NEC3 Engineering and Construction Contract

entered into by and between

Transnet SOC Ltd

Registration Number 1990/000900/30

(hereinafter referred to as the *"Employer"*)

and

TBA
Registration Number .....
(hereinafter referred to as the *"Service Provider"*)

CONVERSION OF THE OLD SABS BUIDING INTO A SECURITY CONTROL FACILITY AT THE RICHARDS BAY TERMINALS FOR TRANSNET SOC LTD OPERATING AS TRANSNET PORT TERMINALS (TPT) FOR A PERIOD OF EIGHTEEN (18) MONTHS

Start Date **TBA**

Completion Date **TBA**

CONVERSION OF THE OLD SABS BUIDING INTO A SECURITY CONTROL FACILITY AT THE RICHARDS BAY TERMINALS FOR TRANSNET SOC LTD OPERATING AS TRANSNET PORT TERMINALS (TPT)

CONTRACT DOCUMENTS

Form of Offer and Acceptance

Contract Data

Part One – Data provided by the *Employer*

Part Two – Data provided by the *Contractor*

Pricing Data

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:

CONVERSION OF THE OLD SABS BUILDING INTO A SECURITY CONTROL FACILITY AT THE RICHARDS BAY TERMINALS FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF FOR A PERIOD OF EIGHTEEN (18) MONTHS.

The tenderer, identified in the Offer signature block, has

either	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.
or	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	*(Insert name and address of organisation)*	Transnet SOC Ltd
Name & signature of witness		
Date		

C1.2 Contract Data

Part one - Data provided by the *Employer*

(Compilers) Please read the relevant clauses in the conditions of contract before you enter data. The number of the principal clause is shown for each statement however other clauses may also use the same data.

Clause	Statement	Data
1	**General**	
	The *conditions of contract* 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
		X4: Parent company guarantee
		X7: Delay damages
		X16: Retention
		X18: Limitation of liability
		Z: *Additional conditions of contract*
	of the NEC3 Engineering and Construction Contract June 2005 (amended June 2006 and April 2013)	
10.1	The *Employer* is:	**Transnet SOC Ltd (Registration No. 1990/000900/30)**

	Address	Registered address: **Transnet Corporate Centre** **138 Eloff Street** **Braamfontein** **Johannesburg** **2000**
	Having elected its Contractual Address for the purposes of this contract as:	**Transnet Port Terminals** **202 Anton Lembede Street** **Durban** **4000**
10.1	The *Project Manager* is: (Name)	**Phakamani Zikalala**
	Address	**Office 127 MHA Building, Port of Richardsbay**
	Tel	**0834643362**
	e-mail	**Phakamani.Zikalala@transnet.net**
10.1	The *Supervisor* is: (Name)	**Benedict Kopo**
	Address	**Office 127 MHA Building, Port of Richardsbay**
	Tel No.	**0810367534**
	e-mail	**Benedict.Kopo@transnet.net**
11.2(13)	The *works* are	**The conversion of the old sabs building into a security control facility at the Richards Bay Terminals for Transnet Soc Ltd (reg.no 1990/000900/30) operating as Transnet Port Terminals (hereinafter referred to as "TPT"), as a once off.**
11.2(14)	The following matters will be included in the Risk Register	**None at this stage. Risks will be updated on the risk register via early warning process**
11.2(15)	The *boundaries of the site* are	**As stated in Part C4.1."Description of the Site and it surroundings"**
11.2(16)	The Site Information is in	**Part C4**
11.2(19)	The Works Information is in	**Part C3**
12.2	The *law of the contract* is the law of	**the Republic of South Africa subject to the jurisdiction of the Courts of South Africa.**

13.1	The *language of this contract* is	**English**
13.3	The *period for reply* is	**2 weeks**
2	**The *Contractor*'s main responsibilities**	**No additional data is required for this section of the *conditions of contract*.**
3	**Time**	
11.2(3)	The *completion date* for the whole of the *works* is	**18 Months from the date of signing this contract.**
11.2(9)	The *key dates* and the *conditions* to be met are:	***Condition* to be met** ***key date*** **N/A**
30.1	The *access dates* are	**Part of the Site** **Date** **1 Port of Richards bay**
31.1	The *Contractor* is to submit a first programme for acceptance within	**2 weeks of the Contract Date.**
31.2	The *starting date* is	**Upon SHE file approval and receipts of TPT access permits.**
32.2	The *Contractor* submits revised programmes at intervals no longer than	**4 weeks.**
35.1	The *Employer* is not willing to take over the *works* before the Completion Date.	
4	**Testing and Defects**	
42.2	The *defects date* is	**52 (fifty-two) weeks after Completion of the whole of the *works*.**
43.2	The *defect correction period* is	**2 weeks**
5	**Payment**	
50.1	The *assessment interval* is monthly on the	**25th (twenty fifth) day of each successive month.**
51.1	The *currency of this contract* is the	**South African Rand.**

51.2	The period within which payments are made is	**Payment will be effected on or before the last day of the month following the month during which a valid Tax Invoice and Statement were received.**
51.4	The *interest rate* is	**the prime lending rate of Standard Bank of South Africa.**
6	**Compensation events**	
60.1(13)	The *weather measurements* to be recorded for each calendar month are,	**the cumulative rainfall (mm)** **the number of days with rainfall more than 10 mm** **the number of days with minimum air temperature less than 0 degrees Celsius** **the number of days with snow lying at 08:00 hours South African Time** **and these measurements: N/A**
	The place where weather is to be recorded (on the Site) is:	**Port of Richardsbay, at the *Contractor's* site.**
	The *weather data* are the records of past *weather measurements* for each calendar month which were recorded at:	**Richards Bay Weather Station, KwaZulu Natal.**
	and which are available from:	**South African Weather Service 012 367 6023 or info3@weathersa.co.za.**
7	**Title**	**No additional data is required for this section of the *conditions of contract*.**
8	**Risks and insurance**	
80.1	These are additional *Employer*'s risks	**None**
84.1	The *Employer* provides these insurances from the Insurance Table	

1	Insurance against:	**Loss of or damage to the *works*, 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 *works*, Plant and Materials & Equipment) and liability for bodily injury to or death of a person (not an employee of the *Contractor)* arising out of or in connection with the performance of the Contract as stated in the insurance policy for Contract Works / Public Liability**
	Cover / indemnity	**Is to the extent as stated in the insurance policy for Contract Works / Public Liability**
	The deductibles are	**as stated in the insurance policy for Contract Works / Public Liability**
3	Insurance against:	**Loss of or damage to Equipment (Temporary Works only) as stated in the insurance policy for contract Works and Public Liability**
	Cover / indemnity	**Is to the extent as stated in the insurance policy for Contract Works / Public Liability**
	The deductibles are:	**As stated in the insurance policy for Contract Works / Public Liability**
4	Insurance against:	**Contract Works SASRIA insurance subject to the terms, exceptions and conditions of the SASRIA coupon**
	Cover / indemnity	**Cover / indemnity is to the extent provided by the SASRIA coupon**
	The deductibles are	**The deductibles are, in respect of each and every theft claim, 0,1% of the contract value subject to a minimum of R2,500 and a maximum of R25,000.**

	Note:	**The deductibles for the insurance as stated above are listed in the document titled "Certificate of Insurance: Transnet (SOC) Limited Principal Controlled Insurance."**
84.1	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the *Contractor* arising out of and in the course of their employment in connection with this contract for any one event is	**The *Contractor* must comply at a minimum with the provisions of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 as amended.**
	The *Contractor* provides these additional Insurances	**1 Where the contract requires that the design of any part of the *works* shall be provided by the *Contractor* the *Contractor* shall satisfy the *Employer* that professional indemnity insurance cover in connection therewith has been affected** **2 Where the contract involves manufacture, and/or fabrication of Plant & Materials, components or other goods to be incorporated into the *works* at premises other than the site, the *Contractor* shall satisfy the *Employer* that such plant & materials, components or other goods for incorporation in the *works* are adequately insured during manufacture and/or fabrication and transportation to the site.** **3 Should the *Employer* have an insurable interest in such items during manufacture, and/or fabrication, such interest shall be noted by endorsement to the *Contractor's* policies of insurance as well as those of any sub-contractor** **4 Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R 5 000 000/R10 000 000.**

		5 The insurance coverage referred to in 1, 2, 3 and 4 above shall be obtained from an insurer(s) in terms of an insurance policy approved by the *Employer*. The *Contractor* shall arrange with the insurer to submit to the *Project Manager* the original and the duplicate original of the policy or policies of insurance and the receipts for payment of current premiums, together with a certificate from the insurer or insurance broker concerned, confirming that the policy or policies provide the full coverage as required. The original policy will be returned to the *Contractor.*
84.2	The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the works, Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the *Contractor*) caused by activity in connection with this contract for any one event is	**Whatever the *Contractor* requires in addition to the amount of insurance taken out by the *Employer* for the same risk.**
84.2	The insurance against loss of or damage to the works, Plant and Materials as stated in the insurance policy for contract works and public liability selected from:	**Principal Controlled Insurance policy for Contract OR Project Specific Insurance for the contract**
9	**Termination**	**There is no additional Contract Data required for this section of the *conditions of contract*.**
10	**Data for main Option clause**	
B	**Priced contract with Bill of Quantities**	**No additional data is required for this Option.**

60.6	The *method of measurement* is	**The Bill of Quantities have been measured in accordance with SANS 1200 unless indicated otherwise.**
11	**Data for Option W1**	
W1.1	The *Adjudicator* is	**Both parties will agree as and when a dispute arises. If the parties cannot reach an agreement on the *Adjudicator*, the Chairman of the Association of Arbitrators will appoint an *Adjudicator.***
W1.2(3)	The *Adjudicator nominating body* is:	**The Chairman of the Association of Arbitrators (Southern Africa)**
	If no *Adjudicator nominating body* is entered, it is:	**the Association of Arbitrators (Southern Africa)**
W1.4(2)	The *tribunal* is:	**Arbitration**
W1.4(5)	The *arbitration procedure* is	**The Rules for the Conduct of Arbitrations of the Association of Arbitrators (Southern Africa)**
	The place where arbitration is to be held is	**KwaZulu Natal, South Africa**
	The person or organisation who will choose an arbitrator - if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is	**The Chairman of the Association of Arbitrators (Southern Africa)**
12	**Data for secondary Option clauses**	
X1	**Price adjustment for inflation**	
X1.1(a)	The *base date* for indices is	**TBC**
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)**
	0.15	**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**

	0.15	**Material (Civil)**	**The "Civil Engineering Material - Total" index in Table 6 (Civil engineering material price indices) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South Africa. (Link – http://www.statssa.gov.za/?page_id=1854&PPN=P0151.1); and**
	0.36	**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.**

		0.03	**Material (Mechanical)**	**The "Mechanical Engineering" index in Table 5 (Mechanical and Electrical Engineering Input Price Indices) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South Africa.**
		0.01	**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		
		0.15	**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**
X4	**Parent company guarantee**	**No additional data is required for this Option**
X7	**Delay damages**	

X7.1	Delay damages for Completion of the whole of the *works* are	**R500-00 per day**
X13	**Performance bond**	
X13.1	The amount of the performance bond is	**Nil**
X16	**Retention**	
X16.1	The retention free amount is	**Nil**
	The retention percentage is	**10% on all payments certified.**
X18	**Limitation of liability**	
X18.1	The *Contractor*'s liability to the *Employer* for indirect or consequential loss is limited to:	**Nil** **The deductible of the relevant insurance policy**
X18.2	For any one event, the *Contractor's* liability to the *Employer* for loss of or damage to the *Employer's* property is limited to:	**The cost of correcting the Defect**
X18.3	The *Contractor's* liability for Defects due to his design which are not listed on the Defects Certificate is limited to:	**The Total of the Prices**
X18.4	The *Contractor's* total liability to the *Employer* for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	**5 years after Completion of the whole of the *works***
X18.5	The *end of liability date* is	
Z	***Additional conditions of contract* are*:***	

Z3 Additional clauses relating to Joint Venture

Z3.1 **Insert the additional core clause 27.5**

27.5. In the instance that the *Contractor* is a joint venture, the *Contractor* shall provide the *Employer* with a certified copy of its signed joint venture agreement, and in the instance that the joint venture is an 'Incorporated Joint Venture,' the Memorandum of Incorporation, within 4 (four) weeks of the Contract Date.
The Joint Venture agreement shall contain but not be limited to the following:

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

		iii. Identification of the roles and responsibilities of the constituents to provide the Works. • **Financial requirements for the Joint Venture:** **iv. the working capital requirements for the Joint Venture and the extent to which and manner whereby this will be provided and/or guaranteed by the constituents from time to time;** **v. the names of the auditors and others, if any, who will provide auditing and accounting services to the Joint Venture.**
Z3.2		**Insert additional core clause 27.6** **27.6. The *Contractor* shall not alter its composition or legal status of the Joint Venture without the prior approval of the *Employer.***
Z4	**Additional obligations in respect of Termination**	
Z4.1		**The following will be included under core clause 91.1:** **In the second main bullet, after the word 'partnership' add 'joint venture whether incorporate or otherwise (including any constituent of the joint venture)' and** **Under the second main bullet, insert the following additional bullets after the last sub-bullet:** • **commenced business rescue proceedings (R22)** • **repudiated this Contract (R23)**

Z4.2	**Termination Table**	**The following will be included under core clause 90.2 Termination Table as follows:** **Amend "A reason other than R1 – R21" to "A reason other than R1 – R23"**
Z4.3		**Amend "R1 – R15 or R18" to "R1 – R15, R18, R22 or R23."**
Z5	**Right Reserved by the *Employer* to Conduct Vetting through SSA**	
Z5.1		**The *Employer* reserves the right to conduct vetting through State Security Agency (SSA) for security clearances of any *Contractor* who has access to National Key Points for the following without limitations:** **1. Confidential – this clearance is based on any information which may be used by malicious, opposing or hostile elements to harm the objectives and functions of an organ of state.** **2. Secret – clearance is based on any information which may be used by malicious, opposing or hostile elements to disrupt the objectives and functions of an organ of state.** **3. Top Secret – this clearance is based on information which may be used by malicious, opposing or hostile elements to neutralise the objectives and functions of an organ of state.**

Z6	**Additional Clause Relating to Collusion in the Construction Industry**	
Z6.1		**The contract award is made without prejudice to any rights the *Employer* may have to take appropriate action later with regard to any declared tender rigging including blacklisting.**
Z7	**Protection of Personal Information Act**	
Z7.1		**The *Employer* and the *Contractor* are required to process information obtained for the duration of the Agreement in a manner that is aligned to the Protection of Personal Information Act.**

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

		CV's (and further key persons data including CVs) are appended to Tender Schedule entitled .
11.2(14)	The following matters will be included in the Risk Register	
31.1	The programme identified in the Contract Data is	
B	**Priced contract with bill of quantities**	
11.2(21)	The *bill of quantities* is in	
11.2(31)	The tendered total of the Prices is	(in figures) (in words), excluding VAT
	Data for Schedules of Cost Components	*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.*

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	**%**	
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 formas for Guarantees

For use with the NEC3 Supply Contract (December 2009 with amendments April 2013)

The *conditions of contract* stated in the Contract Data Part 1 may include the following Options:

Option X13: Performance guarantee

These Options require a guarantee "in the form set out in the Goods Information".
Pro forma documents for these guarantees are provided here for convenience but are to be treated as part of the Goods Information.

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

Pro forma Performance Guarantee – Demand Guarantee (for use with Option X13)
(to be reproduced exactly as shown below on the letterhead of the Bank providing the Guarantee / Guarantee)

[*Transnet SOC Ltd* and 138 Eloff Street Braamfontein Johannesburg 2000] Bank reference No.

Date:

Dear Sirs,

Performance Guarantee – Demand Guarantee for [……]

required in terms of contract [- O CONVERSION OF THE OLD BUILDING INTO A SECURITY CONTROL FACILITY AT THE RICHARDS BAY TERMINALS FOR A PERIOD OF EIGHTEEN (18) MONTHS NCE OFF SERVICE FOR A PERIOD OF EIGHTEEN (18) MONTHS]

1. In this Guarantee the following words and expressions shall have the following meanings:-

1.1	"Bank" means	[Name of Bank], …….. Branch, …….. Registration No. ……..
1.2	"Bank's Address" means	
1.3	"Contract" means	the written agreement relating to providing the *goods* and *services*, entered between the *Purchaser* and the *Supplier*, on or about the **TBA** (Contract Reference No. **TBA** as amended, varied, restated, novated or substituted from time to time;
1.4	"*Supplier*" means	a company registered in accordance with the laws of [Republic of South Africa] under Registration No
1.5	"*Purchaser*" means	**Transnet SOC Ltd** a company registered in accordance with the laws of the Republic of South Africa under Registration Number **[1990/000900/30].**
1.6	"Expiry Date" means	the earlier of • the date that the Bank receives a notice from the *Purchaser* stating that all amounts due from the *Supplier* as certified in terms of the contract have been received by the *Purchaser* and that the *Supplier* has fulfilled all his obligations under the Contract, or • the date that the Bank issues a replacement Guarantee for such lesser or higher amount as may be required by the *Purchaser*.
1.7	"Guaranteed Sum" means	the sum of

1.8	"*goods* and *services*" means	**CONVERSION OF THE OLD BUILDING INTO A SECURITY CONTROL FACILITY AT THE RICHARDS BAY TERMINALS FOR A PERIOD OF EIGHTEEN (18) MONTHS**

2. At the instance of the *Supplier*, we the undersigned _____ and _____, in our respective capacities as _____ and _____ of the Bank, and duly authorized thereto, confirm that we hold the Guaranteed Sum at the disposal of the *Purchaser* as security for the proper performance by the *Supplier* of all of its obligations in terms of and arising from the Contract and hereby undertake to pay to the *Purchaser*, on written demand from the *Purchaser* received prior to the Expiry Date, any sum or sums not exceeding in total the Guaranteed Sum.

3. A demand for payment under this guarantee shall be made in writing at the Bank's address and shall:

   - be signed on behalf of the *Purchaser* by a director of the *Purchaser*;
   - state the amount claimed ("the Demand Amount');
   - state that the Demand Amount is payable to the *Purchaser* in the circumstances contemplated in the Contract.

4. Notwithstanding the reference herein to the Contract the liability of the Bank in terms hereof is as principal and not as surety and the Bank's obligation/s to make payment:

   - is and shall be absolute provided demand is made in terms of this guarantee in all circumstances; and
   - is not, and shall not be construed to be, accessory or collateral on any basis whatsoever.

5. The Bank's obligations in terms of this Guarantee:

   - shall be restricted to the payment of money only and shall be limited to the maximum of the Guaranteed Sum; and
   - shall not be discharged and compliance with any demand for payment received by the Bank in terms hereof shall not be delayed, by the fact that a dispute may exist between the *Purchaser* and the *Supplier*.

6. The *Purchaser* shall be entitled to arrange its affairs with the *Supplier* in any manner which it sees fit, without advising us and without affecting our liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release or compromise granted to the *Supplier* or any variation under or to the Contract.

7. Should the *Purchaser* cede its rights against the *Supplier* to a third party where such cession is permitted under the Contract, then the *Purchaser* shall be entitled to cede to such third party the rights of the *Purchaser* under this Guarantee on written notification to the Bank of such cession.

