

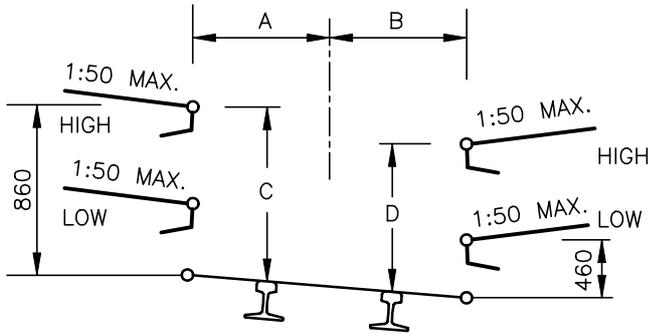
LOCATION	NOT ELECTRIFIED S (mm)	ELECTRIFIED (PRESENT OR FUTURE)	
		3kV & 25kV V (mm)	50kV V (mm)
* BELOW ALL AREAS OTHER THAN THOSE INDICATED BY * BELOW	100	5 050	5 400
	300	5 020	5 370
	600	5 000	5 350
	1 000	4 990	5 340
	1 500	4 960	5 310
2 000	4 290	4 940	5 290
>3 000	4 270	4 930	5 280
* OVER OR NEAR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

REMARKS:

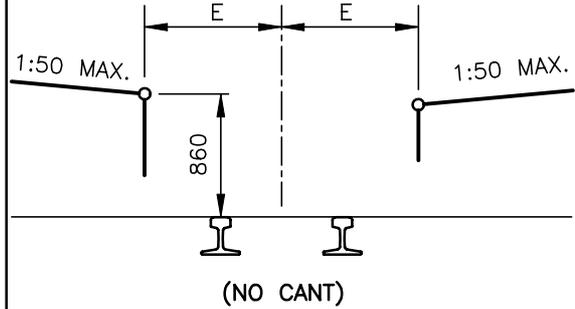
1. V IS THE REQUIRED VERTICAL CLEARANCE EXCEPT WHERE REDUCED CLEARANCE S APPLIES.
2. S IS THE MINIMUM VERTICAL CLEARANCE FOR STRUCTURES AND TEMPORARY WORK OVER NON-ELECTRIFIED LINES.
3. INTERMEDIATE VALUES MAY BE INTERPOLATED BY THE ENGINEER IN CHARGE.
4. FOR APPLICATION AT CURVES
 - 4.1 APPLY INCREASED CLEARANCES FOR CURVES TO POINTS 3m BEYOND THE ENDS OF THE CIRCULAR CURVE.
 - 4.2 REDUCE CLEARANCES AT A UNIFORM RATE OVER THE REMAINDER OF THE TRANSITION CURVE.
 - 4.3 FOR NON-TRANSITIONED CURVES REDUCE AT A UNIFORM RATE OVER A LENGTH OF 15m ALONG STRAIGHTS.
5. NEW STRUCTURES: SEE BRIDGE CODE.
6. TUNNELS: SEE DRAWING BE 82-35.
7. FOULING POINTS: SEE CLAUSE 8.1.
8. CLEARANCES ARE BASED ON 15m BOGIE CENTRES AND 21.2m VEHICLE BODY LENGTH.
9. SEE ANNEXURE 1 SHEET 3 FOR PLATFORM CLEARANCES.

PLATFORMS : TRACK GAUGE 1 065mm

PASSENGERS



GOODS

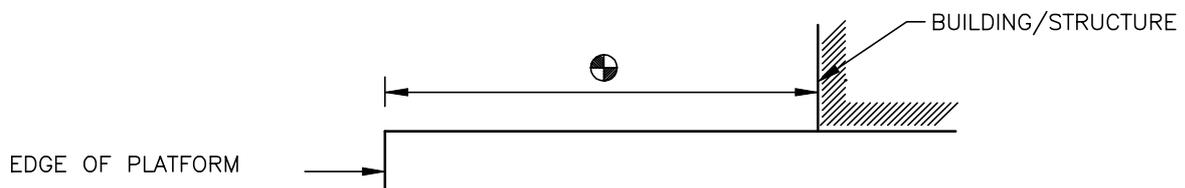


RADIUS (m)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
90	1 690	1 820	890	810	1 840
100	1 650	1 790	890	810	1 810
120	1 610	1 740	890	810	1 760
140	1 580	1 700	890	810	1 720
170	1 550	1 660	890	810	1 690
200	1 530	1 630	890	820	1 670
250	1 520	1 600	890	820	1 640
300	1 520	1 580	890	830	1 620
350	1 520	1 560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

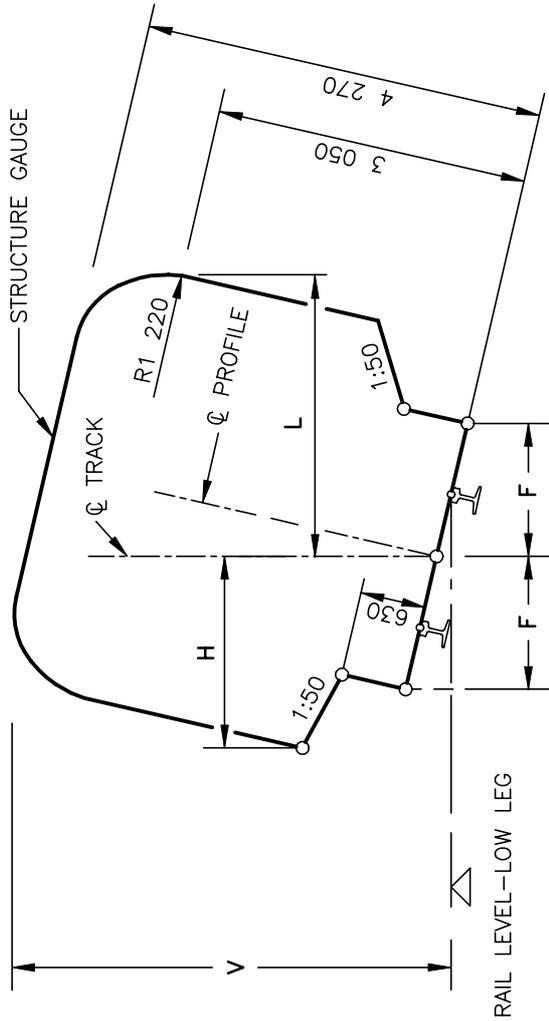
REMARKS:

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

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



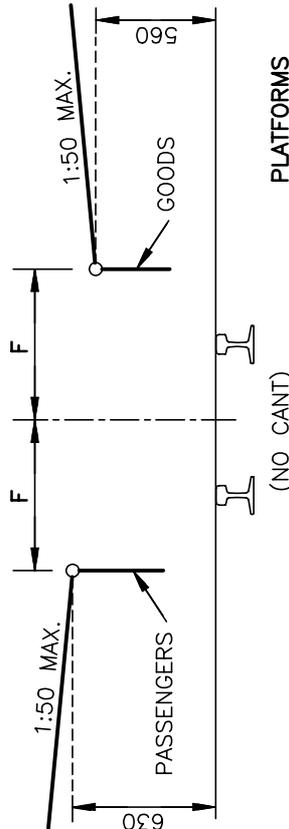
CLEARANCES : 610mm TRACK GAUGE



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

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

CLEARANCES



REMARKS:

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



TRANSNET FREIGHT RAIL

TENDER NUMBER: SIE21015CIDB (HOAC_HO_36727)

DESCRIPTION OF THE WORKS: FOR DESIGN, SUPPLY, INSTALL, TEST AND COMMISSIONING OF OUTDOOR AND INDOOR TRACTION SUBSTATION EQUIPMENT INCLUDING THE REMOVAL OF OLD AND OBSOLETE ELECTRICAL EQUIPMENT AT VARIOUS TRACTION SUBSTATIONS UNDER HEIDELBERG, LADYSMITH AND DURBAN DEPOTS.

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	
		X1: Price adjustment for inflation
		X2: Changes in the law
		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



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10.1	The <i>Project Manager</i> is: (Name)	Selby Mathebula
	Address	138 Eloff Street
	Tel	011 583 0136
	e-mail	Selby.Mathebula@transnet.net
10.1	The <i>Supervisor</i> is: (Name)	Sinethemba Gqibisa
	Address	138 Eloff Street
	Tel No.	011 583 0154
	e-mail	Sinethemba.Gqibisa@transnet.net
11.2(13)	The <i>works</i> are	For the design, supply, install, test and commissioning of outdoor and indoor Traction Substation equipment including the removal of old and obsolete electrical equipment at various traction Substations under Heidelberg, Ladysmith and Durban Depots
11.2(14)	The following matters will be included in the Risk Register	Safety risk (electrocution, injuries etc.), security risk (theft, vandalism etc.); planning risk (scope creep, budget overrun etc.), Environmental risk (oil spillage, soil pollution etc.) and technical risk (compromised quality, nuisance tripping etc.)
11.2(15)	The <i>boundaries of the site</i> are	As stated in Part C4.1. "Description of the Site and its 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	2weeks
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	31 May 2025
11.2(9)	The <i>key dates</i> and the <i>conditions</i> to be met are:	<i>Condition</i> to be met <i>key date</i>



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		1	Equipment ordering	30 September 2022
		2	Site Establishment	31 October 2022
		3	Site works commence	1 November 2022
		4	Project completion and handover	30 May 2025
30.1	The <i>access dates</i> are		Part of the Site	Date
		1	- Georgedale Traction Substation	1 November 2022
		2	- Umbulwana Traction Substation	15 February 2023
		3	- Stilwater Traction Substation	1 June 2023
		4	- Hattingspruit Traction Substation	15 September 2023
		5	- Dannhauser Traction Substation	15 January 2024
		6	- Alcockspruit Traction Substation	1 May 2024
		7	- Vooruitsig Traction Substation	15 August 2024
		8	- Kromdraai Traction Substation	1 December 2024
		9	- Val Traction Substation	1 March 2025
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		01 June 2022	
32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than		4weeks.	
35.1	The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date.		Employer will take over works that are fully completed, commissioned and handed over for operation and maintenance.	
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> .	



