbar sections. Contractor to advise the Project Manager at least four (4) weeks prior to commencing with this item.				
1.1		Allow for de-energising of existing transformers, removal and transport to a disposal site allocated by the <i>Project Manager</i> . This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation of busbar sections inline with the existing Single Line Diagrams.	sum	1		
2		POWER CABLES SUPPLY				
2.1		Supply, installation and commissioning of new 50mm ² 3-Core Unarmoured XLPE, 11kV cable	m	60		
2.2		Supply, installation and commissioning of new 300mm ² 4-Core ECC, PVC Copper cable	m	180		
2.3		Termination of new 50mm ² 3-Core Unarmoured XLPE insulated 11kV cable. This is inclusive of termination accessories.	ea	4		
2.4		Termination of new 300mm ² 4-Core ECC, PVC Copper cable from Transformer to Low Voltage panel. This is inclusive of glands, lugs and termination accessories.	ea	12		
3		DRY TYPE TRANSFORMER				
3.1		Supply, Delivery and Offloading of 1MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing.	ea	2		
3.2		Installation and commissioning of 1MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing.	ea	2		
4		CABLE MANAGEMENT SYTEM				
4.1		Removal of the existing cable ladder system including delivery to TNPA depot				
4.2		Equal or similar approved to O-Line OL75 3CR12 powder coated heavy duty 500mm wide cable ladder complete with fixing and support brackets and accessories	m	25		
4.3		Supply and installation of O-Line 3CR12 powder coated OL254 Heavy Duty 250mm Cantilever Arms complete with accessories	ea	16		
(a)		Straight	m	50		
(b)		Tee	ea	5		
(c)		Internal bend	ea	5		
(d)		External bend	ea	5		
(e)		Horizontal bend	ea	5		
(f)		1050x2.5mm Double Cantilever Arms	ea	50		
(g)		Slotted pierced channel	m	200		
4.4		Allowance installation accessories: for stainless steel M10 Raw bolts, Splices, earth straps and Fasteners	sum	1		
5		EARTHING				
5.1		Provisional amount of fifty thousand rands for design, supply and installation of earthing and bonding in compliance with TPD-004-EARTHSPEC, Transnet Earthing Specification including supply and installation of ancilliary cables from dry type transformers to existing MV protection relays	sum	1		
6		GENERAL				
6.1		Design, supply, installation and painting of hot dipped galvanised chequer plate in trenches where transformers have been removed.	sum	1		
6.2		supply and installation of ancilliary cables from dry type transformers to existing MV protection relays	sum	1		
7		TESTING AND COMMISSIONING				
7.1		FAT Attendance by Independent Certified Engineer and witnessed by Transnet electrical design engineering team.	sum	1		
7.2		Testing and Commissioning of complete installation in accordance to SANS 10142-1 and SANS 10142-2 including the issue of COC certificates	sum	1		
7.3		Grading of protection relays and testing and commissioning of the medium voltage installation by a protection engineer. Tests shall be witnessed by Transnet Design Engineer. This will also include the commissioning of the medium voltage equipment by a specialist commissioning engineer.	sum	1		
8		VENTILATION				
8.1		Design, supply, installation and commissioning of equal or similar approved to TPM40041 fan, filtration units and powder coated 3CR12 ducting, including installation of washable filter on all existing wall and door louvers. (Typical details are displayed on Enginers drawing)	ea	1		
8.2		Supply and installation of 3CR12 powder coated stainless steel temperature controlled stop/start station with equal or similar approved to RS PRO (875-1214) Linear, RTD, 48x96mm, J Thermocouple input as detailed in drawings	ea	1		
8.3		Supply and installation of equal or similar approved to RS PRO PTBO TYPE J Nozzle M6x100 Thermocouple	ea	1		
		Total carried to Summary Page				

Item No.	Payment Ref.	Description	Unit	Qty	Rate	Price
1		EXISTING SUBSTATION EQUIPMENT - ADMIN QUAY SUBSTATION				
		This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation philosophy of busbar sections. Contractor to advise the Project Manager at least four (4) weeks prior to commencing with this item.				
1.1		Allow for de-energising of existing transformers, removal and transport to a disposal site allocated by the <i>Project Manager</i> . This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation of busbar sections inline with the existing Single Line Diagrams.	sum	1		
2		POWER CABLES SUPPLY				
2.1		Supply, installation and commissioning of new 50mm ² 3-Core Unarmoured XLPE, 11kV cable	m	60		
2.2		Supply, installation and commissioning of new 300mm ² 4-Core ECC, PVC Copper cable	m	180		
2.3		Termination of new 50mm ² 3-Core Unarmoured XLPE insulated 11kV cable. This is inclusive of termination accessories.	ea	4		
2.4		Termination of new 300mm ² 4-Core ECC, PVC Copper cable from Transformer to Low Voltage panel. This is inclusive of glands, lugs and termination accessories.	ea	12		
3		DRY TYPE TRANSFORMER				
3.1		Supply, Delivery and Offloading of 1MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing.	ea	2		
3.2		Installation and commissioning of 1MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing.	ea	2		
4		CABLE MANAGEMENT SYTEM				
4.1		Removal of the existing cable ladder system including delivery to TNPA depot				
4.2		Equal or similar approved to O-Line OL75 3CR12 powder coated heavy duty 500mm wide cable ladder complete with fixing and support brackets and accessories	m	25		
4.3		Design supply and installation of O-Line 3CR12 powder coated OL254 Heavy Duty 250mm Cantilever Arms complete with accessories	ea	16		
4.4		Allowance installation accessories: for stainless steel M10 Raw bolts, Splices, earth straps and Fasteners	sum	1		
5		EARTHING				
5.1		Provisional amount of fifty thousand rands for design, supply and installation of earthing and bonding in compliance with TPD-004-EARTHSPEC, Transnet Earthing Specification.	sum	1		
6		GENERAL				
6.1		Design, supply, installation and painting of hot dipped galvanised chequer plate in trenches where transformers have been removed.	sum	1		
6.2		supply and installation of ancilliary cables from dry type transformers to existing MV protection relays	sum	1		
7		TESTING AND COMMISSIONING				
7.1		FAT Attendance (generator) by Independent Certified Engineer and witnessed by electrical design engineering team.	sum	1		
7.2		Testing and Commissioning of complete installation in accordance to SANS 10142-1 and SANS 10142-2 including the issue of COC certificates	sum	1		
7.3		Grading of protection relays and testing and commissioning of the medium voltage installation by a protection engineer. Tests shall be witnessed by Transnet Design Engineer. This will also include the commissioning of the medium voltage equipment by a specialist commissioning engineer.	sum	1		
8		VENTILATION				
8.1		Design, supply, installation and commissioning of equal or similar approved to TPM40041 fan, filtration units and powder coated 3CR12 ducting, including installation of washable filter on all existing wall and door louvers. (Typical details are displayed on drawing)	ea	1		
8.2		Supply and installation of 3CR12 powder coated stainless steel temperature controlled stop/start station with equal or similar approved to RS PRO (875-1214) Linear, RTD, 48x96mm , J Thermocouple input as detailed in drawings	ea	1		
8.3		Supply and installation of equal or similar approved to RS PRO PTBO TYPE J Nozzle M6x100 Thermocouple	ea	1		
		Total carried to Summary Page				

TRANSNET NATIONAL PORTS AUTHORITY
TENDER NUMBER: TNPA/2022/05/0438/4322/RFP
DESCRIPTION OF THE WORKS: SUPPLY, INSTALL AND COMMISSION 20 DRY-TYPE TRANSFORMERS FOR 10 X
11/0.4KV SUBSTATIONS IN THE PORT OF RICHARDS BAY

Item No.	Payment Ref.	Description	Unit	Qty	Rate	Price
1		EXISTING SUBSTATION EQUIPMENT - ARRIVALS SUBSTATION				
		This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation philosophy of busbar sections. Contractor to advise the Project Manager at least four (4) weeks prior to commencing with this item.				
1.1		Allow for de-energising of existing transformers, removal and transport to a disposal site allocated by the <i>Project Manager</i> . This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation of busbar sections inline with the existing Single Line Diagrams.	sum	1		
2		POWER CABLES SUPPLY				
2.1		Supply, installation and commissioning of new 50mm ² 3-Core Unarmoured XLPE, 11kV cable	m	30		
2.2		Supply, installation and commissioning of new 300mm ² 4-Core ECC, PVC Copper cable	m	156		
2.3		Termination of new 50mm ² 3-Core Unarmoured XLPE insulated 11kV cable. This is inclusive of termination accessories.	ea	4		
2.4		Termination of new 300mm ² 4-Core ECC, PVC Copper cable from Transformer to Low Voltage panel. This is inclusive of glands, lugs and termination accessories.	ea	12		
3		DRY TYPE TRANSFORMER				
3.1		Supply, Delivery and Offloading of 500KVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing	ea	2		
3.2		Installation of 500KVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing	ea	2		
4		CABLE MANAGEMENT SYSTEM				
4.1		Removal of the existing cable ladder system including delivery to TNPA depot				
4.2		Equal or similar approved to O-Line OL75 3CR12 powder coated heavy duty 500mm wide cable ladder complete with fixing and support brackets and accessories	m	16		
4.3		Design supply and installation of O-Line 3CR12 powder coated OL254 Heavy Duty 250mm Cantilever Arms complete with accessories	ea	10		
4.4		Allowance installation accessories: for stainless steel M10 Raw bolts, Splices, earth straps and Fasteners	sum	1		
5		EARTHING				
5.1		Provisional amount of fifty thousand rands for design, supply and installation of earthing and bonding in compliance with TPD-004-EARTHSPEC, Transnet Earthing Specification.	sum	1		
6		GENERAL				
6.1		Design, supply, installation and painting of hot dipped galvanised chequer plate in trenches where transformers have been removed.	sum	1		
6.2		supply and installation of ancilliary cables from dry type transformers to existing MV protection relays	sum	1		
7		TESTING AND COMMISSIONING				
7.1		FAT Attendance (generator) by Independent Certified Engineer and witnessed by electrical design engineering team.	sum	1		
7.2		Testing and Commissioning of complete installation in accordance to SANS 10142-1 and SANS 10142-2 including the issue of COC certificates	sum	1		
7.3		Grading of protection relays and testing and commissioning of the medium voltage installation by a protection engineer. Tests shall be witnessed by Transnet Design Engineer. This will also include the commissioning of the medium voltage equipment by a specialist commissioning engineer.	sum	1		
8		VENTILATION				
6.2		Design, supply, installation and commissioning of equal or similar approved to TPM40041 fan, filtration units and powder coated 3CR12 ducting, including installation of washable filter on all existing wall and door louvers. (Typical details are displayed on drawing)	ea	1		
8.2		Supply and installation of 3CR12 powder coated stainless steel temperature controlled stop/start station with equal or similar approved to RS PRO (875-1214) Linear, RTD, 48x96mm, J Thermocouple input as detailed in drawings	ea	1		
8.3		Supply and installation of equal or similar approved to RS PRO PTBO TYPE J Nozzle M6x100 Thermocouple	ea	1		
		Total carried to Summary Page				

TRANSNET NATIONAL PORTS AUTHORITY
TENDER NUMBER: TNPA/2022/05/0438/4322/RFP
DESCRIPTION OF THE WORKS: SUPPLY, INSTALL AND COMMISSION 20 DRY-TYPE TRANSFORMERS FOR 10 X 11/0.4KV SUBSTATIONS IN THE PORT OF RICHARDS BAY

Item No.	Payment Ref.	Description	Unit	Qty	Rate	Price
1		EXISTING SUBSTATION EQUIPMENT - DEPARTURE SUBSTATION				
		This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation philosophy of busbar sections. Contractor to advise the Project Manager at least four (4) weeks prior to commencing with this item.				
1.1		Allow for de-energising of existing transformers, removal and transport to a disposal site allocated by the <i>Project Manager</i> . This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation of busbar sections inline with the existing Single Line Diagrams.	sum	1		
2		POWER CABLES SUPPLY				
2.1		Supply, installation and commissioning of new 50mm ² 3-Core Unarmoured XLPE, 11kV cable	m	60		
2.2		Supply, installation and commissioning of new 300mm ² 4-Core ECC, PVC Copper cable	m	180		
2.3		Termination of new 50mm ² 3-Core Unarmoured XLPE insulated 11kV cable. This is inclusive of termination accessories.	ea	4		
2.4		Termination of new 300mm ² 4-Core ECC, PVC Copper cable from Transformer to Low Voltage panel. This is inclusive of glands, lugs and termination accessories.	ea	12		
3		DRY TYPE TRANSFORMER				
3.1		Supply, Delivery and Offloading of 500kVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing	ea	2		
3.2		Installation of 500kVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing	ea	2		
4		CABLE MANAGEMENT SYTEM				
4.1		Removal of the existing cable ladder system including delivery to TNPA depot				
4.2		Equal or similar approved to O-Line OL75 3CR12 powder coated heavy duty 500mm wide cable ladder complete with fixing and support brackets and accessories	m	25		
4.3		Design supply and installation of O-Line 3CR12 powder coated OL254 Heavy Duty 250mm Cantilever Arms complete with accessories	ea	16		
4.4		Allowance installation accessories: for stainless steel M10 Raw bolts, Splices, earth straps and Fasteners	sum	1		
5		EARTHING				
5.1		Provisional amount of fifty thousand rands for design, supply and installation of earthing and bonding in compliance with TPD-004-EARTHSPEC, Transnet Earthing Specification.	sum	1		
6		GENERAL				
6.1		Design, supply, installation and painting of hot dipped galvanised chequer plate in trenches where transformers have been removed.	sum	1		
6.2		supply and installation of ancilliary cables from dry type transformers to existing MV protection relays	sum	1		
7		TESTING AND COMMISSIONING				
7.1		FAT Attendance (generator) by Independent Certified Engineer and witnessed by electrical design engineering team.	sum	1		
7.2		Testing and Commissioning of complete installation in accordance to SANS 10142-1 and SANS 10142-2 including the issue of COC certificates	sum	1		
7.3		Grading of protection relays and testing and commissioning of the medium voltage installation by a protection engineer. Tests shall be witnessed by Transnet Design Engineer. This will also include the commissioning of the medium voltage equipment by a specialist commissioning engineer.	sum	1		
8		VENTILATION				
8.1		Design, supply, installation and commissioning of equal or similar approved to TPM40041 fan, filtration units and powder coated 3CR12 ducting, including installation of washable filter on all existing wall and door louvers. (Typical details are displayed on drawing)	ea	1		
8.2		Supply and installation of 3CR12 powder coated stainless steel temperature controlled stop/start station with equal or similar approved to RS PRO (875-1214) Linear, RTD, 48x96mm, J Thermocouple input as detailed in drawings	ea	1		
8.3		Supply and installation of equal or similar approved to RS PRO PTBO TYPE J Nozzle M6x100 Thermocouple	ea	1		
		Total carried to Summary Page				

TRANSNET NATIONAL PORTS AUTHORITY
TENDER NUMBER: TNPA/2022/05/0438/4322/RFP
DESCRIPTION OF THE WORKS: SUPPLY, INSTALL AND COMMISSION 20 DRY-TYPE TRANSFORMERS FOR 10 X 11/0.4KV SUBSTATIONS IN THE PORT OF RICHARDS BAY

Item No.	Payment Ref.	Description	Unit	Qty	Rate	Price
1		EXISTING SUBSTATION EQUIPMENT - EASTERN INTAKE SUBSTATION				
		This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation philosophy of busbar sections. Contractor to advise the Project Manager at least four (4) weeks prior to commencing with this item.				
1.1		Allow for de-energising of existing transformers, removal and transport to a disposal site allocated by the <i>Project Manager</i> . This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation of busbar sections inline with the existing Single Line Diagrams.	sum	1		
2		POWER CABLES SUPPLY				
2.1		Supply, installation and commissioning of new 50mm ² 3-Core Unarmoured XLPE, 11kV cable	m	60		
2.2		Supply, installation and commissioning of new 300mm ² 4-Core ECC, PVC Copper cable	m	100		
2.3		Termination of new 50mm ² 3-Core Unarmoured XLPE insulated 11kV cable. This is inclusive of termination accessories.	ea	4		
2.4		Termination of new 300mm ² 4-Core ECC, PVC Copper cable from Transformer to Low Voltage panel. This is inclusive of glands, lugs and termination accessories.	ea	12		
3		DRY TYPE TRANSFORMER				
3.1		Supply, Delivery, Offloading and Installation of 1MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification . and drawing no:	ea	2		
3.2		Installation and commissioning of 1MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing.	ea	2		
4		CABLE MANAGEMENT SYTEM				
4.1		Removal of the existing cable ladder system including delivery to TNPA depot				
4.2		Equal or similar approved to O-Line OL75 3CR12 powder coated heavy duty 500mm wide cable ladder complete with fixing and support brackets and accessories	m	38		
4.3		Design supply and installation of O-Line 3CR12 powder coated OL254 Heavy Duty 250mm Cantilever Arms complete with accessories	ea	26		
4.4		Allowance installation accessories: for stainless steel M10 Raw bolts, Splices, earth straps and Fasteners	sum	1		
5		EARTHING				
5.1		Provisional amount of fifty thousand rands for design, supply and installation of earthing and bonding in compliance with TPD-004-EARTHSPEC, Transnet Earthing Specification.	sum	1		
6		GENERAL				
6.1		Design, supply, installation and painting of hot dipped galvanised chequer plate in trenches where transformers have been removed.	sum	1		
6.2		supply and installation of ancilliary cables from dry type transformers to existing MV protection relays	sum	1		
7		TESTING AND COMMISSIONING				
7.1		FAT Attendance (generator) by Independent Certified Engineer and witnessed by electrical design engineering team.	sum	1		
7.2		Testing and Commissioning of complete installation in accordance to SANS 10142-1 and SANS 10142-2 including the issue of COC certificates	sum	1		
7.3		Grading of protection relays and testing and commissioning of the medium voltage installation by a protection engineer. Tests shall be witnessed by Transnet Design Engineer. This will also include the commissioning of the medium voltage equipment by a specialist commissioning engineer.	sum	1		
8		VENTILATION				
8.1		Design, supply, installation and commissioning of equal or similar approved to TPM40041 fan, filtration units and powder coated 3CR12 ducting, including installation of washable filter on all existing wall and door louvers. (Typical details are displayed on drawing)	ea	1		
8.2		Supply and installation of 3CR12 powder coated stainless steel temperature controlled stop/start station with equal or similar approved to RS PRO (875-1214) Linear, RTD, 48x96mm , J Thermocouple input as detailed in drawings	ea	1		
8.3		Supply and installation of equal or similar approved to RS PRO PTBO TYPE J Nozzle M6x100 Thermocouple	ea	1		
		Total carried to Summary Page				

Item No.	Payment Ref.	Description	Unit	Qty	Rate	Price
1		EXISTING SUBSTATION EQUIPMENT - HARBOUR WEST SUBSTATION				
		This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation philosophy of busbar sections. Contractor to advise the Project Manager at least four (4) weeks prior to commencing with this item.				
1.1		Allow for de-energising of existing transformers, removal and transport to a disposal site allocated by the <i>Project Manager</i> . This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation of busbar sections inline with the existing Single Line Diagrams.	sum	1		
2		POWER CABLES SUPPLY				
2.1		Supply, installation and commissioning of new 50mm ² 3-Core Unarmoured XLPE, 11kV cable	m	60		
2.2		Supply, installation and commissioning of new 300mm ² 4-Core ECC, PVC Copper cable	m	150		
2.3		Termination of new 50mm ² 3-Core Unarmoured XLPE insulated 11kV cable. This is inclusive of termination accessories.	ea	4		
2.4		Termination of new 300mm ² 4-Core ECC, PVC Copper cable from Transformer to Low Voltage panel. This is inclusive of glands, lugs and termination accessories.	ea	12		
3		DRY TYPE TRANSFORMER				
3.1		Supply, Delivery, Offloading of 1,6MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification . and drawing no: 4128234-1-000-E-LA-0008-01	ea	2		
3.2		Installation of 1,6MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification . and drawing no: 4128234-1-000-E-LA-0008-01	ea	2		
4		CABLE MANAGEMENT SYTEM				
4.1		Removal of the existing cable ladder system including delivery to TNPA depot				
4.2		Equal or similar approved to O-Line OL75 3CR12 powder coated heavy duty 500mm wide cable ladder complete with fixing and support brackets and accessories	m	38		
4.3		Design supply and installation of O-Line 3CR12 powder coated OL254 Heavy Duty 250mm Cantilever Arms complete with accessories	ea	16		
4.4		Allowance installation accessories: for stainless steel M10 Raw bolts, Splices, earth straps and Fasteners	sum	1		
5		FUSE UNITS				
5.1		Supply, Delivery, Offloading and Installation of 3phase breakeoutlet unit with 2000A fuses as per drawing no: 4128234-1-000-E-LA-0001-01	ea	2		
6		EARTHING				
6.1		Provisional amount of fifty thousand rands for design, supply and installation of earthing and bonding in compliance with TPD-004-EARTHSPEC, Transnet Earthing Specification.	sum	1		
7		GENERAL				
7.1		Design, supply, installation and painting of hot dipped galvanised chequer plate in trenches where transformers have been removed.	sum	1		
7.2		supply and installation of ancilliary cables from dry type transformers to existing MV protection relays	sum	1		
8		TESTING AND COMMISSIONING				
8.1		FAT Attendance (generator) by independent Certified Engineer and witnessed by electrical design engineering team.	sum	1		
8.2		Testing and Commissioning of complete installation in accordance to SANS 10142-1 and SANS 10142-2 including the issue of COC certificates	sum	1		
8.3		Grading of protection relays and testing and commissioning of the medium voltage installation by a protection engineer. Tests shall be witnessed by Transnet Design Engineer. This will also include the commissioning of the medium voltage equipment by a specialist commissioning engineer.	sum	1		
9		VENTILATION				
9.1		Design, supply, installation and commissioning of equal or similar approved to TPM40041 fan, filtration units and powder coated 3CR12 ducting, including installation of washable filter on all existing wall and door louvers. (Typical details are displayed on drawing)	ea	1		
9.2		Supply and installation of 3CR12 powder coated stainless steel temperature controlled stop/start station with equal or similar approved to RS PRO (875-1214) Linear, RTD, 48x96mm , J Thermocouple input as detailed in drawings	ea	1		
9.3		Supply and installation of equal or similar approved to RS PRO PTBO TYPE J Nozzle M6x100 Thermocouple	ea	1		
		Total carried to Summary Page				