8. This Guarantee:

   - shall expire on the Expiry Date until which time it is irrevocable;
   - is, save as provided for in 7 above, personal to the *Purchaser* and is neither negotiable nor transferable;
   - shall be returned to the Bank upon the earlier of payment of the full Guaranteed Sum or expiry hereof;
   - shall be regarded as a liquid document for the purpose of obtaining a court order; and
   - shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the Courts of the Republic of South Africa.
   - will be invalid and unenforceable if any claim which arises or demand for payment is received after the Expiry Date.

9. The Bank chooses domicilium citandi et executandi for all purposes in connection with this Guarantee at the Bank's Address.

Signed at _____ on this _____ day of _____ 20__

For and on behalf of the Bank

Bank Signatories(s)		
Name(s) (printed)		
Witness(s)		
Bank's seal or stamp		

PART 2: PRICING DATA

Document reference	Title	No of pages
C2.1	Pricing instructions: Option B	35
C2.2	The *bill of quantities*	

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 (ECC) Option B states:

Identified and defined terms 11 11.2

(21) The Bill of Quantities is the *bill of quantities* as changed in accordance with this contract to accommodate implemented compensation events and for accepted quotations for acceleration.
(22) Defined Cost is the cost of the components in the Shorter Schedule of Cost Components whether work is subcontracted or not excluding the cost of preparing quotations for compensation events.
(28) The Price for Work Done to Date is the total of

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

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

(31) The Prices are the lump sums and the amounts obtained by multiplying the rates by the quantities for the items in the Bill of Quantities.

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

1.2. Function of the Bill of Quantities

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

1.3. Guidance before pricing and measuring

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

Historically bill of quantities based contracts in South Africa have been influenced by the different approaches of the civil engineering and building sectors of the industry through their respective discipline based standard forms of contract and methods of measurement. This is particularly apparent in the approach to the Preliminary and General bill. On the other hand, because ECC caters for a number of disciplines in the same contract, including electrical works, a different approach not currently found in local methods of measurement to the Preliminary & General bill items may have been used.

The NEC approach to the P & G bill assumes use will be made of method related charges for Equipment applied to Providing the Works based on durations shown in the Accepted Programme, fixed charges for the use of Equipment that is required throughout the construction phase, time related charges for people

working in a supervisory capacity for the period required, and lump sum charges for other facilities or services not directly related to performing work items typically included in other parts of the bill.

2. Measurement and payment

2.1. Symbols

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

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

2.2. General assumptions

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

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

2.2.2. 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.

2.3. Departures from the *method of measurement*

2.3.1.

2.4. Amplification of or assumptions about measurement items

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

2.4.1.

C2.2 the *bill of quantities*

Use this page as a summary page or as a cover page to the *bill of quantities*.

Trade	Total
Building works	
Electrical works	
Mechanical works	
Total carried forward to form of offer	