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43.2	The <i>defect correction period</i> is	2 weeks
5	Payment	
50.1	The <i>assessment interval</i> is monthly on the	25 th (twenty fifth) day of each successive month.
51.1	The <i>currency of this contract</i> is the	South African Rand.
51.2	The period within which payments are made is	30 days from invoice date.
51.4	The <i>interest rate</i> is	the prime lending rate of Standard Bank of South Africa.
6	Compensation events	
60.1(13)	The <i>weather measurements</i> to be recorded for each calendar month are,	<p>the cumulative rainfall (mm)</p> <p>the number of days with rainfall more than 10 mm</p> <p>the number of days with minimum air temperature less than 0 degrees Celsius</p> <p>the number of days with snow lying at 08:00 hours South African Time</p> <p>and these measurements: N/A</p> <p>The place where weather is to be recorded (on the Site) is:</p> <p>The Contractor's Site establishment area at Georgedale, Umbulwana, Stilwater, Hattingspruit, Dannhausser, Alcockspruit, Vooruitsig, Kroomdraai and Val or at an area closer to the sites mentioned above.</p> <p>The <i>weather data</i> are the records of past <i>weather measurements</i> for each calendar month which were recorded at:</p> <p>the sites mentioned above, or if not so issued the national weather data available from the South African Weather Services</p> <p>and which are available from:</p> <p>South African Weather Service 012 367 6023 or info3@weathersa.co.za.</p>
7	Title	No additional data is required for this section of the <i>conditions of contract</i> .
8	Risks and insurance	
80.1	These are additional <i>Employer's</i> risks	Included in the risk register and baseline risk assessment



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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.



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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 *Contractor* arising out of and in the course of their employment in connection with this contract for any one event is

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

The *Contractor* provides these additional Insurances

- 1 Where the contract requires that the design of any part of the *works* shall be provided by the *Contractor* the *Contractor* shall satisfy the *Employer* that professional indemnity insurance cover in connection therewith has been affected
- 2 Where the contract involves manufacture, and/or fabrication of Plant & Materials, components or other goods to be incorporated into the *works* at premises other than the site, the *Contractor* shall satisfy the *Employer* that such plant & materials, components or other goods for incorporation in the *works* are adequately insured during manufacture and/or fabrication and transportation to the site.
- 3 Should the *Employer* have an insurable interest in such items during manufacture, and/or fabrication, such interest shall be noted by endorsement to the *Contractor's* policies of insurance as well as those of any sub-contractor
- 4 Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R5 000 000.



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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 policy for Contract
9	Termination	There is no additional Contract Data required for this section of the <i>conditions of contract</i> .
10	Data for main Option clause	
B	Priced contract with Bill of Quantities	No additional data is required for this Option.
60.6	The <i>method of measurement</i> is	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:	The Chairman of the Association of Arbitrators (Southern Africa)
	If no <i>Adjudicator nominating body</i> is entered, it is:	the Association of Arbitrators (Southern Africa)
W1.4(2)	The <i>tribunal</i> is:	Arbitration
W1.4(5)	The <i>arbitration procedure</i> is	The Rules for the Conduct of Arbitrations of the Association of Arbitrators (Southern Africa)
	The place where arbitration is to be held is	Johannesburg, South Africa



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	The person or organisation who will choose an arbitrator		
	- if the Parties cannot agree a choice or	The Chairman of the Association of Arbitrators (Southern Africa)	
	- if the arbitration procedure does not state who selects an arbitrator, is		
12	Data for secondary Option clauses		
X1	Price adjustment for inflation		
X1.1(a)	The <i>base date</i> for indices is	30 May 2022	
X1.1(b)	The <i>latest date</i> for indices is	One (1) calendar month prior to date of measurement.	
X1.1(c)	The proportions used to calculate the Price Adjustment Factor are:		
	Pro-portion	linked to index for	Index prepared by
	0.30	Labour (People)	The Consumer Price Index (CPI) for "All Items" in Table 1 (Consumer price indices for the total country) of the Statistical Release P0141 "Consumer Price Index - Additional Tables" published by Statistics South Africa. (Link- http://www.statssa.gov.za/?page_id=1854&PPN=P0141)



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		0.10	Plant (Equipment)	The "Plant and Equipment" index in Table 4 (Mining and construction plant and equipment price index) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South Africa. (Link - http://www.statssa.gov.za/?page_id=1854&PPN=P0151.1)
		0.40	Material (Electrical)	The "Electrical Engineering" index in Table 5 (Mechanical and Electrical Engineering Input Price Indices) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South Africa.
		0.10	Fuel	The "Diesel" index in Table 1 (PPI for final manufactured goods) of the Statistical Release P0142.1 "Producer Price Index" published by Statistics South Africa. (Link - http://www.statssa.gov.za/?page_id=1854&PPN=P0142.1)
		1.00		
		0.10	Non-adjustable	
*Statistical release P0151 – Contract Price Adjustment Provisions (CPAP) Work Group and Selected Materials Indices				
X2	Changes in the law	No additional data is required for this Option		
X7	Delay damages			
X7.1	Delay damages for Completion of the whole of the <i>works</i> are	R5000 per day		
X13	Performance bond			



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X13.1	The amount of the performance bond is 5 (five)% of the total of the Prices at Contract Date	The performance bond need to be issued by a financial institution/bank with a minimum long term credit rating of A3 (Moody's), A- (Standard and Poors) and or A- (Fitch Ratings) and need acceptance by Transnet before such bonds are issued"
X16	Retention	
X16.1	The retention percentage is	10% on all payments certified.
X18	Limitation of liability	
X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:	Nil (this is the default position depending on a risk assessment, therefore this can go up to Total of the Prices)
X18.2	For any one event, the <i>Contractor's</i> liability to the <i>Employer</i> for loss of or damage to the <i>Employer's</i> property is limited to:	The deductible of the relevant insurance policy
X18.3	The <i>Contractor's</i> 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 <i>Contractor's</i> total liability to the <i>Employer</i> 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 <i>end of liability date</i> is	5 years after Completion of the whole of the <i>works</i>
Z	<i>Additional conditions of contract are:</i>	



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Z1	Obligations in respect of Job Creation	
Z1.1		It will be a material term of this contract that the <i>Contractor</i> must contribute to the <i>Employer's</i> job-creation objectives as set out in Returnable Schedule T.2.2-25
Z1.2		The <i>Contractor's</i> undertaking as to the number of new jobs created due to the award of this contract as set out in Returnable Schedule T.2.2-25 will constitute a binding agreement throughout the duration of the contract until Completion, if not, it will be deemed that the <i>Contractor</i> has failed in full to meet this specific material term of the contract, which may constitute a reason for termination..
Z1.3		The <i>Contractor</i> shall provide to the <i>Employer</i> , on a monthly basis or upon receiving an instruction to do so by the <i>Project Manager</i> , any documentation and/or evidence required by the <i>Employer</i> , which in the <i>Employer's</i> opinion would be necessary to verify whether the <i>Contractor</i> has maintained the job-creation undertaking as stipulated in Returnable Schedule T.2.2 -25 The <i>Contractor</i> shall provide the said documentation and/or evidence within the period stated or as instructed. The provision of the documentation and/or evidence shall not constitute a compensation event.
Z2	Additional clause relating to Performance Bonds and/or Guarantees	
Z2.1		The Performance Guarantee under X13 above shall be an irrevocable, on-demand performance guarantee, to be issued exactly in the form of the Pro Forma documents provided for this purpose under C1.3 (Forms of Securities), in favour of the <i>Employer</i> by a financial institution reasonably acceptable to the <i>Employer</i> .



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 <i>Contractor</i> shall not alter its composition or legal status of the Joint Venture without the prior approval of the <i>Employer</i> .
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: <ul style="list-style-type: none"> • 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 <i>Employer</i> to Conduct Vetting through SSA	
Z5.1		The <i>Employer</i> reserves the right to conduct vetting through State Security Agency (SSA) for security clearances of any <i>Contractor</i> who has access to National Key Points for the following without limitations: <ol style="list-style-type: none"> 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 <i>Employer</i> 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 <i>Employer</i> and the <i>Contractor</i> are required to process information obtained for the duration of the Agreement in a manner that is aligned to the Protection of Personal Information Act.



TRANSNET FREIGHT RAIL

TENDER NUMBER: SIE21015CIDB (HOAC_HO_36727)

DESCRIPTION OF THE WORKS: FOR DESIGN, SUPPLY, INSTALL, TEST AND COMMISSIONING OF OUTDOOR AND INDOOR TRACTION SUBSTATION EQUIPMENT INCLUDING THE REMOVAL OF OLD AND OBSOLETE ELECTRICAL EQUIPMENT AT VARIOUS TRACTION SUBSTATIONS UNDER HEIDELBERG, LADYSMITH AND DURBAN DEPOTS.

Z8 Foreign Exchange Rate Fluctuation

- Z8.1** The amount payable to the Contractor in respect of rate exchange will be adjusted for increases and decreases in costs of imported materials, due to fluctuations in foreign currency exchange rates after the conclusion of the Contract. Tenderers shall indicate whether or not their tenders or part(s) thereof are subject to variation on account of exchange rate fluctuations.
- Z8.2** Where no particulars are furnished, such tenders will be deemed to be not subject to variation on account of exchange rate fluctuations.
- Z8.3** Bidders must show the currency and currency amount of imported content rather than only the rand equivalent amount. For this procurement event to be easily evaluated, all foreign currency will be converted to the local currency (ZAR) as per the rates at close business on dd/mm/yy on the Reserve Banks' website
(<https://www.resbank.co.za/Research/Rates/Pages/SelectedHistoricalExchangeAndInterestRates.aspx>)
- Z8.4** The Contractor at its own cost obtains forward exchange cover on foreign currency to protect itself against any currency rate fluctuation risks from the date of tender submission until the end of the service period. The cost of foreign exchange rate hedging executed by the Contractor need to be accepted by Transnet Freight Rail before a final rand Price is established. The Employer does not accept any fluctuations in the rate of exchange at the time when payments are made. The contractor to complete Returnable Schedule **T2.2-18**
- Z8.5** Forward cover to be arranged by the contractor within 2 weeks after notification of award
-



TRANSNET FREIGHT RAIL

TENDER NUMBER: SIE21015CIDB (HOAC_HO_36727)

DESCRIPTION OF THE WORKS: FOR DESIGN, SUPPLY, INSTALL, TEST AND COMMISSIONING OF OUTDOOR AND INDOOR TRACTION SUBSTATION EQUIPMENT INCLUDING THE REMOVAL OF OLD AND OBSOLETE ELECTRICAL EQUIPMENT AT VARIOUS TRACTION SUBSTATIONS UNDER HEIDELBERG, LADYSMITH AND DURBAN DEPOTS.