TRANSNET NATIONAL PORTS AUTHORITY
TENDER NUMBER: TNPA/2022/05/0438/4322/RFP
DESCRIPTION OF THE WORKS: SUPPLY, INSTALL AND COMMISSION 20 DRY-TYPE TRANSFORMERS FOR 10 X 11/0.4KV SUBSTATIONS IN THE PORT OF RICHARDS BAY

Item No.	Payment Ref.	Description	Unit	Qty	Rate	Price
1		EXISTING SUBSTATION EQUIPMENT - LIQUID PITCH SUBSTATION				
		This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation philosophy of busbar sections. Contractor to advise the Project Manager at least four (4) weeks prior to commencing with this item.				
1.1		Allow for de-energising of existing transformers, removal and transport to a disposal site allocated by the <i>Project Manager</i> . This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation of busbar sections inline with the existing Single Line Diagrams.	sum	1		
2		POWER CABLES SUPPLY				
2.1		Supply, installation and commissioning of new 50mm ² 3-Core Unarmoured XLPE, 11kV cable	m	50		
2.2		Supply, installation and commissioning of new 300mm ² 4-Core ECC, PVC Copper cable	m	300		
2.3		Termination of new 50mm ² 3-Core Unarmoured XLPE insulated 11kV cable. This is inclusive of termination accessories.	ea	4		
2.4		Termination of new 300mm ² 4-Core ECC, PVC Copper cable from Transformer to Low Voltage panel. This is inclusive of glands, lugs and termination accessories.	ea	12		
3		DRY TYPE TRANSFORMER				
3.1		Supply, Delivery and Offloading of 2MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification . and drawing no: 4128234-1-000-E-LA-0008-01	ea	2		
3.2		Installation of 2MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification . and drawing no: 4128234-1-000-E-LA-0008-01	ea	2		
4		CABLE MANAGEMENT SYTEM				
4.1		Removal of the existing cable ladder system including delivery to TNPA depot				
4.2		Equal or similar approved to O-Line OL75 3CR12 powder coated heavy duty 500mm wide cable ladder complete with fixing and support brackets and accessories	m	16		
4.3		Design supply and installation of O-Line 3CR12 powder coated OL254 Heavy Duty 250mm Cantilever Arms complete with accessories	ea	10		
4.4		Allowance installation accessories: for stainless steel M10 Raw bolts, Splices, earth straps and Fasteners	sum	1		
5		FUSE UNITS				
5.1		Supply, Delivery, Offloading and Installation of 3phase breakoutlet unit with 2000A fuses as per drawing no: 4128234-1-000-E-LA-0008-01	ea	2		
6		EARTHING				
6.1		Provisional amount of fifty thousand rands for design, supply and installation of earthing and bonding in compliance with TPD-004-EARTHSPEC, Transnet Earthing Specification.	sum	1		
7		GENERAL				
7.1		Design, supply, installation and painting of hot dipped galvanised chequer plate in trenches where transformers have been removed.	sum	1		
7.2		supply and installation of ancilliary cables from dry type transformers to existing MV protection relays	sum	1		
8		TESTING AND COMMISSIONING				
8.1		FAT Attendance (generator) by Independent Certified Engineer and witnessed by electrical design engineering team.	sum	1		
8.2		Testing and Commissioning of complete installation in accordance to SANS 10142-1 and SANS 10142-2 including the issue of COC certificates	sum	1		
8.3		Grading of protection relays and testing and commissioning of the medium voltage installation by a protection engineer. Tests shall be witnessed by Transnet Design Engineer. This will also include the commissioning of the medium voltage equipment by a specialist commissioning engineer.	sum	1		
9		VENTILATION				
9.1		Design, supply, installation and commissioning of equal or similar approved to TPM40041 fan, filtration units and powder coated 3CR12 ducting, including installation of washable filter on all existing wall and door louvers. (Typical details are displayed on drawing)	ea	1		
9.2		Supply and installation of 3CR12 powder coated stainless steel temperature controlled stop/start station with equal or similar approved to RS PRO (875-1214) Linear, RTD, 48x96mm , J Thermocouple input as detailed in drawings	ea	1		
9.3		Supply and installation of equal or similar approved to RS PRO PTBO TYPE J Nozzle M6x100 Thermocouple	ea	1		
		Total carried to Summary Page				

Item No.	Payment Ref.	Description	Unit	Qty	Rate	Price
1		EXISTING SUBSTATION EQUIPMENT - OFFICE SUBSTATION				
		This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation philosophy of busbar sections. Contractor to advise the Project Manager at least four (4) weeks prior to commencing with this item.				
1.1		Allow for de-energising of existing transformers, removal and transport to a disposal site allocated by the <i>Project Manager</i> . This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation of busbar sections inline with the existing Single Line Diagrams.	sum	1		
2		POWER CABLES SUPPLY				
2.1		Supply, installation and commissioning of new 50mm ² 3-Core Unarmoured XLPE, 11kV cable	m	70		
2.2		Supply, installation and commissioning of new 300mm ² 4-Core ECC, PVC Copper cable	m	160		
2.3		Termination of of new 50mm ² 3-Core Unarmoured XLPE insulated 11kV cable. This is inclusive of termination accessories.	ea	4		
2.4		Termination of new 300mm ² 4-Core ECC, PVC Copper cable from Transformer to Low Voltage panel. This is inclusive of glands, lugs and termination accessories.	ea	12		
3		DRY TYPE TRANSFORMER				
3.1		Supply, Delivery and Offloading of 800kVA 1MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing	ea	2		
3.2		Installation of 800kVA 1MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing	ea	2		
4		CABLE MANAGEMENT SYTEM				
4.1		Removal of the existing cable ladder system including delivery to TNPA depot				
4.2		Equal or similar approved to O-Line OL75 3CR12 powder coated heavy duty 500mm wide cable ladder complete with fixing and support brackets and accessories	m	20		
4.3		Design supply and installation of O-Line 3CR12 powder coated OL254 Heavy Duty 250mm Cantilever Arms complete with accessories	ea	12		
4.4		Allowance installation accessories: for stainless steel M10 Raw bolts, Splices, earth straps and Fasteners	sum	1		
5		EARTHING				
5.1		Provisional amount of fifty thousand rands for design, supply and installation of earthing and bonding in compliance with TPD-004-EARTHSPEC, Transnet Earthing Specification.	sum	1		
6		GENERAL				
6.1		Design, supply, installation and painting of hot dipped galvanised chequer plate in trenches where transformers have been removed.	sum	1		
6.2		supply and installation of ancilliary cables from dry type transformers to existing MV protection relays	sum	1		
7		TESTING AND COMMISSIONING				
7.1		FAT Attendance (generator) by Independent Certified Engineer and witnessed by electrical design engineering team.	sum	1		
7.2		Testing and Commissioning of complete installation in accordance to SANS 10142-1 and SANS 10142-2 including the issue of COC certificates	sum	1		
7.3		Grading of protection relays and testing and commissioning of the medium voltage installation by a protection engineer. Tests shall be witnessed by Transnet Design Engineer. This will also include the commissioning of the medium voltage equipment by a specialist commissioning engineer.	sum	1		
8		VENTILATION				
8.1		Design, supply, installation and commissioning of equal or similar approved to TPM40041 fan, filtration units and powder coated 3CR12 ducting, including installation of washable filter on all existing wall and door louvers. (Typical details are displayed on drawing)	ea	1		
8.2		Supply and installation of 3CR12 powder coated stainless steel temperature controlled stop/start station with equal or similar approved to RS PRO (875-1214) Linear, RTD, 48x96mm, J Thermocouple input as detailed in drawings	ea	1		
8.3		Supply and installation of equal or similar approved to RS PRO PTBO TYPE J Nozzle M6x100 Thermocouple	ea	1		
		Total carried to Summary Page				

TRANSNET NATIONAL PORTS AUTHORITY
TENDER NUMBER: TNPA/2022/05/0438/4322/RFP
DESCRIPTION OF THE WORKS: SUPPLY, INSTALL AND COMMISSION 20 DRY-TYPE TRANSFORMERS FOR 10 X 11/0.4KV SUBSTATIONS IN THE PORT OF RICHARDS BAY

Item No.	Payment Ref.	Description	Unit	Qty	Rate	Price
1		EXISTING SUBSTATION EQUIPMENT - SORTING SUBSTATION				
		This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation philosophy of busbar sections. Contractor to advise the Project Manager at least four (4) weeks prior to commencing with this item.				
1.1		Allow for de-energising of existing transformers, removal and transport to a disposal site allocated by the <i>Project Manager</i> . This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation of busbar sections inline with the existing Single Line Diagrams.	sum	1		
2		POWER CABLES SUPPLY				
2.1		Supply, installation and commissioning of new 50mm ² 3-Core Unarmoured XLPE, 11kV cable	m	30		
2.2		Supply, installation and commissioning of new 300mm ² 4-Core ECC, PVC Copper cable	m	156		
2.3		Termination of new 50mm ² 3-Core Unarmoured XLPE insulated 11kV cable. This is inclusive of termination accessories.	ea	4		
2.4		Termination of new 300mm ² 4-Core ECC, PVC Copper cable from Transformer to Low Voltage panel. This is inclusive of glands, lugs and termination accessories.	ea	12		
3		DRY TYPE TRANSFORMER				
3.1		Supply, Delivery, Offloading and Installation of 500kVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing.	ea	2		
3.2		Installation of 500kVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing	ea	2		
4		CABLE MANAGEMENT SYTEM				
4.1		Removal of the existing cable ladder system including delivery to TNPA depot				
4.2		Equal or similar approved to O-Line OL75 3CR12 powder coated heavy duty 500mm wide cable ladder complete with fixing and support brackets and accessories	m	16		
4.3		Design supply and installation of O-Line 3CR12 powder coated OL254 Heavy Duty 250mm Cantilever Arms complete with accessories	ea	10		
4.4		Allowance installation accessories: for stainless steel M10 Raw bolts, Splices, earth straps and Fasteners	sum	1		
5		EARTHING				
5.1		Provisional amount of fifty thousand rands for design, supply and installation of earthing and bonding in compliance with TPD-004-EARTHSPEC, Transnet Earthing Specification.	sum	1		
6		GENERAL				
6.1		Design, supply, installation and painting of hot dipped galvanised chequer plate in trenches where transformers have been removed.	sum	1		
6.2		supply and installation of ancilliary cables from dry type transformers to existing MV protection relays	sum	1		
7		TESTING AND COMMISSIONING				
7.1		FAT Attendance (generator) by Independent Certified Engineer and witnessed by electrical design engineering team.	sum	1		
7.2		Testing and Commissioning of complete installation in accordance to SANS 10142-1 and SANS 10142-2 including the issue of COC certificates	sum	1		
7.3		Grading of protection relays and testing and commissioning of the medium voltage installation by a protection engineer. Tests shall be witnessed by Transnet Design Engineer. This will also include the commissioning of the medium voltage equipment by a specialist commissioning engineer.	sum	1		
8		VENTILATION				
8.1		Design, supply, installation and commissioning of equal or similar approved to TPM40041 fan, filtration units and powder coated 3CR12 ducting, including installation of washable filter on all existing wall and door louvers. (Typical details are displayed on drawing)	ea	1		
8.2		Supply and installation of 3CR12 powder coated stainless steel temperature controlled stop/start station with equal or similar approved to RS PRO (875-1214) Linear, RTD, 48x96mm, J Thermocouple input as detailed in drawings	ea	1		
8.3		Supply and installation of equal or similar approved to RS PRO PTBO TYPE J Nozzle M6x100 Thermocouple	ea	1		
		Total carried to Summary Page				

Item No.	Payment Ref.	Description	Unit	Qty	Rate	Price
1		EXISTING SUBSTATION EQUIPMENT - SOUTH DUNES				
		This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation philosophy of busbar sections. Contractor to advise the Project Manager at least four (4) weeks prior to commencing with this item.				
1.1		Allow for de-energising of existing transformers, removal and transport to a disposal site allocated by the <i>Project Manager</i> . This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation of busbar sections inline with the existing Single Line Diagrams.	sum	1		
2		POWER CABLES SUPPLY				
2.1		Supply, installation and commissioning of new 50mm ² 3-Core Unarmoured XLPE, 11kV cable	m	60		
2.2		Supply, installation and commissioning of new 300mm ² 4-Core ECC, PVC Copper cable	m	180		
2.3		Termination of new 50mm ² 3-Core Unarmoured XLPE insulated 11kV cable. This is inclusive of termination accessories.	ea	4		
2.4		Termination of new 300mm ² 4-Core ECC, PVC Copper cable from Transformer to Low Voltage panel. This is inclusive of glands, lugs and termination accessories.	ea	12		
3		DRY TYPE TRANSFORMER				
3.1		Supply, Delivery and Offloading of 1MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing	ea	2		
3.2		Installation of 1MVA 11kV/400V, dry type, 3phase 50Hz transformers including all cable termination boxes, integrated ventilation fans, testing and commissioning etc, as per specification and Engineers drawing	ea	2		
4		CABLE MANAGEMENT SYTEM				
4.1		Removal of the existing cable ladder system including delivery to TNPA depot				
4.2		Equal or similar approved to O-Line OL75 3CR12 powder coated heavy duty 500mm wide cable ladder complete with fixing and support brackets and accessories	m	25		
4.3		Design supply and installation of O-Line 3CR12 powder coated OL254 Heavy Duty 250mm Cantilever Arms complete with accessories	ea	16		
4.4		Allowance installation accessories: for stainless steel M10 Raw bolts, Splices, earth straps and Fasteners	sum	1		
5		EARTHING				
5.1		Provisional amount of fifty thousand rands for design, supply and installation of earthing and bonding in compliance with TPD-004-EARTHSPEC, Transnet Earthing Specification.	sum	1		
6		GENERAL				
6.1		Design, supply, installation and painting of hot dipped galvanised chequer plate in trenches where transformers have been removed.	sum	1		
6.2		supply and installation of ancilliary cables from dry type transformers to existing MV protection relays	sum	1		
7		TESTING AND COMMISSIONING				
7.1		FAT Attendance (generator) by Independent Certified Engineer and witnessed by electrical design engineering team.	sum	1		
7.2		Testing and Commissioning of complete installation in accordance to SANS 10142-1 and SANS 10142-2 including the issue of COC certificates	sum	1		
7.3		Grading of protection relays and testing and commissioning of the medium voltage installation by a protection engineer. Tests shall be witnessed by Transnet Design Engineer. This will also include the commissioning of the medium voltage equipment by a specialist commissioning engineer.	sum	1		
8		VENTILATION				
8.1		Design, supply, installation and commissioning of equal or similar approved to TPM40041 fan, filtration units and powder coated 3CR12 ducting, including installation of washable filter on all existing wall and door louvers. (Typical details are displayed on drawing)	ea	1		
8.2		Supply and installation of 3CR12 powder coated stainless steel temperature controlled stop/start station with equal or similar approved to RS PRO (875-1214) Linear, RTD, 48x96mm , J Thermocouple input as detailed in drawings	ea	1		
8.3		Supply and installation of equal or similar approved to RS PRO PTBO TYPE J Nozzle M6x100 Thermocouple	ea	1		
		Total carried to Summary Page				

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PART C3: SCOPE OF WORK

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SECTION 1

1 DESCRIPTION OF THE WORKS

1.1 Executive overview

The Works that the Contractor is to perform involve the Supply, Installation and Commission of the new twenty (20) x Dry-Type Transformers in various substations at the Port of Richards Bay. The port has ten 11 kV substations to distribute power supply throughout the port which were commissioned between 1976 and 1982. Each substation consists of 2 x 11 kV transformers to share the load, as well as for backup purposes should one transformer fail. Due to the age of these transformers, maintenance and repair costs are high and these units are becoming unreliable and therefore require replacement.

The Port is responsible for the replacement of the above-mentioned transformers so as to ensure a reliable power supply, reduced maintenance costs, to ensure statutory compliance and to eliminate environmental hazards due to oil spillages.

This project takes into account power requirements within TNPA's network, while the future port expansion requirements has been addressed by the upgrade of the Harbour West Substation.

The scope of work in this document covers the specific requirements for TNPA Richards Bay, which include, Eastern Intake, Departure, Arrivals, Admin Quay, Harbour West, Sorting, Office, Liquid Pitch, Workshop and South Dunes substations. The works that the Contractor is to perform includes but is not limited to the following:

- Removal of existing transformers and supply and installation of new Dry-Type Transformers
- Removal of existing LV cables
- Supply and installation of new LV cables
- Removal of existing MV cables
- Supply and installation of new MV cables
- Design, supply and installation of new ventilation systems
- Perform Dry type Transformer protection setting calculations, relay grading, and relay programming
- Testing, commissioning and handover of the new Dry-Type Transformers
- Securely disposal of all existing oil cooled transformers
- Design, supply, installation and painting of hot dip galvanised chequer plates in trenches where transformers have been removed.

2 EMPLOYER'S OBJECTIVES

The Employer's objectives are to maintain continuity of supply due to ageing electrical plant reaching the end of its reliable service life.

2.1 Interpretation and terminology

The following abbreviations are used in this Works Information: The following abbreviations are used in this Works Information:

Abbreviation	Meaning given to the abbreviation
0°C	Degree Celsius
AC	Alternating Current
ACB	Air Circuit Breaker
AIS	Air Insulated Switchgear
AIA	Authorised Inspection Authority
BBBEE	Broad Based Black Economic Empowerment
CEMP	Construction Environmental Management Plan
CD	Compact Disc
CDR	Contractor Documentation Register
CDS	Contractor Documentation Schedule
CRL	Contractor Review Label
CSHEO	Contractor's Safety, Health and Environmental Officer
CM	Construction Manager
CT	Current Transformer
D	Diameter
DC	Direct Current
DTI	Department of Trade and Industry
DWG	Drawings
EO	Environmental Officer
ECC	Earth Continuity Conductor
ECSA	Engineering Council of South Africa
FAT	Factory Acceptance Test
FEL	Front End Loading
GIS	Gas Insulated Switchgear

HAW	Hazard Assessment Workshop
HAZOP	Hazard and Operability Study
HSSP	Health and Safety Surveillance Plan
Hz	Hertz
ICs	Service Short Circuit Current
INC	Independent Nominated Consultant
IP	Industrial Participation
IR	Industrial Relations
IPP	Industrial Participation Policy
IPO	Industrial Participation Obligation
IPS	Industrial Participation Secretariat
IRCC	Industrial Relations Co-ordinating Committee
JSA	Job Safety Analysis
km	Kilo meter
kVA	Kilo-Volt Ampere
LV	Low Voltage
m	meter
MCB	Miniature Circuit Breaker
MCC	Motor Control Centre
MCCB	Moulded Case Circuit Breaker
mm	millimetre
mm ²	millimetre squared
MV	Medium Voltage
CIRP	Contractor's Industrial Relations Practitioner
Native	Original electronic file format of documentation
NRS	National Rationalised Standards
N/C	Normally Closed breaker
N/O	Normally Open breaker
ONAN	Oil Natural Air Natural
PDU	Project Delivery Unit
PES	Project Environmental Specifications
PHA	Preliminary Hazard Assessment
PIRM	Project Industrial Relations Manager

PIRPMP	Project Industrial Relations Policy and Management Plan
PLA	Project Labour Agreements
PSIRM	Project Site Industrial Relations Manager
PSPM	Project Safety Program Manager
PSSM	Project Site Safety Manager
ProgEM	Programme Environmental Manager
ProjEM	Project Environmental Manager
PVC	Polyvinyl Chloride
QA	Quality Assurance
R&D	Research and Development
SANS	South African National Standards
SASRIA	South African Special Risks Insurance Association
SAT	Site Acceptance Test
SCADA	Supervisory Control and Data Acquisition
SES	Standard Environmental Specification
SF ₆	Sulphur Hexafluoride
SHE	Safety, Health and Environment
SHEC	Safety, Health and Environment Co-ordinator
SIP	Site Induction Programme
SMP	Safety Management Plan
SSRC	Site Safety Review Committee
TNPA	Transnet National Ports Authority
V	Voltage/Volts
VT	Voltage Transformer
PSS	Power supply & services
XLPE	Cross Linked Polyethylene

3 ENGINEERING AND THE CONTRACTOR'S DESIGN

3.1 Employer's design

3.1.1 The Employer's design for the Works is:

- The high level schematic designs for the Port of Richards Bay TNPA Substations.