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT [R]
		BILL NO. 1				
		PRELIMINARY AND GENERAL ITEMS				
	SANS 1200 A	**SCHEDULED FIXED-CHARGE ITEMS**				
		NOTE				
		Tenderers are to price this Schedule strictly in accordance with the Specifications and SANS 1200, where a conflict arises between these two documents the Specifications shall take precedence. Where a conflict arises between this Schedule and the Specifications, the Specifications shall take precedence. Tenderers shall study the Drawings before pricing this Schedule and the Schedule shall be priced to provide the complete Works.				
	8.3.1	**CONTRACTUAL REQUIREMENTS:**				
1.1.1	8.3.1.a	Sureties	Sum	1		
1.1.2	8.3.1.b	Insurance of the works and plant	Sum	1		
1.1.3	8.3.1.c	Third party or public liability insurance	Sum	1		
1.1.4	8.3.1.d	Unemployment insurance	Sum	1		
1.1.5	8.3.1.e	Other	Sum	1		
	8.3.2	**ESTABLISHMENT OF FACILITIES ON THE SITE:**				
	8.3.2.2	**FACILITIES FOR CONTRACTOR**				
1.1.6	8.3.2.2.a	Offices and storage sheds	Sum	1		
1.1.7	8.3.2.2.b	Workshops	Sum	1		
1.1.8	8.3.2.2.c	Laboratories	Sum	1		
1.1.9	8.3.2.2.d	Living accommodation	Sum	1		
1.1.10	8.3.2.2.e	Ablution and latrine facilities	Sum	1		
1.1.11	8.3.2.2.f	Tools and equipment	Sum	1		
1.1.12	8.3.2.2.g	Water supplies, electric power and communications	Sum	1		
1.1.13	8.3.2.2.h	Dealing with water	Sum	1		
1.1.14	8.3.2.2.i	Access	Sum	1		
1.1.15	8.3.2.2.j	Plant	Sum	1		
		OTHER FIXED-CHARGE OBLIGATIONS				
1.1.16	8.3.3.a	a) Management meetings	Sum	1		
1.1.17	8.3.3.b	b) Documentation control	Sum	1		
1.1.18	8.3.3.c	c) Safety risk management	Sum	1		
1.1.19	8.3.3.d	d) Environmental management	Sum	1		
1.1.20	8.3.3.e	e) Quality assurance requirements	Sum	1		
1.1.21	8.3.3.f	f) Programming and progress reporting	Sum	1		
1.1.22	8.3.3.g	g) Industrial relations management	Sum	1		
1.1.23	8.3.3.h	h) Factory acceptance tests	Sum	1		
1.1.24	8.3.3.i	i) Site acceptance tests	Sum	1		
1.1.25	8.3.3.j	j) Other	Sum	1		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY		
		Brought Forward				
		REMOVAL OF SITE ESTABLISHMENT				
1.1.26	8.3.4	Removal of site establishment	Sum	1		
		SCHEDULED TIME-RELATED ITEMS				
	8.4.1	**CONTRACTUAL REQUIREMENTS**				
1.1.27	8.4.1.a	Sureties	Sum	1		
1.1.28	8.4.1.b	Insurance of the works and plant	Sum	1		
1.1.29	8.4.1.c	Third party or public liability insurance	Sum	1		
1.1.30	8.4.1.d	Unemployment insurance	Sum	1		
1.1.31	8.4.1.e	Other	Sum	1		
	8.4.2	**OPERATION AND MAINTENANCE OF FACILITIES**				
	8.4.2.2	**FACILITIES FOR CONTRACTOR**				
1.1.32	8.4.2.2.a	Offices and storage sheds	Sum	1		
1.1.33	8.4.2.2.b	Workshops	Sum	1		
1.1.34	8.4.2.2.c	Laboratories	Sum	1		
1.1.35	8.3.2.2.d	Living accommodation	Sum	1		
1.1.36	8.4.2.2.e	Ablution and latrine facilities	Sum	1		
1.1.37	8.4.2.2.f	Tools and equipment	Sum	1		
1.1.38	8.4.2.2.g	Water supplies, electric power and communications	Sum	1		
1.1.39	8.4.2.2.h	Dealing with water	Sum	1		
1.1.40	8.4.2.2.i	Access	Sum	1		
1.1.41	8.4.2.2.j	Plant	Sum	1		
		SUPERVISION FOR THE DURATION OF THE CONTRACT				
1.1.42	8.4.3	Supervision for the duration of the contract	Sum	1		
		COMPANY AND HEAD OFFICE OVERHEAD COSTS FOR THE DURATION OF THE CONTRACT				
1.1.43	8.4.4	Company and head office costs for the duration of the contract	Sum	1		
		OTHER TIME-RELATED OBLIGATIONS				
1.1.47	8.4.5.a	a) Management meetings	Sum	1		
1.1.48	8.4.5.b	b) Documentation control	Sum	1		
1.1.49	8.4.5.c	c) Safety risk management	Sum	1		
1.1.50	8.4.5.d	d) Environmental management	Sum	1		
1.1.51	8.4.5.e	e) Quality assurance requirements	Sum	1		
1.1.52	8.4.5.f	f) Programming and progress reporting	Sum	1		
1.1.53	8.4.5.g	g) Industrial relations management	Sum	1		
1.1.54	8.4.5.h	h) Factory acceptance tests	Sum	1		
1.1.55	8.4.5.i	i) Site acceptance tests	Sum	1		
1.1.56	8.4.5.j	j) Other	Sum	1		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY		
Brought Forward						
		GENERAL ITEMS				
	8.5	SUMS STATED PROVISIONALLY BY ENGINEER				
		For works to be executed by a nominated contractor (for the *Employer*)				
		a) Acceptance control testing				
1.1.57	8.5.a.i)	i) Testing by approved commercial laboratory	PS	1		
		b) Checking of As-Built information				
1.1.58	8.5.b.i)	i) Checking by independent Surveyor	PS	1		
	8.8	TEMPORARY WORKS				
1.1.59	8.8.2	Dealing with traffic	Sum	1		
1.1.60	8.8.3	Protection of the works and surrounding structures until construction in vicinity is complete	Sum	1		
	8.8.4	EXISTING SERVICES				
1.1.61	8.8.4.a	Supply (or hire) of specialist equipment for the detection of underground services	Sum	1		
1.1.62	8.8.4.b	Labour for the use of equipment for detection	Sum	1		
1.1.63	8.8.4.c	Excavation by hand to expose existing services	m^3	80		
1.1.64	8.8.4.d	Temporary protection of existing services	Sum	1		
Total Carried Forward to Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY		
		BILL NO 2				
		ALTERATIONS				
		PREAMBLES				
		The tenderer is referred to the "Model Preambles for Trades 2008" as published by the ASAQS.				
		SUPPLEMENTARY PREAMBLES				
		The Contractor is to develop (prior to site establishment) and implement a Waste Management Plan, retain all waste records, issue quarterly reports to the building owner and ensure that 50% minimum (by mass) of all demolition and construction waste is re-used or recycled. Soil, land clearing debris and hazardous waste are excluded from this target as well as total waste calculation. The WMP is to be signed and dated with the project name on the front cover and provided to the project team prior to site establishment for comment.				
		The Contractor is to provide a Hazardous Materials Survey, prior to site establishment and commencement of works, indicating whether all asbestos, lead and polychlorinated biphenyls and disposal requirements in accordance with the standards of the Occupational Health and Safety legislation and the Department of Water Affairs and Forestry: Minimum requirements for Handling, Classification and Disposal of Hazardous Waste are met.				
		At project completion, the Contractor is to provide disposal receipts confirming that all asbestos, lead and polychlorinated biphenyls have been removed and disposed of in accordance with the standards of the Occupational Health and Safety legislation and the Department of Water Affairs and Forestry: Minimum requirements for Handling, Classification and Disposal of Hazardous Waste.				
		The Contractor is to take note that all remaining material from the demolitions will remain the property of Transnet until advised otherwise				
		ENVIRONMENTAL MANAGEMENT PLAN & WASTE MANAGEMENT PLAN				
1		Environmental Management Plan (EMP)	Item	1		
2		Waste Management Plan (WMP)	Item	1		
		DEMOLITION AND REMOVAL OF EXISTING STRUCTURES				
		The following work comprises the demolition and removal of existing structures, including structural components, infills, applied finishes and sundries, complete (making good to existing structure and finishes elsewhere measured)				
		NOTE: The tenderer is advised that there could be asbestos products in the existing buildings.				
		NOTE: The tenderer is to take into account in pricing that the demolitions is to include for the safe removal and disposal of these products and all associated costs and charges				
3		Sampling and testing for asbestos	Item	1		
4		Taking down and removing Astebes corrugated sheeting roof size approximately 15 x 16.710m overall extreme on plan (approximately 164m², complete, including timber roof trusses, eaves construction, rainwater gutters and connecting downpipes, carefully removing all fixings, etc.	Item	1		
		CUTTING THROUGH FLOORS AND CEILINGS				
		Cutting through				
5		200mm Thick unreinforced concrete surface bed for 300mm wide concrete wall footings and making good concrete on both sides of new one brick walls	m	100		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY		
		Brought Forward				
		REMOVAL OF EXISTING WORK				
		Breaking down and removing brickwork etc				
6		Half brick wall	m^2	12		
7		230mm Brick wall	m^2	24		
		Taking out and removing doors, windows, etc from brickwork to be demolished				
8		Timber single door and frame not exceeding 2,5m2	No	5		
		Carefully taking out and removing aluminium and steel windows, and opening to be built up with bricks (elsewhere measured)				
9		Aluminium window size approximately 5780 x 2032 high	No	1		
		Taking down and removing roofs, floors, panelling, ceilings, partitions, etc				
10		Gypsum plasterboard ceilings including cornices, timber brandering, etc	m^2	251		
		Hacking up/off and removing ceramic tile floor and wall finishes including removing mortar bed or backing and preparing concrete or brick surfaces for new screed, plaster or tile finishes				
11		200 x 200mm white glazed tiles on walls	m^2	109		
12		300 x 300mm ceramic tile on floors	m^2	24		
		Taking out and removing piping, sanitary fittings, etc including disconnecting piping from fittings and making good floor and wall finishes (making good tiling and paintwork elsewhere)				
13		Vitreous china wash hand basin	No	2		
14		Vitreous china WC pan with flushmaster	No	4		
15		Urinals	No	3		
		OPENINGS THROUGH EXISTING WALLS, ETC.				
		Breaking out for and forming openings through brick walls for new doors and frames (new doors and frames and making good finishes elsewhere):				
16		Opening for door with timber frame size approximately 900 x 2100mm high overall through 230mm wall	No	1		
		Extra over for carting away				
17		Cart away all rubish, ruble and all none reusable material to the nearest dumpsite located by the contractor	m^3	28		
18		Cart away and dispose the removes Asbestos all rubish, ruble and all none reusable material to the nearest dumpsite located by the contractor	m^3	30		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 3				
		CONCRETE, FORMWORK AND REINFORCEMENT				
		PREAMBLES				
		The tenderer is referred to the "Model Preambles for Trades 2008" as published by the ASAQS.				
		SUPPLEMENTARY PREAMBLES				
		Costs of tests				
		The costs of making, storing and testing of concrete test cubes as required under clause 7 "Tests" of SABS 1200 G shall include the cost of providing cube moulds necessary for the purpose, for testing costs and for submitting reports on the tests to the Engineer. The testing shall be undertaken by an independent firm or institution nominated by the contractor and to the approval of the Engineer. (Test cubes are measured separately)				
		Formwork				
		Descriptions of formwork shall be deemed to include use and waste only (except where described as "left in" or "permanent"), for fitting together in the required forms, wedging, plumbing and fixing to true angles and surfaces as necessary to ensure easy release during stripping and for reconditioning as necessary before re-use.				
		The vertical strutting shall be carried down to such construction as is sufficiently strong to afford the required support without damage and shall remain in position until the newly constructed work is able to support itself.				
		Formwork to sides of bases, pile caps, ground beams, etc will only be measured where it is prescribed by the engineer for design reasons. Formwork necessitated by irregularity or collapse of excavated faces will not be measured and the cost thereof shall be deemed to be included in the allowance for taking the risk of collapse of the sides of the excavations, provision for which is made in "Earthworks"				
		REINFORCED CONCRETE				
		30MPa/19mm concrete				
1		Strip Foundations	m^3	8		
2		concrete slab	m^3	22		
3		Ramps and stairs	m^3	14		
		PRECAST CONCRETE SLABS				
		CONCRETE SUNDRIES				
		Finishing top surfaces of concrete smooth with a wood float				
4		Ramps and stairs	m^2	68		
		SMOOTH FORMWORK (DEGREE OF ACCURACY II)				
		Smooth formwork to sides				
5		Edges, risers, ends and reveals not exceeding 300mm high or wide (Provisional)	m	39		
		REINFORCEMENT (PROVISIONAL)				
		High tensile steel reinforcement to structural concrete work				
6		Ref 395 mesh reinforcing	m^2	68		
		SAW CUT JOINTS				
7		10 x 2mm Saw-cut joints in top of concrete	m	100		
Total Carried Forward to Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 4				
		MASONRY				
		PREAMBLES				
		The tenderer is referred to the "Model Preambles for Trades 2008" as published by the ASAQS.				
		BRICKWORK				
		Sizes in descriptions				
		Where sizes in descriptions are given in brick units, "one brick" shall represent the length and "half brick" the width of a brick				
		SUPERSTRUCTURE				
		Brickwork of NFP bricks (14MPa nominal compressive strength) in class II mortar				
1		Half brick walls	m^2	40		
2		One brick walls	m^2	37		
		BRICKWORK SUNDRIES				
		Brickwork reinforcement				
3		75mm Wide reinforcement built in horizontally	m	72		
4		150mm Wide reinforcement built in horizontally	m	52		
		FACE BRICKWORK				
		Corobrik Country Classic Satin' face bricks pointed with recessed horizontal and vertical joints				
5		Extra over for face brick.	m^2	19		
		Corobrik Country Classic Satin' face bricks pointed with recessed horizontal and vertical joints				
6		Extra over brickwork for brick-on-edge header course lintels, pointed on face and 230mm soffit.	m	10		
		Prestressed fabricated lintels				
7		110 x 75mm Lintol not exceeding 3m long laid over openings, including temporary support	m	14		
		Galvanised hoop iron cramps, ties, etc				
8		30 x 1,6mm Wall tie 500mm long with one end shot pinned to existing brick wall and other end built into brickwork	No	54		
Total Carried Forward to Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 5				
		PRECAST CONCRETE				
		PREAMBLES				
		Sizes				
		Blocks, sills, etc measured linear shall be made in suitable lengths. Large size setting out drawings shall be prepared where necessary and submitted to the principal agent for approval before moulds are made				
		General				
		800 Where kerbstones, blocks, etc are laid in ground descriptions shall be deemed to include necessary excavation, filling in and ramming				
		PRECAST CONCRETE SLABS ETC				
1		3000 x 2000 x 150mm Thick cover slab including bedding edges all round ontop of the the gun room	No	1		
		Precast concrete finished smooth on exposed surfaces, including bedding, jointing and pointing				
2		150 x 300mm High kerbs (SANS 927 fig 3) with 150 x 150 x 300mm unreinforced concrete haunching at back of each joint, including excavation, backfilling, etc	m	280		
Total Carried Forward to Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 7				
		WATERPROOFING				
		PREAMBLES				
		Waterproofing of roofs, basements, etc shall be laid under a ten year guarantee. Waterproofing to roofs shall be laid to even falls to outlets etc with necessary ridges, hips and valleys. Descriptions of sheet or membrane waterproofing shall be deemed to include additional labour to turn-ups and turn-downs				
		DAMPPROOFING OF WALLS AND FLOORS				
		WATERPROOFING TO ROOFS, BASEMENTS, BALCONIES, ETC				
		One layer of 250 micron "Consol Plastics Gunplas USB Green" or similar approved waterproof sheeting sealed at laps with "Gunplas Pressure Sensitive Tape"				
3		On roofs	m^2	318		
Total Carried Forward to Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 7				
		ROOF COVERINGS ETC				
		PREAMBLES				
		The tenderer is referred to the "Model Preambles for Trades 2008" as published by the ASAQS.				
		SUPPLEMENTARY PREAMBLES				
		Straight cutting				
		Descriptions of all roof coverings are deemed to include for all straight and circular cutting and waste				
		PROFILED METAL SHEETING AND ACCESSORIES				
		klip-tite 700 roll-formed concealed fix sheeting manufactured from isq 550 galv steel, colour: chromadek dove grey n13639. purlin spacing as per manufacturers spec. all flashings to be in accordance with the product. fixed to timber intermediate 50x38mm purlins, side laps to be secured using 6 x 20mm aluminium seam bolts over purlins and at centres not exceeding 500mm between purlins with minimum 230mm end laps sealed with double row of sealing tape, all in accordance with manufacturer's recommendation. all timber members to sabs approved, roof trusses				
1		Roof covering	m^2	318		
2		Ridge capping	m	34		
3		Side wall flashing	m	54		
4		Allow a sum of R 65 000.00 (Sixty five thousand rands) for designing, supplying fixing and installing timber trusses	item	1		
Total Carried Forward to Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 8				
		CARPENTRY AND JOINERY				
		PREAMBLES				
		The tenderer is referred to the "Model Preambles for Trades 2008" as published by the ASAQS.				
		SUPPLEMENTARY PREAMBLES				
		Joinery				
		Descriptions of frames shall be deemed to include frames, transomes, mullions, rails, etc.				
		Unless otherwise specified all exposed timber to be planed and sanded smooth and to be in selected hardwood meranti				
		Fixing				
		Items described as "nailed" shall be deemed to be fixed with hardened steel nails or shot pins to brickwork or concrete.				
		Descriptions of hardwood joinery shall be deemed to include pelleting of bolt holes.				
		All sections of timber to be built into brickwork or concrete to be wrapped in Gunplas and the cost is deemed to be included in the relevant item.				
		SKIRTINGS				
		Wrot meranti				
1		10 X 8mm Meranti glaze beading	m	156		
		ROOFS ETC				
2		Timber gangnail trusses with bracing and roof fixing to eaves beams	m2	3		
		EAVES AND VERGES				
2		Allow provisional sum for closed eaves	P.sum	1		
		DOORS, ETC				
		Purpose made solid timber doors hung to timber frames:				
3		44mm thick solid timber hardwood doors 820 x 2080mm high	No	1		
4		44mm thick solid timber hardwood double door doors 1640 x 2080mm high	No	2		
		Hollow core flush doors with comercial veneer				
5		Interior Hollow core door plain hard board	No	8		
		Bitcon Industries Rubicor or similar approved fire doors with masonite veneer hung to companion 1.6mm hot dipped galvanised frames:				
6		Class B fire door 1020 x 2635mm high overall including pressed steel frame and preparing frame for door closer and lock as per architects specification	No	2		
		FRAMED FRAMES ETC				
		Purposed made wrought meranti				
7		76 x 108mm Frames for single door 820 x 2080mm high plugged to brickwork as per architects drawing	No	9		
8		1.6mm Steel Frames for Double door 2032 x 1613 x 40mm plugged to brickwork as per architects drawing	No	2		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		Total Brought Forward				
		JOINERY FITTINGS (furniture)				
		Joinery work				
8		office chairs as specified on the scope of works	no	2		
9		10 Seater Solid wood boardroom table as specified on the scope of works	no	1		
10		Boadroom chair as specified on the scope of works	no	4		
		Food lockers:				
11		Metal storage lockers LMT004	no	2		
		Clothing lockers:				
12		Metal storage lockers LMT001	no	6		
		Kitchen cupboard and countertop				
14		Kitchen cupboard and countertop	no	1		
		Control room desks:				
15		Control room desks	no	1		
16		Gaming chair as specified on the scope	no	2		
Total Carried Forward to Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 9				
		CEILINGS, PARTITIONS AND ACCESS FLOORING				
		PREAMBLES				
		The tenderer is referred to the "Model Preambles for Trades 2008" as published by the ASAQS.				
		SUPPLEMENTARY PREAMBLES				
		Descriptions				
		Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins or shot pinned to brickwork or concrete.				
		Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 600mm centres, and where described as "bolted", the bolts have been given.				
		Boards must be stacked on a level surface in a dry place on a timber platform. Boards must be carried on edge.				
		Skimmed ceilings must be plastered the same day that the 'Rhinoboard' has been erected.				
		Steel Components				
		All steel components for ceilings, partitions, etc are to be galvanised in accordance with SANS 121				
		Electrical light fittings, diffusers, panels, etc generally are "lay in" units of the same dimensions as the suspension grid described and allowance must be made accordingly for their support inclusive of any flexibility insetting out that may be required (ceiling panels have not been deducted and pricing is to take cognisance thereof)				
		NAILED-UP CEILINGS Openings				
		Prices for openings for light fittings, ventilation grilles, air conditioning diffusers, etc are to include for any necessary additional support, trimming around, etc				
		suspended ceiling				
1		595 x 595 Thick straight edge embosed white vinyl clad Nutec tiles laid on double stitched slotted white T38 main tees (code :685-292) at 1200mm centres and white T25 cross teesat centres including all necessary grids, suspension plates, clips and holding down clips. see ceiling drawing 000182R-2-182-A-DE-0001-01-2TD	m²	251		
2		GYPROC RHINOCEIL premier S Flush plastered ceiling 12,5mm thick taper-edge Rhinoboard fixed print side up and screwd down to donn T37k screw up ceiling grid with drywall screws spaced at 150mm centres. see ceiling drawing 000182R-2-182-A-DE-0001-01-2TD	m²	75		
3		2mm THICK NUTEC FC PLANKS FIXED AS PER MANUFACTURERSSPECIFICATION TO TIMBER PURLINS AND RAFTERS. PREPARE, PRIME AND PAINT WITH MIN 2 FINISHING COATS DULUX. see ceiling drawing 000182R-2-182-A-DE-0001-01-2TD	m²	8		
		PARTITIONS ETC				
		FIXED PARTITIONS				
4		Allow provisional sum of R 36 000.00 (Thirty Six Thousand Rands) for video wall	item	1		
		GypRoc Standard System Steel stud partitions with both sides clad with one layer of 12,5 taper -edge rihnoboard				
5		Partitions 2.3m high with bottom and top tracks plugged	m	12		
		ACCESS FLOORING				
6		Allow provisional sum of R 160 000.00 (One Hundred and Sixty Thousand Rands) for access flooring for the server room and control room	item	1		
Total Carried Forward to Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 10				
		FLOOR COVERINGS, WALL LININGS, ETC				
		PREAMBLES				
		Fixing				
		Floor coverings, wall linings, etc shall, where applicable, be fixed with adhesive as recommended by the manufacturers of the flooring, linings, etc				
		FLOOR COVERING				
		Carpet tiles				
1		500x500 nexus synergy laid in monolithic format in accordance with manufacturers specification. colour : fallow	m^2	69		
		Granolythic screed				
2		apply granolythic screed on floors as per drawing	m^2	72		
		rubber mats				
3		600x600 pvc heavy duty interlock rubber mats in accordance with manufacturers specification. colour : black	m^2	57		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 11				
		IRONMONGERY				
		PREAMBLES				
		The tenderer is referred to the "Model Preambles for Trades 2008" as published by the ASAQS.				
		SUPPLEMENTARY PREAMBLES				
		Finishes to ironmongery				
		The tenderer is referred to the Architect's door and window schedule as issued with these bills of quantities for tendering purposes.				
		Where applicable finishes to ironmongery are indicated by suffixes in accordance with the following list:				
		BS Satin bronze lacquered CH Chromium plated				
		SC Satin chromium plated				
		SE Silver enamelled				
		SS Stainless steel				
		GE Grey enamelled				
		AS Anodised silver				
		AB Anodised bronze				
		AG Anodised gold				
		ABL Anodised black				
		PB Polished brass				
		PL Polished and lacquered				
		PT Epoxy coated				
		SD Sanded				
		SUPPLY AND FIX THE FOLLOWING IRONMONGERY				
		HINGES, BOLTS, ETC				
		Dorma':				
1		Dorma 102x75x3mm SS four ball bearing butt hinge dbb-ss-009	Pairs	11		
2		HBFMF Hinges by fire door manufacturer	Pairs	2		
		LOCKS				
		Dorma or similar approved				
3		SS euro-profile sash lock case (D036S)	No	13		
4		43mm Masterkeyed single cylinder lock (DSC104201)	No	2		
5		DH20/S Dorma PHB2/S Two-point locking panic bar	No	1		
		PUSH PLATES AND KICKING PLATES				
6		170x170 SS plate with cylinder cut out (th120/bp)	No	3		
Total Carried Forward to Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		DOOR CLOSERS				
		Dorma' or similar approved				
7		Parallel arm door closer with delayed action (TS83/EN2-6)	No	8		
		HANDLES				
		Dorma' or similar approved				
8		SS lever handles with rose and cylinder hole escutcheons (SH810)	Sets	10		
		BLINDS, FIRE CURTAINS, ETC.				
9		2600 x 1500mm high venetian plaswood blind	No	7		
		SUNDRIES				
		Dorma' or similar approved				
10		SS door stop (dds-ss-017)	No	2		
		Franke or similar approved				
11		SS wall mounted toilet roller holder (Code RODX672)	No	3		
12		Waste disposal bin strx 605 product (code 359730)	No	1		
13		Hands free soap dispenser hf950 sd	No	3		
14		Hands-free hand dryer hf2400 hd product (code 359961)	No	3		
15		Paper towel dispenser strx 600 product (code 359700)	No	3		
		Vaal or similar approved				
16		Grab rail 8939z000	No	1		
		SIGNAGE & SUNDRY IRONMONGERY				
		Sundry Signage & Ironmongery				
17		Allow provisional sum for signage	P.sum	1		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 12				
		PLASTERING				
		PREAMBLES				
		The tenderer is referred to the "Model Preambles for Trades 2008" as published by the ASAQS.				
		SUPPLEMENTARY PREAMBLES				
		Preparation of surfaces				
		Surfaces shall be dry and clean, free of dust, sand, grit and flaking particles, laitance and loose matter, contaminants such as oil, grease, etc. Surfaces shall have a moisture content not exceeding 4 %. All free standing water to be removed prior to application of primers or compounds. Absorbent surfaces to be thoroughly pre-soaked in fresh water. Oil, grease, animal fats, etc. to be removed with suitable 'Ivory Chemicals' product to be applied in strict accordance with the manufacturer's instructions. Once clean, surfaces to be profiled mechanically (scrabbling, blasting, scarifying, chipping or grinding) or by means of acid etching (one part 'Ivory Concrete Etchant' thinned with two parts water applied at the rate of 2m²/1 litre in strict accordance with the manufacturer's instructions).				
		Generally substrate surfaces to have good wood float, steel trowel or power floated finish conforming in evenness and level to required tolerance with minimum compressive strength of 20MPa or above 25 N/mm² compressive strength. Screeded surfaces to be minimum 30mm thick.				
		Expansion joints in Granolithic screed finish to be approved polysulphide sealant, laid at 5m² apart in strict accordance with manufacturer's specifications.				
		SCREEDS				
		TAL Screedmaster or similar approved self levelling screed strictly in accordance with the manufacturer's specification				
1		25mm Thick on floors and landings	m²	36		
		INTERNAL PLASTER				
		One coat cement plaster on brickwork				
2		On walls	m²	120		
3		On narrow widths	m²	12		
		Gypsum skim plaster on previously painted walls				
4		On walls	m²	10		
5		On narrow widths	m²	3		
Total Carried Forward to Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 13				
		TILING				
		PREAMBLES				
		The tenderer is referred to the "Model Preambles for Trades 2008" as published by the ASAQS.				
		SUPPLEMENTARY PREAMBLES				
		Descriptions				
		Unless described as "fixed with adhesive to plaster (plaster elsewhere)" descriptions of tiling on brick or concrete walls, columns, etc shall be deemed to include 1:4 cement plaster backing and descriptions of tiling on concrete floors etc shall be deemed to include 1:3 plaster bedding.				
		Tiling to have matching aluminium edging to all exposed tile edges and corners				
		WALL TILING				
		600 x 600mm porcelain tiles, trim (code AFQE120). fixed with adhesive to plaster (plaster elsewhere measured) and flush pointed with jointing compound: see drawing 000182R-2-182-A-SC-0003-01-2TD				
1		On walls	m^2	104		
2		On narrow widths	m^2	12		
		FLOOR TILING				
		600 x 600mm porcelain tiles, DARC9678MG as per ferreiras. fixed with adhesive to plaster (plaster elsewhere measured) and flush pointed with jointing compound: see drawing 000182R-2-182-A-SC-0003-01-2TD				
3		On floors	m^2	125		
		300x300 Quarry tiles, DARC9833MG & DARC9836MG, as per ferreiras. natural stone tiles to exterior woodfloated render. apply tal gold star 6 rapid setting adhesive mixed 20kg with approximately 5 litres of tal bond (replacing the water in the mix) using a tal notched trowel. Refer to drawing 000182R-2-182-A-SC-0003-01-2TD				
4		On floors	m^2	8		
		DIVIDING STRIPS, EDGE TRIMS, ETC				
5		Aluminium edge trim on walls	m	11		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 14 **PLUMBING AND DRAINAGE (PROVISIONAL)** **PREAMBLES** The tenderer is referred to the "Model Preambles for Trades 2008" as published by the ASAQS. **PROVISIONAL MEASUREMENT** This trade is measured provisionally and will be subject to remeasurement on completion. **SUPPLEMENTARY PREAMBLES** **Polycop polypropylene pipes** Polypropylene pipes 54mm diameter and under shall be seamless copper coloured class 16 pipes jointed with "Fast-fuse" heat welded thermoplastic or brass compression fittings as designed for use with copper pipes as stated Pipes shall be firmly fixed to walls etc with coloured nylon snap-in pipe clips with provision for accommodating thermal movement and jointed and fixed strictly in accordance with the manufacturer's instructions All pipe diameters are nominal external **uPVC pipes and fittings** Sewer and drainage pipes and fittings shall be jointed and sealed with butyl rubber rings Soil, waste and vent pipes and fittings shall be solvent weld jointed **Copper pipes** Pipes shall be hard drawn and half-hard pipes of the class stated. Class 0 (thin walled hard drawn) pipes shall not be bent. Class 1 (thin walled half-hard), class 2 (half-hard) and class 3 (heavy walled half-hard) pipes shall only be bent with benders with inner and outer formers. Fittings to copper waste, vent and anti-syphon pipes, capillary solder fittings and compression fittings shall be "Cobra Watertech" type. Capillary solder fittings shall comply with ISO 2016. Only compression fittings shall be used in walls or in ground **Reducing fittings** Where fittings have reducing ends or branches they are described as "reducing". In the case of pipes with diameters not exceeding 60mm only the largest end or branch size is given. Should the contractor wish to use other fittings and bushes or reducers he may do so on the understanding that no claim in this regard will be entertained. In the case of pipes with diameters exceeding 60mm all sizes are given and no claim for extra bushes, reducers, etc will be entertained **Exposed concrete surfaces** Exposed surfaces of concrete stormwater channels, cover slabs, inspection eye marker slabs, gulley tops, cleaning eye tops, catchpits, inspection chambers, etc shall be finished smooth with plaster **Excavations** No claim for rock excavation will be entertained unless the contractor has timeously notified the quantity surveyor thereof prior to backfilling Soft rock and "hard rock" shall be as defined in "Earthworks" **Laying, backfilling, bedding, etc. of pipes**				
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		Total Brought Forward				
		Pipes shall be laid and bedded and trenches shall be carefully backfilled in accordance with manufacturers' instructions Where no manufacturers' instructions exist pipes shall be laid in accordance with clauses 5.1 and 5.2 of each of the following: SABS 1200 L : Medium-pressure pipelines LD : Sewers LE : Stormwater drainage Pipe trenches etc shall be backfilledin accordance with clauses 3, 5.5, 5.6, 5.7 and 7 of SABS 1200 DB : Earthworks (Pipe trenches) Pipes shall be bedded in accordance with clauses 3.1 to 3.4.1, 5.1 to 5.3 and 7 of SABS 1200 LB : Bedding (Pipes). Unless otherwise described bedding of rigid pipes shall be class B bedding **Fixing of pipes** Unless specifically otherwise stated, descriptions of pipes shall be deemed to include fixing to walls, etc, casting in, building in or suspending not exceeding 1m below suspension level **Flush pans** Flush pans shall have straight or side outlets and "P" or "S" traps as necessary **Waste unions** Descriptions of waste unions shall be deemed to include rubber or vulcanite plugs and chains fixed to fittings **Sealing of edges** Outer edges of sinks, basins, shower trays, urinals, shower doors etc are to be sealed against adjacent surfaces with "Dow Corning 785" or similar approved silicone sealant deemed included **Tests** All WCs to be flush tested and ensure that the correct level has been set and that the overflow tube and height conform to/operates according to local by-laws/SABS specifications **SANITARY FITTINGS** Sanitary fittings to be supplied and installed as per sanitary schedule reference 000182-R-2-182-A-SC-0003-01-2-TD Vaal Sanitary vitrous china 510 x 405mm rounded Hibiscus basin with 3 semi punched holes, intergrated overflow and chain stay hole through the centre				
1		wash hand basin Vaal sanitary vitreous china "hibiscus elite" close coupled 90 degrees outlet open rim single flush suit complete withlid and fitment	No	4		
2		water closet Vaal Sanitary ware vitreous china "pearl Paraplegic" semi close coupled 90 degrees outlet open rim washdown pan and matching 9 litres cistern complete with lid	No	3		
3		water closet	No	1		
Total Carried Forward to Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		Total Brought Forward				
		Franke Nouveau single bowl stainless steel Model S2 sink size 1000 X 450mm wide				
4		Sink	No	1		
		Franke Stella undermount prep sink stainless steel Model S2 sink size 450 X 450mm wide				
5		Sink	No	1		
		TAPS, VALVES, ETC				
		Franke or similar approved				
6		Flatbed basin : cobra pillar spout showerfare wall mounted spout (code: 066tu/pt210), sabs 1808-9 compliant and connected to 15mm cold water supply. cobra watertech melia chrome 15mm c x c inlet and outlet underwall stoptaps (code: me-238-15	No	2		
7		basin : cobra watertech 20mm ixion wall mounted basin outlet with 150mm throw in chrome code (066tu/wt150cp). cobra watertech melia chrome 15mm c x c inlet and outlet underwall stoptaps (code: me-238-15)	No	1		
8		Cobra watertech 20mm exposed wc junior flushmaster flushvalve with straight chrome plated top entry flushpipe, compression pan connector, wall flange, rubber seat buffer, integral vacuum breaker and "ball-o-stop" control inlet (code: fj2.210)	No	1		
9		sink mixer : cobra watertech noka 15mm chrome plated deck mounted sink mixer with overarm swivel outlet and adjustable flanges (code: na-970), manufactured in accordance with sans 226:2004 type 1 (bs 5412).	No	1		
10		Shower head : franke aquajet-slimline 359747 with cobra watertech melia chrome 15mm c x c inlet and outlet underwall stoptaps (code: me-238-15	No	1		
11		Cobra watertech melia chrome pillar tap (Code: ME-214-15)	No	1		
12		cobra watertech 15mm chrome plated square pattern elbow action pillar tap with aerator with blue indicator for cold water (code: 505-21b), manufactured in accordance with sans 226:2004 type 2 (bs 5412)	No	1		
		RAINWATER GOODS				
13		Allow provisional sum for Rainwater Disposal/Stormwater	P.sum	1		
		SANITARY PLUMBING				
14		Allow provisional sum for sanitary plumbing	P.sum	1		
		SOIL DRAINAGE				
15		Allow provisional sum for soil drainage	P.sum	1		
		ELECTRIC WATER HEATERS				
		Kwikot or similar approved				
16		underbasin 15 litre geyser prx-10-ub	No	1		
		Zip Hydroboil' or similar approved				
17		3 Litre White powdered coated hot water heater (code 1330212)	No	1		
		BUILDERS WORK				
18		Allow the a provisional sum of R 18 000.00 (eighteen thousand rand) for supply and install sanitary ware taps and unions, including chasing fixing and making good	Item	1		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 15				
		PAINTWORK				
		PREAMBLES				
		The tenderer is referred to the "Model Preambles for Trades 2008" as published by the ASAQS.				
		SUPPLEMENTARY PREAMBLES				
		General				
		All paints shall be SABS approved				
		SURFACE PREPARATION:				
		Ensure that surfaces are dry, sound and clean.				
		Remove any hollow and soft/underbound plaster and replaster.				
		Remove dirt and loose particles.				
		Remove any oil, grease and other contaminants with Plascon Metalcare Aquasolv Degreaser (GR 1) working it well into affected areas with bristle broom or brush. Leave for 20 minutes to react, then rinse thoroughly with fresh water to remove all traces of Plascon Metalcare Aquasolv Degreaser (GR1), using high pressure water jet or scrubbing with brush or broom. Allow to dry completely.				
		Fill cracks and other surface defects with the appropriate Polycell filler- refer Surface Preparation, SP4 Crack Repair.				
		PAINTWORK, ETC TO NEW WORK				
		ON FLOATED PLASTER				
		One Coat "Plascon Professional Gypsum and Plaster Primer (PP 700)" Plaster Primer and two coats "Plascon Professional Superior Low Sheen" exterior acrylic paint (Colour)				
1		On internal walls	m²	682		
		ON PLASTER BOARD				
		One Coat "Plascon Professional Gypsum and Plaster Primer (PP 700)" Plaster Primer and two coats "Plascon Professional Superior Low Sheen" exterior acrylic paint (Colour)				
2		On partitions (video wall)	m²	55		
3		Ceiling	m²	240		
		ON WOOD				
		Two coats wood primer				
4		On backs of frames, linings, etc not exceeding 300mm wide	m²	8		
		One coat "Plascon Professional wood primer (PP800), and two coats "Plascon" Waterbased Velvaglo (VLW) paint (Colour)				
5		On doors	m²	16		
6		On door frames	m²	6		
		PAINTWORK ETC TO PREVIOUSLY PAINTED WORK				
		ON FLOATED PLASTER One Coat "Plascon Professional Gypsum and Plaster Primer (PP 700)" Plaster Primer and two coats "Plascon Professional Superior Low Sheen" exterior acrylic paint (Colour)				
7		On walls	m²	149		
Total Carried Forward to Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 16				
		METALWORK				
		SUPPLEMENTARY PREAMBLES				
		Descriptions of bolts, anchors, etc				
		Descriptions of bolts shall be deemed to include nuts and washers				
		Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete				
		Items described as "holed for bolt(s)" shall be deemed to exclude the bolts unless otherwise described				
		Aluminium doors, windows, etc				
		Doors and windows shall comply with AAAMSA design criteria				
		Glazing shall comply with SAGGA regulations. Glass shall be type ? laminated performance glass as shown on the window schedules/drawings appended to these bills of quantities (as described in the headings to window descriptions?). Glass thickness shall comply with SAGGA regulations irrespective of thicknesses shown on the schedules/drawings				
		Doors and windows shall be supplied with protective tape and plastic and shall be removed only once surrounding trades have been completed				
		For purpose made windows and doors, refer to drawings annexed to (000182R-2-182-A-SC-0002-01-2TD)issued separately with these bills of quantities				
		ALUMINIUM WINDOWS				
		All windows to be epoxy powder coated charcoal grey.				
		Powder coated casement window units as per "drawing 000182R-2-182-A-SC-0002-01-2TD" complete with subframes, ironmongery, glass, sealing, etc and fixing to brickwork or concrete				
1		W1 : Standard window sections as per Wispeco casement 340 series amin surround and intermediate frmaes to be 32mm wide	No	4		
2		W2 : Standard window sections as per Wispeco casement 340 series amin surround and intermediate frmaes to be 32mm wide	No	2		
3		W3 : Standard window sections as per Wispeco casement 340 series amin surround and intermediate frmaes to be 32mm wide	No	6		
4		W4 : Standard window sections as per Wispeco casement 340 series amin surround and intermediate frmaes to be 32mm wide	No	4		
		ALUMINIUM DOORS All Doors to be powder coated charcoal grey.				
		Powder coated sliding doors as per "drawing 000182R-2-182-A-SC-0002-01-2TD" system, complete with subframes, ironmongery, glass to include sand blast with the transnet logo as shown on drawing ,luvres, sealing, etc and fixing to brickwork or concrete				
5		SF01 Frame as approved by manufacture	No	1		
6		SF02 Frame as approved by manufacture	No	1		
7		SF03 Frame as approved by manufacture	No	1		
8		SF04 Frame as approved by manufacture	No	1		
9		SF05 Frame as approved by manufacture	No	1		
10		SF06 Frame as approved by manufacture	No	1		
Total Carried Forward to Summary						