Z9	Contract price adjustment factor additional clauses
Z9.1	A contract price adjustment factor to be determined in accordance with Contract Price Adjustment Provision will be applied to allow for all increases or decreases in costs, from any cause whatsoever, which may occur after the closing date of the submission of tenders and before the date of completion. The factor shall be rounded off to four decimal places
Z9.2	When the value of an index at the time of calculation is not known the latest available index shall be used and any correction necessary shall be made by addition or subtraction in subsequent monthly payment certificates.
Z9.3	The amounts to be added to or subtracted from the monthly payment certificates shall be calculated by multiplying the amount certified for payment for that month (but excluding amounts not subject to price adjustment) by the contract price adjustment factor for that month.
Z9.4	Any additions to or deductions from the amount payable, brought about by the application of the contract price adjustment factor, shall be deemed to have made full allowance for all increases or decreases in cost from any cause whatsoever, including all overhead costs as well as any increases and decreases therein, and profit.
Z9.5	Value added tax shall be excluded from individual payment item rates and price adjustment indices as it will be added to the total of the month's measurement, after price adjustment has been made in terms hereof.
Z9.6	<p>The formulae to be used for calculating the contract price adjustment factor (PAF) is given below as:</p> $PAF = 0.3 \left(\frac{Lt}{Lo} - 1 \right) + 0.1 \left(\frac{Pt}{Po} - 1 \right) + 0.4 \left(\frac{Mt}{Mo} - 1 \right) + 0.1 \left(\frac{Ft}{Fo} - 1 \right)$ <p>Where: Lo, Po, Mo and Fo are respectively labour, machinery, material and diesel fuel indices ruling for the calendar</p>

TRANSNET FREIGHT RAIL

TENDER NUMBER: SIE21015CIDB (HOAC_HO_36727)

DESCRIPTION OF THE WORKS: FOR DESIGN, SUPPLY, INSTALL, TEST AND COMMISSIONING OF OUTDOOR AND INDOOR TRACTION SUBSTATION EQUIPMENT INCLUDING THE REMOVAL OF OLD AND OBSOLETE ELECTRICAL EQUIPMENT AT VARIOUS TRACTION SUBSTATIONS UNDER HEIDELBERG, LADYSMITH AND DURBAN DEPOTS.

month one (1) month prior to closing date of the tender and;

Lt, Pt, Mt and Ft are respectively labour, machinery, material and diesel fuel indices ruling for the calendar month one (1) month prior to the date of measurement

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	
B	Priced contract with bill of quantities	
11.2(21)	The <i>bill of quantities</i> is in	
	Data for Schedules of Cost Components	<i>Note "SCC" means Schedule of Cost Components starting on page 60 of ECC, and "SSCC" means Shorter Schedule of Cost Components starting on page 63 of ECC.</i>

B	Priced contract with bill of quantities	Data for the Shorter Schedule of Cost Components		
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 in SSCC	The percentage for design overheads is	%		

TRANSNET FREIGHT RAIL
 TENDER NUMBER: SIE21015CIDB (HOAC_HO_36727)
 DESCRIPTION OF THE WORKS: FOR DESIGN, SUPPLY, INSTALL, TEST AND COMMISSIONING OF OUTDOOR AND INDOOR TRACTION SUBSTATION EQUIPMENT INCLUDING THE REMOVAL OF OLD AND OBSOLETE ELECTRICAL EQUIPMENT AT VARIOUS TRACTION SUBSTATIONS UNDER HEIDELBERG, LADYSMITH AND DURBAN DEPOTS.

63 in SSCC	The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:	

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 Freight Rail
Transnet Corporate Centre
138 Eloff Street
Braamfontein
Johannesburg

Date:

Dear Sirs,

Performance Bond for Contract No. SIE21015CIDB (HOAC_HO_36727)

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

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

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

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

I/We the undersigned

on behalf of the
Guarantor

of physical address

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

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



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

Signed at _____ on this _____ day of _____ 201_

Signature(s)

Name(s) (printed)

Position in Guarantor company

Signature of Witness(s)

Name(s) (printed)

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:

FOR DESIGN, SUPPLY, INSTALL, TEST AND COMMISSIONING OF OUTDOOR AND INDOOR TRACTION SUBSTATION EQUIPMENT INCLUDING THE REMOVAL OF OLD AND OBSOLETE ELECTRICAL EQUIPMENT AT VARIOUS TRACTION SUBSTATIONS UNDER HEIDELBERG, LADYSMITH AND DURBAN DEPOTS

The tenderer, identified in the Offer signature block, has

<i>either</i>	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.
<i>or</i>	examined the draft contract as listed in the Acceptance section and agreed to provide this Offer.

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	R
(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		
5		

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 _____	_____



PART 2: PRICING DATA

Document reference	Title	No of pages
C2.1	Pricing instructions: Option B	3
C2.2	The <i>bill of quantities</i>	



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	<p>(21) The Bill of Quantities is the <i>bill of quantities</i> as changed in accordance with this contract to accommodate implemented compensation events and for accepted quotations for acceleration.</p> <p>(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.</p> <p>(28) The Price for Work Done to Date is the total of</p> <ul style="list-style-type: none"> • the quantity of the work which the <i>Contractor</i> has completed for each item in the Bill of Quantities multiplied by the rate and • a proportion of each lump sum which is the proportion of the work covered by the item which the <i>Contractor</i> has completed. <p>Completed work is work without Defects which would either delay or be covered by immediately following work.</p> <p>(31) The Prices are the lump sums and the amounts obtained by multiplying the rates by the quantities for the items in the Bill of Quantities.</p>

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



1.2. Function of the Bill of Quantities

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

1.3. Guidance before pricing and measuring

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

Historically bill of quantities based contracts in South Africa have been influenced by the different approaches of the civil engineering and building sectors of the industry through their respective discipline based standard forms of contract and methods of measurement. This is particularly apparent in the approach to the Preliminary and General bill. On the other hand, because 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
kg	kilogram
kl	kilolitre
km	kilometre
kW	kilowatt
l	litre
m	metre
mm	millimetre
m ²	square metre
m ³	cubic metre
No.	number
Prov sum ¹	provisional sum
kV	kilovolt
R/only	Rate only

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



sum	Lump sum
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.
- 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.

TOTAL AND IMPORTED CONTENT - TABLE 2

ContainerCor

A - TOTALS	
Georgedale Total	
Umbulwana Total	
Stillwater Total	
Hattingspruit Total	
Dannhauser Total	
Alcockspruit Total	
Vooruitsig Total	
Kroomdraai Total	
Val Total	
Training	
GRAND TOTAL	

B - IMPORTED CONTENT						
Item No.	Description	Country of Origin	Exchange Rate	Rates	Quantity	Amount/Cost
				TOTAL		

C - RATES				
No.	Item	Unit	Rates	
			Labour	Material and Equipment
1	Cleaning/Sreening of existing crusher stones and putting them back	Per Substation		
2	Cast foundation for primary surge arresters	Per Substation		
3	Supply and Install new steelwork for primary surge arresters	Per Substation		

8,1	Supply and install 50kVA auxilliary transformer	each	Transformer (class 0)	100%		2		
9,0	Main Traction Transformer							
9,1	Supply and Install new 5MVA traction transformer	each	Transformer (Class 1)	80%		2		
9,2	Demolish the existing transformer plinth and cast a new transformer plinth with a bundwall system	each	Steel	100%		2		
9,3	Supply and install PVC mesh grid drain cover to secure the concrete gutter (Bundwall).	each	N/A	N/A		2		
10,0	Fencing							
10,1	Supply and install 1.2m high diamond mesh fence between the AC disconnect and Primary Cicut Breaker	m	Steel	100%		28		
10,2	Supply and install 1.2m high diamond mesh gate	each	Steel	100%		2		
11,0	Gate Switch and Spark Gap							
11,1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1		
12,0	Security lighting							
12,1	Supply and install 250W high pressure sodium vapour lamp in yard(including wiring)	sum	Electrical Cables	90%		1		
12,2	Supply and install a double tube fluorescent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		4		
	Other, (Specify)							
	TOTAL OUTDOOR WORK							

* Contractor to determine

ItemNo.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1,0	3kV DC High Speed Circuit Breaker								
1,1	Supply and install trucks, modular cells and high speed cirucit breakers with feeder protection relays and associated equipment	each	N/A	N/A		4			
1,2	Supply and install electronic busbar interlocking system	sum	N/A	N/A		1			
2,0	Substation Wavefilter								
2,1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		2			
3,0	Substation Light and Power Distribution								
3,1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			

4,0	<u>Traction Substation Battery Charger</u>								
4,1	Supply and install new battery charger	each	N/A	N/A		1			
5,0	<u>Substation Ventilation and Cooling</u>								
5,1	Design, supply and install building ventilation (including battery room ventilation)	sum	Steel	100%		1			
6,0	<u>Cabling and Interconnection</u>								
6,1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
7,0	<u>Traction Substation Batteries</u>								
7,1	Supply and Install Substation batteries	sum	N/A	N/A		1			
8,0	<u>Automatic Changeover Facility</u>								
8,1	Supply and install automatic changeover facility with cabling and interconnections for the unit A and B auxilliary supply	each	Electrical Cables	90%		1			
	<i>Other, (Specify)</i>								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1,0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Alcockspruit Total	

* Contractor to determine

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	<u>DANNHAUSER SUBSTATION (DOUBLE UNIT)</u>								
A	GENERAL								
1,0	Preliminary and General /Site Establishment.	sum				1			
2,0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3,0	Dismatle/remove old equipment including existing current transformer steel structure	sum				1			
4,0	Transport old equipment to depot.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1,0	<u>Outdoor Earthing</u>								
1,1	Renew outdoor earthing, crusher stones etc. complete including earthmat renewal	sum	Electrical Cables	90%		1			
2,0	<u>Primary Surge Arrestors</u>								
2,1	Supply and install 88kV primary surge arresters	each	N/A	N/A		3			
3,0	<u>Secondary Surge Arrestors</u>								
3,1	Supply and install secondary freestanding 88kV surge arrestors complete with foundations and steel structures on main transformer HV side	each	Steel Substation Structures	100%		6			
4,0	<u>AC Disconnect and earthing switches</u>								
4,1	Supply and install new 88kV AC disconnects	sum	N/A	N/A		2			
5,0	<u>Auxilliary Transformer (unit A & B)</u>								
5,1	Supply and install 50kVA auxullary transformer	each	Transformer (class 0)	100%		2			
6,0	<u>Main Current Transformers</u>								
6,1	Supply and install outdoor 88kV Current Transformers between primary circuit breaker and secondary surge arrestors	each	N/A	N/A		4			
6,2	Cast new foundations, supply and install new lattice structure to mount the new CT's	each	Steel	100%		4			
7,0	<u>Fencing</u>								
7,1	Supply and install 1.2m high diamond mesh fence between the AC disconnect and Primary Cicut Breaker	m	Steel	100%		28			
7,2	Supply and install 1.2m high diamond mesh gate	each	Steel	100%		2			