- The selection of all electrical equipment associated with the MV and LV systems.
- The switching philosophy to ensure continuity of power supply in the Port of Richards Bay.
- The phasing out of the existing electrical plant in a proper manner which retains power supply in the Port of Richards Bay.

3.1.2 The Employer grants the Contractor a licence to use the copyright in design data presented to the Contractor for the purpose of the Works (and the Contractor's obligation under paragraph 2.2 of the Employer's Works Information) ONLY.

3.2 Parts of the Works which the Contractor is to design

3.2.1 The Contractor is to design the following parts of the Works:

- a) All supporting infrastructure required to implement all of the Employers' high level designs. These may include, but is not necessarily limited to, switchgear support system, cableways, cable support systems, conduit systems and arrangement, piped systems and pipe support systems, and the selection of fasteners and fastening systems for these items, where not specified, referenced or detailed by the Employer.
- b) All detailed designs of all cable and cableways.
- c) The Mechanical ventilation System.
- d) The Contractor shall submit detailed drawings and Workshop details for all designs, both Contractor's designs and Employer's designs, to the Project Manager for acceptance.
- e) Unless expressly stated to form part of the design responsibility of the Employer as stated under 2.1 Employer's design above and whether or not specifically stated to form part of the design responsibility of the Contractor under this paragraph 2.2, all residual design responsibility and overall responsibility for the total design solution for the Works rests with the Contractor.

3.2.2 The Contractor is responsible in his design for the overall integration of the design of the Works with the design of the Employer as stated under 2.1 Employer's design above for the following parts of the Works:

- a) All supporting infrastructure required to implement all of the Employers' high level designs. These may include, but is not necessarily limited to, switchgear support system, cableways, cable support systems, conduit systems and arrangement, piped systems and pipe support systems, and the selection of fasteners and fastening systems for these items, where not specified, referenced or detailed by the Employer.
- b) The Contractor is wholly responsible for all design coordination, integration and liaison activities involved in the Works, and shall take all measures necessary and make all arrangements for activities such as meetings, inspections, endorsements, and any other activities required for the timeous completion of the Works and to the appropriate quality. When these activities require the involvement of the Employer's Professional Engineering team or any other stakeholders, the Contractor is required to make these arrangements with due consideration of

the Employer's Professional Engineering team's availability and the availability of other stakeholders.

- c) Procedure for submission and acceptance of Contractor's design
- d) The Contractor's documentation shall be issued to the Project Manager under cover of the Contractor's Transmittal Note indicating all Contract references (i.e. Project No, Contract No, etc.) as well as the Contractor's Project Document Number, Revision Number, Title and chronological listing of transmitted documentation. Formats of Contractor data submitted is dependent on the project procedure and shall be specified by the Project Manager, upon the notified request of the Contractor.
- e) The Contractor shall deliver both hard copies and electronic media copies (CD Rom) to the Project Manager either at the address stated within the Contract Data or at the Project site office.
- f) All electronic documentation shall be submitted by the Contractor in Adobe Acrobat (.PDF) and native file format
- g) Acceptance of documentation by the Project Manager will in no way relieve the Contractor of his responsibility for the correctness of information, or conformance with his obligation to provide the Works. This obligation rests solely with the Contractor.
- h) After review, a copy of the original reviewed/marked-up drawing/document, with the Project Manager's consolidated comments and document status marked on the Contractor Review Label, is scanned and the copy shall be returned to the Contractor under cover of the project's Transmittal Note for revision or re-submittal as instructed.
- i) The Contractor shall allow the Project Manager 2 weeks (unless otherwise stated and agreed) to review and respond to the Contractor's submission of their documentation, i.e. from time of receipt by the project to the time of despatch. However, work shall proceed without delay in the event of late return of the documentation by the Project Manager with prior notification in writing by the Contractor.
- j) On receipt of the reviewed documentation the Contractor shall make any modifications requested/marked-up and resubmit the revised documentation to the Project Manager within 2 weeks. Queries regarding comments/changes should be addressed with the Project Manager prior to re-submittal.
- k) Any re-submittals, which have not included the changes/comments identified, will be returned to the Contractor to be corrected. The Contractor shall re-issue the revised documentation incorporating all comments and other specified details not included in the previous issue within 2 working days of receipt of the marked-up document.
- l) In undertaking the Works (including all incidental services required), the Contractor shall conform and adhere to the requirements of the Contractor Document Submittal Requirements Standard included within Annexures (Refer DOC-STD 0001 Rev 03).

3.3 Other requirements of the Contractor's design

3.3.1 The Contractor's design complies with the following:

- a) All Statutes, Standards, Specifications, Policies, Conventions, Requirements as referenced in Section 4 of this document and all Statutes, Standards, Specifications, Policies, Conventions, Requirements as referenced in any Annexures thereto.

3.4 Use of Contractor's design

The Contractor grants the Employer a licence to use the copyright in all design data presented to the Employer in relation to the Works for any purpose in connection with the construction, re-construction, refurbishment, repair, maintenance and extension of the Works with such licence being capable of transfer to any third party without the consent of the Contractor.

The Contractor vests in the Employer full title guarantee in the intellectual property and copyright in the design data created in relation to the Works as follows:

All supporting infrastructure required to implement all of the Employers' high level designs. These may include, but is not necessarily limited to, switchgear support system, cableways, cable support systems, conduit systems and arrangement, piped systems and pipe support systems, and the selection of fasteners and fastening systems for these items, where not specified, referenced or detailed by the Employer.

The detailed designs of the ventilation systems that support the Employers high level Mechanical Engineering Designs as described in this document.

3.5 Design of Equipment

3.5.1 The Contractor submits his design details for the following categories of his proposed principal Equipment to the Project Manager for his information only:

- a) Any formwork required to provide the Works.
- b) Temporary electrically powered compressed air systems and pneumatic equipment that may be required to provide the Works.
- c) Small electrically powered equipment.
- d) Equipment designed for the lifting of personnel to access any areas necessary to provide the Works, which are not at ground level.
- e) Equipment designed for the lowering of personnel to access any areas necessary to provide the Works, which are below ground level.

3.5.2 The following principal Equipment categories deployed for the Contractor to provide the Works require its design to be accepted by the Project Manager under ECC Clause 23.1:

- f) Temporary petrol or diesel powered compressed air systems and pneumatic equipment that may be required to provide the Works.
- g) Small petrol or diesel powered equipment.

- h) Specialist Equipment required providing the Works.
- i) Rigging platforms and specialised rigging Equipment that may be required by the Contractor to provide the Works.
- j) Launching platforms and incremental launching equipment that may be required by the Contractor to provide the Works.
- k) Temporary access platforms, ladders, walkways, scaffolds, and any other temporary structures required to provide the Works:

3.6 Equipment required to be included in the Works

3.6.1 No equipment is required to be included in the Works.

3.7 As-built drawings, operating manuals and maintenance schedules

3.7.1 The Contractor provides the following:

- a) Red Line/Final Documentation
 - In undertaking the Works (including all incidental services required), the Contractor shall conform and adhere to the requirements of the Contractor Document Submittal Requirements Standard included in the Annexures (Refer DOC-STD-0001 Rev 03).
 - All Red Line information to be signed off by Contractor's responsible Professional Engineer/Technologist before issue to TNPA.
- b) Installation, Maintenance and Operating Manuals and Data Books
 - The Contractor provides manuals in an A4 hard covered, red, grease and waterproof binder, using 2 ring type binders. The manuals are well indexed and user friendly and include a summarized Table of Contents.
 - Drawings and charts larger than A4 are folded and those greater than A3 are enclosed in an A4 plastic pocket of adequate strength.
 - The Contractor submits the draft Table of Contents to the Project Manager for acceptance prior to the compilation and official submittal of the manuals.
 - The originals of all brochures shall be issued to the Project Manager. When a general brochure is applicable to a range of equipment, then the specific item, catalogue number or model number shall be stated, which is best achieved by introducing a separate index page, which cross-references the specific item to a tag number.
 - The address, phone numbers, fax numbers and reference numbers of all Sub-Contractors is provided.
 - Where manuals include drawings that still need to be revised to "As-Built" status, and such manuals are required prior to 'As-Built' status, the manual will not be considered

to be in its final form until the "As-Built" version of each such drawing has been incorporated.

- The required number of copies of the manual (s) shall be as specified by the Project Manager and submitted per type or model number of equipment included in the contract, or as specified by the Project Manager.
- All electronic copies (pdf.) of Data Packs to be properly indexed.
- A typical example of what the binder/file (s) shall be marked with on the spine and the front cover is as follows: -
 - Project Name
 - Manual Title, e.g. Installation, Maintenance and Operating Manual
 - FBS No. and Title
 - Manual Numbering (e.g. Volume 1 of 2, etc.)
 - Contract Number
 - Contractor Name
- Unless otherwise stated in the CDS, the required number of copies of all As-Built/Final/Data Packs shall be:
 - 3 x hard copies (Full size)
 - 3 x CD Roms with Adobe Acrobat (.pdf) and "Native" formats

4 CONSTRUCTION

4.1 Temporary Works, Site services & construction constraints

4.1.1 Employer's Site entry and security control, permits, and Site regulations

4.1.2 The Contractor complies with the following requirements of the Employer:

- a) The Contractor shall attend all necessary Safety Inductions and ensure that all personnel engaged in the provision of the Works are inducted as directed by the Project Manager, NEC Supervisor, TNPA Safety Officer and the TNPA Electrical Engineer.
- b) The Contractor and all personnel engaged in the provision of the Works shall attend all Safety Inductions as required by the TNPA Safety Officer as directed through the Project Manager.
- c) All work inside the SS, and DHI substations are required to be supervised by a Transnet Category A "Brown" certified officer.
- d) The Contractor shall make arrangements for the Transnet Category A "Brown" officer to arrange access to the substations during the execution of the Works.

- e) All personnel working or accessing the substation are required to sign the Substation Register and indicate the time of entry, time of exit and the details of the work carried out.
- f) The Contractor shall obtain work permits and access permits from the TNPA Security Officer, the TNPA Electrical Supervisor-
- g) The Contractor shall at all times comply with the Transnet MV Safety Instructions "Blue Book" whilst providing the Works.
- h) All costs associated with the Safety Inductions, Access Permits and Work Permits shall be borne by the Contractor.
- i) The Contractor shall ensure that all relevant safety inductions and access permits are obtained well before the Site Access Date as reflected in the Contract Data.

4.1.3 Restrictions to access on Site, roads, walkways and barricades

- a) Richards Bay TNPA Substations
- b) Access to the substations shall be arranged by the Contractor through the Project Manager, the TNPA Electrical Supervisor.
- c) The Contractor is prohibited from entering the Employer's Operational Areas which are adjacent to the Sites and Working Areas.
- d) The Contractor plans and organises his work in such a manner so as to cause the least possible disruption to the Employer's operations.
- e) The Contractor is hereby made aware that the areas adjacent to the sites are fully operational areas that form part of a working harbour environment.
- f) The Contractor ensures the safe passage of Contractor's traffic to and around the Site and Working Areas at all times. This includes providing flagmen, protective barriers, signage, etc. for protection, direction and control of traffic.
- g) The Contractor ensures that any of his staff, labour and Equipment moving outside of his allocated Site and Working Areas does not obstruct operations. To this end access routes are allocated and co-ordinated by the Contractor in liaison with the Project Manager.
- h) The Contractor ensures that all his construction staff, labour, and Equipment remains within his allocated and fenced off construction areas.
- i) All Contractor's staff and labour engaged in the provision of the Works shall comply with TNPA and TNPA safety requirements and are equipped with all necessary PPE, high visibility apparel and, when working within two meters of the quay wall, floating apparel.

4.1.4 People restrictions on Site; hours of work, conduct and records:

- a) The Contractor keeps daily records of his people, plant and equipment engaged on the Site and Working Areas (including Sub-Contractors) with access to such daily records available for inspection by the Project Manager at all reasonable times.(summarised activity and progress for the day must be mentioned).

4.1.5 The Contractor complies with the following hours of work for his people (including Sub Contractors) employed on the Site:

- b) The Contractor specifies normal working hours per day, which shall not exceed 9 hours per day, and 5 working days per week.

4.1.6 The Contractor keeps daily records of his people engaged on the Site and Working Areas (including Sub Contractors) with access to such daily records available for inspection by the Project Manager at all reasonable times.

4.1.7 Health and safety facilities on Site

The provision of security for the Contractor's Site Establishment shall be his own responsibility.

Suitable temporary fencing, watching, lighting and barricading shall be maintained for the duration of the contract to ensure the security requirements are met.

Both the "Factories, Machinery and Building work Act (Act 22 of 1941) and the "Machinery and Occupational Safety Act (Act 6 of 1983)" shall, wherever they appear in the SANS 1200 standardized specifications, be substituted by the "Occupational Health and Safety Act (Act 85 of 1993)" and Health Safety Regulations..

The safety of the entire site shall be the responsibility of the Contractor and as such precaution against injury and loss of life shall be taken where open excavations and other uncompleted Works are present.

A specific requirement of the Employer for work in Port areas is that all Contractors' temporary accommodation is to be securely tied down immediately after arrival on site.

Reference should also be made to Project HS Specification TNPA Transformer Upgrade.

4.1.8 Environmental controls, fauna & flora, dealing with objects of historical interest

All care and precautions must be exercised by the Contractor to minimise and eradicate environmental pollution during the execution of the Works.

Refer to the Environmental standard specifications and Construction environmental management plan: ENV-STD-001 Rev 2 and ENV-STD-002 Rev 2.

4.1.9 The Contractor complies with the CEMP, SES and PES in the construction of the Works, all as described under paragraph 2.4 of C3.1 Employer's Works Information.

4.1.10 Title to Materials from demolition and excavation

4.1.11 The Contractor has no title to any materials arising from excavation and demolition in the performance of the Works with title to such materials remaining with the Employer. The Project Manager shall instruct the Contractor how to label, mark, set aside and/or dispose of such materials for the benefit of the Employer in accordance with ECC3 Clause 73.1

4.1.12 The Contractor has title to all Materials arising from excavation and demolition in the performance of the Works with the exception of:

4.1.13 Cooperating with and obtaining acceptance of others

- a) The Contractor performs the Works and co-operates with The Employer (including the agents of the Employer) who operates on Site during the entire duration of the Contract period.

- b) The Contractor performs the Works and co-operates with others, of whom the Contractor is to be notified once appointed by the Employer, who operate on Site during the entire duration of the Contract period.

4.1.14 Publicity and progress photographs

- a) The Contractor shall obtain the permission and approval of the Employer before erecting any notice boards or using the details of the contract in any advertising media.
- b) The Contractor does not advertise the contract or the project to any third party, nor communicate directly with the media (in any jurisdiction) whatsoever without the express written notification and consent of the Project Manager.
- c) The Contractor provides a complete intrinsically safe digital photographic record of the progress of the construction of the Works to the Project Manager, monthly as part of the Contractor's monthly programme narrative report. Taking of photographs inside the berths to be pre-authorised by the TNPA fire services department.

4.1.15 Contractor's Equipment

- a) All equipment used by the Contractor on site shall be properly maintained and operated. All vehicles on public roads shall be roadworthy, with the necessary licences and safety requirements.
- b) A checklist/register shall be implemented which lists the operators qualifications and medical records.
- c) All equipment to be supplied by the Contractor will comply with the relevant standard specifications.
- d) Any tools, test equipment and devices needed for installation, testing and commissioning shall be provided by the Contractor.
- e) The Contractor keeps daily records of his Equipment used on Site and the Working Areas (distinguishing between owned and hired Equipment) with access to such daily records available for inspection by the Project Manager at all reasonable times.
- f) The Contractor complies with the following permissions and restrictions in the use of Equipment as required by the Employer:

4.1.16 Equipment provided by the Employer

- a) The Employer shall not provide any Equipment to the Contractor for the purposes of this contract.

4.1.17 Site services and facilities:

- a) The Contractor shall make his own arrangements for the connection to the existing supply of services such as electricity, potable water, ablutions, fire protection, lighting and all other services required for undertaking the Works.

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- b) The Contractor shall provide, maintain and finally remove any additional portable latrines of sufficient number required, above the facilities provided by the Employer, at his cost. Latrines shall be properly constructed and placed in suitable positions and maintained in a clean and sanitary working condition.
- c) The locations of the potential lay down areas (if required) will be pointed out during site inspection.
- d) The Contractor may establish a site camp anywhere within the boundary of this area.
- e) The Contractor shall ensure that the area used has a suitable continuous security fence and the necessary access gates.
- f) The area may be used for offices, stores, laydown of Contractors equipment and any other engineering work that may be required.
- g) All preparation and fencing, etc. shall be done by the Contractor and shall be for his account, this includes clearing away and leaving clean and clear at completion.
- h) The Employer provides the following facilities for the Contractor:
Connections to services for Contractor's use:
- A supply point for Potable Water on Site and laydown areas.
 - A supply point for Power, which is only available at the lay down area.
- This shall be pointed out at the site clarification meeting.
- i) The Supervisor will arrange for the closing of the water valves during the installation of the metered take-off points. All further connections from this point on shall be for the Contractors accounts.
- j) The Contractor shall be responsible for providing water and power for all other Working Areas where not provided by Employer.
The Contractor shall provide, maintain and remove lockable portable chemical type toilets.
- k) The Contractor shall provide everything else necessary for providing the Works in accordance to this contract and attached Annexures.
- l) Wherever the Employer provides facilities (including, inter alia, temporary power, water, waste disposal, telecommunications etc.) for the Contractor's use within the Working Areas and the Contractor adapts such facilities for use, then the Contractor makes good and provides full reinstatement to the land (including all apparatus of the Employer and Others in, on or under the land) and surrounding areas to its original standard upon dismantling of such facilities and hand-back to the Employer.

4.1.18 Facilities provided by the Contractor:

- a) The Contractor ensures that the site establishment area is compliant with the relevant safety regulations and restrictions, is clearly sign posted, and has a suitable security fence, lighting and the necessary access control gates.
- b) All costs for preparation of the site establishment area are for the Contractor's account.
- c) The Contractor submits details of the layout of his site establishment to the Project Manager for his acceptance.

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- d) The Contractor installs a metering device, accepted by the Project Manager, immediately downstream at each of the Employer's connections from where he draws services. The Contractor provides the Project Manager details of his monthly consumption of potable water and, if applicable, power.
 - e) The Contractor is responsible for his own connection to the Employer's services and for the reticulation of his services from the connection point. The cost of meters, connections, reticulation and all other usage costs associated with the provision of services are for the Contractor's account.
 - f) The Contractor provides the Project Manager with a "Certificate of Compliance" (COC), by an "Accredited" Person as defined by the OHS Act, in respect of his Construction Power electrical installation. The Project Manager only makes construction power available upon receipt of the COC.
 - g) The Supervisor (or his nominated representative) conducts routine inspections of the Contractor's construction power reticulation and power tools. If found to be un-safe and / or non-compliant with statutory requirements, the electrical power supply is disconnected until the Contractor rectifies all defaults.
 - h) The Contractor provides, at his cost, a sufficient number of toilets and maintains them in a clean and sanitary working condition.
 - i) The Contractor provides temporary lighting and fencing around every section occupied by him during the phased construction of the Works.
 - j) Such fencing demarcates and secures the construction area. The fencing is erected before any work starts and is removed only upon completion of the work in that area.
 - k) The Contractor includes for all costs for such lighting and fencing, including access control into and out of these restricted areas.
 - l) Wherever the Contractor provides facilities (either his own or for the Project Manager and/or Supervisor) and all items of equipment, involving, inter alia, offices, accommodation, laboratories, materials storage, etc., within the Working Areas, then the Contractor makes good and provides full reinstatement to the land (including all apparatus of the Employer and Othersin, on or under the land) and surrounding areas to its original standard, upon dismantling of such facilities and items of Equipment.
 - m) Upon completion, and within one month of the date of acceptance of the Works, the Contractor completely removes from the Site and Working Areas all his Equipment, including the foundations of any structures, stores, office accommodation or any other asset belonging to him, and leaves the Site and Working Areas in a tidy condition to the satisfaction of the Project Manager.
 - n) No excess or discarded materials or equipment may be buried or dumped within the port boundary.
 - o) Demolition of all temporary structures, surfaces etc. shall be first approved by the Project Manager prior to the work being carried out.