BILL No	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		Total Brought Forward				
		BILL NO 17				
		EXTERNAL WORKS				
		LANDSCAPING				
		Refer to the landscape architect's specification annexed to these bills of quantities which is supplementary to and shall take precedence over the "Model Preambles for Trades"				
		Allow a provisional sum of R 50 000.00 (fifty thousand rands) for landscaping, including profits and attendance	item	1		
		ROADWORK, PARKING AREAS AND PAVING				
		SUPPLEMENTARY PREAMBLES				
		Testing of material and filling				
		Descriptions of earth filling, compaction, etc shall be deemed to include for all necessary testing required in accordance with the SABS 1200 series				
		Precast concrete block road surfacing				
		Paving shall be laid in accordance with SABS 1200 MJ, SANS 1058 and the Concrete Masonry Association's specifications				
		Clean sand shall be swept into joints between roadstones at completion				
		Site clearance				
		Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth	m^2	1,225		
		Open face excavation to form platforms under parking areas etc and depositing excavated material over site, including haulage not exceeding ?m from perimeter of excavations	m^3	39		
		Extra over all excavations for carting away				
		Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor	m^3	20		
		Earth filling supplied by the contractor under parking areas, roadways, etc				
		150mm Rip and compact insitu material to 98% Mod AASHTO density	m^2	1,225		
		Filling of C2 material in accordance with SABS 1200 DM, compacted to 98% Mod AASHTO density	m^3	79		
		Base course of crushed stone in accordance with SABS 1200 ME, compacted to 100% of apparent density (PI<6, maximum, TRH14-G1)	m^3	184		
		Bituminous premix road surfacing				
		30mm Thick paving to parking areas, roadways, etc including bitumin spray to base course	m^3	37		
		Precast concrete finished smooth on exposed surfaces, including bedding, jointing and pointing				
		150 x 300mm High kerbs (SANS 927 fig 3) with 150 x 150 x 300mm unreinforced concrete haunching at back of each joint, including excavation, backfilling, etc	m	300		
		Paintwork				
		Prepare and apply one coat white reflective road marking paint on bituminous road surfacing, precast concrete paving blocks, etc				
		100mm Wide line m Not Priced	m	220		
		?mm Letter	No	4		
Total Carried Forward to Final Summary						

BILL No	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		CONCRETE STORMWATER CHANNELS				
		Excavation in earth not exceeding 2m deep for channels	m^3	16		
		Risk of collapse of sides of excavations not exceeding 1,5m deep	m^2	108		
		30MPa/300mm reinforced concrete in bottoms and sides of channels	m^3	27		
		Rough formwork to sides of channels	m^2	108		
		EXTERNAL WORKS				
		FENCING				
		Refer to Drawing BETAVIEW 3D 3510-8 SYSTEM 2400MM - SEC00800004 for all fenc				
		Fence 2398m high of standards at not exceeding 3083mm centres with type shown on drawing droppers at not exceeding 3083mm centres in between	m	140		
		Extra over for 400mm diameter inclined stay 3083m long, including concrete base	No	47		
		Gate				
		Gate 7500 x 2398m high of of the betaview gate, refer to drawing provided	No	1		
		Extra over for 400mm diameter straining or gate post 7500m long, including concrete base	No	2		
Total Carried Forward to Final Summary						

BILL No	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		BILL NO 18				
		BUDGETARY ALLOWANCE				
1		Allow a sum of R 120 000.00 (one hundred and twenty thousand) for supply and install carport as specifies on drawing number 000182-R-2-182-A-DE-001-01-2TD including concrete bases	item	1	R120,000.00	R120,000.00
2		Allow a sum of Two Hundred Thousand (R 200 000) for furniture as per Architech's specification	item	1	R200,000.00	R200,000.00
3		Allow a provisional sum of 140 000.00 (one hundred and forty) for Design supply and install burglar guard on the roof to prevent break-ins from roof	item	1	R140,000.00	R140,000.00
Total Carried Forward to Final Summary						

BILL	DESCRIPTION	AMOUNT R
	SUMMARY	
1	Preliminaries and generals	
2	Alterations	
3	Concrete Formwork and reinforcement	
4	Masonry	
4	Precast concrete	
5	Waterproofing	
6	Roof coverings	
7	Carpentry and joinery	
8	Ceiling, Partition and accessflooring	
9	Floor covering	
10	Ironmongery	
11	Platering	
12	Tiling	
13	Plumbing and drainage	
14	Paintwork	
15	Metal works	
16	External works	
17	Budgetary allowances	
	Total	

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT [R]
		BILL NO. 1				
		ELECTRICAL INSTALLATION				
1		**Offices**				
1.1		LIGHTING				
1.1.1		**Supply and Installaton of equal or similar approved to TLF LED panel (600 x 1200mm)**	ea	10.0		
1.1.4		**Supply and Installaton of equal or similar approved to TLF LED panel - EMG/15Min (600 x 1200mm)**	ea	6.0		
1.1.7		Equal or similar approved to BEKA Rondo H, 22W LED downlighter luminaire	ea	10		
1.1.8		Equal or similar approved to BEKA Rondo H, 22W LED Emergency downlighter luminaire	ea	8		
1.1.9		Supply and Installaton of equal or similar approved to Beka series 300 LED bulkhead (black trim) mounted on the wall	ea	0		
1.1.10		Supply and Installation of new equal or similar approved to BEKA VLN LED 40W	ea	4		
1.1.11		**Supply and Installation of new equal or similar approved to BEKA VLN LED 40W/EMG**	ea	3		
1.1.15		Supply and installation of equal or similar approved to BEKA SERIES 300 21W LED BULKHEAD (BLACK TRIM)	ea	1		
1.1.18		Supply and Installation of new equal or similar approved to Magnet sch occupancy sensor	ea	12		
1.2		LIGHT SWITCHES				
1.2.1		Equal or Similar approved to Schneider SCH occupancy sensor	ea	10		
1.2.2		Equal or similar approved to National Photocell, installed in a weather-proof IP65 york box with a clear window.	ea	1		
1.2.3		**Supply and Installaton of equal or similar approved to 16A dimmer light switch equal or similar to legrand arteor 4x2 graphite**	ea	5		
1.2.4		Supply and installation of equal or similar approved to one lever two way light switch equal or similar to legrand arteor 4x2 graphite	ea	4		
1.2.5		Supply and installation of equal or similar approved to one lever one way switch equal or similar approved to legrand arteor 4x2 graphite	ea	6		
1.3		LOW VOLTAGE DISTRIBUTION BOARDS				
1.3.1		Design,Supply and installation of Distribution Board A ,comprising of all the switch gear, earthleakage,surge protection, labelling and wiring as per DISTRIBUTION BOARD drawing and TPD - 002- DBSPEC	sum	1		
1.4		CABLE				
1.4.4		Supply, Delivery, Offloading and Installation of 35mm², 4 core, PVC, ECC, copper cable	m	80		
1.4.5		Supply, Delivery, Offloading and Installation of 4mm²,4 core, PVC, ECC, SWA, copper cable	m	70		
1.5		CABLE TERMINATIONS				
1.5.3		**Termination of 4mm², 4 core, PVC, ECC, copper cable**	each	9.0		
1.5.4		**Termination of 35mm², 4 core, PVC, ECC, copper cable**	each	2.0		
1.6		WIRING				
1.6.1		Low Voltage 2.5 mm² stranded house wiring for internal wiring - red	m	200		
1.6.2		Low Voltage 2.5 mm² stranded house wiring for internal wiring - white	m	200		
1.6.3		Low Voltage 2.5 mm² stranded house wiring for internal wiring - blue	m	200		
1.6.4		**Low Voltage 2.5 mm² stranded house wiring for internal wiring - black**	m	200		
1.6.5		Low Voltage 2.5 mm²stranded house wiring for internal wiring - green/yellow	m	200		
1.6.6		Low Voltage 4 mm² stranded house wiring for internal wiring - red	m	50		
1.6.7		Low Voltage 4 mm² stranded house wiring for internal wiring - white	m	50		
1.6.8		Low Voltage 4 mm² stranded house wiring for internal wiring - blue	m	50		
1.6.9		Low Voltage 4 mm² stranded house wiring for internal wiring - black	m	50.0		
1.6.10		**Low Voltage 4 mm²stranded house wiring for internal wiring - green/yellow**	m	50.0		
1.7		**ISOLATORS**				
1.7.1		**Equal or similar approved to Legrand Arteor 20A single phase cordgrip isolator.**	each	15.0		
1.7.2		**Equal or similar approved to Legrand Arteor 20A single phase isolator.**	each	4.0		
1.7.2		**Equal or similar approved to Legrand Arteor 20A single phase weatherproof isolator.**	each	3.0		
1.7.3		Equal or similar approved to Legrand Arteor 40A weather proof three phase isolator.	each	1		
1.7.4		Equal or similar approved to Legrand Arteor 20A three phase isolator.	each	2		
1.7.5		Equal or similar approved to Legrand Arteor 32A weatherproof three phase isolator.	each	2		
1.7.6		Equal or similar approved to Legrand Arteor 63A weatherproof three phase isolator.	each	1		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		Total Brought Forward				
1.8		SOCKET OUTLETS				
1.8.1		Equal or similar approved to Legrand Arteor 16A double socket outlet (4x4)	each	12		
1.8.2		Equal or similar approved to Legrand Arteor 16A single dedicated socket outlet (4x2) installed on power skirting	each	32		
1.8.3		Equal or similar approved to Legrand 16A single socket outlet (4x2), installed on power skirting	each	16		
1.8.4		**Equal or similar approved to Legrand 16A single socket outlet (4x2)**	each	13		
1.8.5		**Equal or similar approved to Legrand 16A weather proof single socket outlet (4x2)**	each	0		
1.8.6		**Equal or similar approved to Legrand 2-tier power skirting (70mm DATA, 70mm ELECTRICAL), including bends, covers, fixings, etc**	m	68		
1.8.8		**Equal or similar approved to multiplug pull-up tower with 2 x 16A RSA (164-1), 2 x 16A slimline (164-2) and 1 x RJ45 module with 3.5m power lead and 16A slimline (164-2) plugtop**	each	8		
1.8.9		Equal or similar approved to legrand socket outlet with 2 x 16A slimline (164-2) and 2 x RJ45 modules installed in underfloor box with lid	each	8		
5.10		**PVC PRODUCTS, SLEEVES AND CONDUIT ACCESSORIES AND TRUNKING**				
5.10.1		32mm sleeve pipes chased in the floor	m	40		
		PVC Conduit and Sleeves				
5.10.2		**32 mm Diameter PVC conduit, boxes,couples adapters and accessories**	sum	1.0		
5.10.3		20 mm diameter PVC conduit, boxes,couples adapters and accessories	sum	1		
5.10.4		Equal or similar approved to Legrand 2-tier power skirting (70mm DATA, 70mm ELECTRICAL), including bends, covers, fixings, etc	m	30.0		
1.9		CABLE WAYS				
1.9.1		**PVC trunking Wiring Consumable acessories including Lugs, Ferrules, Terminal Blocks, Screws,connections, compression glands etc**	sum	1.0		
1.9.2		Supply and Installation of 4mm² 4core PVC insulated PVC bedded SWA PVC sheathed	m	100		
1.9.3		Trenching (Excavating and backfilling) as per the trenching detail showed on site plan	m³	100		
1.10		AREA LIGHTING				
1.10.1		Equal or similar approved to BEKA LEDlume-Midi	ea	4		
1.10.2		Supply and installation of equal or similar approved to 6m fibreglass street light pole c	ea	4		
1.11		EXISTING ELECTRICAL EQUIPMENT				
1.11.1		**Stripping and removal of all existing electrical cabling, DB's, lighting, wire ways and r**	sum	1.00		
1.12		EARTHING AND LIGHTNING PROTECTION				
1.12.1		Design, Supply and installation of the building earthing, bonding and lightning protect	sum	1		
1.14		TESTING AND COMMISSIONING				
1.14.1		Testing and Commissioning of complete installation in accordance to SANS 10142-1 in	sum	1		
Total Carried Forward to Final Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT [R]
		BILL NO. 1				
		MECHANICAL INSTALLATION				
		Split Type VRF Air Conditioning Units Supply; deliver; installation; connecting to refrigerant pipework and duct work, insulation of refrigerant piping, install and commissioning; Complete with associated vibration mountings, fixing attachements, galvanised steel hanger rods, valves, flanges, etc. for all chilled water air handling units below. All floor mounted outdoor units to be installed on plinths with 150mm level above ground level to be constructed by general builder. All outdoor units to be Bluchem treated.				
		AC Split type VRF Condenser unit -Daikin RZAG35A - equal or similar approved	each	1		
		AC Split type VRF Condenser unit -Daikin RXYSQ10TY1 - equal or similar approved	each	1		
		AC Split type VRF Condenser unit -Daikin RXYSQ16TY1 - equal or similar approved	each	1		
		AC Split type DX Coil Ceiling Cassette Evaporator Unit - Daikin FXFQ 40B - equal or similar approved	each	2		
		AC Split type DX Coil Ceiling Cassette Evaporator Unit - Daikin FXFQ 63B - equal or similar approved	each	1		
		AC Split type DX Coil Wall mounted Evaporator Unit - Daikin FXAQ 20A - equal or similar approved	each	2		
		AC Split type DX Coil Wall mounted Evaporator Unit - Daikin FXAQ 25A - equal or similar approved	each	1		
		AC Split type DX Coil Wall mounted Evaporator Unit - Daikin FXAQ 40A - equal or similar approved	each	1		
		AC Split type DX Coil Wall mounted Evaporator Unit - Daikin FHA35A9 - equal or similar approved	each	1		
		AC Split type DX Coil Ceiling Concealed ducted Evaporator Unit - Daikin FXMQ200MF - equal or similar approved	each	2		
		Refrigerant pipework -Insulated	sum	1		
		Extraction Fans-Ventilation Supply; deliver; installation; connecting, testing and commissioning including all builders works for provision of opening, electrical supply and associated seating and mounting components on indoor and outdoor sides.				
		Fantech Silent 300 extraction fans - equal or similar approved	each	9		
		Air Grilles, Wall Louvers **Supply, deliver, installation including all builder's works opening through wall and ceiling panels and associated mounting frames.**				
		Trox VAT 300 x 450 air grille including balancing damper -equal or similar approved	each	3		
		Trox VAT 150 x 250 air grille including balancing damper -equal or similar approved	each	3		
		Trox VAT 200 x 500 air grille including balancing damper -equal or similar approved	each	3		
		Trox AWG 450 x 600 wall louver - equal or similar approved	each	2		
		Trox AWG 400 x 500 wall louver - equal or similar approved	each	2		
		Door Grilles Supply, deliver, installation including all builder's works opening through doors and associated mounting frames.				
		Trox AGS-T 300 x 300 air grille including balancing damper -equal or similar approved	each	8		
		Trox AGS-T 350 x 350 air grille including balancing damper -equal or similar approved	each	8		
		Dampers - ventilation Supply, deliver, installation including all mounting brackets to supported from roof structure.				
		Trox JS-B+Q - 250 x 200	each	2		
Total Carried Forward						R0.00