8,0	<u>AC Earth Leakage</u>								
8,1	Supply and install AC Earth Leakage Protection	each	N/A	N/A		2			
9,0	<u>Main Traction Transformer</u>								
9,1	Supply and Install new 5MVA traction transformer	each	Transformer (Class 1)	80%		2			
9,2	Demolish the existing transformer plinth and cast a new transformer plinth with a bundwall system	each	Steel	100%		2			
9,3	Supply and install PVC mesh grid drain cover to secure the concrete gutter (Bundwall).	each	N/A	N/A		2			
10,0	<u>Gate Switch and Spark Gap</u>								
10,1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1			
11,0	<u>Security lighting</u>								
11,1	Supply and install 250W high pressure sodium vapour lamp in yard(including wiring)	sum	Electrical Cables	90%		1			
11,2	Supply and install a double tube fluorescent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		4			
	<i>Other, (Specify)</i>								
	TOTAL OUTDOOR WORK								

* Contractor to determine

ItemNo.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1,0	<u>3kV DC High Speed Circuit Breaker</u>								
1,1	Supply and install trucks, modular cells and high speed circuit breakers with feeder protection relays and associated equipment	each	N/A	N/A		4			
1,2	Supply and install electronic busbar interlocking system	sum	N/A	N/A		1			
2,0	<u>Substation Wavefilter Equipment</u>								
2,1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		2			
3,0	<u>Traction Substation Batteries</u>								
3,1	Supply and Install Substation batteries	sum	N/A	N/A		1			
4,0	<u>Substation Light and Power Distribution</u>								
4,1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			

5,0	<u>Substation interlocking</u>								
5,1	Supply and install outdoor and indoor equipment mechanical interlocking	sum	N/A	N/A		1			
6,0	<u>Cabling and Interconnection</u>								
6,1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
7,0	<u>Substation Ventilation and Cooling</u>								
7,1	Design, supply and install building ventilation (including battery room ventilation)	sum	Steel	100%		1			
8,0	<u>Automatic Changeover Facility</u>								
8,1	Supply and install automatic changeover facility with cabling and interconnections for the unit A and B auxilliary supply	each	Electrical Cables	90%		1			
	<i>Other, (Specify)</i>								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1,0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Dannhauser Total	

* Contractor to determine

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	<u>GEORGEDALE SUBSTATION (SINGLE UNIT)</u>								
A	GENERAL								
1,0	Preliminary and General /Site Establishment.	sum				1			
2,0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3,0	Dismatle/remove old equipment including existing current transformer steel structure	sum				1			
4,0	Transport old equipment to depot.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1,0	<u>Primary Surge Arrestors</u>								
1,1	Supply and install 88kV primary surge arresters	each	N/A	N/A		3			
2,0	<u>Main Current Transformers</u>								
2,1	Supply and install outdoor 88kV Current Transformers between primary circuit breaker and secondary surge arrestors	each	N/A	N/A		2			
2,2	Cast new foundations, supply and install new lattice structure to mount the new CT's	each	Steel	100%		2			
3,0	<u>Cabling and Interconnection</u>								
3,1	Supply and install new cabling and interconnections in outdoor yard	sum	Electrical Cables	90%		1			
4,0	<u>Fencing</u>								
4,1	Supply and install 1.2m high diamond mesh fence between the AC disconnect and Primary Cicuit Breaker	m	Steel	100%		12			
4,2	Supply and install 1.2m high diamond mesh gate	each	Steel	100%		1			
5.0	<u>Substation Buildings Refurbishment(x2)</u>								
5,1	Design, supply and install a steel IBR roof for the building	sum	Steel	100%		2			
5,2	Supply and install the substation's single standard doors	each	Steel	100%		3			
5,3	Supply and install the substation's double standard doors	each	Steel	100%		2			
5,4	Close the two single doors at the back with bricklaying (busbar chamber and battery rooms)	sum	N/A	N/A		1			
5,5	Supply and install standard double door at isolation transformer room	each	Steel	100%		1			
	<i>Other, (Specify)</i>								
	TOTAL OUTDOOR WORK								

* Contractor to determine

C	COMMISSIONING								
1,0	Conduct Site Tests and Commissioning the substation	sum				1			
							GeorgedaleTotal		

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	<u>HATTINGSPRUIT SUBSTATION (SINGLE UNIT)</u>								
A	GENERAL								
1,0	Preliminary and General /Site Establishment.	sum				1			
2,0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3,0	Dismatle/remove old equipment.	sum				1			
4,0	Transport old equipment to depot.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1,0	<u>Main Traction Transformer Primary Bushings</u>								
1,1	Supply and install main traction transformer 88kV primary bushings	each	Transformer (Class 1)	100%		3			
2,0	<u>Gate Switch and Spark Gap</u>								
2,1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1			
3,0	<u>Security lighting</u>								
3,1	Supply and install 250W high pressure sodium vapour lamp in yard(including wiring)	sum	Electrical Cables	90%		1			
3,2	Supply and install a double tube fluorescent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		4			
	<i>Other, (Specify)</i>								
	TOTAL OUTDOOR WORK								

* Contractor to determine

Item No.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1,0	<u>Substation Light and Power Distribution</u>								
1,1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			
2,0	<u>Positive Isolator</u>								
2,1	Supply and Install Positive Isolator and Earth Switch	each	N/A	N/A		1			
3,0	<u>3kV DC High Speed Circuit Breakers</u>								
3,1	Supply and install trucks, modular cells and high speed circuit breakers with feeder protection relays and associated equipment	each	N/A	N/A		4			
3,2	Supply and install electronic busbar interlocking system	sum	N/A	N/A		1			
4,0	<u>Cabling and Interconnection</u>								
4,1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
5,0	<u>Wavefilter equipment</u>								
5,1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		1			
	<i>Other(Specify):</i>								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1,0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Hattingspruit Total	

* Contractor to determine

7,1	Desing, supply and cast new foundations replacing all structures with cracked foundations	sum	N/A	N/A		1		
8,0	<u>Transformer refurbishment work</u>							
8,1	Oil sampling, Testing and analysis prior work commencement	sum	Transformer (class 1)	100%		1		
8,2	Clean, treat (rust), oil and re-paint transformer and conservator.	sum	Transformer (class 1)	100%		1		
8,3	Complete re-gasketing of the transformer	sum	Transformer (class 1)	100%		1		
8,4	Supply and replace winding, oil temperature gauges with their probe pockets	each	Transformer (class 1)	100%		2		
8,5	Supply and replace breather & silica gel	sum	Transformer (class 1)	100%		1		
8,6	Supply and install main transformer with Resin Impregnated Paper Synthetic Primary Bushings	each	Transformer (class 1)	100%		3		
8,7	Supply Aluminium bus bar & flexibles from secondary insulators to wall bushings	sum	Electrical Cables	100%		1		
8,8	Top up transformer with virgin oil (210L)	sum	Transformer (class 1)	100%		210L		
8,9	Oil purification process at 4 passes	sum	Transformer (class 1)	100%		1		
8,10	Repair oil leaks on all other parts of the transformer (If any)	sum	Transformer (class 1)	100%		1		
8,11	Chemically treat polluted ballast.	sum	N/A	N/A		1		
8,12	Treat plinth for oil pollution.	sum	N/A	N/A		1		
8,13	Supply and install new insulation under the transformer	sum	Transformer (class 1)	100%		1		
8,14	Generator utilisation	sum	N/A	N/A		1		
8,15	Crane Truck utilisation	sum	N/A	N/A		1		
9,0	<u>Gate Switch and Spark Gap</u>							
9,1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1		
10,0	<u>Substation Buildings Refurbishment</u>							
10,1	Design, supply and install a steel IBR roof for the building	sum	Steel	100%		1		
11,0	<u>Security lighting</u>							
11,1	Supply and install 250W high pressure sodium vapour lamp in yard(including wiring)	sum	Electrical Cables	90%		1		
11,2	Supply and install a double tube fluorescent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		4		
11,0	<u>Primary Surge Arrestors</u>							
11,1	Supply and install 88kV primary surge arresters	each	N/A	N/A		3		
	<u>Other(Specify):</u>							

	TOTAL OUTDOOR WORK								

* Contractor to determine

ItemNo.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1,0	<u>Positive Isolator</u>								
1,1	Supply and Install Positive Isolator and Earth Switch	each	N/A	N/A		1			
2,0	<u>Substation Light and Power Distribution</u>								
2,1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			
3,0	<u>Substation Wavefilter Equipment</u>								
3,1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		1			
4,0	<u>Cabling and Interconnection</u>								
4,1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
5,0	<u>3kV DC Under Voltage</u>								
5,1	Supply and Install 3kV DC Under-Voltage Relay	each	N/A	N/A		1			
10,0	<i>Other(Specify):</i>								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1,0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Kroomdraai Total	

* Contractor to determine

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	<u>STILLWATER SUBSTATION (SINGLE UNIT)</u>								
A	GENERAL								
1,0	Preliminary and General /Site Establishment.	sum				1			
2,0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3,0	Dismatle/remove old equipment.	sum				1			
4,0	Transport old equipment to depot.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1,0	<u>Outdoor Earthing</u>								
1,1	Renew outdoor earthing, crusher stones etc. complete including earthmat renewal	sum	Electrical Cables	90%		1			
2,0	<u>Main Traction Transformer Primary Bushings</u>								
2,1	Supply and install main traction transformer 88kV primary bushings	each	Transformer (class 1)	100%		3			
3,0	<u>Substation Interlocking</u>								
3,1	Supply and install outdoor equipment interlocking	sum	N/A	N/A		1			
4,0	<u>Main Current Transformers</u>								
4,1	Supply and install outdoor 88kV Current Transformers between primary circuit breaker and secondary surge arrestors	each	N/A	N/A		2			
5,0	<u>Auxilliary Transformer</u>								
5,1	Supply and install 50kVA auxulliy transformer	each	Transformer (class 0)	100%		1			
6,0	<u>Gate Switch and Spark Gap</u>								
6,1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1			
7,0	<u>AC Disconnect and earthing switches</u>								
7,1	Supply and install new 88kV AC disconnects	sum	N/A	N/A		1			
8,0	<u>Security lighting</u>								
8,1	Supply and install 250W high pressure sodium vapour lamp in yard(including wiring)	sum	Electrical Cables	90%		1			

8,2	Supply and install a double tube fluorescent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		4			
	Other, (Specify)								
	TOTAL OUTDOOR WORK								