- p) The Employer does not provide any security for the Site and Working Areas. The Contractor provides same and indemnifies and holds indemnified the Project Manager and Employer against any claims and actions that may arise out of Site and Working Area security.
- q) No housing is available for the Contractor's employees. The Contractor makes his own arrangements to house his employees and transports them to site in a closed vehicle specifically designed for passenger transport (bus or similar) accepted by the Project Manager.
- r) Wherever the Employer provides facilities for the Contractor's use and the Contractor adapts such facilities for use, then the Contractor makes good and provides full reinstatement to the land (including all apparatus of the Employer and Others in, on or under the land) and surrounding areas to its original standard upon dismantling of such facilities and hand-back to the Employer.

4.1.19 The Contractor provides the following facilities for the Project Manager and Supervisor:

- a) Furnished air-conditioned offices. (2No in accordance to SANS 12200A 8.3.2.1a)

4.1.20 Wherever the Contractor provides facilities (either his own or for the Project Manager and/or Supervisor) and all items of Equipment, involving, inter alia, offices, accommodation, laboratories, Materials storage, compound areas etc., within the Working Areas, then the Contractor makes good and provides full reinstatement to the land (including all apparatus of the Employer and Others in, on or under the land) and surrounding areas to its original standard, upon dismantling of such facilities and items of Equipment.

4.1.21 Unless expressly stated as a responsibility of the Employer as stated under 3.1.16 Site services and facilities, all residual requirements for the provision of facilities and all items of Equipment necessary for the Contractor to Provide the Works remains the responsibility of the Contractor.

4.1.22 Existing premises, inspection of adjoining properties and checking work of Others

- a) The Contractor will be held responsible for any damage to the existing structures and surfacing caused by the Contractor during the execution of this contract; fair wear and tear excluded, and shall repair it to the satisfaction of the Supervisor on conclusion of the Works.
- b) For this purpose a joint inspection with the Supervisor will be carried out prior to occupation of the site(s) and any existing damage noted.
- c) The Contractor is required to forward a photographic report following the inspection to the Project Manager for record purposes.

4.1.23 The Contractor inspects and surveys the adjacent to the Site in accordance with and in conjunction with the Project Manager

:All Richards Bay Substations, access roads and parking areas.

4.1.24 The Contractor inspects and satisfy any work of any third party employed by the Contractor and ensure that all relevant standards, regulations and specifications mentioned herein are met.

4.1.25 Survey control and setting out of the Works

a) The Employer provides the following information and survey controls for the Contractor:

4.1.26 Survey control points for the setting out of the Works. The Contractor will be responsible for the setting out of the Works.

4.1.27 For the purposes of this contract the datum level shall be Chart Datum (CD) (Port), which is 0,9m below Mean Sea Level (MSL).

For example: +0,00m CD (Port) = -0,90m MSL

+0,90m CD (Port) = +0,00m MSL

a) The Contractor validates the information provided by the Project Manager and records all existing and final levels on a drawing and presents this to the Project Manager for acceptance.

4.1.28 The Employer provides the following information and survey controls for the Contractor:

4.1.29 Excavations and associated water control

a) Where applicable, the Contractor protects all excavations against any water ingress whether by seepage, rains, storms, floods or any other means.

b) Where applicable, the Contractor immediately removes any water found in the excavation by pumping and / or bailing and provides all necessary Equipment (pumps, pipes, etc.) to do so.

c) Water is cleared in such a way that it cannot seep or flow back into the excavations.

4.1.30 Possibility of Asbestos / Hydrocarbon Contamination in Excavations

a) The Contractor exercises due care and attention in carrying out any excavation or bulk earthworks as there is a probability of uncovering asbestos contaminated material during these operations.

b) The Contractor ensures his staff and labour are equipped with the necessary PPE and are trained to recognise asbestos contamination.

c) On encountering asbestos contamination, (i.e. loose asbestos fibre) the Contractor immediately stops all work in the affected area, he summonses the Supervisor and secures the area.

4.1.31 The Contractor arranges for a specialist waste disposal Contractor to collect, bag, remove and dispose the contaminated material from the excavation or bulk earthworks.

a) The Contractor continues with the excavation or bulk earthworks on receipt of a written instruction from the Supervisor.

4.1.32 The Contractor complies with the following requirements:

4.1.33 Underground services, other existing services, cable and pipe trenches and covers

a) The Contractor is required to liaise with, the Project Manager, the NEC Supervisor and the Employer's Engineers, and establish as accurately as possible the location of the various existing services situated within the Works area and record all such information on a suitable "marked-up" drawing for reference at all times.

b) In addition to the above, the Contractor shall consult the Project Manager, the NEC Supervisor and the Employer's Engineers, prior to undertaking any excavation work.

- c) Where the Contractor encounters existing underground services / existing services cables / pipe trenches, the Contractor is to notify the Project Manager, the Supervisor and the Employers Engineers.
- d) Where the encountered services are causing a delay in the provision of the Works, the Contractor shall approach the Project Manager, the Supervisor and the Employer's Engineers for a decision by submitting a Field Engineering Query (FEQ).
- e) The Contractor shall then provide the solution described in the answered FEQ.
- f) The Contractor must thereafter exercise due care and attention in carrying out the agreed excavation Works and any Works as may be directed by the Project Manager to avoid damage or disruption to existing services.
- g) The Contractor shall be liable for all claims arising out of any damage caused by such excavation if the Contractor fails to exercise the requisite care and attention in carrying out the excavation.
- h) The cost of locating and protecting, if necessary, services shall be included in the rates for the services intersecting and adjoining the trenches.
- i) A group of cables intersecting or adjoining a trench will be regarded as one service.
- j) The existing services shall be protected when excavating.
- k) The costs of protecting these services shall be included in the rates for excavation and compaction.
- l) All existing services shall be treated as in service and "live". All necessary Safety Instructions of the Employer and statutory requirements as per the OHS Act and its Regulations shall be complied with in the handling of the "live" service.
- m) In the case of electrical services the Contractor shall trace, locate and identify all cables within the service and record the information as per 3.1.29.a.1 above.
- n) The Contractor shall also comply with all of the relevant Employers Specifications in Section 4 below and any annexed thereto in the reinstatement of the services

4.1.34 Where the Contractor encounters existing underground services / existing services cables / pipe trenches, the Contractor is to notify the Project Manager and Supervisor.

4.1.35 Control of noise, dust, water and waste

- a) Before moving Equipment onto the Site and Working Areas and commencing the Works, the Contractor submits his proposed methods of construction which demonstrate the measures taken to avoid and or reduce any environmental and health issues arising from dust, noise and vibration for acceptance by the Project Manager.
- b) The Contractor shall also comply with the requirements of 7.4 of Section C3.1 Employer's Works Information.

4.1.36 The Contractor complies with the following:

- a) Submits method statements which adequately address issues relating to noise, dust, water and waste control

4.1.37 Sequences of construction or installation

- a) The Contractor is referred to the requirements of maintaining the continuity of supply to the Port of Richards Bay, as described in 4.4 of C3.1 Employers Works Information, and is required to arrange and sequence his Works so as to ensure that there is no disruption to the Port of Richards Bay.
- b) Should it be impossible to avoid a disruption as described in 3.1.43.a.1 above, the Contractor shall notify the Project Manager, Supervisor and the Employers Engineers and request authorization to commence with the aspect of the Works that will cause the disruption. The Contractor shall not proceed without said authorization to proceed.

4.1.38 The Contractor complies with the following:

- a) Access to the site will traverse through operational areas. The Contractor shall co-operate with other common users of this portion of access.
- b) The Contractor shall not commit or permit any act that may interfere with the performance of work by any of the other parties. Working with limited access to the site services to ensure vehicular traffic is able to access the site.

4.1.39 Giving notice of work to be covered up

- a) The Contractor notifies the Supervisor in writing of any elements of the Works which are to be covered up. This notification is given not less than 48 (forty eight) hours prior to the proposed covering up.
- b) The Contractor shall not cover the Works without the authorization of the Supervisor.
- c) The Contractor shall make the Project Manager and Supervisor aware of any tests and inspections required by the Employer's Quality Management Procedures and/or the Employer's Engineers.

4.1.40 The Contractor notifies the Supervisor of the following elements of the Works which are to be covered up:

- a) All elements of the Works that are to be covered up in the provision of the Works.
- b) The Contractor is required to maintain continuity of Supply to the Port of Richards Bay during the provision and completion of the Works with no interruptions in supply.

4.2 Completion, testing, commissioning and correction of Defects

4.2.1 The work to be done by the Sectional Completion Date

On or before the *Sectional Completion Date* the *Contractor* shall have done everything required to Provide the Works including the work listed below which is to be done before the *Sectional Completion Date* and in any case before the dates stated. The *Project Manager* cannot certify *Sectional Completion* until all the work listed below has been done and is also free of Defects, which would have, in his opinion, prevented the *Employer* from using the *Works* and others from doing their work.

Item of work	To be completed by
As built drawings, operating manuals and maintenance schedule/s.	Within 2 weeks after completion date
Performance testing of the Works in use	Sectional Completion date

4.2.2 The *Contractor* is permitted to carry out the following *Works* after Completion:

- a) None
- b) Use of the Works before Completion has been certified

4.2.3 The Employer uses the following part / parts of the Works before Completion is certified by the Project Manager which do not constitute take over by the Employer for the reason(s) stated:

- a) All Cable, Switchgear, Protection relays, Control Systems Plant and Software or any other Electrical or Mechanical Plant installed by the Contractor so that the Employer may maintain the functionality of systems and existing plant that is required by the Employer to conduct the Employers operational activities.
- b) All Cable, Plant and Software or any other Electrical or Mechanical Plant installed by the Contractor so that the Employer may maintain the continuity of the Electrical Supply to the Port of Richards Bay.

4.2.4 The Contractor provides the Employer with the following:

- a) The Contractor is required to provide all materials, facilities and samples for any tests required in Item 4 Plant and Material Standards and Workmanship below.
- b) The Contractor shall furnish samples of any Plant that is other than, or different to, that specified by the Employer's Engineers, to the Supervisor for Acceptance by the Employer's Engineers. The Contractor is prohibited from installing said plant without the required prior authorization from the Employers Engineers.
- c) The Contractor shall furnish samples of any Plant that is other than, or different to, that required by the Employer's Engineering Specifications, that shall be utilised in the Contractor's Designs, to the Supervisor for Acceptance by the Employer's Engineers. The Contractor is prohibited from installing said plant without the required prior authorization from the Employer's Engineers.
- d) The Contractor shall furnish samples of any Plant that is proposed to be used in the Contractor's Designs, to the Supervisor for Acceptance by the Employer's Engineers. The Contractor is prohibited from designing with, and subsequently installing said plant without the required prior authorization from the Employer's Engineers.

4.2.5 The Employer provides the Contractor with the as ECC Clause 40.2:

- a) The Employer will not provide any materials or facilities for the use of the Contractor, to perform tests and inspections.

4.2.6 Commissioning

TNPA High Level Commissioning Plan for details of the inspections tests and activities required for commissioning of Plant. Where the word or expression in the former document reads "Equipment" the meaning is "Plant" and vice versa. The Contractor shall arrange for Factory Acceptance Testing of all electrical and Mechanical Plant at the Supplier's Premises before any Plant is despatched to site. The Factory Acceptance Testing shall be witnessed by the Employers Engineers, but in doing so; the Employers Engineers assume no responsibility or accountability for the proper functionality of the equipment in any way whatsoever. The Contractor shall arrange Site Acceptance Testing for the Plant when it arrives on Site. The Site Acceptance Testing shall be witnessed by the Employers Engineers, but in doing so; the Employers Engineers assume no responsibility or accountability for the proper functionality of the equipment in any way whatsoever. The cost of the FATs and SATs, including travel, accommodation and daily stipend for the Employer's Engineers, shall be for the Contractor, and shall be included in the Contractor's price. Testing and commissioning is considered part of the Works and is to be done before completion.

4.2.7 The Contractor provides the following commissioning activities to bring the Works in use in liaison with the Employer:

- a) The Contractor shall appoint an independent Dry type Transformer commissioning specialist for commissioning of the New Plants installed in various TNPA Richards Bay Substations in the presence of the Employer's Engineer. The Cost for the appointment of the specialist will be incurred by the Contractor.
- b) The Contractor shall appoint an independent MV protection specialist for relay grading of the New Plants installed in various TNPA Richards Bay Substations in the presence of the Employer's Engineer. The Cost for the appointment of the specialist will be incurred by the Contractor.

4.2.8 Start-up procedures required to put the Works into operation

- a) Protection relay grading and configuration.
- b) The Contractor performs the following duties and actions on behalf of the Employer to put the Works into operation:

4.2.9 Works according to section 4.4 of C3.1 Employers Works Information

4.2.10 Take over procedures

4.2.11 The Contractor provides the following assistance to the Employer:

- a) The Contractor shall (at the cost of the Contractor) provide training Workshops for at least 10 people on how to operate the Dry type Transformer Plant installed in the two substations.

- b) The Contractor shall (at the cost of the Contractor) hand-over at least 3 copies of documentation specifically related to the operation and maintenance of the 11/0.4kV Dry type Transformer Plant installed in the substation.
- 4.2.12 The Contractor ensures that the documentation as described under paragraph 3.7 of the Works Information is presented to the Project Manager before Completion.
- 4.2.13 The Contractor ensures that the Project Manager has a full and accurate dossier of As-built documents that represent the status of the completed Works (to include Plant within the Works) to present to the Employer.
- 4.2.14 The Contractor ensures that the Project Manager has a full and accurate dossier of the newly installed plant Dry Type Transformers and Ventilation Systems Maintenance and Operating manuals at the earlier of take-over or Completion.
- 4.2.15 Where the Contractor has presented the newly installed plant Dry Type Transformers and Ventilation Systems Maintenance and Operating manuals to the Project Manager at take-over, the Contractor modifies and updates As-built documents as necessary prior to Completion.
- 4.2.16 Access given by the Employer for correction of Defects.
- 4.2.17 The Contractor complies with the following constraints and procedures of the Employer where the Project Manager arranges access for the Contractor after Completion:
- 4.2.18 None
- 4.2.19 Performance tests after Completion
- 4.2.20 The Contractor performs the following performance tests after Sectional Completion of the Works:
- 4.2.21 The Contractor shall conduct a factory acceptance test (FAT) and site acceptance test (SAT) in the presence of the Employer's Engineer.
- a) The Contractor shall test the transformers after installation in the presence of the Employer's Engineer. The test shall be done as per specification TPD-017-DRY TYPE TRF.
- b) The Contractor shall appoint a protection specialist to conduct a protection test in the presence of the Employer's Engineer for the installed plant before commissioning. The Contractor shall bear all costs associated with the appointment of the specialist. The test results shall be submitted to the Project Manager. All relevant documents for the specialist must be submitted to the Project Manager prior to appointment.
- 4.2.22 Training and technology transfer
- 4.2.23 The Contractor facilitates the following requirements for training Workshops after Completion for the Works in use:
 - a) Full operation of the installed plant for at least 10 people.
 - b) Operational maintenance training for the installed plant for at least 10 people.
 - c) A safety pre-mobilisation
 - d) Contractor employee safety training programme
 - e) Any other training as required by law or specifications referred to in this document

- 1.1.2 The Contractor arranges for the following technology transfer to the Employer after Completion for the Works in use:

None

4.2.26 Operational maintenance after Completion

- 4.2.27 The Contractor performs the following operational maintenance in relation to the Works after Completion:

- a) None

5 PLANT AND MATERIALS STANDARDS AND WORKMANSHIP

5.1 Investigation, Survey and Site Clearance

- 5.1.1 The information (Dry Type Transformers and Ventilation Systems) indicated on the drawings is issued for information purposes only and the responsibility rests with the Contractor to verify the information provided on Site.

- 5.1.2 Therefore prior to commencing the Works the Contractor records any defects or inaccuracies related to the existing transformers, etc. and presents this record to the Project Manager for acceptance. Only items recorded in this manner will be accepted as having pre-existed the Works and the remedying of all other damage will be the Contractor's responsibility and for his cost. The Contractor shall carry out the following investigations and surveys at the Site:

- a) Plant and Materials general requirements

5.1.3 Manufacturer's instructions and specifications

- a) All materials and products shall be used in strict accordance with manufacturer's instructions and specifications.

5.1.4 Use of locally manufactured materials and products

- a) Materials and products manufactured in South Africa shall be used in carrying out the work to which this specification refers, unless an imported product is prescribed specifically, or when no suitable locally manufactured product for the specific use is available.

5.1.5 Samples

- a) Where applicable, the *Contractor* shall furnish without delay, such samples and / or certificates as called for or may be called for by the Supervisor / *Project Manager*. Materials and / or workmanship not corresponding with approved samples may be rejected.

5.1.6 Protection of Works

- b) The *Contractor* shall provide all necessary dust sheets, covers, etc. and shall exercise all necessary care to prevent marking surfaces, walls, floors, glass, electrical fittings, etc. and shall keep all parts of the *Works* perfectly clean and free at all times from spotting, accumulation of rubbish, debris of dirt arising from the operations. Any surface disfigured or otherwise damaged shall be completely renovated or replaced as necessary by the *Contractor* at his own expense

to the Supervisor's approval. The premises shall be left clean and fit for occupation at completion of the work.

5.1.7 Standard Specifications applicable to the Works

- c) All Works shall be carried out in accordance with the latest revision and amendments of the applicable standards.
- d) Workmanship, tolerances and frequency of testing of all materials shall be in accordance with relevant specifications pertaining to the work performed. These include the following specifications:
 - SANS 10142-1 : Wiring Code
 - OHS Act, 1993: (Act No 181 Of 1993)
 - The local Fire Office Regulations
 - The municipal By-Laws
 - Transnet Automation Control Standards
 - Any special requirements and of the Supply Authorities of the area and district concerned
 - Other Transnet Specifications referred to in the Detail Design Specifications
- e) All specifications referred to in the contract documents but not bound therein shall be the latest edition or revision published at least 3 months before the closing date for receipt of tenders.
- f) The following interpretations and meanings shall apply to the Specifications:
 - In case of any conflict in interpretation, ambiguity or discrepancy between any SANS Specification (whether standard or written as a particular project specification) contained in the *Works* Information and the conditions of contract, the conditions of contract take precedence within the ECC3 contract.
 - In case of any conflict in interpretation, ambiguity or discrepancy between any SANS Specification (whether standard or written as a particular project specification) contained in this paragraph 4.4 of the Employer's *Works* Information and specific statements contained elsewhere in C3.1 Employer's *Works* Information, the specific statements contained elsewhere shall prevail, without prejudice to the Project Manager's express duty to resolve any ambiguity or inconsistency in the *Works* Information under ECC3 Clause 17.1.

5.2 Building Works

5.2.1 None

5.3 Civil Engineering and Structural Works

5.3.1 None

5.4 Electrical & Mechanical Engineering Works

5.4.1 Eastern Intake Substation

a) Removal of existing Transformer 1

The Contractor shall de-energise the existing Oil Cooled Transformer 1 and ensure the MV circuit breaker connected to Transformer 1 is racked out and in the earth position. On the LV board, the incomer from Transformer 1 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 1.

The Contractor shall remove the oil from transformer 1 and dispose of it in an environmentally friendly manner.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to the designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

b) Supply and Installation of New Transformer 1

The Contractor shall supply and install a new 1 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0002-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 1 secondary side to the existing 400V LV switchgear incomer 1 Air circuit breaker (ACB), shown in drawing number 4128234-1-000-E-LA-0002-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0002-01. The contractor shall ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination

kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

c) Removal of existing Transformer 2

The Contractor shall de-energise the existing Oil Cooled Transformer 2 and ensure the MV circuit breaker connected to Transformer 2 is racked out and in the earth position. On the LV board, the incomer from Transformer 2 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the contractor shall disconnect the LV and MV cables connected to Transformer 2.

The Contractor shall remove the oil from transformer 2 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to the designated TNPA storage area, which will be determined by the client and handed over to the electrical supervisor.

d) Supply and Installation of New Transformer 2

The Contractor shall supply and install a new 1 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number: 4128234-1-000-E-LA-0002-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 2 secondary side to the existing 400V LV switchgear incomer 2 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0002-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0002-01. The contractor shall

ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

e) Earthing and Bonding

1.1.2.e.1 The metallic transformer housing and all exposed metallic components of the transformers shall be bonded and connected to the substation building earth bar with appropriate sized protective earth conductors in compliance to SANS 10142-1 and TPD-004-EARTHINGSPEC.

f) Cable way system

The Contractor shall design, supply and install a new cable way system for the substation as shown in typical layouts on drawings and shall present the design to the Employer's electrical engineer for acceptance. The Contractor shall make other necessary accessories and fixtures to support the cable way system. The OEM bending radii requirements of the cable shall be adhered to when designing the system. The cable ladder system design shall also present evidence for the sufficient support of the cables weight including a 30% allowance for future capacity. The cable ladder system shall be suitably bonded and connected to the substation building earth bar with an appropriate sized protective earth conductor in compliance to SANS 10142-1 and TPD-004-EARTHINGSPEC.

g) Ventilation Installation

The Contractor shall provide an opening in the Eastern Intake substation wall to accommodate a fan and ducting for ventilation purposes as shown in typical drawing number 4128234-1-000-E-LA-0002-02.