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		Total Brought Forward				**R0.00**
		Ductwork Manufacture, Supply delivery, installation, testing and commissioning of all HVAC ductwork in accordance with the relevant SANS codes, inculding all duct insulation inside and duct hangers, duct straps, duct supports. All ductwork to be internall and externally insulated as specified on drawing.				
		Rectangular duct reducer piece from 1300mm x 400mm to 350mm x 350mm and 2000mm long	each	1		
		Rectangular duct reducer piece from 1300mm x 400mm to 300mm x 250mm and 2000mm long	each	1		
		Rectangular duct 300mm x 250mm	m	4		
		Rectangular duct 250mm x 200mm	m	4		
		Rectangular duct 250mm x 200mm	m	1		
		Rectangular duct 200mm x 150mm	m	4		
		Rectangular duct 200mm x 150mm	m	2		
		Rectangular duct 250mm x 200mm	m	5		
		Rectangular duct 200mm x 150mm	m	1		
		Rectangular duct 350mm x 250mm	m	3		
		Rectangular duct 250mm x 200mm	m	6		
		Rectangular duct 250mm x 200mm	m	4		
		Rectangular duct 250mm x 200mm	m	0.6		
21		Plumbing Works For Potable Water in Ground Floor, Female Ablution, Male Ablution, Paraplegic Ablution, Ground Floor Canteen kitchen For the design, supply, delivery, installation testing and Commissioning of the potable cold water and hot water reticulation system including geyser, connection pipework, supports, hangers, pipe fittings, valves as per the SANS 10252, SANS 10254 and other referenced codes to manufacturer's specification and recommendations.	sum	1		
		Pipe Lengths				
22		Pipe, DN 54: copper pipe	m	5		
		Pipe, DN 42: copper pipe	m	15.0		
23		Pipe, DN 35: copper pipe	m	10		
		Pipe, DN 28: copper pipe	m	8		
24		Pipe, DN 22: copper pipe	m	22		
		Pipe, DN 15: copper pipe	m	32		
		Tee fittings				
		Equal Tee, DN 15 x DN 15: copper pipe compression fitting	no	6		
		Equal Tee, DN 22 x DN 22: copper pipe compression fitting	no	9		
		Reducing Tee, DN 28 x DN 22 x DN28: copper pipe compression fitting	no	4.00		
		90 Degrees Fittings				
		DN 28, 90 degree bends	no	5		
		DN 22, 90 degree bends	no	12		
		DN 15, 90 degree bends	no	20		
		Isolating valves				
		Brass Gate valve, SABS, DN 28 - With compression fitting ends	no	1		
		Stop brass stopcock, DN 22	no	11		
		Plastic-coated aluminium die-cast lever valve, DN 15	no	7		
		Reducers				
		Reducer, DN 28 x DN 22 brass compression fitting	no	5		
		Reducer, DN 22 x DN 15 brass compression fitting	no	5		
		Hot water system				
		Kwikot DSG 150-5 Superline geyser - 150 liter geyser together with all its associated pipe components, vacumm breakers, pressure relieve valves, etc.	no	1		
		Geyser Structural Mountings	sum	1		
		Insulation of all hot water pipework as per relevant code	m	13		
		Pipe Hangers, Fittings, Supports, Saddles	sum	1		
		Testing and Commissioning	sum	1		
		Plumbing System Shop Drawings & As-built Drawings of final Plumbing System	sum	1		
		Fire Extinguishers Supply, installation, mounting of all fire extinguishers at the relevant indicated positions, including mounting brackets and timber backing boards.				
		4.5kg DCP Fire extinguishers	each	2		
		4.5kg CO2 Fire extinguishers	each	2		
Total Carried Forward to Final Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		Total Brought Forward				
		Fire detection and Alarm system				
		Supply, installation, testing, commissioning and certification of fire detection and alarm system including all associated components, mounting brackets and comms wiring asnd cabling.				
		Fire control panel-Ziton ZP3-1 loop control panel-equal or similar approved	each	1		
		Smoke detector- Ziton ZP730-2 - equal or similar approved	each	7		
		Heat detector- Ziton ZP543-2 - equal or similar approved	each	1		
		Internal siren- Ziton ZP755HAV-2W - equal or similar approved	each	2		
		Manual call point- Ziton ZP785-3 - equal or similar approved	each	2		
		Gaseous Fire Extinguishing system				
		Design, supply, installation, testing, commissioning, certification and handover of gaseous fire extinguishing system based on the FK5-1-12. The system shall include the detectors, gas cylinder(s), nozzles, pipework, control panels and all other associated cabling to ensure a complete working system.	sum	1		
		Symbolic Safety Signage Supply, Installation of all symbolic safety signage incuding all frames, bracket hangers and mounting brackets in accordance with SANS 1186.				
		Fire hose reel sign with down arrow-SANS 1186	each	2		
		Fire hose reel sign with down arrow-SANS 1186	each	4		
		Emergency Escape signage with down arrow - SANS 1186	each	5		
		Emergency Escape signage with side ways arrow - SANS 1186	each	2		
21		HVAC System Shop Drawings & As-built Drawings of final HVAC Systems	sum	1		
		Handover Packs of all HVAC systems installed and constructed as desribed in Works Information Document	sum	1.0		
		Plumbing Works For Potable Water in Ground Floor, Female Ablution, Male Ablution, Paraplegic Ablution, Ground Floor Canteen kitchen				
22		For the design, supply, delivery, installation testing and Commissioning of the potable cold water and hot water reticulation system including geyser, connection pipework, supports, hangers, pipe fittings, valves as per the SANS 10252, SANS 10254 and other referenced codes to manufacturer's specification and recommendations.				
23		**Pipe Lengths**				
		Pipe, DN 54: copper pipe	m	5		
24		Pipe, DN 42: copper pipe	m	15		
		Pipe, DN 35: copper pipe	m	10		
		Pipe, DN 28: copper pipe	m	8		
		Pipe, DN 22: copper pipe	m	22		
		Pipe, DN 15: copper pipe	m	32		
		Tee fittings				
		Equal Tee, DN 15 x DN 15: copper pipe compression fitting	no	6		
		Equal Tee, DN 22 x DN 22: copper pipe compression fitting	no	9		
		Reducing Tee, DN 28 x DN 22 x DN28: copper pipe compression fitting	no	4		
		90 Degrees Fittings				
		DN 28, 90 degree bends	no	5		
		DN 22, 90 degree bends	no	12		
		DN 15, 90 degree bends	no	20		
		Isolating valves				
		Brass Gate valve, SABS, DN 28 - With compression fitting ends	no	1		
		Stop brass stopcock, DN 22	no	11		
		Plastic-coated aluminium die-cast lever valve, DN 15	no	7		
		Reducers				
		Reducer, DN 28 x DN 22 brass compression fitting	no	5		
		Reducer, DN 22 x DN 15 brass compression fitting	no	5		
		Hot water system				
		Kwikot DSG 150-5 Superline geyser - 150 liter geyser together with all its associated pipe components, vacumm breakers, pressure relieve valves, etc.	no	1		
		Geyser Structural Mountings	sum	1		
		Insulation of all hot water pipework as per relevant code	m	13		
		Pipe Hangers, Fittings, Supports, Saddles	sum	1		
		Testing and Commissioning	sum	1		
		Plumbing System Shop Drawings & As-built Drawings of final Plumbing System Fire Extinguishers	sum	1		
Total Carried Forward to Final Summary						

PART C3: SCOPE OF WORK

Document reference	Title	No of page
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C3.1 EMPLOYER'S WORKS INFORMATION

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SECTION 1

1 Description of the *works*

1.1 Executive overview

Transnet Port Terminals (TPT) has initiated a project to enhance terminal safety and security through a comprehensive upgrade of its CCTV infrastructure. A key component of this upgrade involves relocating the existing security control room to the old SABS building. The project encompasses the refurbishment and conversion of the old SABS building into a modern, fit-for-purpose security control room, ensuring compliance with operational and safety standard.

The Works that the Contractor is to performs involves civil, structural, electrical, mechanical and building Works for construction by alterations and conversion of the existing SABS Laboratory Building into the New CCTV Control Facility, in the Port of Richards Bay.

The following work forms part of the high-level scope of work to be executed during the construction phase of the project:

- This facility includes for additions and alterations to the existing single storey face brick building including total replacement of the existing roof structure.
- The alteration component of the works includes for demolition of internal walls and construction of new walls and partitions including the associated finishes.
- Provision of all new internal finishes floor, walls, ceiling including furniture and fittings.
- Provision for designs fabrication and installation of Control room desk and Video Wall to house monitors.
- Provision for design fabrication and installation of all cupboards as noted on the detail drawings.
- Provision and installation of gun safe as noted on drawings and specifications.
- The additions include for extension of the existing parking area to accommodate new covered shad cloth carports and entrance feature to the front façade. All new finishes are to match the existing facility or as noted on the detail drawings.
- The civil works includes for provision of all service connections including water, sewer, storm water and pipe and chamber for data and communications and electrical services. Existing services are to be serviced where necessary with all premix / surfacing uplifted to be re-instated.
- Electrical, Lighting and Power (EL and P) to the existing building includes for:
    1. New power supply and distribution board
    2. New lighting in the interior with emergency lighting
    3. New Power points, power skirting to the offices
- The Mechanical component of the works includes for Heating, ventilation and cooling (HVAC) to the building which is specifically extractor fans to the shower and locker area and Air-conditioning in

offices and boardrooms and eating areas. Fire detection and suppression is also included in the mechanical scope of works.

- The data and communication installation by others which includes for new telephone points and data points for computers.

1.2 *Employer's* objectives

The Employer's objectives are to appoint a contractor with extensive experience in building construction and refurbishment, to upgrade and convert the existing SABS Laboratory Building, to provide a secure and modern facility to house staff to man the control room on a 24 - hour operation.

In addition to the above, the Employer's objectives are to achieve Completion of the Works by meeting the Completion Date whilst still maintaining the highest environmental, quality and safety standards and whilst minimising disruptions to ongoing port and terminal operations.

1.3 Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation	**Meaning given to the abbreviation**
CA	Contract Administrator
CCTV	Closed-Circuit Television
CQA/QCM	Contractor's QA/QC Manager
CDR	Contractor Documentation Register
CDS	Contractor Documentation Schedule
CSHEO	Contractor's Safety Health and Environmental Officer
CHSMP	Contractor's Health and Safety Management Plan
CM	Construction Manager
PORB	Port Of Richards Bay
PSIRM	Project Site Industrial Relations Manager
PSPM	Project Safety Program Manager
PSSM	Project Site Safety Manager

ProjM	*Project Manager*
ProjEM	Project Environmental Manager
ProjEO	Project Environmental Officer
QA	Quality Assurance
SANS	South African National Standards
SES	Standard Environmental Specification
SHE	Safety, Health and Environment
TPT	Transnet Port Terminal
CEMPr	Construction Environmental Management Programme
RAC	Registered Asbestos Contractor
DPC	Damp Course Membrane
AIA	Approved Inspection Authority

2 Engineering and the *Employer's* design

2.1 *Employer's* design

2.1.1 The *Employer's* design for the *Works* is:

2.1.1.1 Building Works

- The detail architectural designs and some interior fittings for the building.

2.1.1.2 Civil Works

- The detail civil designs aspects of the Works.

2.1.1.3 Structural *Works*

- The detail structural designs aspects of the Works.

2.1.1.4 Electrical *Works*

- The detail designs of the LV reticulation, distribution and protection systems for the facility and the selection of all electrical Plant associated with the LV systems.

2.1.1.5 Mechanical *Works*

- The HVAC systems associated with the *Works*.
- The detail designs of the mechanical aspects and systems associated with the *Works*.
- The selection of all mechanical Plant associated with the *Works*.

2.1.2 The Employer's designs are contained in Section 5 of this document and all Annexures, Standards, Specifications and Schedules referenced therein.

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 (and the Contractor's obligation under paragraph 2.2 of the Employer's Works Information) ONLY.

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

2.2.1 The Contractor submits to the Project manager for acceptance the following designs and drawings:

2.2.1.1 Shade Cloth Carports – refer to typical drawing.

2.2.1.2 All built-in cupboards, shopfitting and joinery works as noted on the drawings for kitchen and common areas.

2.2.1.3 Loose Furniture i.e desks, chair and 12-seater Boardroom table.

2.2.1.4 Reception desk

2.2.1.5 Concrete mix design.

2.2.1.6 Sand / cement screed mix design.

2.2.1.7 Distribution board shop drawings.

2.2.1.8 Shop drawings for steelwork

2.2.1.9 Truss design.

2.2.2 A gaseous fire extinguishing system for the sever room in the CCTV Control Room (hereafter referred to as "the system") shall be designed, supplied, installed, tested, commissioned, certified and handed

over in accordance with SANS 14520 and all its relevant parts and other referenced codes, contractor to refer to the Mechanical section elsewhere in the document.

2.2.3 The *Contractor* examines the design drawings and checks them for dimensional accuracy. Should any Discrepancies or ambiguities be found the *Contractor* immediately requests the *Project Manager* to provide clarification.

2.2.4 As per OHSA 85 of 1993 all trenches deeper than 1,5m needs to be shored with closed board shoring. The design and installation of shoring is as per Contractor's design to conform to SANS 1200DB.

2.2.5 All trenches deeper than 1,5m are to be shored.

2.2.6 The contractor shall allow for de-watering in trenches.

2.2.7 Unless expressly stated to form part of the design responsibility of the Employer as stated under 2.1 Employer's design above and whether specifically stated to form part of the design responsibility of the Contractor under this paragraph 2.2, or not, all residual design responsibility and overall responsibility for the total design solution for the works rests with the Contractor.

2.2.8 The Contractor shall engage the services of ECSA registered Engineers and/or Technologists for all aspects of the Works for which the Contractor is to design as per Clauses 2.2.1 and 2.2.2 above.

2.2.9 The Contractor shall thus be wholly accountable and responsible for all aspects of his designs, including the implementation of all Statutory Safety, Health and Environmental Regulations of South Africa AND the requirements, specifications, and regulations of the Employer pertaining to Health and Safety, Environment, Quality and Engineering.

2.3 Procedure for submission and acceptance of Contractor's design

2.3.1 The Contractor's documentation shall be issued to the Project Manager under cover of the Contractor's Transmittal Note indicating all Contract references (i.e. Project No, Contract No, etc.) as well as the Contractor's Project Document Number, Revision Number, Title and chronological listing of transmitted documentation. Formats of Contractor data submitted is dependent on the project procedure and shall be specified by the Project Manager, upon the notified request of the Contractor.

2.3.2 The Contractor shall deliver both hard copies and electronic media copies (CD Rom) to the Project Manager either at the address stated within the Contract Data or at the Project site office.

2.3.3 All electronic documentation shall be submitted by the Contractor in Adobe Acrobat (.PDF) and native file format

2.3.4 Acceptance of documentation by the Project Manager will in no way relieve the Contractor of is responsibility for the correctness of information, or conformance with his obligation to provide the Works. This obligation rests solely with the Contractor.

2.3.5 After review, a copy of the original reviewed/marked-up drawing/document, with the Project Manager's consolidated comments and document status marked on the Contractor Review Label, is scanned and the copy shall be returned to the Contractor under cover of the project's Transmittal Note for revision or re-submittal as instructed.

2.3.6 The Contractor shall allow the Project Manager 2 weeks (unless otherwise stated and agreed) to review and respond to the Contractor's submission of their documentation, i.e. from time of receipt by the project to the time of despatch. However, work shall proceed without delay in the event of late return of the documentation by the Project Manager with prior notification in writing by the Contractor.

2.3.7 On receipt of the reviewed documentation the Contractor shall make any modifications requested/marked up and resubmit the revised documentation to the Project Manager within 2 weeks. Queries regarding comments/changes should be addressed with the Project Manager prior to re-submittal.

2.3.8 Any re-submittals, which have not included the changes/comments identified, will be returned to the Contractor to be corrected. The Contractor shall re-issue the revised documentation incorporating all comments and other specified details not included in the previous issue within 2 working days of receipt of the marked-up document.

2.3.9 In undertaking the works (including all incidental services required), the Contractor shall conform and adhere to the requirements of the Contractor Document Submittal Requirements Standard included in Annexure A (Refer DOC-STD 0001 Rev 03).

2.4 Other requirements of the *Contractor's* design

2.4.1 The *Contractor* must obtain design approval from Transnet Port Terminals engineers with parallel notification to the Project Manager.

2.4.1.1 Compliance to all Statutes, Standards, Specifications, Policies, Conventions, Requirements as referenced in Section 4 of this document and any Annexures thereto.

2.5 Use of *Contractor's* design

2.5.1 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 Design of Equipment

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

2.6.1.1 Any formwork required to Provide the Works

2.6.1.2 Temporary electrically powered compressed air systems and pneumatic equipment that may be required to Provide the Works

2.6.1.3 Small electrically powered equipment

2.6.1.4 Equipment designed for the lifting of personnel to access any areas necessary to Provide the Works, which are not at ground level.

2.6.1.5 Equipment designed for the lowering of personnel to access any areas necessary to Provide the Works, which are below ground level.

2.7 Equipment required to be included in the *works*

2.7.1 No Equipment is required to be included in the *works*.

2.7.2 The *Contractor* provides all qualified operators, special certificates, permits to operate, and the like for Equipment as required by the General Machineries Regulations of the Occupational Health and Safety Act, act 85 of 1993, and submits same to the *Project Manager* for his acceptance prior to using the Equipment on the Site and/or Working Areas.

2.8 As-built Drawings, Operating Manuals and Data Packs

2.8.1 The Contractor provides the following:

2.8.1.1 As-Built/Final Documentation

2.8.1.1.1 In undertaking the works (including all incidental services required), the Contractor shall

2.8.1.1.2 conform and adhere to the requirements of the Contractor Document Submittal

2.8.1.1.3 Requirements Standard included in Annexure A (Refer DOC-STD-0001 Rev 03).

2.8.1.2 Installation, Maintenance and Operating Manuals and Data Books

2.8.1.2.1 The Contractor provides manuals in an A4 hard covered, red, grease and waterproof Binder, using 2 ring type binders. The manuals are well indexed and user friendly and include a summarized Table of Contents.