* Contractor to determine

ItemNo.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1,0	<u>Substation Interlocking</u>								
1,1	Supply and install indoor equipment interlocking system	sum	N/A	N/A		1			
2,0	<u>Positive Isolator</u>								
2,1	Supply and Install Positive Isolator and Earth Switch	each	N/A	N/A		1			
3,0	<u>3kV DC High Speed Circuit Breaker</u>								
3,1	Supply and install trucks, modular cells and high speed circuit breakers with feeder protection relays and associated equipment	each	N/A	N/A		2			
3,2	Supply and install electronic busbar interlocking system	sum	N/A	N/A		1			
4,0	<u>Traction Substation Batteries</u>								
4,1	Supply and Install Substation batteries	sum	N/A	N/A		1			
5,0	<u>Wavefilter equipment</u>								
5,1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		1			
6,0	<u>3kV DC Traction Rectifier</u>								
6,1	Supply and Install 6MW traction rectifier	each	N/A	N/A		1			
7,0	<u>3kV DC Earth Leakage</u>								
7,1	Supply and Install 3kV DC Earth leakage Protection system	each	N/A	N/A		1			
8,0	<u>AC Primary Circuit Breaker control Panel</u>								
8,1	Supply and Install AC Primary Circuit Breaker Control Panel complete with all protection equipment	each	N/A	N/A		1			
9,0	<u>AC/DC Distribution Panel</u>								
9,1	Supply and Install AC/DC Distribution Panel complete with all necessary protection equipment	each	N/A	N/A		1			

10,0	3kV DC Under Voltage								
10,1	Supply and Install 3kV DC Under-Voltage Relay	each	N/A	N/A		1			
11,0	Cabling and Interconnection								
11,1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
12,0	Substation Light and Power Distribution								
12,1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			
	Other(Specify):								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1,0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Stilwater Total	

* Contractor to determine

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	UMBULWANA SUBSTATION (SINGLE UNIT)								
A	GENERAL								
1,0	Preliminary and General /Site Establishment.	sum				1			
2,0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3,0	Dismatle/remove old equipment	sum				1			
4,0	Transport old equipment to depot	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1,0	<u>Outdoor Earthing</u>								
1,1	Renew outdoor earthing, crusher stones etc. complete including earthmat renewal	sum	Electrical Cables	90%		1			
2,0	<u>AC Earth Leakage</u>								
2,1	Supply and install AC Earth Leakage Protection	each	N/A	N/A		1			
3,0	<u>Main Current Transformers</u>								
3,1	Supply and install outdoor 88kV Current Transformers between primary circuit breaker and secondary surge arrestors	each	N/A	N/A		2			
4,0	<u>Primary Surge Arrestors</u>								
4,1	Supply and install 88kV primary surge arrestors	each	N/A	N/A		3			
5,0	<u>Secondary Surge Arrestors</u>								
5,1	Supply and install secondary freestanding 88kV surge arrestors complete with foundations and steel structures on main transformer HV side	each	Steel Substation Structure	100%		3			
6,0	<u>AC Disconnect and earthing switches</u>								
6,1	Supply and install new 88kV AC disconnects	sum	N/A	N/A		1			
7,0	<u>Substation Outdoor Interlocking</u>								
7,1	Supply and install outdoor and indoor equipment interlocking	sum	N/A	N/A		1			
8,0	<u>Fencing</u>								
8,1	Supply and install 1.2m high diamond mesh fence between the AC disconnect and Primary Cicut Breaker	m	Steel	100%		14			

8,2	Supply and install 1.2m high diamond mesh gate	each	Steel	100%		1		
9,0	<u>Transformer refurbishment work</u>							
9,1	Oil sampling, Testing and analysis prior work commencement	sum	Transformer (class 1)	100%		1		
9,2	Clean, treat (rust), oil and re-paint transformer and conservator.	sum	Transformer (class 1)	100%		1		
9,3	Complete re-gasketing of the transformer	sum	Transformer (class 1)	100%		1		
9,4	Supply and replace winding, oil temperature gauges with their probe pockets	each	Transformer (class 1)	100%		2		
9,5	Supply and replace breather & silica gel	sum	Transformer (class 1)	100%		1		
9,6	Supply and install main transformer with Resin Impregnated Paper Synthetic Primary Bushings	each	Transformer (class 1)	100%		3		
9,7	Supply Aluminium bus bar & flexibles from secondary insulators to wall bushings	sum	Electrical Cables	90%		1		
9,8	Top up transformer with virgin oil (210L)	sum	Transformer (class 1)	100%		210L		
9,9	Oil purification process at 4 passes	sum	Transformer (class 1)	100%		1		
9,10	Repair oil leaks on all other parts of the transformer (If any)	sum	Transformer (class 1)	100%		1		
9,11	Chemically treat polluted ballast.	sum	N/A	N/A		1		
9,12	Treat plinth for oil pollution.	sum	N/A	N/A		1		
9,13	Supply and install new insulation under the transformer	sum	Transformer (class 1)	100%		1		
9,14	Generator utilisation	sum	N/A	N/A		1		
9,15	Crane Truck utilisation	sum	N/A	N/A		1		
10,0	<u>Gate Switch and Spark Gap</u>							
10,1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1		
11,0	<u>Cabling and Interconnection</u>							
11,1	Supply and install new cabling and interconnections in outdoor yard	sum	Electrical Cables	90%		1		
12,0	<u>Security lighting</u>							
12,1	Supply and install 250W high pressure sodium vapour lamp in yard(including wiring)	sum	Electrical Cables	90%		1		
12,2	Supply and install a double tube fluorescent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		4		
	<i>Other, (Specify)</i>							
	TOTAL OUTDOOR WORK							

* Contractor to determine

ItemNo.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1,0	<u>3kV DC High Speed Circuit Breaker</u>								
1,1	Supply and install trucks, modular cells and high speed circuit breakers with feeder protection relays and associated equipment	each	N/A	N/A		4			
1,2	Supply and install electronic busbar interlocking system	sum	N/A	N/A		1			
2,0	<u>Wavefilter equipment</u>								
2,1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		1			
3,0	<u>Traction Substation Battery Charger</u>								
3,1	Supply and install new battery charger	sum	N/A	N/A		1			
4,0	<u>Substation Light and Power Distribution</u>								
4,1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			
5,0	<u>Substation Ventilation and Cooling</u>								
5,1	Design, supply and install building ventilation (including battery room ventilation)	sum	Steel	100%		1			
6,0	<u>Cabling and Interconnection</u>								
6,1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
	<i>Other(Specify):</i>								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1,0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Umbulwana Total	

* Contractor to determine

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	<u>VAL SUBSTATION (SINGLE UNIT)</u>								
A	GENERAL								
1,0	Preliminary and General /Site Establishment.	sum				1			
2,0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3,0	Dismatle/remove old equipment.	sum				1			
4,0	Transport old equipment to depot.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1,0	<u>AC Earth Leakage</u>								
1,1	Supply and install AC Earth Leakage Protection	each	N/A	N/A		1			
2,0	<u>Gate Switch and Spark Gap</u>								
2,1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1			
3,0	<u>Primary Surge Arrestors</u>								
3,1	Supply and install 88kV primary surge arresters	each	N/A	N/A		3			
4,0	<u>Secondary Surge Arrestors</u>								
4,1	Supply and install secondary freestanding 88kV surge arrestors complete with foundations and steel structures on main transformer HV side	each	Steel	100%		3			
5,0	<u>Security lighting</u>								
5,1	Supply and install 250W high pressure sodium vapour lamp in yard(including wiring)	sum	Electrical Cables	90%		1			
5,2	Supply and install a double tube fluorescent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		4			
6,0	<u>Transformer refurbishment work</u>								
6,1	Oil sampling, Testing and analysis prior work commencement	sum	Transformer (class 1)	100%		1			
6,2	Clean, treat (rust), oil and re-paint transformer and conservator.	sum	Transformer (class 1)	100%		1			
6,3	Complete re-gasketing of the transformer	sum	Transformer (class 1)	100%		1			
6,4	Supply and replace winding, oil temperature gauges with their probe pockets	each	Transformer (class 1)	100%		2			

6,5	Supply and replace breather & silica gel	sum	Transformer (class 1)	100%		1			
6,6	Supply and install main transformer with Resin Impregnated Paper Synthetic Primary Bushings	each	Transformer (class 1)	100%		3			
6,7	Supply Aluminium bus bar & flexibles from secondary insulators to wall bushings	sum	Electrical Cables	90%		1			
6,8	Top up transformer with virgin oil (210L)	sum	Transformer (class 1)	100%		210L			
6,9	Oil purification process at 4 passes	sum	Transformer (class 1)	100%		1			
6,10	Repair oil leaks on all other parts of the transformer (If any)	sum	Transformer (class 1)	100%		1			
6,11	Chemically treat polluted ballast.	sum	N/A	N/A		1			
6,12	Treat plinth for oil pollution.	sum	N/A	N/A		1			
6,13	Supply and install new insulation under the transformer	sum	Transformer (class 1)	100%		1			
6,14	Generator utilisation	sum	N/A	N/A		1			
6,15	Crane Truck utilisation	sum	N/A	N/A		1			
	Other(Specify):								
	TOTAL OUTDOOR WORK								

* Contractor to determine

ItemNo.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1,0	<u>3kV DC High Speed Circuit Breakers</u>								
1,1	Supply and install trucks, modular cells and high speed circuit breakers with feeder protection relays and associated equipment	each	N/A	N/A		4			
1,2	Supply and install electronic busbar interlocking system	sum	N/A	N/A		1			
2,0	<u>Traction Substation Batteries</u>								
2,1	Supply and Install Substation Batteries	sum	N/A	N/A		1			
3,0	<u>Substation Light and Power Distribution</u>								
3,1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			
4,0	<u>Wavefilter equipment</u>								
4,1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		1			

5,0	Cabling and Interconnection								
5,1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
	<i>Other(Specify):</i>								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1,0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Val Total	

* Contractor to determine

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	<u>VOORUITSIG SUBSTATION (SINGLE UNIT)</u>								
A	GENERAL								
1,0	Preliminary and General /Site Establishment.	sum				1			
2,0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3,0	Dismatle/remove old equipment.	sum				1			
4,0	Transport old equipment to depot.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1,0	<u>Primary Surge Arrestors</u>								
1,1	Supply and install 88kV primary surge arresters	each	N/A	N/A		3			
2,0	<u>Outdoor Earthing</u>								
2,1	Renew outdoor earthing, crusher stones etc. complete including earthmat renewal	sum	Electrical Cables	90%		1			
3,0	<u>Auxilliary Transformer</u>								
3,1	Supply and install 50kVA auxilliary transformer	each	Transformer (class 0)	100%		1			
4,0	<u>Substation interlocking</u>								
4,1	Supply and install outdoor and indoor equipment mechanical interlocking	sum	N/A	N/A		1			
5,0	<u>Fencing</u>								
5,1	Supply and install 1.2m high diamond mesh fence between the AC disconnect and Primary Cicut Breaker	m	Steel	100%		14			
5,2	Supply and install 1.2m high diamond mesh gate	each	Steel	100%		1			
6,0	<u>Gate Switch and Spark Gap</u>								
6,1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1			
7,0	<u>Security lighting</u>								
7,1	Supply and install 250W high pressure sodium vapour lamp in yard(including wiring)	sum	Electrical Cables	90%		1			
7,2	Supply and install a double tube fluoresent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		4			
8,0	<u>Transformer refurbishment work</u>								
8,1	Oil sampling, Testing and analysis prior work commencement	sum	Transformer (class 1)	100%		1			
8,2	Clean, treat (rust) and re-paint transformer and conservator.	sum	Transformer (class 1)	100%		1			
8,3	Complete re-gasketing of the transformer	sum	Transformer (class 1)	100%		1			
8,4	Supply and replace winding, oil temperature gauges with their probe pockets	each	Transformer (class 1)	100%		2			
8,5	Supply and replace breather & silica gel	sum	Transformer (class 1)	100%		1			
8,6	Supply and install main transformer with Resin Impregnated Paper Synthetic Primary Bushings for both transformers	each	Transformer (class 1)	100%		3			