The Contractor shall design, supply, deliver and install ducting complete with a filtration system and fan unit according to the typical layout on drawing number 4128234-1-000-E-LA-

0002-02. The ducting design shall be reviewed and accepted by the employers engineer before installation.

The Contractor shall supply, deliver, install a direct-on-line motor starter and temperature control unit according to the typical layout on drawing number 4128234-1-000-E-LA-0002-02 and shall terminate the cable connecting the fan to the direct-on-line motor starter and temperature control unit, and the cable connecting the direct-on-line motor starter and temperature control unit to the LV board.

h) Testing and Commissioning of the installation

The Contractor shall conduct a Factory Acceptance Test (FAT) as part of the Works to be executed in this Contract prior to delivery to site. The FAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the equipment's supplier to the Contractor shall be held by the Contractor until the equipment is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall conduct a Site Acceptance Test (SAT) for all Plant's supplied, offloaded and delivered to the designated Employer's site. The SAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the Plant's supplier to the Contractor shall be held by the Contractor until the Plant is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall test the entire installation, including but not limited to the MV installation and LV installation as per SANS 10142-1/2 and hand over all relevant test certificates to the Employers Project Manager for acceptance. The Contractor shall hand over both MV and LV certificate of compliance as per the OHS Act of 85 and SANS 10142-1 and SANS1042-2 for the installations.

5.4.2 Departure Substation

a) Removal of existing Transformer 1

The Contractor shall de-energise the existing Oil Cooled Transformer 1 and ensure the MV circuit breaker connected to Transformer 1 is racked out and in the earth position. On the LV board, the incomer from Transformer 1 shall have the main Air Circuit Breaker switched off

(open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 1.

The Contractor shall remove the oil from transformer 1 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

b) Supply and Installation of New Transformer 1

The Contractor shall supply and install a new 0.5 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0005-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 1 secondary side to the existing 400V LV switchgear incomer 1 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0005-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0005-01. The contractor shall ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination

kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

c) Removal of Existing Transformer 2

The Contractor shall de-energise the existing Oil Cooled Transformer 2 and ensure the MV circuit breaker connected to Transformer 2 is racked out and in the earth position. On the LV board, the incomer from Transformer 2 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 2.

The Contractor shall remove the oil from transformer 2 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

d) Supply and Installation of New Transformer 2

The Contractor shall supply and install a new 0.5 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0005-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 2 secondary side to the existing 400V LV switchgear incomer 2 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0005-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0005-01. The contractor shall

ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

e) Ventilation Installation

The Contractor shall provide an opening in the Departure substation wall to accommodate a fan and ducting for ventilation purposes as shown in typical drawing number 4128234-1-000-E-LA-0005-02.

The Contractor shall design, supply, deliver and install ducting complete with a filtration system and fan unit according to the typical layout on drawing number 4128234-1-000-E-LA-0005-02.

The Contractor shall design, supply, deliver, install a direct-on-line motor starter and temperature control unit according to the typical layout on drawing number 4128234-1-000-E-LA-0005-02 and shall terminate the cable connecting the fan to the direct-on-line motor starter and temperature control unit, and the cable connecting the direct-on-line motor starter and temperature control unit to the LV board.

f) Testing and Commissioning of the installation

The Contractor shall conduct a Factory Acceptance Test (FAT) as part of the Works to be executed in this Contract prior to delivery to site. The FAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the equipment's supplier to the Contractor shall be held by the Contractor until the equipment is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall conduct a Site Acceptance Test (SAT) for all Plant's supplied, offloaded and delivered to the designated Employer's site. The SAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the Plant's supplier to the

Contractor shall be held by the Contractor until the Plant is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall test the entire installation, including but not limited to the MV installation and LV installation as per SANS 10142-1/2 and hand over all relevant test certificates to the Employers Project Manager for acceptance. The Contractor shall hand over both MV and LV certificate of compliance as per the OHS Act of 85 and SANS 10142-1 and SANS1042-2 for the installations.

5.4.3 Arrivals Substation

a) Removal of existing Transformer 1

The Contractor shall de-energise the existing Oil Cooled Transformer 1 and ensure the MV circuit breaker connected to Transformer 1 is racked out and in the earth position. On the LV board, the incomer from Transformer 1 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 1.

The Contractor shall remove the oil from Transformer 1 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

b) Supply and Installation of New Transformer 1

The Contractor shall supply and install a new 0.5 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0004-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 1 secondary side to the existing 400V LV switchgear incomer 1 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0002-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0004-01. The contractor shall

ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

c) Removal of Existing Transformer 2

The Contractor shall de-energise the existing Oil Cooled Transformer 2 and ensure the MV circuit breaker connected to Transformer 2 is racked out and in the earth position. On the LV board, the incomer from Transformer 2 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 2.

The Contractor shall remove the oil from transformer 2 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

d) Supply and Installation of New Transformer 2

The Contractor shall supply and install a new 0.5 MVA, enclosed Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0004-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 2 secondary side to the existing 400V LV switchgear incomer 2 shown Air Circuit Breaker (ACB) in drawing number 4128234-1-000-E-LA-0004-01. The cables shall be supplied with termination kits for

appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0004-01. The contractor shall ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

e) Ventilation Installation

The Contractor shall provide an opening in the Arrivals substation wall to accommodate a fan and ducting for ventilation purposes as shown in typical drawing number 4128234-1-000-E-LA-0004-02.

The Contractor shall design, supply, deliver and install ducting complete with a filtration system and fan unit according to the typical layout on drawing number 4128234-1-000-E-LA-0004-02.

The Contractor shall design, supply, deliver, install a direct-on-line motor starter and temperature control unit according to the typical layout on drawing number 4128234-1-000-E-LA-0004-02 and shall terminate the cable connecting the fan to the direct-on-line motor starter and temperature control unit, and the cable connecting the direct-on-line motor starter and temperature control unit to the LV board.

f) Testing and Commissioning of the installation

The Contractor shall conduct a Factory Acceptance Test (FAT) as part of the Works to be executed in this Contract prior to delivery to site. The FAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the equipment's supplier to

the Contractor shall be held by the Contractor until the equipment is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall conduct a Site Acceptance Test (SAT) for all Plant's supplied, offloaded and delivered to the designated Employer's site. The SAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the Plant's supplier to the Contractor shall be held by the Contractor until the Plant is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall test the entire installation, including but not limited to the MV installation and LV installation as per SANS 10142-1/2 and hand over all relevant test certificates to the Employers Project Manager for acceptance. The Contractor shall hand over both MV and LV certificate of compliance as per the OHS Act of 85 and SANS 10142-1 and SANS1042-2 for the installations.

5.4.4 Admin Quay Substation

a) Removal of existing Transformer 1

The Contractor shall de-energise the existing Oil Cooled Transformer 1 and ensure the MV circuit breaker connected to Transformer 1 is racked out and in the earth position. On the LV board, the incomer from Transformer 1 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 1.

The Contractor shall remove the oil from Transformer 1 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

b) Supply and Installation of New Transformer 1

The Contractor shall supply and install a new 1 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0003-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 1 secondary side to the existing 400V LV switchgear incomer 1 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0003-01. The cables shall be supplied with termination kits for

appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0003-01. The contractor shall ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

c) Removal of Existing Transformer 2

The Contractor shall de-energise the existing Oil Cooled Transformer 2 and ensure the MV circuit breaker connected to Transformer 2 is racked out and in the earth position. On the LV board, the incomer from Transformer 2 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 2.

The Contractor shall remove the oil from Transformer 2 and dispose of it in an environmentally friendly manner.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor

d) Supply and Installation of New Transformer 2

The Contractor shall supply and install a new 1 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number: 4128234-1-000-E-LA-0003-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 2 secondary side to the existing 400V LV switchgear incomer 2 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0003-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0003-01. The contractor shall ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

e) Ventilation Installation

The Contractor shall provide an opening in the Admin Quay substation wall to accommodate a fan and ducting for ventilation purposes as shown in typical drawing number 4128234-1-000-E-LA-0003-02.

The Contractor shall design, supply, deliver and install ducting complete with a filtration system and fan unit according to the typical layout on drawing number 4128234-1-000-E-LA-0003-02.

The Contractor shall design, supply, deliver, install a direct-on-line motor starter and temperature control unit according to the typical layout on drawing number 4128234-1-000-E-LA-0003-02 and shall terminate the cable connecting the fan to the direct-on-line motor

starter and temperature control unit, and the cable connecting the direct-on-line motor starter and temperature control unit to the LV board.

f) Testing and Commissioning of the installation

The Contractor shall conduct a Factory Acceptance Test (FAT) as part of the Works to be executed in this Contract prior to delivery to site. The FAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the equipment's supplier to the Contractor shall be held by the Contractor until the equipment is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall conduct a Site Acceptance Test (SAT) for all Plant's supplied, offloaded and delivered to the designated Employer's site. The SAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the Plant's supplier to the Contractor shall be held by the Contractor until the Plant is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall test the entire installation, including but not limited to the MV installation and LV installation as per SANS 10142-1/2 and hand over all relevant test certificates to the Employers Project Manager for acceptance. The Contractor shall hand over both MV and LV certificate of compliance as per the OHS Act of 85 and SANS 10142-1 and SANS1042-2 for the installations.

5.4.5 Harbour West Substation

a) Removal of existing Transformer 1

The Contractor shall de-energise the existing Oil Cooled Transformer 1 and ensure the MV circuit breaker connected to Transformer 1 is racked out and in the earth position. On the LV board, the incomer from Transformer 1 shall have the main Air Circuit Breaker switched off

(open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 1.

The Contractor shall remove the oil from transformer 1 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

b) Supply and Installation of New Transformer 1

The Contractor shall supply and install a new 1.6 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0001-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 1 secondary side to the existing 400V LV switchgear incomer 1 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0001-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0001-01. The contractor shall ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination

kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

c) Removal of Existing Transformer 2

The Contractor shall de-energise the existing Oil Cooled Transformer 2 and ensure the MV circuit breaker connected to Transformer 2 is racked out and in the earth position. On the LV board, the incomer from Transformer 2 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 2.

The Contractor shall remove the oil from transformer 2 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

d) Supply and Installation of New Transformer 2

The Contractor shall supply and install a new 1.6 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0001-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 2 secondary side to the existing 400V LV switchgear incomer 2 shown in drawing number 4128234-1-000-E-LA-0001-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0001-01. The contractor shall

ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

e) Supply and Installation of Fuses

The Contractor shall supply and install 2× breakthrough units integrated with 2000A Fuses in accordance to drawing number: 4128234-1-000-E-LA-0008-01. The Contractor shall position the new fuse units in the substation transformer room as indicated in drawing number: 4128234-1-000-E-LA-0001-01.

The 2000A fuse units shall be installed and terminated in between the secondary side of the new 11kV/400V dry type transformers and the existing 400V LV switchgear Air Circuit Breaker (ACB) incomers as indicated in drawing number 4128234-1-000-E-LA-0001-01.

f) Ventilation Installation

The Contractor shall provide an opening in the Harbour West substation wall to accommodate a fan and ducting for ventilation purposes as shown in typical drawing number 4128234-1-000-E-LA-0001-02.

The Contractor shall design, supply, deliver and install ducting complete with a filtration system and fan unit according to the typical layout on drawing number 4128234-1-000-E-LA-0001-02.

The Contractor shall design, supply, deliver, install a direct-on-line motor starter and temperature control unit according to the typical layout on drawing number 4128234-1-000-E-LA-0001-02 and shall terminate the cable connecting the fan to the direct-on-line motor

starter and temperature control unit, and the cable connecting the direct-on-line motor starter and temperature control unit to the LV board.

g) Testing and Commissioning of the installation

The Contractor shall conduct a Factory Acceptance Test (FAT) as part of the Works to be executed in this Contract prior to delivery to site. The FAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the equipment's supplier to the Contractor shall be held by the Contractor until the equipment is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall conduct a Site Acceptance Test (SAT) for all Plant's supplied, offloaded and delivered to the designated Employer's site. The SAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the Plant's supplier to the Contractor shall be held by the Contractor until the Plant is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall test the entire installation, including but not limited to the MV installation and LV installation as per SANS 10142-1/2 and hand over all relevant test certificates to the Employers Project Manager for acceptance. The Contractor shall hand over both MV and LV certificate of compliance as per the OHS Act of 85 and SANS 10142-1 and SANS1042-2 for the installations.

5.4.6 Sorting Substation

a) Removal of existing Transformer 1

The Contractor shall de-energise the existing Oil Cooled Transformer 1 and ensure the MV circuit breaker connected to Transformer 1 is racked out and in the earth position. On the LV board, the incomer from Transformer 1 shall have the main Air Circuit Breaker switched off

(open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 1.

The Contractor shall remove the oil from transformer 1 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

b) Supply and Installation of New Transformer 1

The Contractor shall supply and install a new 0.5 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0006-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 1 secondary side to the existing 400V LV switchgear incomer 1 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0006-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0006-01. The contractor shall ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination

kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

c) Removal of Existing Transformer 2

The Contractor shall de-energise the existing Oil Cooled Transformer 2 and ensure the MV circuit breaker connected to Transformer 2 is racked out and in the earth position. On the LV board, the incomer from Transformer 2 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 2.

The Contractor shall remove the oil from transformer 2 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

d) Supply and Installation of New Transformer 2

The Contractor shall supply and install a new 0.5 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0006-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 2 secondary side to the existing 400V LV switchgear incomer 2 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0006-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0006-01. The contractor shall

ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

e) Ventilation Installation

The Contractor shall provide an opening in the Sorting substation wall to accommodate a fan and ducting for ventilation purposes as shown in typical drawing number 4128234-1-000-E-LA-0006-02.

The Contractor shall design, supply, deliver and install ducting complete with a filtration system and fan unit according to the typical layout on drawing number 4128234-1-000-E-LA-0006-02.

The Contractor shall design, supply, deliver, install a direct-on-line motor starter and temperature control unit according to the typical layout on drawing number 4128234-1-000-E-LA-0006-02 and shall terminate the cable connecting the fan to the direct-on-line motor starter and temperature control unit, and the cable connecting the direct-on-line motor starter and temperature control unit to the LV board.

f) Testing and Commissioning of the installation

The Contractor shall conduct a Factory Acceptance Test (FAT) as part of the Works to be executed in this Contract prior to delivery to site. The FAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the equipment's supplier to the Contractor shall be held by the Contractor until the equipment is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall conduct a Site Acceptance Test (SAT) for all Plant's supplied, offloaded and delivered to the designated Employer's site. The SAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the Plant's supplier to the

Contractor shall be held by the Contractor until the Plant is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall test the entire installation, including but not limited to the MV installation and LV installation as per SANS 10142-1/2 and hand over all relevant test certificates to the Employers Project Manager for acceptance. The Contractor shall hand over both MV and LV certificate of compliance as per the OHS Act of 85 and SANS 10142-1 and SANS1042-2 for the installations.

5.4.7 Office Substation

a) Removal of existing Transformer 1

The Contractor shall de-energise the existing Oil Cooled Transformer 1 and ensure the MV circuit breaker connected to Transformer 1 is racked out and in the earth position. On the LV board, the incomer from Transformer 1 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 1.

The Contractor shall remove the oil from transformer 1 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

b) Supply and Installation of New Transformer 1

The Contractor shall supply and install a new 800 KVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0007-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 240 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 1 secondary side to the existing 400V LV switchgear incomer 1 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0007-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0007-01. The contractor shall

ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

c) Removal of Existing Transformer 2

The Contractor shall de-energise the existing Oil Cooled Transformer 2 and ensure the MV circuit breaker connected to Transformer 2 is racked out and in the earth position. On the LV board, the incomer from Transformer 2 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 2.

The Contractor shall remove the oil from transformer 2 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to the TNPA depot, located on xxx and handed over to the electrical supervisor.

d) Supply and Installation of New Transformer 2

The Contractor shall supply and install a new 800 KVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0007-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 240 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 2 secondary side to the existing 400V LV switchgear incomer 2 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0007-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as

per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0007-01. The contractor shall ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

e) Ventilation Installation

The Contractor shall provide an opening in the Office substation wall to accommodate a fan and ducting for ventilation purposes as shown in typical drawing 4128234-1-000-E-LA-0007-02.

The Contractor shall design, supply, deliver and install ducting complete with a filtration system and fan unit according to the typical layout on drawing number 4128234-1-000-E-LA-0007-02.

The Contractor shall design, supply, deliver, install a direct-on-line motor starter and temperature control unit according to the typical layout on drawing number 4128234-1-000-E-LA-0007-02 and shall terminate the cable connecting the fan to the direct-on-line motor starter and temperature control unit, and the cable connecting the direct-on-line motor starter and temperature control unit to the LV board.

f) Testing and Commissioning of the installation

The Contractor shall conduct a Factory Acceptance Test (FAT) as part of the Works to be executed in this Contract prior to delivery to site. The FAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the equipment's supplier to the Contractor shall be held by the Contractor until the equipment is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall conduct a Site Acceptance Test (SAT) for all Plant's supplied, offloaded and delivered to the designated Employer's site. The SAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the Plant's supplier to the

Contractor shall be held by the Contractor until the Plant is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall test the entire installation, including but not limited to the MV installation and LV installation as per SANS 10142-1/2 and hand over all relevant test certificates to the Employers Project Manager for acceptance. The Contractor shall hand over both MV and LV certificate of compliance as per the OHS Act of 85 and SANS 10142-1 and SANS1042-2 for the installations.

5.4.8 Liquid Pitch Substation

a) Removal of existing Transformer 1

The Contractor shall de-energise the existing Oil Cooled Transformer 1 and ensure the MV circuit breaker connected to Transformer 1 is racked out and in the earth position. On the LV board, the incomer from Transformer 1 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 1.

The Contractor shall remove the oil from transformer 1 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

b) Supply and Installation of New Transformer 1

The Contractor shall supply and install a new 2 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0008-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 6 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 1 secondary side to the existing 400V LV switchgear incomer 1 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0008-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 70 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0008-01. The contractor shall

ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

c) Removal of Existing Transformer 2

The Contractor shall de-energise the existing Oil Cooled Transformer 2 and ensure the MV circuit breaker connected to Transformer 2 is racked out and in the earth position. On the LV board, the incomer from Transformer 2 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 2.

The Contractor shall remove the oil from transformer 2 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

d) Supply and Installation of New Transformer 2

The Contractor shall supply and install a new 2MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0008-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 6 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 2 secondary side to the existing 400V LV switchgear incomer 2 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0008-01. The cables shall be supplied with termination kits for

appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 70 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0008-01. The contractor shall ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

e) Supply and Installation of Fuses

The Contractor shall supply and install 2× breakthrough units integrated with 2000A Fuses in accordance to drawing number: 4128234-1-000-E-LA-0008-01. The Contractor shall position the new fuse units in the substation transformer room as indicated in drawing number: 4128234-1-000-E-LA-0008-01.

The 2000A fuse units shall be installed and terminated in between the secondary side of the new 11kV/400V dry type transformers and the existing 400V LV switchgear Air Circuit Breaker (ACB) incomers as indicated in drawing number 4128234-1-000-E-LA-0008-01.

f) Ventilation Installation

The Contractor shall provide an opening in the Liquid Pitch substation wall to accommodate a fan and ducting for ventilation purposes as shown in typical drawing number 4128234-1-000-E-LA-0008-02.

The Contractor shall design, supply, deliver and install ducting complete with a filtration system and fan unit according to the typical layout on drawing number 4128234-1-000-E-LA-0008-02.

The Contractor shall design, supply, deliver, install a direct-on-line motor starter and temperature control unit according to the typical layout on drawing number 4128234-1-000-E-LA-0008-02 and shall terminate the cable connecting the fan to the direct-on-line motor

starter and temperature control unit, and the cable connecting the direct-on-line motor starter and temperature control unit to the LV board.

g) Testing and Commissioning of the installation

The Contractor shall conduct a Factory Acceptance Test (FAT) as part of the Works to be executed in this Contract prior to delivery to site. The FAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the equipment's supplier to the Contractor shall be held by the Contractor until the equipment is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall conduct a Site Acceptance Test (SAT) for all Plant's supplied, offloaded and delivered to the designated Employer's site. The SAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the Plant's supplier to the Contractor shall be held by the Contractor until the Plant is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall test the entire installation, including but not limited to the MV installation and LV installation as per SANS 10142-1/2 and hand over all relevant test certificates to the Employers Project Manager for acceptance. The Contractor shall hand over both MV and LV certificate of compliance as per the OHS Act of 85 and SANS 10142-1 and SANS1042-2 for the installations.

5.4.9 Workshop Substation

a) Removal of existing Transformer 1

The Contractor shall de-energise the existing Oil Cooled Transformer 1 and ensure the MV circuit breaker connected to Transformer 1 is racked out and in the earth position. On the LV board, the incomer from Transformer 1 shall have the main Air Circuit Breaker switched off

(open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 1.

The Contractor shall remove the oil from transformer 1 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

Supply and Installation of New Transformer 1

The Contractor shall supply and install a new 1 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0009-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 1 secondary side to the existing 400V LV switchgear incomer 1 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0009-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0009-01. The contractor shall ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination

kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

b) Removal of Existing Transformer 2

The Contractor shall de-energise the existing Oil Cooled Transformer 2 and ensure the MV circuit breaker connected to Transformer 2 is racked out and in the earth position. On the LV board, the incomer from Transformer 2 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 2.