2.8.1.2.2 Drawings and charts larger than A4 are folded and those greater than A3 are enclosed in an A4 plastic pocket of adequate strength.

2.8.1.2.3 The Contractor submits the draft Table of Contents to the Project Manager for acceptance prior to the compilation and official submittal of the manuals.

2.8.1.2.4 The originals of all brochures shall be issued to the Project Manager. When a general brochure is applicable to a range of equipment, then the specific item, catalogue number or model number shall be stated, which is best achieved by introducing a separate index page, which cross-references the specific item to a tag number.

2.8.1.2.5 The address, phone numbers, fax numbers and reference numbers of all Sub-Contractors is provided.

2.8.1.2.6 Where manuals include drawings that still need to be revised to “As-Built” status, and such manuals are required prior to ‘As-Built’ status, the manual will not be in its final form until the “As-Built” version of each such drawing has been incorporated.

2.8.1.2.7 The required number of copies of the manual (s) shall be as specified by the Project Manager and submitted per type or model number of equipment included in the contract, or as specified by the Project Manager.

2.8.1.2.8 A typical example of what the binder/file (s) shall be marked with on the spine and the front cover is as follows: -

- Project Name
- Manual Title, e.g. Installation, Maintenance and Operating Manual
- FBS No. and Title
- Manual Numbering (e.g. Volume 1 of 2, etc.)
- Contract Number
- Contractor Name

2.8.1.2.9 Unless otherwise stated in the CDS, the required number of copies of all As Built/Final/Data Packs shall be:

- 3 x hard copies (Full size)
- 3 x CD Roms with Adobe Acrobat (.pdf) and "Native" formats

3 Construction

3.1 Temporary *works*, Site services & construction constraints

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

3.1.1.1. The Site is located along Ventura Road, adjacent to Vikela Clinic, within the Port of Richards Bay

3.1.1.2. Access permits shall be made by the *Contractor* to a standard acceptable to the *Project Manager*, be allowed for within the *Contractor's* access control provision and shall include at least the following information:

- Company name and logo.
- Employees name and ID number.
- Date of issue and period of validity.
- Company details
- Telephone number
- Fax number
- E-mail address

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

3.1.2.1 The *Contractor* is specifically excluded from entering the *Employer's* Operational Areas which are adjacent to the Site and Working Areas. The *Contractor* plans and organises his work in such a manner so as to cause the least possible disruption to the *Employer's* operations.

3.1.2.2 The Contractor's site camp will be located within the Port of Richards Bay. The exact location and for the site camp will be communicated by the *Employer* after Contract award.

3.1.2.3 The *Contractor* ensures the safe passage of *Contractor's* traffic to and around the Site and Working Areas at all times that includes providing flagmen, protective barriers, signage, etc for protection, direction and control of traffic. The *Contractor* is required to submit a detailed Traffic Management Plan, detailing how they are intending to control the passage of traffic around the site.

3.1.2.4 The *Contractor* ensures that any of his staff, labour and Equipment moving outside of his allocated Site and Working Areas does not obstruct the operations of the Terminal. To this end access routes are allocated and coordinated by the *Project Manager*.

3.1.2.5 The Contractor ensures that all his construction staff, labour, and equipment remain within his allocated and fenced off construction area.

3.1.2.6 All Contractor's staff and labour working within the port boundary complies with Transnet Port Terminals' (TPT) operational safety requirements and are equipped with all necessary PPE, high visibility apparel and, when working within two meters of the quay wall, floating apparel.

3.1.2.7 Where scaffolding or ladders are required to perform work in elevated positions the scaffolding and ladders shall comply with the OHSACT. The Contractor's personnel shall submit a detail fall protection plan, accompanied by proof of training for working at heights for all personnel that will be performing work at elevated positions..

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

3.1.3.1 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.

3.1.3.2 Walking anywhere within the Port area, except areas authorised by the Project Manager and on routes designated by the Project Manager, is not permitted and any person found contravening this will be subject to disciplinary action.

3.1.4 Title to Materials from demolition and excavation

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

3.1.4.2 Carting away of excess material to approved dumpsite. Waybills to be provided by the *Contractor*. Unless instructed by the Project Manager, the Contractor is not allowed to dispose the waste material within the Terminal operations areas.

3.1.4.3 All excess material shall be spoiled off site to an approved dumpsite to be identified by the Contractor. The Contractor is to allow for everything necessary to load haul, tip, and spread and compact if necessary. Spoiling on Transnet property shall not be permitted unless a specific authority is obtained in writing. The contractor shall provide written confirmation that permission has been obtained from the operator /owner of the spoil site that they have accepted the material and all obligations in regarding to the spoiling of material has been met.

3.1.4.4 The removal, carting away and disposal of the asbestos containing materials, such as roof sheeting fascia boards and roof trusses, shall be carried out by an RAC. In a case where the main contractor is not certified to handle asbestos, an approved RAC may be appointed as a subcontractor.

3.1.4.5 Asbestos will be undertaken in accordance with Asbestos Abatement Regulation 21 of Asbestos Abatement Regulations 2020. Upon completion of asbestos removal, the asbestos clearance certificate must be obtained. TPT has already appointed an AIA to administer the asbestos removal process. All asbestos records will be provided with the TPT in accordance with Regulation 23 of the Asbestos Regulations.

3.1.4.6 An RAC will carry out only the removal and disposal of all asbestos – containing material, which includes the already broken and fallen pieces of the materials within the site. Full removal and disposal by a RAC are prerequisite before any other demolition works may proceed.

3.1.5 Co-operating with and obtaining acceptance of others

3.1.5.1 The Employer (including the agents of the Employer) operates on Site during the entire duration of the Contract period.

3.1.5.2 The Contractor will co-operate with Terminal Operations.

3.1.5.3 The Contractor will further co-operate with other contractor's sharing the designated site camp area.

3.1.6 Publicity and progress photographs

3.1.6.1 The *Contractor* shall obtain permission from the Employer to publish project photographs.

3.1.7 *Contractor*'s Equipment

3.1.7.1 The Contractor keeps daily records of his Equipment used on Site and the Working Areas.

3.1.7.2 The access to the equipment record shall be made available to the Project Manager upon request.

3.1.8 Site service and facilities

2.1.8.1 For the duration of the Contract, the Project Manager will provide an area, free of charge, for the Contractor to establish eating areas and portable chemical type toilets.

2.1.8.2 The Project Manager makes no provision for the connection to services within the Site for Contractor's use.

2.8.1.3 Connection into the existing water borne sewage at the existing site could be exploded and agreement reached with the Project Manager for the use of same.

3.1.9 Facilities provided by the *Contractor*:

3.1.9.1 No facilities are provided for by the Contractor for the Project Manager and Supervisor.

3.1.9.2 All services made available to the contractor is to be metered with the contractor making the necessary service applications to the relevant bodies.

3.1.9.3 Construction power and water at the work area is free issue to the Contractor.

3.1.9.4 Electrical Power and water made available to the contractor at the site camp will be to the contractor's cost.

3.1.9.5 The Contractor ensures his staff does not make use of any existing TPT staff facility or temporary park-home facilities beyond the site boundary.

3.1.9.6 The Contractor ensures that this site establishment area is compliant with the relevant safety regulations and restrictions, is clearly sign posted, and has a suitable security fence, lighting and the necessary access control gates.

3.1.9.7 All costs for preparation of the site establishment area are for the Contractor's account.

3.1.9.8 The Contractor submits details of the layout of his site establishment to the Project Manager for acceptance.

3.1.9.9 At the respective working areas the Contractor provides, at his cost, a sufficient number of toilets and shaded eating areas and maintains them in a clean and sanitary working condition.

3.1.9.10 The Contractor includes for all costs for lighting and fencing, including access control into and out of these restricted areas.

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

3.1.9.12 Upon completion, and within one week of the date of acceptance of the works, the Contractor completely removes from the Site and Working Areas all his Equipment, including the foundations of any structures, belonging to him, and leaves the Site and Working Areas in a tidy condition to the satisfaction of the Project Manager.

3.1.9.13 No excess or discarded materials or Equipment may be buried or dumped within the port boundary.

3.1.9.14 Demolition of all temporary structures, surfaces etc shall be first approved by the Project Manager prior to the work being carried out.

3.1.9.15 The Employer does not provide any security for the Site and Working Areas. The Contractor provides same and indemnifies and holds indemnified the Project Manager and Employer against any claims and actions that may arise out of Site and Working Area security.

3.1.9.16 The Contractor transports staff to site in a closed vehicle specifically designed for passenger transport (bus or similar) accepted by the Project Manager.

3.1.9.17 Wherever the Employer provides facilities for the Contractor's use and the Contractor adapts such facilities for use, then the Contractor makes good and provides full reinstatement to the land (including all apparatus of the Employer and Others in, on or under the land) and surrounding areas to its original standard upon dismantling of such facilities and hand-back to the Employer.

3.1.10 Survey control and setting out of the works

3.1.10.1 The Contractor undertakes a complete survey of the entire site and all associated structures and establishes the relevant control points and benchmarks to be use for the Works.

3.1.10.2 The *Contractor* shall verify all trench dimensions on site with the *Supervisor* before setting out of the *work*s.

3.1.10.3 The *Contractor* provides benchmarks and survey controls points for the *Works.*

3.1.10.4 No longer than two weeks before commencing bulk earthworks (or profiling in the relevant area) the Contractor provides an in-survey of the construction area, recorded on a drawing to a scale of at least 1: 500, which forms the basis for calculations of earthwork quantities.

3.1.10.5 The in-survey is carried out in collaboration with the Supervisor, on a 5m grid, with levels generally taken at right angles to the longest length of the area being surveyed. Relevant features, such as existing services and identification of ground survey control stations are also determined.

3.1.10.6 On completion of construction (or profiling of the relevant area) to the required tolerances, the Contractor provides the out-survey, which records the final levels on a drawing, for acceptance by the Project Manager.

3.1.10.7 The Contractor signs the in-survey and out-survey and furnishes copies in accordance with the CDS to the Project Manager for record purposes.

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

3.1.11.1 As a guide only, the Project Manager provides the Contractor with drawing(s) showing various known existing underground services for his information; however, due to the lack of adequate as-built records, the Contractor will be required to prove all services. The Contractor shall take the necessary precautions to ensure that the existing services are not damaged.

3.1.11.2 Test holes to locate services shall be excavated at least 2 weeks ahead of construction in order to allow time for alterations to services or amendments to the design of the works. Once the services have been located the test holes are to be backfilled.

3.1.11.3 The *contractor* is to notify all service authorities and service providers and make arrangements for emergency repairs to any services that may be damaged during the course of the *works*.

3.1.11.4 The *contractor* in liaison with the *Project Manager* is to notify the area operator ie TPT of their daily activities and arrange with the area operator in terms of notification and reinstatement of any possible downtime with regards to the interruption of any services.

3.1.11.5 The *Contractor* is to notify the *Supervisor* within 24 hours when services are exposed for the *Supervisor* to co-ordinate the survey. All services proved will be surveyed in detail (x, y, z, description). i.e. Pipes – top of pipe, pipe diameter, pipe type, pipe fittings.

3.1.11.6 The *Contractor* is required to liaise with the *Project Manager* and establish as accurately as possible; the location of the various existing services situated within the *Works* area and record all such information on a suitable "marked up" drawing for reference at all times.

3.1.11.7 In addition to the above, the *Contractor* shall consult the *Project Manager* prior to undertaking any excavation work. The *Contractor* must thereafter exercise due care and attention in carrying out the agreed excavation work as may be directed by the *Project Manager* to avoid damage or disruption to existing services.

3.1.11.8 The *Contractor* shall be liable for all claims arising out of any damage caused by such excavation if the *Contractor* fails to exercise the requisite care and attention in carrying out the excavation.

3.1.11.9 The cost of locating and protecting, if necessary, services shall be included in the rates for the services intersecting and adjoining the trenches. A group of cables intersecting or adjoining a trench will be regarded as one service. The existing services shall be protected when excavating for surfacing. The costs of protecting these services shall be included in the rates for excavation and compaction.

3.1.11.10 The *Contractor*, shall before commencement of any work, ascertain from the *Project Manager* whether any live overhead or underground electrical cables are affected by the *Works* and he shall ensure that all precautionary measures required by the Project Manager are strictly observed.

3.1.12 Control of noise, dust, water and waste

3.1.12.1 Before moving Equipment onto the Site and Working Areas and commencing operations, the Contractor submits his proposed methods of construction which demonstrate the measures taken to avoid and or reduce any nuisance arising from dust, noise and vibration for acceptance by the Project Manager.

3.1.12.2 All deep excavations are to be adequately barricaded as instructed by the Project Manager. The Contractor shall comply in all respects with "Act 6 of the Machinery and Occupational Safety Act of 1983."

3.1.12.3 The Contractor shall take adequate precautions for the protection of the works from storm-water runoff during periods of prolonged heavy rainfall and shall also ensure adequate measures for dealing with water in excavations.

3.1.12.4 The Contractor shall be responsible for all repair works necessary to reinstate any damage caused by stormwater to the approval of the Project Manager.

3.1.13 Sequences of construction or installation

3.1.13.1 The contractor is to sequence the works to include a sectional completion date for the Control Room and Server Room to be handed over to the client for equipment installation set up and testing and commissioning.

3.1.14 Giving notice of work to be covered up

3.1.14.1 The Contractor is to notify the Supervisor when the respective excavations are exposed so that the Supervisor can make arrangements to profile the soil strata. This notification is given no less than 24 (twenty-four) hours prior to the proposed covering up.

3.1.15 The Contractor complies with the following constraints in the execution of the works:

3.1.15.1 Interface with 'live' cargo truck Operations along and around site.

3.1.15.2 Traffic congestion at the main entrance gates to the port and the route alongside the site to the water's edge.

3.2 Completion, testing, commissioning and correction of Defects

3.2.1 The work to be done by the Completion Date

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

Item of work	**To be completed by**
As built drawings as specified in paragraph 2.9 of this Works Information	Within 14 days prior to Completion.
Performance testing of the works	Within 5 days prior to Completion.

3.2.2 Materials facilities and samples for tests and inspections

3.2.2.1 The *Contractor* provides the *Employer* with the material test certificates and Inspections. This includes but not limited to compaction tests results and concrete cubes tests.

3.2.2.2 The *contractor* is to have soil laboratory facility available for use by the *Supervisor*.

3.2.2.3 The *Supervisor* shall inspect the soil conditions at founding level and either accept the conditions or instruct the Contractor how to proceed. The Contractor shall give notice to the *Supervisor* of the required inspection not less than 24 hours before the inspection is required.

3.2.3 Loading, handling, transport and storage

3.2.3.1 The *Contractor* is responsible for carting and dumping excess material from excavations to an approved dumpsite with the relevant waybills provided to the *Project Manager.*

3.2.4 Access given by the *Employer* for correction of Defects

3.2.4.1 The *Contractor* complies with the following constraints and procedures of the *Employer* where the *Project Manager* arranges access for the *Contractor* after Completion:

- Safety, access control and work procedures as determined by the Employer's Terminal Operator.

- These may be the same as communicated elsewhere within this Works Information as at the starting date / access date, or as the works are now in use by the Employer's occupation of the Site, the same may be incrementally or substantially changed post Completion

3.2.5 Investigation, Survey and Site Clearance

3.2.5.1 The Contractor carries out inspection and investigations at the Site:

- Maintains a record of the conditions of all existing buildings, structures and services.
- Provides a detail condition assessment report to the Project Manager.

4 Description of *Works*

4.1 Building Works

4.1.1 The building is a single -storey, face brick structure with a conventional timber A frame roof. A simple light weight steel framed lean too structure is clipped on to the rear of the building, this is to be demolished and reconstructed. The building is currently unoccupied and derelict. On completion of the scope of works it will serve as a CCTV Control Facility, comprising locker rooms, showers, toilets, kitchen, offices and covered parking.

4.1.2 **Building Scope of Works**

4.1.2.1 The building scope of works to be undertaken by the Contractor will be the entire Conversion, Alteration and additions for the New CCTV Control Facility in the Port of Richards Bay, the works include but not limited to the following:

4.1.2.1.1 Demolition of walls and foundations and removal of existing doors and windows.

4.1.2.1.2 Removal of existing fittings and furniture.

4.1.2.1.3 Demolition and removal of existing steel shed structure and making good.

4.1.2.1.4 Removal of the entire existing roof structure including roof trusses.

4.1.2.1.5 Creating openings in brick walls as stated on detail drawings.

4.1.2.1.6 Provision of new foundations and concrete surface bed

4.1.2.1.7 Construction of new brick walls and modifications to existing, make provision for plaster and paint.

4.1.2.1.8 Design and installation for new roof structure as noted on drawings and specifications.

4.1.2.1.9 Provision for new offices space and upgrade of wet core for ablutions, showers, and kitchen.

4.1.2.1.10 Provision for specialist control room and gun room including provision and installation of Gun Safe as stated on drawings and specifications.

4.1.2.1.11 New entrance ramp area and new storeroom as noted on detail drawings.

4.1.2.1.12 Provision of new sanitary fittings, doors and windows, floor and wall finish as noted on details schedules and drawings.

4.1.2.1.13 Provision of new ceilings as noted on details drawings and schedules.

4.1.2.1.14 Provision of fixed and loose furniture as noted on drawings.

4.1.2.1.15 Design fabrication and installation of shade cloth carports

4.1.3 **Supporting Specifications for Building Works**

4.1.2.2 The Model Preamble for Trades as published by the Association of South African Quantity Surveyors Model Preamble for Trades 2008 shall be applicable to all the building works associated with this contract. The following interpretations and meanings shall apply:

4.1.2.3 In case of any conflict in interpretation, ambiguity or discrepancy between the Model Preamble for Trades 2008, (any standard or written particular project specification) contained in The Works Information and the conditions of contract, the conditions of contract shall take precedence.

4.1.2.4 In case of any conflict in interpretation, ambiguity or discrepancy between the Model Preamble for Trades 2008 contained in this paragraph 4.3 of C3.1 Employer's Works Information and specific statements contained elsewhere in C3.1 Employer's Works Information, the specific statements contained elsewhere shall prevail, without prejudice to the Project Manager's express duty to resolve any ambiguity or inconsistency in The Works Information under ECC3 Clause 17.1.

4.1.2.5 Within the Model Preambles for Trades 2008, the following amendments and interpretations shall apply:

- Where the word or expression "Principal Agent" is used, read "Project Manager" or "Supervisor" as the context requires.
- Where the word or expression "Contractor" is used, read "Contractor".
- Where the word or expression "Engineer" is used, read "Project Manager" or "Supervisor" as the context requires.
- Where the Model Preambles for Trades 2008 mention "rates" for measured work and any contractual statements relating to payment, all such statements shall be discounted, with the ECC3 conditions of contract taking precedence.
- Within the Model Preambles for Trades 2008, A. GENERAL, the following amendments and interpretations shall apply:
- Where the word or expression "bills of quantities" is used, this shall be discounted for the purposes of The Works Information. The ECC3 Contract Data Part One states the main option to apply within the ECC3 Contract between the Parties.
- Within the Model Preambles for Trades 2008, B. ALTERATIONS, B.2 MATERIALS FROM THE ALTERATIONS, CREDIT, ETC and C. EARTHWORKS, C1.4 Materials from demolitions shall not apply. C3.1 Employer's Works Information paragraph 3.1.4 states details of the Contractor's title (if any) to Materials arising from excavations and/or demolitions and how such Materials are either to be disposed of or re-used in The Works.
- Within the Model Preamble for Trades 2008 Q. PLUMBING AND DRAINAGE, Q.24 TESTS shall be deemed to be included within paragraph 3.2 of C3.1 Employer's Works Information.
- Within the Model Preamble for Trades 2008 U. EXTERNAL WORKS, U.3.8 Process control tests shall be deemed to be included within paragraph 3.2 of C3.1 Employer's Works Information.
- The principles, meanings and interpretation stated and established within paragraphs 2.2.8 to 4.2.1 with respect to the Model Preambles for Trades 2008 apply equally to other references used within C3.1 Employer's Works Information.