8,7	Supply Aluminium bus bar & flexibles from secondary insulators to wall bushings	sum	Electrical Cables	90%		1		
8,8	Top up transformer with virgin oil (210L)	sum	Transformer (class 1)	100%		210L		
8,9	Oil purification process at 4 passes	sum	Transformer (class 1)	100%		1		
8,10	Repair oil leaks on all other parts of the transformer (If any)	sum	Transformer (class 1)	100%		1		
8,11	Chemically treat polluted ballast.	sum	N/A	N/A		1		
8,12	Treat plinth for oil pollution.	sum	N/A	N/A		1		
8,13	Supply and install new insulation under the transformer	sum	Transformer (class 1)	100%		1		
8,14	Generator utilisation	sum	N/A	N/A		1		
8,15	Crane Truck utilisation	sum	N/A	N/A		1		
	Other(Specify):							
	TOTAL OUTDOOR WORK							

* Contractor to determine

ItemNo.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1,0	<u>3kV DC Positive Isolator</u>								
1,1	Supply and Install Positive Isolator and Earth Switch	each	N/A	N/A		1			
2,0	<u>Traction Substation Batteries</u>								
2,1	Supply and Install Substation batteries	sum	N/A	N/A		1			
3,0	<u>Substation Light and Power Distribution</u>								
3,1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			
4,0	<u>Substation Wavefilter Equipment</u>								
4,1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		1			
5,0	<u>Cabling and Interconnection</u>								
5,1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
	Other(Specify):								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1,0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Vooruitsig Total	

* Contractor to determine

PART C3: SCOPE OF WORK

Document reference	Title	No of page
C3.1	This cover page	1
	<i>Employer's Works Information</i>	13
Total number of pages		14

C3.1 EMPLOYER’S WORKS INFORMATION

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SECTION 1

1 Description of the works

1.1 Executive overview

The *works* that the *Contractor* is to perform *involve*

- 1.1.1 Decommissioning, dismantling and transportation of 3kV DC Traction substation electrical equipment from the substations to the depots designated scrap yard/s.
- 1.1.2 Design, Supply, Install, Test and Commission of 3 kV DC Traction substation equipment.
- 1.1.3 The area of deployment is Transnet Freight Rail Natal Corridor line.
- 1.1.4 Implementation requirements will differ from site to site, depending on the scope of work per site. However, adherence to the project's technical specification is mandatory.

1.2 Employer's objectives

The *Employer's* objectives are

- 1.2.1 To replace old and obsolete equipment at traction substation located in the Natal Corridor with new equipment that is maintainable and reliable.
- 1.2.2 To ensure that *works* is carried out in good quality and in a safety manner in line with Transnet Freight Rail internal safety specification (E4E) and Occupational Health and Safety Act 85 of 1993 and its regulations. Preferred bidder will be required to adhere to the above.
- 1.2.3 The *Contractor* shall ensure that there's minimal interruption to the electrical network and functioning/ movement of trains is not affected whilst performing the *works*.

1.3 Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation	Meaning given to the abbreviation
TFR	Transnet Freight Rail
AC	Alternating Current
DC	Direct Current
kV	Kilo Volt
SCS	Supply Chain Services
PFMA	Public Finance Management Act
SANS	South African National Standard
IP	Intellectual Property
SMP	Safety Management Plan
QA	Quality Assurance

2 Engineering and the *Contractor's* design

2.1 Employer's design

- 2.1.1 The *Employer's* designs are already contained in relevant Transnet specifications. Should the *Contractor* need to use the relevant specifications, reference will be made as and when required.
- 2.1.2 Section 5, below, contains the specifications the contractor can use.
- 2.1.3 The *Employer* grants the *Contractor* a licence to use the copyright in design data presented to the *Contractor* for the purpose of the *works*.

2.2 Parts of the *works* which the *Contractor* is to design

- 2.2.1 The *Contractor* is to design the outdoor yard equipment and indoor substation equipment as specified on the specification, "Refurbishment and replacement of substations equipment on the Container Corridor.
- 2.2.2 The *Contractor* is responsible in his design for the overall integration of the design of the *works* with the design of the *Employer*.
- 2.2.3 Unless expressly stated to form part of the design responsibility of the *Employer*, all residual design responsibility and overall responsibility for the total design solution for the *works* rests with the *Contractor*.

2.3 Procedure for submission and acceptance of *Contractor's* design

- 2.3.1 The *Contractor* shall, before installation or implementation, supply the *Employer* with the design to be reviewed.
- 2.3.2 All as built drawings shall be supplied in electronic format (Micro station / Acad). The successful *Contractor* shall be required to submit all drawings (paper prints) within four weeks of award tender, to the *Project Manager* or *Supervisor* for approval. No construction or manufacturing activity will be allowed prior to the associated drawings having been approved.
- 2.3.3 During the duration of the contract period, the successful *Contractor* will be required to inform the *Project Manager* or *Supervisor* of any changes to these drawings and will have to submit the affected drawings for approval prior to it being used to this contract.
- 2.3.4 The *Contractor* undertakes design safety reviews.
- 2.3.5 In undertaking the '*Works*' (including all incidental services required), the *Contractor* shall conform and adhere to the requirements of the '*Contractor Document Submittal Requirements*'

- 2.3.6 The *Contractor* submits documentation as the 'Works Information' requires to the *Project Manager* for review and acceptance.
- 2.3.7 All final as built drawings shall be provided to Transnet Freight Rail within Four Weeks after commissioning.
- 2.3.8 Three sets of A3 schematic wiring diagrams shall be supplied in hard copy and electronic format for approval.
- 2.3.9 The list of drawings to be provided by *Employer* are found in section 5 of this document.

2.4 Other requirements of the *Contractor's* design

- 2.4.1 The *Contractor's* design shall comply with Transnet's specifications BBB 5452 version 7.

2.5 Use of *Contractor's* design

- 2.5.1 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, reconstruction, 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*.
- 2.5.2 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*.

2.6 Equipment required to be included in the *works*

- 2.6.1 Calibration and Testing equipment will be as per the specification BBF 8128.

2.7 As-built drawings, operating manuals and maintenance schedules

- 2.7.1 The *Contractor* provides design, installation and as built drawings, instruction manuals and spare parts catalogues in accordance with Transnet specification CEE.0224 of 2002.

3 Construction

3.1 Temporary *works*, Site services & construction constraints

- 3.1.1 The *Contractor* shall only use entrances and exits specified on site access certificate and/or those agreed with the *Employer*.
- 3.1.2 In addition to the above, there may be other restrictions once on the site, plus rules relating to roads, walkways and the provision of barricades.
- 3.1.3 The *Contractor* shall only work on and/or occupy space/area within the *Employers* boundaries.
- 3.1.4 Any site outside what the *Employer* allowed the *Contractor* to work on shall be deemed off limits, to the *Contractor*, his people and/or his sub-contractors.
- 3.1.5 The hours of work for the *Contractor* on site shall be as agreed with the *Employer*.
- 3.1.6 The *Contractor* keeps daily records of his people engaged on the Site and Working Areas (including Subcontractors) with access to such daily records available for inspection by the *Project Manager* at all reasonable times.
- 3.1.7 Health and Safety compliance will be evaluated as per the Tenderer Safety Plan.
- 3.1.8 All material arising from excavation and demolition shall be dealt with in accordance with Transnet specification E7/1.
- 3.1.9 The *Contractor* performs the *works* and co-operates with the *Employer*, and/or *Others (third parties)* where the *Contractor's* work may affect or interfere with their activities.
- 3.1.10 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*.

- 3.1.11 *Contractor's* Equipment shall be handled in accordance with the Transnet specification E7/1.
- 3.1.12 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.
- 3.1.13 The *Contractor* shall handle his/her equipment in accordance with specification E4E.
- 3.1.14 The *Employer* shall provide no equipment for the *Contractor* to use.
- 3.1.15 The *Contractor* under any conditions shall not use *Employer's* Equipment
- 3.1.16 The *Contractor* shall ensure he/she makes provision for power, water, waste disposal, telecoms, ablutions, fire protection, lighting etc.
- 3.1.17 The *Contractor*, will provide no facilities to the *Employer*, except the *work* agreed upon as stipulated in the contract.
- 3.1.18 Unless expressly stated as a responsibility of the *Employer*, 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*.
- 3.1.19 The *Contractor* inspects and surveys the buildings / premises / facilities adjacent to the Site in accordance with and in conjunction with the *Project Manager*.
- 3.1.20 The *Employer* provides the following information and survey controls for the *Contractor*:
 - i) Works specifications,
 - ii) Site instruction book, and
 - iii) Site diaries.
- 3.1.21 The *Contractor's* deep foundations and controlling of water from excavations will be dealt with in accordance with Transnet specification E7-1.
- 3.1.22 Underground services, other existing services, cable and pipe trenches and covers will be dealt with in accordance with Transnet specification E7-1.
- 3.1.23 Where the *Contractor* encounters existing underground services / existing services cables / pipe trenches. The *Contractor* shall not block, obstruct or damage any existing drains either above or below ground level unless he has made adequate prior arrangements to deal with such.
- 3.1.24 Control of noise, dust, water and waste, shall be dealt with in as per the Transnet specification E4E.
- 3.1.25 For sequences of construction or installation, the *Contractor* complies with all Transnet specifications and instructions provided him/her.
- 3.1.26 The Constraints will be site specific and will be determined between the *Contractor* and the *Employer* or *Project Manager* for the project.