The Contractor shall remove the oil from transformer 2 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

c) Supply and Installation of New Transformer 2

The Contractor shall supply and install a new 1 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0009-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 2 secondary side to the existing 400V LV switchgear incomer 2 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0009-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0009-01. The contractor shall

ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

d) Ventilation Installation

The Contractor shall provide an opening in the Workshop substation wall to accommodate a fan and ducting for ventilation purposes as shown in typical drawing number 4128234-1-000-E-LA-0009-02.

The Contractor shall design, supply, deliver and install ducting complete with a filtration system and fan unit according to the typical layout on drawing number 4128234-1-000-E-LA-0009-02.

The Contractor shall design, supply, deliver, install a direct-on-line motor starter and temperature control unit according to the typical layout on drawing number 4128234-1-000-E-LA-0009-02 and shall terminate the cable connecting the fan to the direct-on-line motor starter and temperature control unit, and the cable connecting the direct-on-line motor starter and temperature control unit to the LV board.

e) Testing and Commissioning of the installation

The Contractor shall conduct a Factory Acceptance Test (FAT) as part of the Works to be executed in this Contract prior to delivery to site. The FAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the equipment's supplier to the Contractor shall be held by the Contractor until the equipment is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall conduct a Site Acceptance Test (SAT) for all Plant's supplied, offloaded and delivered to the designated Employer's site. The SAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the Plant's supplier to the

Contractor shall be held by the Contractor until the Plant is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall test the entire installation, including but not limited to the MV installation and LV installation as per SANS 10142-1/2 and hand over all relevant test certificates to the Employers Project Manager for acceptance. The Contractor shall hand over both MV and LV certificate of compliance as per the OHS Act of 85 and SANS 10142-1 and SANS1042-2 for the installations.

5.4.10 South Dunes Substation

a) Removal of existing Transformer 1

- 1.1.2.a.1 The Contractor shall de-energise the existing Oil Cooled Transformer 1 and ensure the MV circuit breaker connected to Transformer 1 is racked out and in the earth position. On the LV board, the incomer from Transformer 1 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 1.
- 1.1.2.a.2 The Contractor shall remove the oil from transformer 1 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.
- 1.1.2.a.3 The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area which will be determined by the client and handed over to the electrical supervisor.

b) Supply and Installation of New Transformer 1

The Contractor shall supply and install a new 1 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0010-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 1 secondary side to the existing 400V LV switchgear incomer 1 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0010-01. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0010-01. The contractor shall

ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

c) Removal of Existing Transformer 2

The Contractor shall de-energise the existing Oil Cooled Transformer 2 and ensure the MV circuit breaker connected to Transformer 2 is racked out and in the earth position. On the LV board, the incomer from Transformer 2 shall have the main Air Circuit Breaker switched off (open position) and the bus section closed. Thereafter, the Contractor shall disconnect the LV and MV cables connected to Transformer 2.

The Contractor shall remove the oil from transformer 2 and dispose of it in an environmentally friendly manner. The oil must be disposed off at a hazardous landfill site. Proof of safe disposal must be provided and kept in the green file at all times.

The Contractor shall remove and transport the dismantled transformer and MV/LV cables to designated TNPA storage area that will be determined by the client and handed over to the electrical supervisor.

d) Supply and Installation of New Transformer 2

The Contractor shall supply and install a new 1 MVA, enclosed, Dry-type transformer with integrated cooling, positioned according to drawing number 4128234-1-000-E-LA-0010-01 and specification TPD-017-DRY TYPE TRF.

The Contractor shall supply and terminate 3 x 300 mm² 4-core, ECC, PVC low voltage 600/1000V, unarmoured, copper cable from 11kV/400V transformer 2 secondary side to the existing 400V LV switchgear incomer 2 Air Circuit Breaker (ACB) shown in drawing number 4128234-1-000-E-LA-0010-01. The cables shall be supplied with termination kits for

appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall supply and terminate a 50 mm² 3-core, XLPE copper cable from the MV 11kV transformer panel feeders to the primary bushings of the 11kV/400V Transformers as per SANS 101980-4. See drawing no: 4128234-1-000-E-LA-0010-01. The contractor shall ensure that the manufacturer's recommendations regarding the minimum cable bending radius is adhered to when installing the cables. The cables shall be supplied with termination kits for appropriate installation on the transformer termination box and the switchgear terminals as per SANS 101980-4 and Transnet specification TPD-003-CABLESPEC.

The Contractor shall appoint a protection grading specialist to regrade the protection on the Dry type Transformer according to the new transformer specifications. The protection design documentation must be submitted to the employer for review and approval.

The Contractor shall test and commission the new transformer in the presence of the Employer's Engineer. The transformers shall as a minimum, comply with specification TPD-017-DRY TYPE TRF and schedule of requirements.

e) Ventilation Installation

The Contractor shall provide an opening in the South Dunes substation wall to accommodate a fan and ducting for ventilation purposes as shown in typical drawing number 4128234-1-000-E-LA-0010-02.

The Contractor shall design, supply, deliver and install ducting complete with a filtration system and fan unit according to the typical layout on drawing number 4128234-1-000-E-LA-0010-02.

The Contractor shall design, supply, deliver, install a direct-on-line motor starter and temperature control unit according to the typical layout on drawing number 4128234-1-000-E-LA-0010-02 and shall terminate the cable connecting the fan to the direct-on-line motor starter and temperature control unit, and the cable connecting the direct-on-line motor starter and temperature control unit to the LV board.

f) Testing and Commissioning of the installation

The Contractor shall conduct a Factory Acceptance Test (FAT) as part of the Works to be executed in this Contract prior to delivery to site. The FAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the equipment's supplier to

the Contractor shall be held by the Contractor until the equipment is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall conduct a Site Acceptance Test (SAT) for all Plant's supplied, offloaded and delivered to the designated Employer's site. The SAT shall be conducted in the presence of the Employer's Engineer. The legal transfer of ownership from the Plant's supplier to the Contractor shall be held by the Contractor until the Plant is fully installed, tested commissioned on the Employer's designated site.

The Contractor shall test the entire installation, including but not limited to the MV installation and LV installation as per SANS 10142-1/2 and hand over all relevant test certificates to the Employers Project Manager for acceptance. The Contractor shall hand over both MV and LV certificate of compliance as per the OHS Act of 85 and SANS 10142-1 and SANS1042-2 for the installations.

5.5 Electrical Conditions

5.5.1 Service conditions

The plant/equipment shall be designed and rated for continuous operation under the following conditions:-

Altitude	0 to 1800m above sea level
Ambient air temperature	Max 45 deg. C; Min. -5 deg. C
Humidity	as high as 96 %
Lightning conditions	Severe with 12 flashes/km ² /annum
In addition the atmosphere will be of a highly saline and dust-laden nature.	

5.5.2 Low Voltage Power System

All Low Voltage equipment and or plants to be provided as part of the engineering solution shall normally operate in the following conditions:

Nominal system voltage:	400V
Minimum -Maximum system voltage:	380V - 420V
Nominal frequency:	50 Hz \pm 2 Hz
No. of phases:	3 Phase and Neutral
Neutral Point	Solidly Earthed

5.5.3 Medium Voltage Power System

All Medium Voltage equipment and or plants to be provided as part of the engineering solution shall normally operate in the following conditions:

Nominal system voltage:	11kV
Minimum -Maximum system voltage:	10.45kV – 11.55kV
Nominal frequency:	50 Hz \pm 2 Hz
No. of phases:	3 Phase
Neutral Point	Solidly Earthed
Short Circuit	25kA

5.6 Codes of Practice

In addition to the specifications, the TNPA transformer upgrade shall comply with the following relevant South African Acts and Regulations and they shall apply in the order of precedence as listed below:

5.7 Reference Documents

Table 5-1: List of South African and International Codes used in the development of this document

Item	Document Number	Description
[1]	OSH ACT 85 of 1993	South African National Occupational Health and Safety Act 85 of 1993

5.8 Standards

Table 5-1: List of all South African and International Standards used in the development of this document

Item	Document Number	Description
[1]	SANS 10142	Code of Practice for the Wiring of Premises.
[2]	SANS 62305-1	Protection against lightning Part 1: General principles
[3]	SANS 62305-2	Protection against lightning Part 2: Risk management
[4]	SANS 62305-3	Protection against lightning Part 3: Physical damage to structures and life hazard

[5]	SANS 10313	Protection against lightning - Physical damage to structures and life hazard
[6]	SANS 10199	The design and installation of earth electrodes
[7]	SANS 1063	Earth rods, couplers and connections
[8]	SANS 10198-8	The selection, handling and installation of electric power cables of rating not exceeding 33 kV Part 8: Cable laying and installation
[9]	SANS 1091	National Colour Codes
[10]	SANS 1973-1	Low Voltage switchgear assemblies >10kA
[11]	SANS 1973-2	Low Voltage switchgear assemblies <10kA
[12]	SANS 10292	Earthing of Low Voltage (LV) distribution systems
[13]	SANS 60529	Degrees of protection by enclosure (IP codes)
[14]	SANS 61689	Instrument Transformer
[15]	SANS 60076-11	Dry-type Transformers
[16]	SANS 60076-12	Loading Guide for Dry-type Transformers
[17]	SANS 725	IEEE Guide for Safety in AC Substation Grounding
[18]	SANS 10198-4	The selection, handling and installation of electrical power cables

5.9 Specifications

Table 5-2: List of all Transnet Specifications used in the development of this document

Item	Document Number	Description
[1]	TPD-001-EL&PSPEC	Specification for electrical installations to buildings other than dwellings houses
[2]	TPD-017-DRY TYPE TRF	Specification for Dry-type Transformers

[3]	TPD-003-CABLESPEC	Specification for the supply and installation of medium voltage and low voltage electrical cables
[4]	TPD-004-EARTHINGSPEC	Specification for earthing and the protection of buildings and structures against lightning.
[5]	TPD-007-MVSWITCHSPEC	Specification for indoor medium/ high voltage (1kV to 33 kV) alternating current switchgear and control gear

5.10 Substation Plant upgrade

The Works to be carried out by the electrical Contractor shall be implemented in phases. The phases of the Works are described in the sub-sections below. Any Works deviated from the phases must be authorised and approved by the Employer's Engineer.

The Work to replace transformer shall not occur simultaneously. This is to ensure that the risk of loss of main electrical supply to the Port of Richards Bay is minimal.

It is the Contractor's responsibility to plan and submit an execution plan to the Employer Engineers through the Project Manager for approval prior to execution.

This Works information shall be read in conjunction with the drawings listed in the drawing list section below (5 List of Drawings).

5.11 General notes applicable to the upgrade of both substations

a) Time Schedule

The Contractor shall submit a proposed time based schedule in a Gant Chart presentation format showing anticipated time to the Project Manager prior to any commencement of the work indicating the following:

- Supply and delivery on site of the new Dry Type Transformers.
- Removal of existing Transformers.
- Installation of new MV and LV Cables.
- Installation of new Dry Type Transformers
- Grading of protection relays by Protection Specialist.
- The Contractor shall submit a time schedule for the protection relay grading by the specialist three weeks before installation.
- Handing over back of the equipment to Transnet National Ports Authority (TNPA) for all substations.
- Removal of oil and transportation of the existing transformers from the respective site to RBAY TNPA Depot.
- The programme shall also indicate the maximum down time required for each phase of work.

- The Contractor shall also submit a notification of switching to the client three (3) weeks prior to the work being performed.

b) Earthing

Earthing shall be carried out as per specification **TPD-004-EARTHINGSPEC**: Technical specification for earthing and the protection of buildings and structures against lightning.

The Contractor shall test the integrity of the existing earth mats in both substations as per SANS 10199 and Transnet earthing specification TPD-004-EARTHINGSPEC prior to the new 11/0.4kV Dry type Transformer Plant installation and check if the resistance of the existing earthing mat is lower than 1 ohm. The Contractor shall submit test results to the Employer's Engineer through the Project Manager.

The testing of the existing earth mat shall be performed in the presence of the Employer's Engineer.

In the case where the earth resistance of the existing earth mat exceeds 1 ohm, the Employer's Engineer shall advise on how to improve the resistance of the existing earth mat and or replace the entire earthing system.

c) Cable Terminations and Joints

Removal of existing MV cables from the panels shall be carried out in a safe and neat manner to avoid unnecessary joints.

Terminations of existing cables to new panels shall be carried out in a safe and neat manner with no or minimal number of joints in the existing cable.

Terminations shall be of high quality and the work shall be of a high standard of workmanship carried out by qualified staff under proper supervision by an experienced and competent officer/s.

The Contractor shall supply, deliver and store safely and securely 3 x 400mm² single core XLPE cable joints for use in case of emergency. On completion of the Works, the remaining joints shall be handed over to the TNPA Maintenance Personnel.

Where cable terminations are damaged and or panel positions have altered and cable joints cannot be avoided, an approval from Employer's Engineer is applicable.

The Contractor shall submit a method statement for the retrieval, handling and disposal plan of the SF6 gas from the existing switchgear plant for both substations to the Project Manager prior to any work commencement.

d) Preliminary work that needs to be completed prior to any commencement of work

The Contractor shall ensure that the level of the substation floors where the new Plant is to be positioned meets the requirements of the Plant manufacture specifications.

Transnet National Ports Authority (TNPA) shall arrange a responsible personnel in-conjunction with the Contractor to check phase rotation before and after any work is done. Before installation and energizing, the Contractor shall check and verify the phase rotation.

Transnet National Ports Authority (TNPA) Control shall arrange a responsible personnel to perform phase switching for both the substation as per the proposed phase switching plan.

e) Inspection

TNPA reserves the right to carry out inspections of any items associated with the Plant and work at any time during the manufacturing, delivering, installation, testing and commissioning process and to be present at any tests.

The Contractor shall conduct a factory acceptance test (FAT) and site acceptance test (SAT) in the presence of the Employer's Engineer.

f) Tests

TNPA also reserves the right to carry out any random tests on the equipment.

Notwithstanding the successful completion of tests, the Contractor shall be responsible for the efficient operation of the installed Plant.

The Contractor shall bear all costs for any tests, which shall be required.

g) Marking, Labelling, Documentation and Painting

All markings/labelling and documentation shall be done in accordance with the Transnet National Ports Authority Specifications; TPD-007-MVSWITCHSPEC and TPD-003-CABLESPEC.

The Contractor shall supply and deliver all relevant documents not limited to but including shop drawings, manuals and etc. about the installed Plant for both substations.

The painting of the new Plant and its apparatus shall be in accordance to Transnet National Ports Authority Specifications; TPD-007-MVSWITCHSPEC in all substations.

h) Guarantee of the new switchgear Plant installation

The Contractor shall undertake to repair all faults due to bad workmanship and/or faulty materials and to replace all defective apparatus or materials during a period of twelve (12) calendar months after the date of installation and acceptance.

Any defects that may become apparent during the guarantee period shall be rectified to the satisfaction of TNPA, and free of cost.

The Contractor shall undertake work on the rectification of any defects that may arise during the guarantee period within 7 days after being notified by TNPA of such defects.

Should the Contractor fail to comply with the requirements stipulated above, Transnet National Ports Authority will be entitled to undertake the necessary repair work or effect replacement of defective apparatus or materials, and the Contractor shall reimburse TNPA the total cost of such repair or replacements, including the labour costs incurred in replacing defective material.

5.12 Process control and IT Works

a) None

5.13 Other [as required]

a) None

6 LIST OF DRAWINGS

6.1 Drawings issued by the Employer

This is the list of drawings issued by the Employer at or before the Contract Date and which apply to this contract.

Note: Some drawings may contain both Works Information and Site Information.

Drawing number	Title
4128234-1-000-E-LA-0001-01	Harbour West Substation Transformer Upgrade
4128234-1-000-E-LA-0002-01	Eastern Substation Transformer Upgrade
4128234-1-000-E-LA-0003-01	Admin Quay Substation Transformer Upgrade
4128234-1-000-E-LA-0004-01	Arrivals Substation Transformer Upgrade
4128234-1-000-E-LA-0005-01	Departure Substation Transformer Upgrade
4128234-1-000-E-LA-0006-01	Sorting Yard Substation Transformer Upgrade
4128234-1-000-E-LA-0007-01	Office Substation Transformer Upgrade
4128234-1-000-E-LA-0008-01	Liquid Pitch Substation Transformer Upgrade
4128234-1-000-E-LA-0009-01	Workshop Substation Transformer Upgrade
4128234-1-000-E-LA-0010-01	South Dunes Substation Transformer Upgrade
4128234-1-000-E-LA-0001-02	Harbour West Substation Transformer Upgrade
4128234-1-000-E-LA-0002-02	Eastern Substation Transformer Upgrade
4128234-1-000-E-LA-0003-02	Admin Quay Substation Transformer Upgrade
4128234-1-000-E-LA-0004-02	Arrivals Substation Transformer Upgrade
4128234-1-000-E-LA-0005-02	Departure Substation Transformer Upgrade
4128234-1-000-E-LA-0006-02	Sorting Yard Substation Transformer Upgrade
4128234-1-000-E-LA-0007-02	Office Substation Transformer Upgrade
4128234-1-000-E-LA-0008-02	Liquid Pitch Substation Transformer Upgrade
4128234-1-000-E-LA-0009-02	Workshop Substation Transformer Upgrade
4128234-1-000-E-LA-0010-02	South Dunes Substation Transformer Upgrade

SECTION 2

7 MANAGEMENT AND START UP

7.1 Management meetings

Regular meetings of a general nature may be convened and chaired by the Project Manager as follows:

Title and purpose	Approximate time & interval	Location	Attendance by:
Risk register and compensation events	Every two weeks	On site	Project Manager, Supervisor , Contractor and appropriate key persons
Overall contract progress and feedback	Every two weeks	On site	Employer, Project Manager, Supervisor , Contractor and appropriate key persons
SHE Meetings	Every two weeks	On site	Appointed and appropriate key persons
Technical Meetings	Every two weeks	On site	Appointed and appropriate key persons
Safety, Health, Environmental Audits	Monthly per Discipline	On site	By Client (TNPA) and appointed appropriate key persons from Contractor
Stakeholder Liaison Meeting	Every two weeks	On site	Project Manager, Supervisor, Contractor and appointed appropriate key persons

Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the Works. Records of these meetings are to be submitted to the Project Manager by the person convening the meeting within five days of the meeting.

All meetings are to be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register are not to be used for the purpose of confirming actions or instructions under the contract as these are to be done separately by the person identified in the conditions of contract to carry out such actions or instructions.

7.2 Documentation Control

In undertaking the Works all documentation requirements for the Works shall be dealt with in accordance with document DOC-STD-0001 – Rev03 (Contractor Documentation Submittal Requirements). The control, maintenance and handling of these documents and drawings, using a suitable document control system, remain the sole responsibility of the Contractor.

The Contractor Documentation Schedule (CDS) is as contemplated in DOC-STD-0001 – Rev 03, as contained in Annexure A.

The Contractor documentation “Starter kit”, as contemplated in DOC-STD-0001 – Rev 03, will be issued at the kick-off meeting following award.

All contract correspondence is issued through document control. All hardcopy communication will be delivered to the Employer via the Lead Document Controller at the Richards Bay offices document control department. In the event of urgent communication, electronic communication can be transmitted to the **Project Manager** via email address with Doc Control email copied (to be provided by Transnet TNPA)

Each supplier of documentation and data to the Project is responsible for ensuring that all documentation and data submitted conforms to the Project Standards and data Quality requirements in terms of numbering, uniqueness, quality, accuracy, format, completeness and currency of information. Data not meeting the Project Standards and data Quality requirements will be cause for rejection and returned to the Contractor for corrective action and re-submission.

Should any change be made to documentation or data, which has already been submitted to the Project, then new or revised documentation or data shall be issued to replace the outdated information.

All drawings supplied shall comply with the CAD Standards, i.e. ENG-STD-0001

It is the responsibility of all Project participants undertaking work on the Project to ensure they obtain and comply with the relevant requirements to suit their deliverables and Scope of Work.

The Contractor is to ensure that the latest versions of the required application software and a suitable ‘IT’ Infrastructure is in place to support the electronic transmission of documentation.

Electronic files submitted to the Project shall be clear of known viruses and extraneous “macros”. The supplier of documentation is required to have, at all times, the latest generation of virus protection software and up-to-date virus definitions.

The Contractor shall be responsible for the supply of all Sub-Supplier/Contractor/ Manufacturer, etc. documentation and data related to their package of work, and shall ensure that these Sub-Suppliers have the capability to supply the necessary documentation and data in the required time-frame and quality as outlined in the specified standards prior to awarding sub-orders.

The required number of copies shall as a minimum be three (3) (1x original + 2 x hard copies), with the corresponding PDF and 'Native' file formats upon final submission.

The required number of copies of documentation and data shall be specified in the 'Contractor Documentation Schedule' (CDS). The required number of copies shall as a minimum be three (3) (1 x original + 2 x hard copies), with the corresponding PDF and 'Native' file formats upon final submission.