4.1.4 **Specifications provided by The Employer**

4.1.4.1 The application of the National Building Regulations (SANS 10400) is to be strictly adhered to.

4.1.5 **Manufacturer's instructions and specifications**

4.1.5.1 All materials and products shall be used and installed in strict accordance with the manufacturer's instructions and specifications.

4.1.6 **Use of locally manufactured materials and products**

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

4.1.7 **Samples**

4.1.7.1 The Contractor shall furnish samples and/or certificates as called for or may be called for by the Supervisor / Project Manager. Materials and/or workmanship not corresponding with approved samples may be rejected. Samples for approval shall be required for paint colours, joinery with associated finishes, furniture, wall finishes, ceiling finishes, floor finishes, windows and shopfronts. These approved samples shall remain on Site for the duration of The Works.

4.1.8 **Signage**

4.1.8.1 The Contractor will be responsible for design, supply and installation of signage based on Transnet guidelines as outline as per Annexure - Signage kit of parts and specifications. The Contractor will be responsible for producing shop drawings for The Employers approval.

4.1.9 **Mortar Joints and brickwork**

4.1.9.1 Mortar joints to face brickwork generally shall be 8mm-16mm in thickness with level bedding joints, vertical perpends. Setting out of brick gauge shall be determined on site as average sizes of bricks may vary. Weather struck joint profile shall be well rubbed with a standard jointing tool of suitable size to ensure that the entire exposed surface on the joint presents a smooth and polished appearance.

4.1.9.2 Brickwork to comply with good brick laying practices as per approved manufacturers. Facebrick shall be selected and blended. Prior to bricklaying, proper setting out of brickwork shall be undertaken by the Contractor's bricklayer for variances in brick dimensions.

4.1.9.3 Facebrick shall be kept clean and protected as the brickwork progresses.

4.1.9.4 For any detail information required on stained or dirty facebrick, approved manufacturers Office shall be contacted.

4.1.9.5 The use of DPC shall be provided and installed as per SANS 10021, to provide barrier against rising damp, water penetration from above and horizontal water penetration.

4.1.9.6 Feature Wall to comply with good natural stone cladding installation practices as per manufacturers. Cladding shall be selected and blended. Prior to installation, proper setting out of cladding stones shall be undertaken by the Contractor's tiler for variances in cladding stones dimensions and colour range.

4.1.9.7 Cladding shall be kept clean and protected as the installation progresses.

4.1.9.8 All necessary measures to provide barrier against rising damp, water penetration from above and horizontal water penetration must be conducted.

4.1.10 **Floor Finishes (Porcelain Tiles, Carpet, Epoxy and access floor)**

4.1.10.1 Subfloor condition (concrete) must be clean, dry, flat, and structurally sound. Floor levelness must be checked with a straight edge (e.g., 2m ruler); any dips or humps should be repaired with a suitable self-leveling compound. All new concrete work and screeds must be adequately cured and have a low moisture content (typically 5% or less) before tiling can begin. Excessively porous surfaces may need priming to ensure proper adhesive bonding. Wet areas (showers) should be waterproofed before tiling.

4.1.10.2 Access floors must be installed as per manufacturer's specification.

4.1.11 **Waterproofing**

4.1.11.1 The Contractor shall furnish the Employer with a written guarantee covering materials and workmanship for all waterproofing specified or offered. This guarantee shall be signed by the Contractor and countersigned by the supplier of the materials used and underwritten by a recognised insurance company. The guarantee shall be valid for a 10-year period.

4.1.11.2 Should any maintenance be required during the guarantee period, the Contractor shall allow for the cost of such in his tender price as the Contractor shall be held solely responsible for any leaks that occur during the guarantee period.

4.1.12 **Glazing**

4.1.12.1 All laminated safety glass shall carry the Manufacturer's warranty against all manufacturing defects and discoloration for a minimum period of 5 years. A stencil mark shall appear on a prominent place on all types of safety glass as per SANS.

4.1.13 **Shopfronts and windows**

4.1.13.1 Installation certificate by AAMSA approved contractor is required for all shopfront installations. All shop fronts and window sections shall be waterproof and able to withstand coastal winds of up to 60m/sec

4.1.14 **Timber Trusses**

4.1.14.1 Engineer's certificate covering the design and installation of trusses to be provided.

4.1.15 **Protection of works**

4.1.15.1 The Contractor shall provide all necessary dust sheets, hoarding, etc. and shall exercise all necessary care to prevent marking surfaces, walls, floors, glass, electrical fittings, etc. and shall always keep all parts of the works perfectly clean and free from spotting, accumulation of rubbish, debris of dirt arising from the operations. Any surface disfigured or otherwise damaged shall be completely renovated or replaced as necessary by the Contractor at his own expense to the Supervisor's approval. The premises shall be left clean and fit for occupation at completion of the work.

4.2 Civil Engineering Works

4.2.1 **Scope of Works**

4.2.1.1 This part of the scope covers the construction of the civil works to be carried out by the Contractor but is not limited to the following:

- Site clearance and exposing of existing services.
- Demolition of existing premix, steel structure, internal walls and associated layer works.
- Earthworks and new layer works.
- Provision of new V drains as noted on the detail drawings.
- Inspection of existing septic tank, provision of new sewer line to existing septic tank.
- Repairs to existing and laying of new stormwater line to connect into existing.
- Uplift and relocation of existing fence and provision of new fence as noted on detail drawings.
- Make provision for new underground cable ducts as noted on detail drawings.
- Contractor to make provision for encasing of existing underground pipes if required.
- Make provision for and installation of new water supply.
- Road marking and road signage.

4.2.2 **The SANS 1200 Series of Specifications are applicable to all Civil Engineering works associated with this contract. The following interpretations and meanings shall apply:**

4.2.2.1 Where the SANS 1200 series of Specifications are used within the Works Information, the following interpretations and meanings shall apply:

4.2.1.2 In case of any conflict in interpretation, ambiguity or discrepancy between any SANS 1200 Specification (whether standard or written as a particular project specification) contained in the Works Information and the conditions of contract, the conditions of contract take precedence within the ECC3 contract.

4.2.1.3 In case of any conflict in interpretation, ambiguity or discrepancy between any SANS 1200 Specification (whether standard or written as a particular project specification) contained in this paragraph 4.3 of the Employer's Works Information and specific statements contained elsewhere in C3.1 Employer's Works Information, the specific statements contained elsewhere shall prevail, without prejudice to the Project Manger's express duty to resolve any ambiguity or inconsistency in the Works Information under ECC3 Clause 17.1.

4.2.3 **Variations to the standardised specifications**

4.2.3.1 Within SANS 1200 A: GENERAL, the following amendments and interpretations shall apply:

- Where the word or expression "Employer" is used, read "Employer".
- Where the word or expression "Contractor" is used, read "Contractor".
- Where the word or expression "Engineer" is used, read "Project Manager" or "Supervisor" as the context requires.
- Where the word or expression "schedule of quantities" is used, this is deleted in entirety. Assessment and payment are in accordance with the conditions of contract (and the ECC3 main and secondary options stated therein).

4.2.3.2 Within SANS 1200 A: GENERAL 2.3 DEFINITIONS, the following apply:

4.2.3.2.1 “Acceptable. Approved (Approval)” is interpreted as either a Project Manager or a Supervisor communication or instruction in relation to Works Information compliance, consistent with the conditions of contract as the context requires.

4.2.3.2.2 “Adequate” is deleted. The Project Manager notifies the Contractor where the Contractor has not complied with the Works Information.

4.2.3.2.3 “Measurement and payment” and the further definitions contained within 6.3 c) are deleted. Assessment and payment are in accordance with the conditions of contract (and the ECC3 main and secondary options stated therein).

4.2.3.3 Within SANS 1200 A: GENERAL 2.6 APPROVAL, the following applies:

4.2.3.3.1 “Approval” by either the Project Manager and/or the Supervisor is without prejudice to ECC3 Clause 14.1 and, inter alia, ECC3 Clauses 13.1, 14.3 and 27.1.

4.2.3.3.2 SANS 1200 A: GENERAL 2.8 ITEMS IN SCHEDULE OF QUANTITIES, is deleted in entirety. Assessment and payment are in accordance with the conditions of contract (and the ECC3 main and secondary options stated therein).

4.2.3.3.3 SANS 1200 A: GENERAL 3.2 STRUCTURES AND NATURAL MATERIAL ON SITE, applies only to the extent that it is consistent with paragraph 3.1.6 of C3.1 Employer’s Works Information.

4.2.3.4 Within SANS 1200 A: GENERAL 7.1 PLANT, the following applies:

4.2.3.4.1 Where the word or expression “Plant” is used, read “Equipment”.

4.2.3.4.2 SANS 1200 A: GENERAL 7.2 CONTRACTOR’S OFFICES, STORES AND SERVICES, applies but the Project Manager resolves any inconsistency with statements included within paragraph 3.1.12 of C3.1 Employer’s Works Information.

4.2.3.4.3 SANS 1200 A: GENERAL 3.1 SURVEY, applies only to the extent that it is consistent with paragraph 3.1.14 of C3.1 Employer’s Works Information.

4.2.3.5 Within SANS 1200 A: GENERAL 3.2 WATCHING, BARRICADING, LIGHTING AND TRAFFIC CROSSINGS, the following applies:

4.2.3.5.1 Where the word or expression “specification” is used, read “Works Information”.

4.2.3.5.2 SANS 1200 A: GENERAL 3.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES applies only to the extent that it is consistent with the specific statements made elsewhere in C3.1 Employer’s Works Information and in any case and always consistent with the conditions of contract.

4.2.3.6 Within SANS 1200 A: GENERAL 5 TESTING, the following applies:

4.2.3.6.1 Where the word or expression “Engineer” is used, read “Supervisor”.

4.2.3.6.2 SANS 1200 A: GENERAL 8 MEASUREMENT AND PAYMENT, is deleted in entirety. Assessment and payment is in accordance with the conditions of contract (and the ECC3 main and secondary options stated therein).

4.2.3.6.3 The principles, meanings and interpretation stated and established within paragraphs 6.3.1 to 6.3.15 with respect to SANS 1200 series and to SANS 1200 A: GENERAL equally apply to the

other SANS 1200 specification references [state particulars of SANS 1200 used] used within this paragraph 6.3 of C3.1 Employer's Works Information.

4.2.4 **Demolition and earthworks**

This part covers the demolition of internal walls and existing steel structure and associated layer works.

4.2.5 **Supporting Specifications**

4.2.5.1 This specification must be read in conjunction with the following specifications:

SANS 1200 DA	Earthworks (small works)
SANS 1200 DB	Earthworks (pipe trenches)
SANS 1200 M	Roads (general)
SANS 1200 MF	Base
SANS 1200 ME	Subbase
SANS 1200 MFL	Base (light pavement structures)

4.2.6 **Existing services**

4.2.6.1 All known services are provided on the drawing, however, due to the lack of adequate as-built records, the Contractor will be required to prove services prior to removal. The Contractor shall take the necessary precautions to ensure that the services within the electrical tunnels are not damaged. The existing water supply to the buildings must be shut off at the closest valve to be determined on site, prior to the removal of plumbing fittings and demolition. The existing sewer to be removed and the condition of the existing septic tank to be assessed prior connection with new sewer pipes.

4.2.6.2 As soon as any underground service not shown on the drawings is discovered, it shall be brought to the attention of the NEC supervisor. The contractor must in collaboration with the NEC supervisor, ascertain whether the service is live. The contractor shall not uplift any such service unless he is instructed to do so.

4.2.6.3 The contractor shall be held responsible for any damage to known services (i.e. services that are within the site of the works and are shown on the drawing) and he shall take all necessary measures to protect them. In the event of a service being damaged, the contractor shall immediately notify the NEC supervisor. The contractor shall not repair any such service unless he is instructed to do so.

4.2.7 **Demolition of premix**

4.2.7.1 The contractor shall demolish and spoil the existing premix layer. The contractor shall not affect the adjacent concrete slabs during the demolition and spoiling of the premix layer. Any damage to the adjacent concrete slabs shall be repaired by the contractor to the satisfaction of the NEC supervisor.

4.2.8 **Demolition of existing structures**

4.2.8.1 The contractor to make reference to the issued drawings for all demolition works.

4.2.9 **Excavation**

4.2.9.1 The material to be excavated consists of mainly 150mm crusher run and the remainder being soft. (SANS 1200 DA cl. 3.1.2.).

4.2.9.2 For the purposes of uplifting of underground pipes, a trench width of 1m shall be used.

4.2.10 **Compaction of in-situ material**

4.2.10.1 The in-situ material shall be trimmed, levelled out and compacted to 98% MOD AASHTO.

4.2.11 **Imported Backfill material**

4.2.11.1 Backfill material shall be selected from the commercial sources and placed in 200mm layers compacted to 100% Mod AASHTO density. No clay shall be used as backfill.

4.2.12 **Base Course**

4.2.12.1 The base course shall be Type G2, maximum size 37,5mm material ex commercial sources. The Project Manager may instruct the Contractor to use the previously excavated crusher run material for the base course.

4.2.12.2 The base course shall be 150mm thick, compacted to 98% of Mod AASHTO density. Levels, moisture content and density shall be to degree of accuracy level II. The applicable reference clauses shall be:

SANS 1200 MFL	8.3.1a
SANS 1200 M	Table 3A
SANS 1200 D	6.1 & 6.2

4.2.13 **Site Clearance, Earthworks & Layer works**

4.2.13.1 The works for the site clearance, earthworks and layer works include the following but not limited to:

4.2.13.1.1 Clearing of site.

4.2.13.1.2 Exposing of existing services, where indicated by Project Manager.

4.2.13.1.3 Bulk excavation and treatment of in-situ material.

4.2.14 **Supporting Specifications**

This section, “Site Clearance, Earthworks and Layerworks”, shall be read in conjunction with the following SABS and Transnet standard specifications.

SANS Specifications:

SANS 1200 DM	Earthworks (roads, sub grade)
SANS 1200 M	Roads General
SANS 1200 ME	Subbase
SANS 1200 MF	Base
SANS 1200 MK	Kerbing
SANS 1200 MJ	Segmented paving
SANS 1200 C	Site Clearance

SANS 1200 D Earthworks

SANS 1200 MH Asphalt surfacing

SANS 1200 MM Ancillary roadworks

4.2.15 **Earthworks (SANS 1200D)**

4.2.15.1 Notwithstanding the provisions of subclause 3.1, the materials excavated will not be classified for the purposes of measurement and payment. The unit rate for excavation shall cover excavation in all materials other than hard rock.

4.2.16 **Spoil site**

4.2.16.1 All excess material shall be spoiled off site in a spoil area to be identified by the Contractor. The Contractor is to allow for everything necessary to load haul, tip, and spread and compact if necessary. Spoiling on Transnet property shall not be permitted unless a specific authority is obtained in writing. The contractor shall provide written confirmation that permission has been obtained from the operator /owner of the spoil site that they have accepted the material and all obligations in regarding to the spoiling of material has been met.

4.2.17 **Exposing existing services**

4.2.17.1 A multitude of services are known to exist over the whole area of the works and based on the information available general layout plan indicating services have been prepared. Prior to commencing work in any area, the Contractor shall consult the Project Manager in regard to the location of services and shall assist him when required in locating the exact position and depths of services by means of hand excavated test holes. The location and depth of all services discovered by the foregoing investigations shall be recorded and plotted by the Contractor on an “as-built” copy of the services plan.

4.2.17.2 The Contractor shall assist when required in alterations to services by providing labour, plant and material and shall carry out the necessary work as instructed by the Project Manager.

4.2.17.3 Test holes to locate services shall be excavated at least 2 weeks ahead of construction in order to allow time for alterations to services or amendments to the design of the works. Once the services have been located the test holes are to be backfilled.

4.2.17.4 Claims for extension of time because of existing services will NOT be entertained if the operation of locating and/or protecting services is less than two weeks ahead of construction.

4.2.17.5 Responsibility for protection of all known services shall rest solely with the Contractor and he shall bear all costs, which may arise as a result of any damage which he may cause to such services, or which may arise as a result of his operations.

4.2.18 **Bulk excavation**

4.2.18.1 The existing damaged pavement layers are required to be excavated and carted to spoil site of the contractor’s choice. The nature of the material varies and includes asphalt, crusher-run, etc.

4.2.19 **Disposal of material**

4.2.19.1 All vegetation, trees, etc. resulting from site clearance shall be removed off site to a disposal dump to be selected by the contractor. The haulage, dump costs and any levies etc shall be deemed to be included in his tendered rates. Burning of materials on site shall not be permitted.

4.2.20 **Subgrade**

4.2.20.1 Preparation of the in-situ subgrade will be by means of ripping and compaction. Compaction of the in-situ subgrade will be done to a minimum of 95% of modified AASHTO maximum density for all materials, to a minimum depth of 150mm and at between –2% and +2% of the optimum moisture content.

4.2.21 **Sub-base**

4.2.21.1 A 150mm G5 sub- base conforming to the requirements of SANS 1200 ME shall be imported from a commercial source. The layer shall be compacted 150 mm layers to 95 % Mod AASHTO density.

4.2.22 **Base**

4.2.22.1 A 150mm C2 sub- base conforming to the requirements of SANS 1200 ME shall be imported from a commercial source. The layer shall be compacted 150 mm layers to 96 % Mod AASHTO density. The base layer shall be 150mm thick using a G2 graded crushed stone, compacted to 98% MOD AASHTO density. The tolerance on the base levels will be -10mm to 0mm.

4.2.23 **Prime coat**

4.2.23.1 The prime coat shall be in accordance with SANS 1200 MH and shall be MSP1 bitumen or similar approved. The rate of application of the prime coat shall be 0,7 litre/m2. Arrangements shall be made with the Supervisor to approve the primed areas before the asphalt surfacing is laid. The Contractor must ensure not to foul concrete surfaces when applying the prime coat. Any surfaces fouled will be made good at the Contractor’s expense.

4.2.24 **Tack coat**

4.2.24.1 The tack coat shall be in accordance with SANS 1200 MH and shall be SS60 anionic emulsion bitumen or similar approved. The rate of application of the tack coat shall be 0,5 litre/m2 Arrangements shall be made with the Supervisor to approve the primed areas before the asphalt surfacing is laid. The Contractor must ensure not to foul concrete surfaces when applying the tack coat. Any surfaces fouled must be made good at the Contractor’s expense. Tack coat shall be applied along all longitudinal and traverse joints, and on laid surfaces.