3.2 Completion, testing, commissioning and correction of Defects.

- 3.2.1 Commissioning and Testing of substations shall be as per the Transnet specification BBF 8128, applicable standards, generic and particular specifications.
- 3.2.2 The *Contractor* ensures that the documentation of the *commissioning and testing* is presented to the *Project Manager* before Completion.
- 3.2.3 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 present to the *Employer*.
- 3.2.4 The *Contractor* ensures that the *Project Manager* has a full and accurate dossier of maintenance and operating manuals before take-over or Completion.
- 3.2.5 The *Contractor* performs *performance tests* after completion of the *works* as specified in specification BBF8128.
- 3.2.6 The *Contractor* facilitates training *workshops* after completion of *works* where an equipment the *Employer* is not familiar with is installed.
- 3.2.7 When, in the opinion of the *Supervisor*, any part of the work done or any items of material used is not in accordance with the requirements of the *Contract*, whether or not payment for such work

- or material has been made, he may order the *Contractor* in writing to remove any objectionable part, item or component thereof, to replace it with an acceptable part, item or component and to rectify or reconstruct the *Works* without cost to Transnet.
- 3.2.8 The equipment shall be inspected/tested and approved by Transnet Freight Rail Quality Assurance at the *Contractor's* workshop prior to it being taken to site. Only once the approval has been granted can the equipment be taken to site for installation.
- 3.2.9 Functional on-site tests shall be conducted on all items of equipment and circuitry to prove the proper functioning and installation thereof.
- 3.2.10 The *Contractor* shall submit a detailed list of on-site tests for the approval of the *Project Manager* or *Supervisor*.
- 3.2.11 The on-site tests and subsequent commissioning will not commence until ALL CONSTRUCTION work has been completed. Construction staff, material and equipment shall be removed from site prior to the commencement of testing.
- 3.2.12 The on-site tests shall include the following:
- i) Test for the functionality of all electrical circuitry.
 - ii) Trip test on relays.
 - iii) Test on equipment as per manufacturer's instructions.
 - iv) Insulation test.
- 3.2.13 At the completion of the on-site tests, the *Project Manager* or *Supervisor* or his representative shall either sign the tests sheets (supplied by the *Contractor*) as having witnessed the satisfactory completion thereof, or hand to the *Contractor* a list of defects requiring rectification.
- 3.2.14 Upon rectification of defects, the *Contractor* shall arrange for the *Project Manager* or *Supervisor* or his representative to certify satisfactory completion of on-site tests.
- 3.2.15 The *Works* will not be accepted by Transnet as complete until all defects of every kind have been made good to the satisfaction of the *Supervisor*.
- 3.2.16 Transnet Freight Rail shall be notified at least 14 days prior to performing these tests.
- 3.2.17 Within a reasonable time after receipt of written instructions from the *Project Manager/Supervisor*, the *Contractor* shall make good to the satisfaction of the *Supervisor* all the defective material and workmanship which are not in accordance with the contract and which may appear within a period of 12 months, or such other period as stipulated in the *Contract Data*, after the date stated in the CERTIFICATE OF COMPLETION, and shall repair all damage caused thereby.
- 3.2.18 Should the *Contractor* fail to comply with the above provisions, Transnet may cause the required *work* to be carried out at the expense of the *Contractor* and may recover the cost thereof from the *Contractor*.
- 3.2.19 The commissioning of protection equipment by Transnet Freight Rail will in no way absolve the *Contractor* from any of his responsibilities during the guarantee period.
- 3.2.20 The *Contractor* shall be responsible for carrying out of on-site tests and commissioning of all equipment supplied and installed in terms of this specification and the contractual agreement.
- 3.2.21 The *Contractor* shall be present during the testing and setting of the protection to rectify any faults found.
- 3.2.22 Commissioning will only take place after all defects have been rectified to the satisfaction of the *Project Manager* or *Supervisor*.
- 3.2.23 On completion of commissioning, the *Contractor* will hand the equipment over to the *Project Manager* or *Supervisor* in terms of relevant instruction.

4 Plant and Materials Standards and Workmanship

4.1 Investigation, Survey and Site Clearance

- 4.1.1 The *Contractor* carries out the investigations on site as specified on the contract or as requested by the *Employer*.

4.2 Civil Engineering and Structural Works

- 4.2.1 All Civil engineering and structural works will be dealt with in accordance with Transnet's specification E7/1.

5 List of SPECIFICATIONS AND DRAWINGS

5.1 Specifications and Drawings issued by the *Employer*

The list of specifications and drawings issued by the *Employer* at or before the Contract Date, which apply to this contract is given below. The *Contractor* shall undertake to comply fully with all issued specifications and drawings. The submission of tender documents confirms full compliance to specifications and drawings issued by the *Employer* to the *Contractor*.

Specification/Drawing number	Revision	Title
BBC0198	2	REQUIREMENTS FOR THE SUPPLY OF ELECTRIC CABLES
BBB0496	15	3 KV RECTIFIER FOR TRACTION SUBSTATIONS
BBB0845	4	REQUIREMENTS FOR METAL OXIDE SURGE ARRESTERS WITHOUT GAPS FOR TRACTION AND POWER DISTRIBUTION SUBSTATIONS IN ACCORDANCE WITH SANS 60099-4
BBB0937	4	REQUIREMENTS FOR OUTDOOR POST TYPE CURRENT TRANSFORMERS FOR TRACTION AND DISTRIBUTION SUBSTATIONS
BBB0938	9	CONNECTION OF HIGH VOLTAGE SURGE ARRESTER INSTALLED ON CROSS ARM
BBB1616	3	450 VOLT GAS ARRESTER SPARKGAP FOR TRACTION POWER SUPPLIES
BBB2502	6	REQUIREMENTS FOR BATTERY CHARGERS FOR 3 KV DC TRACTION SUBSTATIONS
BBB2721	11	AC PRIMARY CIRCUIT BREAKER CONTROL PANEL AND AC/DC DISTRIBUTION PANEL FOR 3 KV TRACTION SUBSTATIONS
BBB3005	2	3 KV DC UNDER VOLTAGE RELAY MANUFACTURING SPECIFICATION
BBB3139	2	WAVE FILTER CAPACITOR FOR 3 KV DC TRACTION SUBSTATIONS
BBB3162	2	WAVE FILTER INDUCTORS FOR 3 KV DC TRACTION SUBSTATIONS
BBB3483	1	WAVE FILTER HARMONIC COIL CARRIER ASSEMBLY 3 KV DC SUBSTATIONS
BBB3620	6	3 KV DC EARTHING ARRANGEMENT FOR HIGH VOLTAGE OUTDOOR YARDS
BBB5019	6	REQUIREMENTS FOR TRACTION TRANSFORMERS FOR 3 KV DC TRACTION SUBSTATIONS IN ACCORDANCE WITH SANS 60076
BBB5452	7	TRANSNET FREIGHT RAIL'S REQUIREMENTS FOR THE INSTALLATION OF ELECTRICAL

		EQUIPMENT FOR 3 KV DC TRACTION SUBSTATIONS
BBB7842	1	OUTDOOR, HIGH VOLTAGE, ALTERNATING CURRENT DISCONNECTORS COMBINED WITH EARTHING SWITCHES
BBB4724		REQUIREMENT FOR POSITIVE ISOLATOR FOR 3KV DC TRACTION SUBSTATIONS
BBD5994		TECHNICAL DOCUMENTATION MANGEMENT POLICY
BBH5026		REFURBISHMENT AND REPLACEMENT OF SUBSTATIONEQUIPMENT ON THE CONTAINER CORRIDOR
BBF8128		HANDBOOK FOR TESTING AND CALIBRATION OF RAILWAY ELECTRICAL PROTECTION EQUIPMENT
BBF3690	1	ELECTRICAL SAFETY INSTRUCTIONS
CEE0023	2012	INSTALLATION OF LOW AND MEDIUM VOLTAGE CABLES
CEE045	2014	PAINTING OF STEEL COMPONENTS OF ELECTRICAL EQUIPMENT
CEE0099	2013	3 KILO VOLTS DC HIGH SPEED CIRCUIT BREAKERS FOR TRACTION SUBSTATIONS
CEE0224	2002	DRAWINGS, CATALOGUES, INSTRUCTION MANUALS AND SPARES LISTS FOR ELECTRICAL EQUIPMENT SUPPLIED UNDER CONTRACT
CEE0227	2018	THE MANUFACTURE OF 3 KV DC BREAKER CELLS AND TRUCKS
E4E	2	TRANSNET FREIGHT RAIL SAFETY HEALTH AND ENVIRONMENT (SHE) SPECIFICATION FOR CONTRACTORS
BBD8210	1	E7/1 –SPECIFICATION FOR GENERAL WORK AND WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR HIGH VOLTAGE EQUIPMENT
CEE-PA-0023		SUBSTATION EARTHING
CEE-PA-0013		TEST BLOCK FOR HV SWITCHGEAR
CEE-PA-0056		PROTECTIVE RELAYS TO CURRENT TRANSFORMERS
CEE-TDF-0016		CONCRETE FENCING
CEE-TBD-0007	10	EARTHING ARRANGEMENTS TRACTION SUBSTATIONS
CEE-TU-0041		NEGATIVE RETURN CABLE TERMINATING BOX
CEE-TBP-0001		WIRING DIAGRAM FOR AUTO-RECLOSURE FOR HSCB
CEE-TBP-0039		CIRCUIT DIAGRAM FOR AUTO-RECLOSURE FOR HSCB
CEE-TBP-0035	4	CONNECTION DIAGRAM FOR HSCB AND ELECTRONIC CONTROL RELAY
CEE-TBP-0038	1	SCHEMATIC DIAGRAM OF 3KV HV PROTECTION
CEE-TCL-0063		3KV BUSBAR CHAMBER ARRANGEMENT: CABLE FEEDERS