The Contractor shall apply "wet signatures" to the original Documentation before scanning the signed original and prior to formal submission to the Project.

Final issues of all documentation shall be supplied to the Project in "wet signature" format along with the associated corresponding electronic 'native files' and PDF renditions.

The Contractor shall ensure adequate resources are available to manage and execute the Document Control function as per the requirements of the Project. (The Contractor shall ensure that a dedicated Document Controller is available for the Project)

7.3 Safety risk management

All health and safety matters associated with the Works will be dealt with in accordance with the Transnet National Ports Authority Project HS Specification TNPA Transformer Upgrade.

The Contractor must prepare, implement and administer the Contractor's Health and Safety Management Plan (CHSMP).

The Plan should be in writing and accepted by Transnet National Ports Authority, prior to mobilisation to the construction site for work under the Contract, to Transnet National Ports Authority or Transnet National Ports Authority nominated Representative, for acceptance.

The Health and Safety Management Plan must comply with Site Specific Health and Safety Functional Execution Plan which indicate Project Site Rules, and applicable law relating to Workplace Health and Safety.

Any proposed amendments or revisions to the Contractor's Safety Management Plan shall be submitted to Transnet National Ports Authority for acceptance, and once accepted, it becomes part of the Transnet National Ports Authority Safety Management Plan.

The Health and Safety Management Plan must provide a systematic method of managing hazards according to the risk priority, and must include all mobilisation and site set-up activities.

The Plan is presented and at least “accepted with comments” by Transnet National Ports Authority BEFORE permission will be granted to the Contractor to mobilise to site and shall include but not limited to the following;

- a. Leadership and Commitment
- b. Performance Measurement and Reporting
- c. Involvement Communication and Motivation
- d. Contractor Management
- e. Training and Competency
- f. Hazard and Risk Management
- g. Occupational Health and Hygiene
- h. Safe systems of Work
- i. Incident Management
- j. Site Management
- k. Communication
- l. Emergency Preparedness
- m. Plant and Equipment
- n. Monthly safety Audit

The Contractor shall ensure that its Sub Contractors comply with the requirements of the CHSMP.

All container type site accommodation must be appropriately secured and tied down to prevent it from being blown over by strong winds.

Pre-employment medicals specific for this project including chest X-rays will be required, exit medicals including X-rays examinations will be required at the end of the project. These medical examinations must be carried out by a registered Occupational Health practitioner.

Contractor’s Safety Health and Environmental manager will be required to undergo TNPA’s safety interview and be based full time on site. The SHE manager must be registered with SACPCMP

The Contractor must ensure that budget provision for SHE requirements is in place.

The roles and responsibilities of the various personnel acting on behalf of the Project Manager and who communicate directly with the Contractor and his key persons with respect to the CHSMP and health and safety issues are:

The Construction Manager (CM), who is responsible for health and safety on the Site and Working Areas and reports to the Project Manager with specific tasks to:

The CM specific tasks (in the context of the SMP) are

- Implement the Employers safety management system.
- Monitor Contractor's compliance to the CHSMP.
- Ensure risk is at an acceptable level.
- Ensure the Contractor's workforce and Construction Management Team is competent.
- Assess regularly SHE performance, analyse SHE indicators and near missing cases.
- Perform regular Site walks around to personally ascertain the application of the SHE Plan
- Assess the regular issue of SHE Reports

The Project Site Safety Manager who is responsible for ensuring that the Contractor complies with the CHSMP and acts on behalf of the Project Manager.

PSSM specific tasks are:

- Provide advice and support to the established governance structures such as Safety Committees.
- Provide advice and input to management on review of safety compliance audits.
- Implement a system for reporting and recording of all incidents, performance analysis and calculating and recording LTIs.
- Implement sustainable statistical process controls so that continuous improvement is achieved.
- Monitor and facilitate training of Safety and Health Policies, Procedures and Practices so that all staff members are aware and adhere to these.
- Investigate any Safety and Health incidents reported by safety officers and officials so that immediate and appropriate measures are taken.
- Review, improve and approve Project Safety and Health Plans.

7.4 Environmental constraints and management

All work is to be conducted in accordance with the principles of the National Environmental Management Act, 1998 (Act no 107 of 1998) but not limited to other applicable regulations as well as eThekweni Municipality bylaws and all accepted environmental good practice.

The following documents provide the minimum acceptable standards that shall be adhered to:

- Construction Environmental management Plan (ENV-STD-001 Rev02);
- Standard Environmental Specification (ENV-STD-002 Rev02);

The CEMP describes the main roles and responsibilities of the project team with respect to Environmental Management.

The SES describes the minimal acceptable standard for environmental management for a range of environmental aspects commonly encountered on construction projects and sets environmental objectives and targets, which the Contractor observes and complies.

The Contractor must appoint a full time SHE Officer to monitor and manage compliance to Environmental Specification and all applicable environmental legislation. The SHE Officer must as a minimum have an Environmental Management background.

The Contractor will be required to submit an environmental file to TNPA post award of tender. Particular requirements of the Employer will be made known on award of the contract. Site access certificate shall not be granted until the environmental file has been approved by the Employer.

The overarching obligations of the Contractor under the CEMP before construction activities commence on the Site and/or Working Areas is to provide environmental method statements (as contained under section 7.1.3 of the CEMP) for all construction operations the Site and/or Working Area by the Contractor and where requested by the CM and to comply with the following:

The Contractor shall identify the kinds of environmental impacts that will occur as a result of their activities and accordingly prepare separate method statements describing how each of these impacts will be prevented or managed so that the standards set out in the SES document are achieved. The method statements will be prepared in accordance with the requirements set out in the CEMP. These method statements shall form part of the environmental file. The Contractor shall ensure that his management, foremen and the general workforce, as well as all suppliers and visitors to Site have attended the Environmental Induction Programme prior to commencing any work on Site. If new personnel commence work on the Site during construction, the Contractor shall ensure that these personnel undergo the Environmental Induction Programme and are made aware of the environmental specifications on Site.

Where required, one of the first actions to be undertaken by the Contractor shall be to erect and maintain a temporary fence along the boundaries of the Site and Working Areas as applicable, and around any no-go areas identified on the layout plans, to the satisfaction of the Project Manager.

During the construction period, the Contractor complies with the following:

A copy of the CEMP and SES shall be available on Site, and the Contractor shall ensure that all the personnel on Site (including SubContractors and their staff) as well as suppliers are familiar with and understand the specifications.

Method statements need to be compiled by the Contractor throughout the Construction and Commissioning phase of the project. These Method Statements must be approved by the TNPA Construction Manager and TNPA Environmental Manager or Environmental Officer. Approval must at least be two weeks prior to the proposed commencement of the activity. Emergency

construction activity method statements may also be required. The activities requiring method statements cannot commence if they have not been approved by the TNPA Environmental Manager or Environmental Officer.

Where applicable, the Contractor shall provide job-specific training on an ad hoc basis when workers are engaged in activities, which require method statements.

The Contractor shall be responsible for rehabilitating and or re-vegetating all areas to the satisfaction of the TNPA Environmental Manager or Environmental Officer as detailed in the SES. Sufficient environmental budget must be allocated for the implementation of environmental management requirements.

The Contractor must ensure that its Sub Contractors comply with the Environmental Specification.

7.5 Quality assurance requirements

The Contractor shall have, maintain and demonstrate its use to the Project Manager (and/or the Supervisor to satisfy the requirements of paragraphs 7.4, 7.5, 3.2.1 and 3.2.8 as appropriate) the documented Quality Management System to be used in the performance of the Works. The Contractor's Quality Management System shall conform to International Standard ISO 9001:2015 (or an equivalent standard acceptable to the Project Manager).

The Contractor submits his Quality Management System documents to the Project Manager as part of his programme under ECC Clause 31.2 to include details of:

- A signed Quality Policy
- ISO 9001:2015 certification
- Manufacturing Quality Control Plan (QCP) for dry-type transformers
- Installation Quality Control Plans (QCP's) for all components (transformers, cables & ventilation system) including Inspection and Test plans

The Contractor develops and maintains a comprehensive register of documents that will be generated throughout the contract including all quality related documents as part of its Quality Plan.

The Project Manager indicates those documents required to be submitted for either information, review or acceptance and the Contractor indicates such requirements within his register of documents. The register shall indicate the dates of issue of the documents with the Project Manager responding to documents submitted by the Contractor for review or acceptance within the period for reply prior to such documents being used by the Contractor.

7.6 Programming constraints

The Contractor shall submit a proposed time-based schedule at time of tendering showing anticipated construction and installation dates including weekends and actual working hours that the Contractor will be working per day. The programme shall also indicate the maximum down time required for phasing of work where necessary and in accordance with stipulations in this regard described in Employer's Works Information.

The Contractor shows on each programme he submits to the Project Manager, the requirements of the CEMP, SES, PES and SMP as described under paragraph 7.4 of the Works Information together with the associated environmental method statements.

The Contractor complies with the Employer's programme when he submits his first programme.

The Contractor complies with the Employer's programme {i.e. estimated project duration of sixty-four (64) weeks [one year – Three months]} inclusive of public holidays, builder's break [i.e. 16 December – 10 January] and known special non-working days} when he submits his first programme.

The Contractor presents his first programme and all subsequently revised programmes (see ECC Clauses 31.2 and 32.1) in hard copy format and in soft copy format.

The Contractor uses Primavera for his programme submissions or a similar programme software package equivalent to Primavera subject to the prior written notification and acceptance by the Project Manager.

The Contractor shows on his Accepted Programme and all subsequently revised programmes schedules showing the critical path or paths and all necessary logic diagrams demonstrating sequence of operations.

It is incumbent upon the Contractor to submit a level-4 schedule/programme clearly showing the project duration and critical path for approval within 14 days of the award of this contract. The schedule/programme is to be discussed and agreed between the Contractor and Sub-Contractor's prior to submission, this must be subject to discussion and review by the Project Manager. No claim for an extension of time or acceleration must be entertained by Project Manager due to any failure of the Contractor and Sub-Contractor(s) to accommodate one another.

The Contractor's proposed construction programme must be in a bar chart form.

The Contractor must submit his programme within 14 days of the award of this contract, to the Project Manager for acceptance. The programme must be in the form of a bar chart or any other time-activity form acceptable to the Project Manager and must clearly show:

- The proposed rate of progress in order to complete the Works within the required period as tendered, showing the various activities, their durations and proposed re-sourcing levels (major plant and labour) for each element of the Works. Sufficient detail must be provided to enable the Project Manager to be able to gauge construction progress.
- The sequence of activities and any dependencies (time or resource related) between them.
- The critical path activities.
- Key dates/information, etc. in respect of work to be carried out or to be provided by others.
- The anticipated value of work to be done during each month i.e. monthly cash flows.
- Other information specifically required by the Project Manager.
- The Contractor shows on each revised programme he submits to the Project Manager a resource histogram showing planned versus actual progress, deviations from the accepted Programme and any other remedial actions proposed by the Contractor.
- The Contractor must submit programme report information to the Project Manager at mutually agreed intervals in addition to the intervals for submission of revised programmes.
- All activities, including establishment on site, trimming, finishing and the completion of all minor ancillary works are to be included in the programme.

NB: The Contractor's performance must be strictly monitored on the provided and mutually agreed and accepted programme.

The Contractor's monthly programme narrative report includes:

- Level 4 Project Schedule – showing two separate bars for each task i.e. the primary bar must reflect the current forecast dates and the secondary bar the latest Accepted Programme.
- 3-week Look ahead Schedule - showing two separate bars for each task i.e. the primary bar must reflect the current forecast dates and the secondary bar the latest Accepted Programme.
- S-curves – reflecting the actual percentage complete versus the planned percentage for the overall contract.
- Detailed progress report
- Project milestone table – reflecting actual, forecasted versus planned milestones.

When drawing up her programme, the Contractor must, inter alia, take into consideration and make allowance for:

- Expected weather conditions and their effects.
- Known physical conditions or artificial obstructions.
- The accommodation and safeguarding of public, traffic and Employer's assets.
- Dealing with, altering and installing services.
- The reasonable requirements and programmes of the Employer.
- All other actions required in terms of this contract.

The following details must be submitted together with the programme:

- The number of working hours per day, working days per week, assumed holiday or shut down periods on which the programme is based.
- The overall labour and major plant resource levels on which the programme is based.

The Contractor must base his initial programme of work on the scope of work as described in the works information, project specification and the Bill of Quantities. This programme must be reviewed on a regular basis by the Contractor in accordance with changing circumstances, delays and amendments to the work ordered by the Project Manager.

Minor revisions to the accepted programme may be introduced from time to time by mutual agreement between the Contractor and the Project Manager. Should there be any major revision required in the programme, this can only be implemented through a written instruction to the Contractor by the Project Manager and subsequently a revised programme must be submitted within two weeks of receipt of such an instruction.

It should be noted that it is in the Contractor's interest to provide a comprehensive programme giving as much information as possible about the times allowed for the various activities as well as resources or other limitations affecting the programme, since the accepted programme may be used to evaluate any claims in terms of the general conditions of contract for extensions of time.

Acceptance of the programme merely constitutes an acknowledgement by the Project Manager that the Accepted Programme represents a contractually compliant, realistic and achievable depiction of the Contractor's intended sequence and timing of construction of the works.

Acceptance of the programme does not relieve the Contractor of his duties in the terms of the contract obligations.

Acceptance does not turn the Contractor's programme into a contract document or mandate that the works should be constructed exactly as set out in the Accepted Programme.

The Contractor must submit to the Project Manager, at least three working days before each monthly site meeting copies of the following:

- The contract programme with progress charts and programme graphs updated to reflect the planned versus actual progress to date.
- The Contractor shall update the program and supply the progress reports to show actual and expected progress compared to the latest agreed Accepted Program. Progress information may be verified by the Project Manager at any stage.
- A summary of progress on site over the month preceding the site meeting. The report must be in the form of a detailed narrative to the contract programme.
- Details of activities running late, indicating what steps have been or must be taken to ensure that the work is completed within the specified time.
- A report on all labour, plant and materials on site.

7.7 Training Workshops and technology transfer

The Contractor facilitates the following requirements for training Workshops:

- A safety pre-mobilisation Workshop
- A Contractor employee safety training programme
- Any other training as required by law or specifications referred to in this document
- A PHA Workshop

7.8 Insurance provided by the Employer

Insurance provided by the Employer is contained in the Contract Data – Part 1.

The insurance that will be provided by the Employer is as per the procedure manual contained in the Annexure.

The procedure manual further details the cover to be arranged by the Contractor and Sub Contractor as well as exclusions and deductibles. Insurance of all the Contractors floating plant, craft, etc. shall be affected by the Contractor.

The Contractor liaises with the Employer and the Project Manager at the Contract Date to declare the ECC3 contract details to the Employer's insurance brokers, Sankofa Insurance Brokers.

Where the Works involve the assembly, erection and installation of Plant, the Contractor declares the full replacement value and not the value included in the ECC3 contract.

The Contractor liaises with the Employer and the Project Manager when a claim is made and assists in completing the Claims Advice Forms that shall be provided.

7.9 Contract change management

At the Contract kick off meeting, the Contractor will be provided with the format of the standard forms to be used for communication of Contract change management (ECC3 Clause 60).

7.10 Provision of bonds and guarantees

The form in which a bond or guarantee required by the conditions of contract (if any) is to be provided by the Contractor is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.

The Contractor provides a bond or guarantee as required by the conditions of contract concurrently with the execution by the Parties of the form of agreement for the ECC contract.

7.11 Records of Defined Cost, payments & assessments of compensation events kept by Contractor

The Contractor keeps the following records available for the Project Manager to inspect:

- Records of design employees location of work (if appropriate); and
- Records of Equipment used and people employed outside the Working Areas (if applicable)

8 PROCUREMENT

8.1 Code of Conduct

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

- The Transnet Procurement Procedures Manual (PPM);
- Section 217 of the Constitution - the five pillars of Public PSCM (Procurement and Supply Chain Management): fair, equitable, transparent, competitive and cost effective;
- The Public Finance Management Act (PFMA);
- The Broad Based Black Economic Empowerment Act (B-BBEE); and
- The Anti-Corruption Act.

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

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

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

1. Transnet will not participate in corrupt practices and therefore expects its suppliers to act in a similar manner.

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

Conflicts of Interest

1. A conflict of interest arises when personal interests or activities influence (or appear to influence) the ability to act in the best interests of Transnet.
 - Doing business with family members
 - Having a financial interest in another company in our industry

8.2 The Contractor's Invoices

When the Project Manager certifies payment (see ECC Clause 51.1) following an assessment date, the Contractor complies with the Employer's procedure for invoice submission.

The invoice must correspond to the Project Manager's assessment of the amount due to the Contractor as stated in the payment certificate.

The invoice states the following:

Invoice addressed to Transnet SOC Ltd;

Transnet SOC Limited's VAT No: 4720103177;

Invoice number;

The Contractor's VAT Number; and

The Contract number

The invoice contains the supporting details:

- A statement of invoices,
- Manager for acceptance,
- The amount paid to date,
- Retention monies to be deducted from the invoice, Interest payable,
- Settlement discount,
- Proof of ownership of materials supplied.
- Copies of delivery notes of equipment
- Summary sheet of man hours
- Summary of progress covered by invoice
- The invoice is presented as an original.

The invoice is presented either by post or by hand delivery.

Invoices submitted by post are addressed to:

Transnet SOC Ltd

P O Box 181

Richards bay

3900

For the attention of The Contract Administrator, Transnet National Ports Authority

Invoices submitted by hand are presented to:

Transnet National Ports Authority
Pioneer Centre
Santhom Road
Port of Richards Bay
3900

For the attention of The Contract Administrator, Transnet National Ports Authority

The invoice is presented as an original.

8.3 People

Minimum requirements of people employed on the Site

The Contractor complies with the following PIRPMP:

8.4 CONTRACTOR LIABILITY

- a) The Contractor warrants that it will be liable to Transnet for any loss or damage caused by strikes, riots, lockouts or any labour disputes by and/or confined to the Contractor's employees, which loss will include any indirect or consequential damages;
- b) The Contractor warrants that no negotiations or feedback meetings by the Contractor's employees shall take place on Transnet premises, whether owned or rented by Transnet.
- c) The Contractor shall give notice to Transnet of any industrial action by the Contractor's employees immediately upon becoming aware of any actual or contemplated action that is or may be carried out on Transnet's premises, whether owned or rented, and shall notify Transnet of all matters associated with such action that may potentially affect Transnet.
- d) The Contractor is responsible for educating its employees on relevant provisions of the Labour Relations Act which deal with industrial action processes, and the risks of non-compliance.
- e) The Contractor is required to develop a Contingency Strike Handling Plan, which plan the Contractor is obliged to update on a three monthly basis. The Contractor must provide Transnet with this plan and all updates to the Plan. The Contractor is responsible to communicate with its employees on site details of the plan.

8.5 INDUSTRIAL ACTION BY CONTRACTOR EMPLOYEES

- a) In the event of any industrial action by the Contractor's employees, the Contractor is required to provide competent contingency resources permitted in law to carry out any of the duties that are or could potentially be interrupted by industrial action in delivering the Service.

- b) The Contractor warrants that it will compensate Transnet for any costs Transnet incurs in providing additional security to deal with any industrial action by the Contractor's employees.
- c) In the event of any industrial action by the Contractor's employees, the Contractor is obliged:
- d) To prepare and deliver to Transnet, within two (2) hours of the commencement of industrial action an Industrial Action Report. If the industrial action persists the Contractor is required to deliver the report at 8h30 each day.
- e) The Industrial Action Report must provide at least the following information:
 - Industrial incident report,
 - Attendance register,
 - Productivity / progress to schedule reports,
 - Operational contingency plan,
 - Site security report,
 - Industrial action intelligence gathered.
- f) The final Industrial Action Report is to be delivered 24 hours after finalization of the industrial action.
- g) The management of the Contractor is required to hold a daily industrial action teleconference with personnel identified by Transnet to discuss the industrial action, settlement of the industrial action, security issues and the impact on delivery under the contract.
- h) The resolution of any disputes or industrial action by the Contractor's employees is the sole responsibility of the Contractor.
- i) Access to Transnet premises by the Contractor and its employees is only provided for purposes of the Contractor delivering its services to Transnet. Should the Contractor and its employees not, for any reason, be capable of delivering its services Transnet is entitled to restrict or deny access onto its premises and unless otherwise authorized; such person will be deemed to be trespassing.

8.6 Subcontracting

Preferred sub-Contractors

None

The Contractor uses one of the following specialists and suppliers as his Sub Contractors:

None

Subcontract documentation, and assessment of subcontract tenders

The Contractor uses an NEC3 contract

Where the Contractor employs a Sub-Contractor who constructs or installs part of the Works or who supplies Plant and Materials for incorporation into the Works which involves a Sub-Contractor operating on the Site and/or Working Areas, then the Contractor ensures that any such Sub-Contractor complies with the CEMP, SES and PES as appropriate and that the subcontract documentation places back-to-back obligations on the Sub Contractor which reflect the Contractor's obligations under the CEMP, SES and PES, all within the Contractor's Quality Management System.