CEE-TCQ-0208		DC HIGH SPEED CIRCUIT BREAKER CELL PANEL (CELL SLABS) (SHEETS 1 TO 10)
CEE-TBP-0033	3	DC TRACK BREAKER AND TRUCK WIRING DIAGRAM
BBF1615		BUSBAR CONNECTION ASSEMBLY
BBG0894		3KV DC TRACTION FEEDER PROTECTION RELAY
BBF9986		10MW 3KV RECTIFIER FOR TRACTION SUBSTATIONS
BBF1338		EMC 3kv DC CIRCUIT BREAKER
BBC5872		DIRT COVER PLATE DIRECT TRIPPING DEVICE FOR SECHERON TRACK BREAKERS
BBB3059		3KV DC TRACTION SUBSTATION EARTHING SYSTEM FOR HIGH VOLTAGE OUTDOOR YARDS
S420		CONCRETE WORK
BBB2007		ENVIRONMENTAL GUIDELINES AND SPECIFICATIONS FOR ELECTRICAL CONSTRUCTION WORK
BBC7616		POLICY AND GUIDELINES FOR THE MANAGEMENT OF POLYCHLORINATED BIPHENYLS IN TRANSNET FREIGHT RAIL
BBB9921		TEST SHEET:3KV TRACTION SUBSTATION.COMMISSIONING TEST BY CONTRACTOR (PRIOR TO FINAL COMMISSIONING BY TRANSNET FREIGHT RAIL)
JEE-TBB-159		WAVE FILTER 3kv DC TRACTION SUBSTATION
CEE-TWN-32 Sheet 2		SIGN, WARNING EXPOSED LIVE HIGH VOLTAGE EQUIPMENT, PEDESTRIAN DANGER SIGN FOR VERTICAL OBJECTS
BBB0041	4	PREPARATION OF DRAWINGS FOR TRANSNET FREIGHT RAIL
CEE0177		CODE OF PRACTICE: EARTH SYSTEMS FOR ELECTRIC LIGHT AND POWER AND TRACTION INSTALLATIONS
CEE0229		DRY-OUT AND REGENERATION OF INSULATING OIL AND RECLAIMING AND DE-SLUDGING OF TRANSFORMERS
CEE0085		SELF- CONTAINED BATTERY AND CHARGER UNITS FOR ELECTRIC LIGHT AND POWER SUBSTATIONS
CEE0183		HOT DIP GALVANISING AND PAINTING OF ELECTRIFICATION STEELWORK

SECTION 2

6 Management and start up

6.1 Management meetings

- 6.1.1 The *Contractor* will be expected to attend meetings relating to maintenance, operations, contract management and other issues that may arise from time to time on monthly basis or any other prescribed terms. As far as is practicable, the *Contractor* will make all required persons available for these meetings.
- 6.1.2 The *Contractor* shall not submit claims for payment for staff attending any of these meetings. There will be minutes kept for this meeting for record purposes.
- 6.1.3 Risk reduction meetings: These meetings can form part of the regular/progress site meetings or be held as separate meetings. At these meetings the following issues will be discussed:
- (i) Compensation events
 - (ii) Early warnings
 - (iii) Contractual claims
 - (iv) Risk register
- 6.1.4 The *Contractor* shall attend ad hoc site meetings when convened by the Transnet Freight Rail *Contract Supervisor*. Such meetings will be for the purpose of discussing specific issues or problems relating to specifications and adherence thereto, quality and contractual matters.
- 6.1.5 *Contractor's* representatives at these meetings shall have the necessary delegated authority in respect of aspects such as planning, change management, health and safety.

6.2 Documentation Control

- 6.2.1 All contractual communications will be in the form of properly compiled letters or forms attached to e-mails and not as a message in the email itself.
- 6.2.2 The *Contractor* will submit inspection reports after each service in report format agreed between the *Project Manager* and the *Contractor*.

6.3 Safety risk management

- 6.3.1 The safety management plan (SMP) will be site specific and will be dealt with in accordance with Transnet's specification E4E.
- 6.3.2 The *Contractor* ensures that its Subcontractors comply with the requirements of the SMP.

6.4 Environmental constraints and management

- 6.4.1 Environmental constraints and management shall be dealt with in accordance with Transnet specifications E7/1, BBB2007, S417, E4B and E4E.

6.5 Quality assurance requirements

- 6.5.1 The *Contractor's* Quality Management System shall conform to International Standard ISO 9001 (or an equivalent standard acceptable to the *Project Manager*).
- 6.5.2 The *Contractor* submits his Quality Management System documents to the *Project Manager* as part of his programme to include details of:
- Quality Plan for the contract;
 - Quality Policy
 - Index of Procedures to be used; and
 - A schedule of internal and external audits during the contract

- 6.5.3 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.
- 6.5.4 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*.
- 6.5.5 The Quality Plan means the *Contractor's* statement, which outlines strategy, methodology, resources allocation, QA and Quality Control co-ordination activities to ensure that the *works* meet the standards stated in the *Works Information*.
- 6.5.6 The *Contractor* shall submit with his tender his proposed QC plan and procedures. This plan shall indicate how the necessary quality assurance and control will be carried out in order to meet the requirements of the contract documents. The *Contractor* shall have his Quality Control plan approved by *Supervisor* prior to the start of any work or ordering of material.
- 6.5.7 The *Contractor* may also be required to use standard quality and control forms supplied by the *Supervisor*.
- 6.5.8 The *Contractor* shall notify the *Supervisor* of all inspections at least 21 working days in advance of such inspections. The *Contractor* shall have the relevant quality control plans available at inspections and tests.
- 6.5.9 Transnet Freight Rail reserves the right to inspect the equipment covered by this specification at any stage during manufacture and to be represented at any tests.
- 6.5.10 Where the *Contract* provides for tests on the premises of the *Contractor* or of his subcontractor or on site, the *Contractor* shall provide assistance such as labour, materials, electricity, fuel, stores, apparatus and instruments as may be a requisite and as may be reasonably demanded to carry out such tests efficiently.
- 6.5.11 As and when the equipment has passed these tests, the *Supervisor* shall furnish the *Contractor* with a certificate in writing to this effect.
- 6.5.12 If as a result of an inspection, examination or test, the Transnet Freight Rail *Contract Supervisor* decides that the equipment is defective or not in accordance with the requirements, he shall notify the *Contractor* accordingly stating in writing his objections and reasons thereof. The *Contractor* shall timeously make good the defect to ensure that the equipment complies with the requirements.
- 6.5.13 Thereafter, if required by the Transnet Freight Rail *Contract Supervisor*, the tests shall be repeated under the same terms and conditions save that all reasonable expenses to which Transnet Freight Rail may be put by the repetition of these tests will be deducted from the contract sum.
- 6.5.14 Unless the Transnet Freight Rail *Contract Supervisor* otherwise directs, no equipment or materials are to be delivered to site until the Transnet Freight Rail *Contract Supervisor* issues an inspection certificate in respect of such equipment or material. The *Contractor* shall be responsible for the reception of all equipment and material delivered to site for the purpose of the contract.
- 6.5.15 Transnet Freight Rail reserves the right to conduct a quality assurance audit on the *Contractor's* quality control system at regular intervals.
- 6.5.16 If at any stage during manufacture, repair, installation or commissioning of equipment or material it becomes evident that the requirements of this specification are not being adhered to, Transnet Freight Rail reserves the right to halt such manufacture, repair, installation or commissioning until such time as the *Contractor* or his subcontractor conforms to the requirements of this specification.
- 6.5.17 Details of any additional tests or inspections proposed by the Tenderer shall be attached and submitted with his tender.
- 6.5.18 Acceptance by the Transnet Freight Rail *Supervisor* of satisfactory completion of on-site tests in no way relieves the *Contractor* of his obligation to rectify defects which may have been overlooked or become evident at a later stage.

6.6 Training workshops and technology transfer

- 6.6.1 The *Contractor* shall provide Training to Transnet staff on any new equipment installed as specified on the contract specification.
- 6.6.2 Technology transfer from the *Contractor* to the *Employer* will be as required per contract specification.

6.7 The *Contractor's* Invoices

- 6.7.1 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.
- 6.7.2 The invoice must correspond to the *Project Manager's* assessment of the amount due to the *Contractor* as stated in the payment certificate.
- 6.7.3 Payment will be paid within 30 days from date of receipt of the approved Invoice been received in the financial office in Johannesburg.
- 6.7.4 Invoice addressed to Transnet Freight Rail;

Transnet Freight Rail VAT Registration No: **4720103177**;

The invoice must contain the following minimum information and/or be substantiated by the following documentation:

Description of service provided for each item invoiced based on the Price List;

The *Contractor's* VAT Registration No.; and

The Contract number [SIE21015CIDB] SAP No:

Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;

6.8 People

- 6.8.1 Minimum requirements of people employed on the Site will be work and site specific and will be determine by the duration of the works.
- 6.8.2 The *CONTRACTOR's* LIABILITY is given as follows:
 - 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.

6.8.3 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. 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.
- b) In the event of any industrial action by the *Contractor's* employees, *the Contractor* is obliged:
 - i) 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.
- c) The Industrial Action Report must provide at least the following information:
 - i) Industrial incident report,
 - ii) Attendance register,
 - iii) Productivity / progress to schedule reports,
 - iv) Operational contingency plan,
 - v) Site security report,
 - vi) Industrial action intelligence gathered.
- d) The final Industrial Action Report is to be delivered 24 hours after finalisation of the industrial action.
- e) 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.
- f) The resolution of any disputes or industrial action by the *Contractor's* employees is the sole responsibility of the *Contractor*.
- g) 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.

6.9 Plant and Material

- 6.9.1 *Employer* provides no Plant and materials for the *Contractor* to use.
- 6.9.2 Procurement and use of Plant and material shall be sole responsibility of the *Contractor*.
- 6.9.3 Procurement shall be as specified on the contract.
- 6.9.4 Plant and material handling, shall be accordance with Transnet specification E4E and E7/1.

6.10 Tests and inspections before delivery

- 6.10.1 Tests and inspections will site and work specific and will be dealt with in accordance with Transnet specification BBF8128.

PART 4: SITE INFORMATION

1. Description of the Site and its surroundings

1.1. General description

Replacement and refurbishment of obsolete substation equipment shall be carried out at various Transnet Freight Rail traction substations located on the Natal corridor. The corridor conveys railway services between Gauteng and KwaZulu-Natal, under the jurisdiction of Depot Engineers of Heidelberg, Ladysmith and Durban.

Names of traction substations where replacement work will be carried out are listed in 'Bill of Quantities' Prices (Part C2.2). Drawing CEE-TVD-2 Sht 1-2 is a map that shows the location of some of these sites, this may be requested from the Supervisor of this project. Accessibility of the sites from the main roads is sometimes via a service road, which its condition may vary depending on amongst other things, vegetation and rainfall. Tenderers are advised to take note of this during the site visits.

The security requirements at each site shall be discussed with the relevant Depot. The access to these sites can only be granted under supervision from the relevant Depot, due to the nature of work that is involving High Voltage isolation.

Substation are located mainly at remote areas where supply of water and electricity supplies and ablution facilities cannot be guaranteed or totally unavailable, therefore tenderers shall make provision for his/her water and power supply as well as ablution facilities on site.

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

High Voltage Steel Structures, Eighty Eight kilo Volts (88kV) Primary Electrical Supply Plant inclusive of High Voltage Electrical Aerial Conductors, 88kV /3kV Primary Step Down Plant, Substation Building, Fencing and gates, 3kV Aerial Conductors, Railway Level Crossings and Overhead Track Equipment.

1.3. Subsoil information

N/A

1.4. Hidden services

Electrical services, Underground Cables and Water services

1.5. Other reports and publicly available information

N/A