Where the Contractor employs a Sub Contractor who constructs or installs part of the Works or who supplies Plant and Materials for incorporation into the Works which involves a Sub Contractor operating on the Site and/or Working Areas, then the Contractor ensures that any such Sub Contractor complies with the PIRPMP as appropriate and that the subcontract documentation places back-to-back obligations on the Sub Contractor which reflect the Contractor's obligations under the PIRPMP, all within the Contractor's Quality Management System.

The Contractor requires a Subcontract, where an NEC3 contract is used, to state the same main option as this contract between the Contractor and the Employer for the following elements of the Works:

None

The Contractor uses an NEC3 contract with respect to the following elements of the Works:

None

Limitations on subcontracting

The Contractor shall not employ or bring a Sub Contractor onto the Working Areas without prior acceptance of the Project Manager and shall comply with the particular conditions of contract (ECC3 Clause 26 - Subcontracting)

Attendance on Sub Contractors

None

8.7 Plant and Materials

Quality

The Contractor provides Plant and Materials for inclusion in the Works in accordance with SANS 1200A sub-paragraph 2.1, unless otherwise stated elsewhere in the Works Information provided by the Employer. All Plant and Materials are new, unless the use of old or refurbished goods and/or Materials are expressly permitted as stated elsewhere in this Works Information or as may be subsequently instructed by the Project Manager.

Where Plant and Materials for inclusion in the Works originate from outside the Republic of South Africa, all such Plant and Materials are new and of merchantable quality, to a recognised national standard, with all proprietary products installed to manufacturers' instructions.

The Contractor replaces any Plant and Materials subject to breakages (whether in the Working Areas or not) or any Plant and Materials not conforming to standards or specifications stated and notifies the Project Manager and the Supervisor on each occasion where replacement is required.

Plant & Materials provided "free issue" by the Employer

None

The Employer provides the following Plant and Materials for the Contractor to use in the Works:

N/A

The Plant and Materials provided by the Employer are solely at the risk of the Contractor for inclusion in the Works. The Contractor takes responsibility for ensuring the Plant and Materials do not contain a Defect(s) and are in compliance with the standards stated elsewhere in the Works Information.

The Contractor takes receipt of the Plant and Materials from the Employer in accordance with the following procedure:

N/A

The Contractor provides all other Plant and Materials necessary for the Works not specifically stated to be provided "free issue" by the Employer.

Contractor's procurement of Plant and Materials, including tests and inspections of plant and materials, shall be done as specified in the detailed specifications

8.8 Tests and inspections before delivery

The Contractor submits to the Supervisor details to certify that tests and inspections have been carried out on Plant and Materials by others

8.9 Marking Plant and Materials outside the Working Areas

No advance payments shall be made for Plant and Materials supplied by the Contractor for the purpose of incorporation or installation as part of the Works other than that which is agreed to in writing before the award of the contract

8.10 Contractor's Equipment (including temporary Works).

The Contractor provides the Project Manager with details of the following category of Equipment (or similar) for the execution of the Works:

N/A

The Equipment category is subject to the following acceptance tests and inspections by the Project Manager prior to using the Equipment on the Site and/or Working Areas:

N/A

TRANSNET NATIONAL PORTS AUTHORITY

TENDER NUMBER: TNPA/2022/05/0438/4322/RFP

DESCRIPTION OF THE WORKS: SUPPLY, INSTALL AND COMMISSION 20 DRY-TYPE TRANSFORMERS FOR
10 X 11/0.4KV SUBSTATIONS IN THE PORT OF RICHARDS BAY

PART C4: SITE INFORMATION

Document reference	Title	No of page
C4	This cover page	1
	Site Information	9
	Total number of pages	9

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

The area where the works or equipment are to be delivered is at various sites within the Port of Richards Bay Boundary. Access to the Port of Richards Bay and the work site(s) or delivery site is Harbour West substation, Departure Yard substation, Office substation, Workshop substation, Sorting Yard substation, Liquid Pitch substation, Arrivals substation, Eastern substation, Admin substation and South Dunes substation. Refer to annexure A showing all substations within the Port of Richards Bay. Access must be subject to the Transnet National Ports Authority security requirements and regulations, which states that “access should be obtained for all the Contractor’s personnel at Permit Office located at Sizakala Truck Staging Facility”.

There is a permit card access system to enter the Port Area. The Port Staff must arrange the required access permits and issue them to the *Contractor* free of charge. Should any person lose his/her access permit these must be replaced at a cost of R 360-00 per person, cost to be incurred by the *Contractor*. This must also apply if permits are not returned at the end of the project completion.

Normal working hours at the Port of Richards Bay are from 08:00 to 16:30, Monday to Friday, Inclusive. Transnet National Ports Authority has a strict Health and Safety policy in place. No person(s) may enter the site and undertake work on the site until undergoing the mandatory induction. The induction must be arranged by the Port personnel at no cost to the *Contractor*. Prior arrangement must be made with the *Project Manager*.

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

Existing substations have roller shutter doors (refer to figure 1 below), therefore new transformer will be able to be rigged in without issues. The scope of work is as follows:

- Removal of obsolete Oil Cooled and Oil insulated Transformers
- Supply and installation of new Dry-type Transformers
- Removal of existing MV cables
- Removal of existing LV cables

- Supply and installation of new MV cables
- Supply and installation of new LV cables
- Supply and installation of new ventilation systems
- Supply and installation of new cable ladder
- Perform MV switchgear protection setting calculations, relay grading and relay programming
- Testing, commissioning and handover of the new Dry-type transformers



Figure 1: Existing substation building with roller shutter doors

1.3. Subsoil information

N/A

1.4. Hidden services

The *Contractor* is to apply care not to damage existing services during walls and floor drillings for some equipment. See project specification for further requirements.

1.5. Other reports and publicly available information

The mentioned information will not be applicable in this project, see project specification.

Annexure A

Aerial view of TNPA Richards Bay showing all substations



Figure 2: Aerial view of TNPA Richards Bay showing all substations

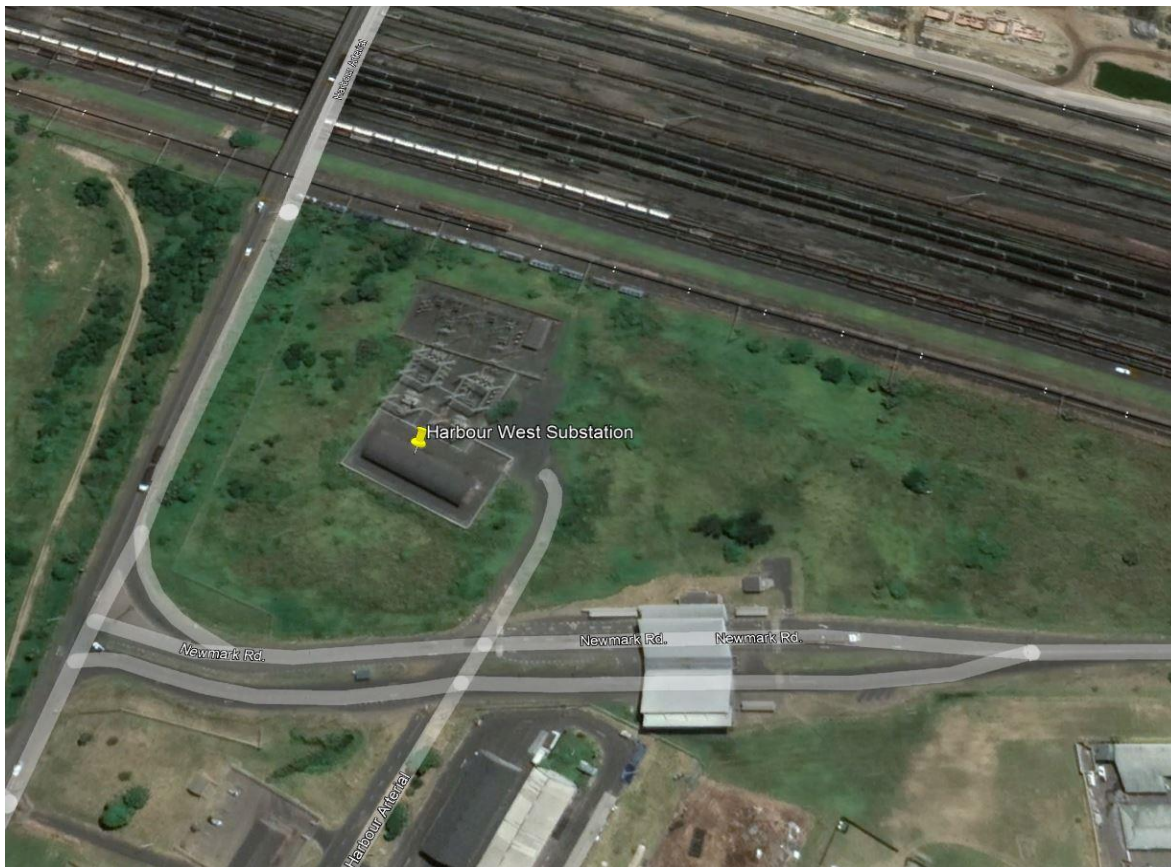


Figure 3: Aerial view of Harbour West substation

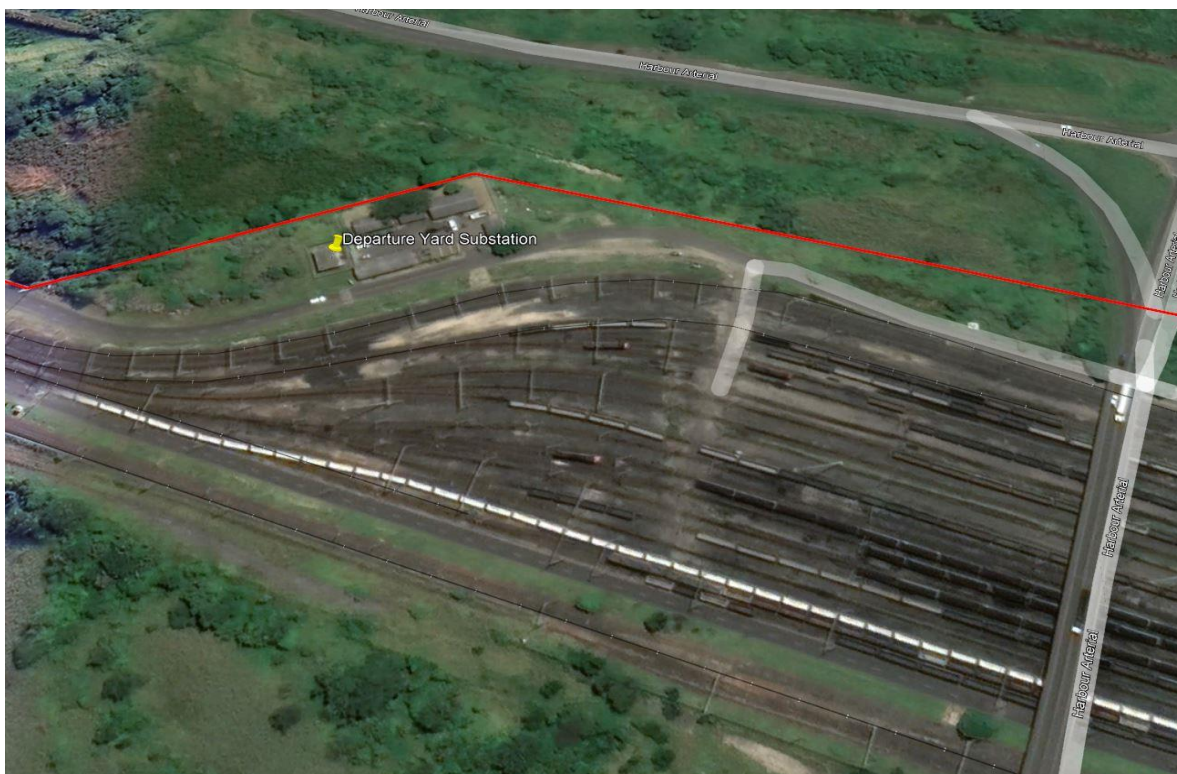


Figure 4: Aerial view of Departure substation

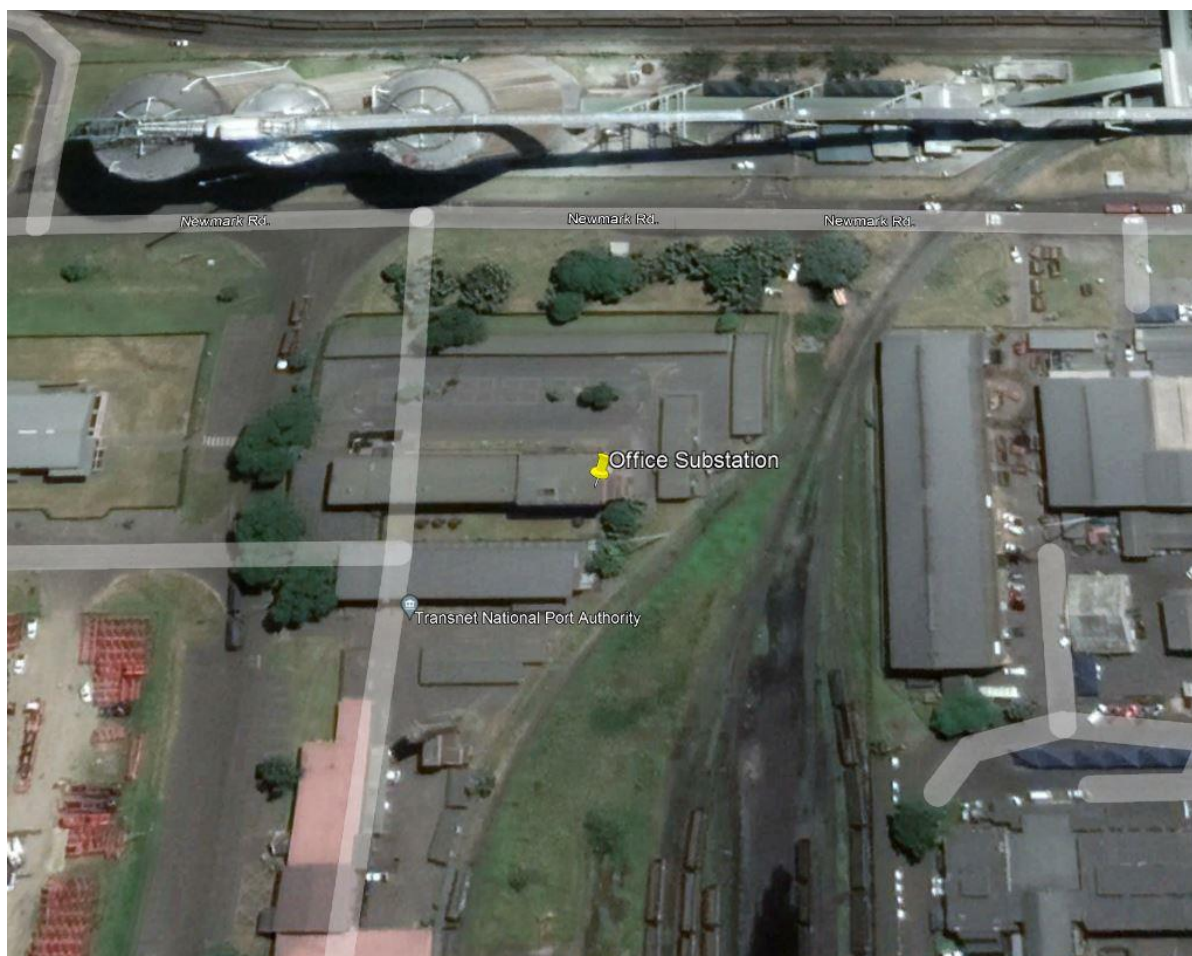


Figure 5: Aerial view of Office substation

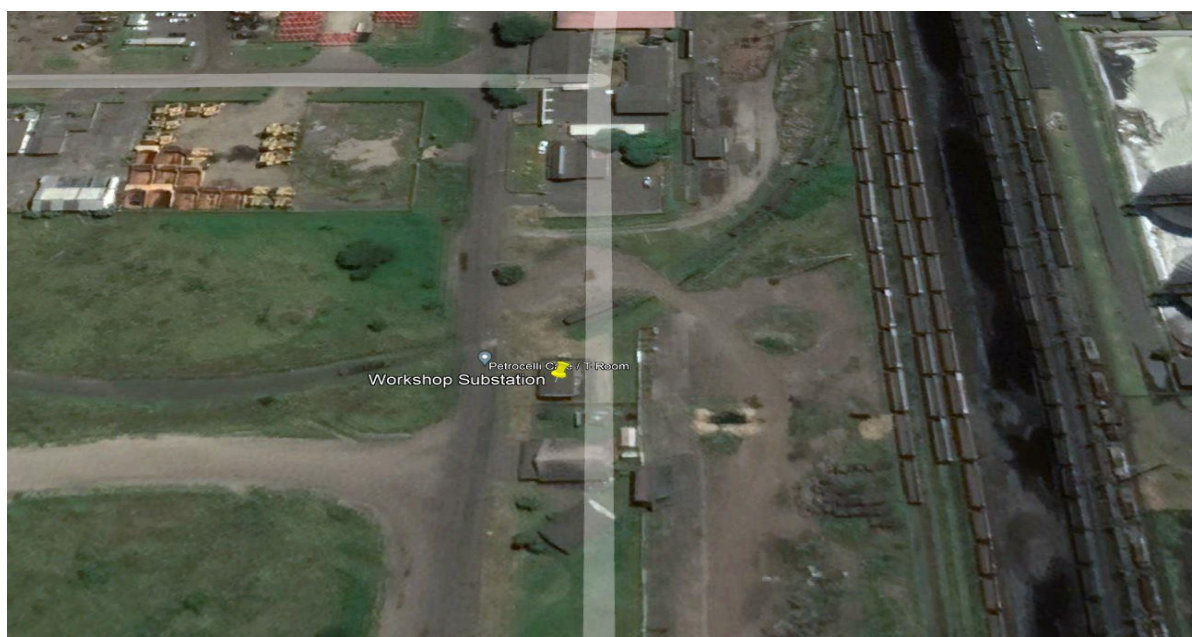


Figure 6: Aerial view of Workshop substation



Figure 7: Aerial view of Sorting Yard substation



Figure 8: Aerial view of Liquid Pitch substation



Figure 9: Aerial view of Liquid Pitch substation



Figure10: Aerial view of Liquid Pitch substation



Figure 11: Aerial view of Liquid Pitch substation

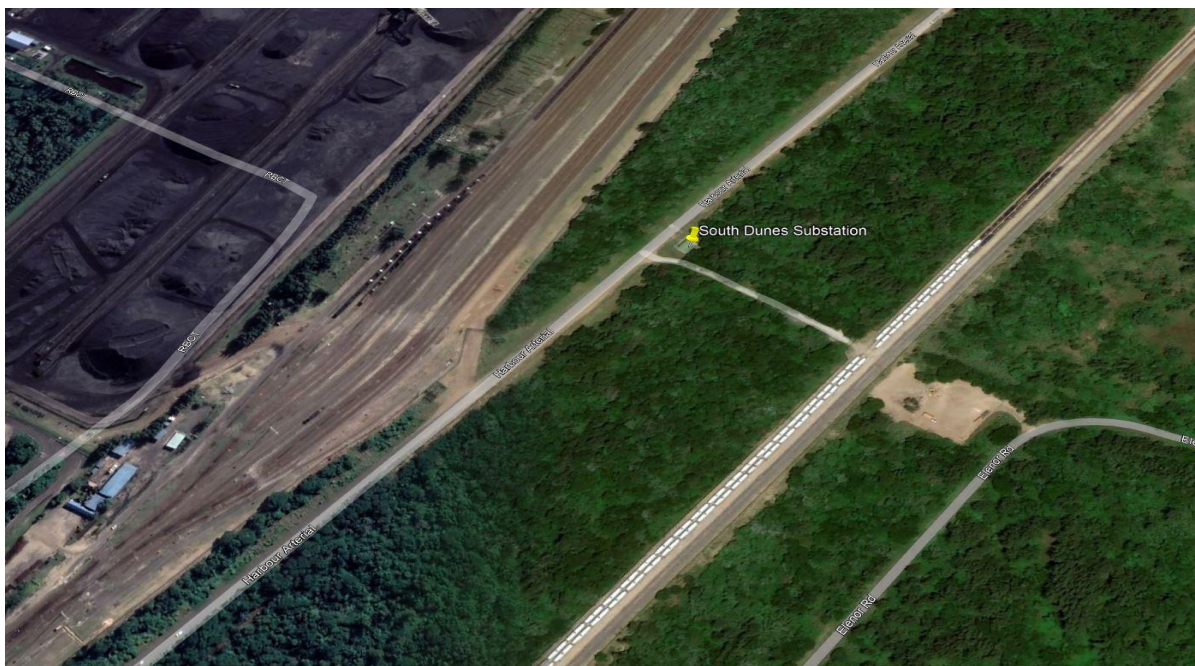


Figure12: Aerial view of Liquid Pitch substation