4.2.25 **Wearing course**

4.2.25.1 A 30mm AC continuously graded asphalt surfacing as per **SANS 1083** (for aggregates) and applicable specification.

4.2.26 **River Sand**

4.2.26.1 The river sand shall be free from substances that may be deleterious to blocks and shall be in accordance with SANS 1200 MJ. It shall be compacted to the required level as per drawing and work specification.

4.2.27 **Kerbing and channel**

4.2.27.1 Kerbs and channels shall comply with the relevant requirements of SANS 927, when applicable, SANS 1200 MK.

4.2.28 **Road marking**

4.2.28.1 The Contractor shall provide all plant required to execute the works. The lines or markings are to be painted with an approved Road and Runway Paint, at an application rate the rate of 0,42 l per m2. The colour of paint to be used shall be as specified in the Schedule of Quantities and indicated on the drawing issued. All paint shall conform to SANS 731-1.

4.2.28.2 The following must be noted by the Contractor in terms of SANS 731-1:

- The paint shall be a Type 2 Paint
- The paint shall be suitable for use in a parking area on a segmented concrete surface
- The paint is not required to be retro reflective
- Drying time classification shall be Class 1

4.2.28.3 The colors required for the completion of the contract shall be:

- White
- Red
- Golden Yellow (BS381C-356 or CKS 279 – D26)

4.2.28.4 All the above colours to meet classifications according to SANS 1091

4.2.29 **Base**

4.2.29.1 Any portion of stabilized base that is too high shall be lowered, harrowed and reconstructed to such depth that, after compaction, the base layer is of the same standard and thickness throughout, and falls and level shall comply.

4.2.30 **Edge restraints**

4.2.30.1 Edge restraints shall be constructed as shown on drawings and shall be constructed on the base layer before any blocks/units are laid.

4.2.31 **Laying of asphalt**

4.2.31.1 The asphalt shall be laid by paving machine approved by the Supervisor. Hand –laying shall be permitted at the Supervisor's discretion where the area is small. The asphalt shall not be laid if the temperature is below 140 degrees Celsius.

4.2.31.2 The asphalt shall be rolled in accordance with the method described in Chapter VI of the Asphalt Institute Paving Manual (MS-8). A final density is required of least 96 % of the Marshall density of the mix.

4.2.32 **Approval of designs**

4.2.32.1 The Contractor shall submit the mix details and properties of the design mixes for both the wearing and levelling courses for approval together with the properties for mixes having bitumen contents 0,5% above and below that of the proposed mix.

4.2.33 **Removing unsuitable material**

4.2.33.1 Any roadbed material which is considered by the NEC supervisor to be of a quality that would be detrimental to the performance of the completed road shall be removed to widths and depths as instructed by the NEC supervisor and shall be disposed of as prescribed. The excavated area shall then be backfilled with approved imported material compacted to the required density.

4.2.34 **Tolerances on paving as laid**

4.2.34.1 The finished paved surface shall present the smooth surface or meet Supervisors requirements.

4.2.35 **Tolerances on Measurement of deviations**

4.2.35.1 Any deviation from the flatness of a plane surface will be measured as the maximum deviation of the surface from the straight line of length 3m joining two points on the surface, determined by means of a straight edge the ends of which are supported on identical unit of suitable thickness placed over each of the points.

4.2.36 **Testing: Checking**

4.2.36.1 The Contractor shall carry out sufficient checks to satisfy himself that the materials used and the workmanship (construction, tolerances and strength) attained comply consistently with the specified requirements. The Supervisor will carry out checks and the result made available to the contractor.

4.2.37 **Testing: Trial**

4.2.37.1 The Supervisor will identify the trial section, and the trial shall be carried in accordance with SANS 1200 MJ – clause 7.2.

4.2.38 **Testing: Quality Control**

4.2.38.1 Workmanship, tolerances and frequency of testing shall be in accordance with the relevant specifications with the following exceptions:

4.2.38.2 An indirect tensile strength and Dynamic Creep Modulus testing shall be carried out as directed by the Supervisor and allowed for in the Schedule of Prices. One test per area.

4.2.38.3 A minimum of 8 tests per lot shall be required for density tests. The nature of the remainder of the tests required is described in clause 7.2 of SANS 1200 ME and SANS 1200 MF.

4.2.39 **Method statement**

4.2.39.1 The Contractor shall submit a detailed method statement setting out what quality control procedures will be implemented with respect to: -

4.2.39.1.1 Quality assurance during the batching and mixing process. The Contractor shall indicate what certification, if any, they have in terms of SANS or ISP quality assurance schemes.

4.2.39.1.2 Procedures, methods and plant for the transportation of hot asphalt to site.

4.2.39.1.3 Procedures, methods and plant to be used for placing and compacting asphalt on site.

4.2.40 **Sewer and Stormwater Drainage**

4.2.40.1 The works for the sewer and stormwater drainage include the following:

4.2.40.1.1 Construct new concrete V-drains as shown in the drawing, ensuring proper gradient and tie-in existing stormwater drains.

4.2.40.1.2 Excavate, supply, bed and lay 110mm Class 34 PVC sewer pipes and rodding eyes, Sewer line to tie into existing septic tank.

4.2.40.1.3 And any other work arising out of or incidental to the above or required of the Contractor for the proper completion of the works.

4.2.41 **Supporting Specifications**

4.2.41.1 This section, “Sewer and Stormwater Drainage”, shall be read in conjunction with the following SANS standard specifications.

SANS 1200 DB	Earthworks (Pipe trenches)
SANS 1200 LB	Bedding (Pipes)
SANS 1200 LE	Stormwater Drainage

4.2.42 **Materials**

4.2.28.1 The stormwater pipes shall be precast reinforced concrete pipes conforming to SANS 677/69 with "Spigot and socket" joints and rubber collars throughout, with the class of the pipe as stated on the contract drawings.

4.2.28.2 Class 34 PVC pipes to the diameter and length as stated on the drawings are to be used for stormwater reticulation from downpipes and the sewer network.

4.2.43 **Construction**

a) Brickwork manholes

4.2.43.1 All brickwork shall be built in manhole bond i.e. stretchers only on the inside face, using cement mortar as specified. Bricks shall be well soaked before use, and the previous course shall be wetted before bricks are laid thereon. All joints on the internal face (and the external face above ground) shall be half round recessed and shall be well rubbed with a standard jointing tool of suitable size to ensure that the entire exposed surface on the joint presents a smooth and polished appearance. Intersecting walls shall be properly toothed with each other and all angles levelled and plumbed. Should cement bricks be utilised, then all internal surfaces shall be plastered with a 12mm thick 3:1 cement sand mortar mix.

4.2.43.2 When brick built' manholes are constructed in wet ground, the external surfaces shall be rendered with 12mm thick 3:1 cement sand mortar mix.

b) Pipe crossings

4.2.43.3 Where pipes cross one another with a vertical height difference of less than 150mm, a polystyrene block must be placed between them, and the fill material around the pipes thoroughly moistened and compacted. The contractor will be held responsible for any damage to pipes resulting from the construction of a pipe crossing.

c) Cut pipe ends

4.2.43.4 All ends may be cut on site. Reinforcement exposed by such cutting is to be protected with 20mm thick cement mortar.

d) Fencing

4.2.43.5 Uplift and relocate the existing boundary fence and gate to the new proposed location as shown on drawing number: 000182R-182-C-LA-0002-01.

4.2.43.6 Install new fencing panels and posts as per manufacturer's specification. to match existing f fencing, refer to drawing number: 000182R-182-C-DE-0002-01

4.2.43.7 Supporting Specifications

This section shall be read in conjunction with the SANS standard specifications**.**

4.2.44 **Cable Ducts**

4.2.30.1 The works for the cable ducts include the following:

- Excavation, bedding and backfill for cable ducts.
- Supply and lay PVC pipes.
- Laying of cable duct markers.
- Construction of electrical manholes
- Any other work arising out of or incidental to the above or required of the Contractor for the proper completion of the works.

4.2.30.2 Supporting Specifications

This section shall be read in conjunction with the following SANS standard specifications.

SANS	
SANS 1200 DB	Earthworks (Pipe trenches)
SANS 1200 LB	Medium pressure pipelines
SANS 1200 LC	Cable ducts

4.2.45 **Materials**

4.2.45.1 All cable ducts shall consist of the indicated number and size of pitch impregnated fibre pipes or, where indicated, hard setting durable plastic pipes.

4.2.46**Laying**

4.2.46.1 Unless otherwise directed by the Supervisor, the ducts shall be laid as shown on Drawings of the Standard Specification.

4.2.47**Depth, position and marking of ducts**

- Electrical and Comms Cable Ducts

4.2.47.1 All cable ducts are to be laid 800mm below finished road level and the pipes must protrude 500mm beyond the edge of the hardened roadway or stormwater drain. Both ends of each duct must be

sealed with an end cap. The position of each duct crossing shall be indicated on site using suit-able markers.

4.2.47.2 Draw wires must be provided in each duct and duct ends must be sealed with suitable stoppers. A double strand copper wire of at least 2,8mm² cross section that will serve as a screen and is to be installed approximately 200mm above all ducts over its entire length.

- Electrical manholes

4.2.47.3 All brickwork shall be built in manhole bond i.e. stretchers only on the inside face, using cement mortar as specified. Bricks shall be well soaked before use, and the previous course shall be wetted before bricks are laid thereon. All joints on the internal face (and the external face above ground) shall be half round recessed and shall be well rubbed with a standard jointing tool of suitable size to ensure that the entire exposed surface on the joint presents a smooth and polished appearance. Intersecting walls shall be properly toothed with each other and all angles levelled and plumbed. Should cement bricks be utilised, then all internal surfaces shall be plastered with a 12mm thick 3:1 cement sand mortar mix.

4.2.47.4 When brick built' manholes are constructed in wet ground, the external surfaces shall be rendered with 12mm thick 3:1 cement sand mortar mix.

4.2.48 **Concrete Works**

The works for the concrete include the following:

- Encasing of pipes where required
- Channelling to kerbing
- Reinforced concrete bases to minor structures,

Any other work arising out of or incidental to the above or required by the Contractor for the proper completion of the works in accordance with the true meaning and intent of the contract documents.

4.2.48.1 Particular Specifications

This section must be read in conjunction with the following specifications:

SANS 1200 G	Concrete
SANS 1083:1994	Aggregates from natural sources
SANS 10100-2:1992	The Structural use of concrete – Part 2 : Materials and execution of work
SANS 50197-1	Cement – composition, specifications and conformity criteria. Part 1: Common cements
SANS 1491-1	Portland cement extenders – Part 1 Ground granulated blast furnace slag
SANS 1491-2	Portland cement extenders – Part 2 Fly ash.
SANS 1491-3	Portland cement extenders – Part 3 Condensed Silica Fume

4.2.49 **Cementitious Binder**

4.2.47.1 Common cements, complying with SANS 50197-1 shall be used for all concrete work. On no account shall masonry cements be used for concrete work, even if the strength designations are the same as for common cements.

4.2.50 **Coastal Zone**

4.2.50.1 In this application, which is within one kilometre of the sea, one or more of the following Portland cementations binders shall be used in all applications:

4.2.50.2 Blast furnace cement, Type III/A, certified as containing not less than 40% and not more than 50% milled granulated blast furnace slag (MGBS), or a blend of Type 1 Portland cement with not less than 40% and not more than 50% MGBS. MGBS shall comply with SANS 1491 Part 1.

4.2.50.3 Fly ash cement Type II/B-V or Portland fly ash cement Type II/B-W, certified as containing not less than 25% and not more than 30% fly ash shall comply with SANS 1491 Part 2.

4.2.51 **Alkali Reactive Concrete**

4.2.51.1 Alkali Reactive Aggregates shall not be used in this project. The equivalent Na2O content of the concrete shall not exceed 2,0 kg/m3 where % Na2O equivalent = % Na2O + (0,658 x %K2O)

4.2.52 **Aggregates**

4.2.52.1 Fine and coarse aggregate shall comply with the relevant clauses of SANS 1083.

4.2.52.2 Where aggregates have constituents, which, in the opinion of the Supervisor, may give rise to damage due to alkali-aggregate reactions, the provisions of PS: C2.3 shall be applicable.

4.2.52.3 Evidence of compliance of the aggregates with the requirements of PS: C3.1 & C3.2 shall be furnished as early as practical. If required by the Project Manager, the Contractor shall submit 40kg samples for approval at least 6 weeks prior to the start of concrete construction. No aggregate shall be delivered for use in the works until approval is given.

4.2.53 **Admixtures**

4.2.53.1 Admixtures containing chlorides will not be permitted in reinforced concrete.

4.2.54 **Cover Blocks**

4.2.54.1 Cover blocks used to ensure the cover to reinforcement shall be made of cement mortar.

4.2.54.2 Cover blocks shall be dense and have a minimum 28 day crushing strength of 50 Mpa and shall be cured in water for at least 14 days before being used.

4.2.54.3 Cover/spacer blocks made of plastic will not be permitted.

4.2.55 **Concrete Quality**

4.2.55.1 Prior to the start of any concrete work on site, the Contractor shall submit a quality assurance plan which will ensure compliance with specification and provide acceptable documentary evidence that all specified operations have been carried out satisfactorily.

4.2.55.2 Where the minimum dimension to be placed during a single pour is larger than 600mm, and the cement content of the reinforced concrete exceeds the following:

- Cement Types I and II/ * S: 400 kg/m3
- Cement Types II/B-V and II/B-W: 450 kg/m3

4.2.55.3 The Project Manager may require that measures be instituted to reduce heat development in the concrete.

4.2.56 **Batching**

4.2.56.1 All cement binders shall be matched by full sack or by mass batching with approved precision weighing equipment.

4.2.56.2 All aggregates shall be precisely measured by mass using approved precision weigh-batching equipment, unless otherwise permitted by the Project Manager.

4.2.56.3 Should any variation in the composition of the aggregate become apparent, the Project Manager shall be notified and a further sample of aggregate submitted immediately for his approval.

4.2.57 **Concrete Placing**

4.2.57.1 The Project Manager shall approve the size, shape and depth of any excavation before concrete is placed.

4.2.57.2 Unless otherwise permitted by the Project Manager, no concrete shall be placed until he has accepted the fixed reinforcement and confirmed in writing by way of a release certificate.

4.2.58 **Construction Joints**

4.2.58.1 Unless otherwise shown on the drawings, the exact position of horizontal construction joints shall be marked on the formwork by means of grout checks in order to obtain truly horizontal joints.

4.2.58.2 Stub columns, stub walls and stays on footings shall be cast integrally with the footing and not afterwards, even where another class of concrete is being used.

4.2.58.3 Joint lines shall be so arranged that they coincide with features of the finished work.

4.2.58.4 Where new concrete is to be cast against a hardened concrete surface, neat cement slurry mixed to a creamy consistency shall be brushed onto the cleaned concrete surface.

4.2.58.5 Contraction joints shall be smooth and shall have one coat of lime wash or PVA applied to the older surface prior to casting the fresher concrete.

4.2.59 **Curing Compound**

4.2.59.1 Unless otherwise directed by the Project Manager, the curing compound shall be:

- An approved trafficable, resin-based, white pigmented, membrane forming for slopes flatter than 1:1.
- An approved clear, aesthetically acceptable, membrane forming for all other concrete surfaces, including beam and slab soffits.

4.2.59.2 The curing compound shall comply with specification ASTM C309, except that the maximum permissible water loss in the test shall be 0,40 kg/m2.

4.2.59.3 Alternatively, the curing compound shall be acceptable if the treated concrete retains 90% or more of its mixing water when subject to the test set out in BS 8110 Part 1 – Chapter 6.6.

4.2.59.4 The total application rate of the curing compound shall be the greater of the supplier's specification or 0,90 l/m2. On textured concrete surfaces, the total application rate shall be 0,90 l/m2.

4.2.59.5 In cases of concrete surfaces with run-off problems, it may be necessary to apply more than one coat of membrane forming curing compound to obtain the specified total or cumulative application rate.

4.2.59.6 Curing in accordance with SABS 1200 G shall commence on all concrete surfaces as soon as it is practical in the opinion of the Project Manager.

4.2.59.7 On unformed surfaces the curing compound shall be applied after finishing and as soon as the free water on the surface has disappeared and no water sheen is visible, but no so late that the liquid curing compound will be absorbed into the concrete.

4.2.59.8 On formed surfaces, the exposed concrete shall be wet with water immediately after the forms are removed and kept moist until the curing compound is applied.

4.2.59.9 Application of the curing compound shall begin once the concrete has reached a uniformly damp appearance with no free water on the surface.

4.2.59.10 Application of the compound may be done by hand or power spray.

4.2.59.11 The compound shall be applied at a uniform rate with two applications at right angles to each other to ensure complete coverage.

4.2.59.12 Pigmented compounds, without a thixotropic agent, shall be adequately stirred to assure even distribution of the pigment during application.

4.2.59.13 Unless otherwise directed by the Project Manager, the initial 24 hour curing of concrete surfaces not covered by formwork shall be carried out by ponding, covering with constantly wetted sand or mats, or continuous spraying in accordance with SABS 1200 G when the following climatic conditions occur:

- Wind velocity greater than 5 m/s and/or
- Ambient temperature is above 25 °C and/or
- The relative humidity is below 60 %

4.2.59.14 If plastic shrinkage occurs, the concrete, while still plastic, shall be re-vibrated, floated and re-coated with curing compound as if no curing has previously taken place.

4.2.59.15 Classification of finishes (Sub clause 5.2.1) - The surface condition required on all exposed finished concrete shall be smooth.

4.2.59.16 The curing period for concrete containing only CEM 1 shall be 7 days.

4.2.59.17 The curing period for concrete containing CEM 1 plus cement extenders (MGBS, FA) shall be 10 days.

4.2.59.18 The curing period will start on completion of the concrete pour and for formed surfaces shall include the time for which forms are still in place after the pour.

4.2.60 **Concrete Records**

4.2.60.1 The Contractor shall maintain the following daily records for every part of the concrete structure and shall always make these available during the progress of the work for inspection by the Project Manager:

- The date and time during which concrete was placed
- Identification of the part of the structure in which the concrete was placed
- The mixed proportions and specified strength
- The type and brand of cement
- The slump of the concrete

- The identifying marks of test cubes made
- Curing procedure applied to concrete placed
- The times when shuttering was stripped and props removed
- The date of despatch of the cubes to the testing laboratory
- The test results.

4.2.60.2 The records shall be delivered to the Project Manager each week except in the case of sub-standard concrete, when the Project Manager shall be informed immediately.

4.2.61 **Tolerances**

4.2.61.1 Deviations shall be within the limits listed in SANS 1200 G for degree of accuracy II unless otherwise specified.

4.2.62 **Testing and Monitoring**

4.2.62.1 Frequency of sampling and testing shall be as specified in SANS 1200 G.

4.2.62.2 If the quantity of concrete from which samples were taken exceeds 40 m3, it shall be subject to the testing of a minimum of 3 sets of samples per day from each grade of concrete placed in each independent structure.

4.2.62.3 If the quantity of concrete from which samples were taken is less than 40 m3, it shall be subject to the testing of a minimum of 2 sets of samples per day from each grade of concrete placed in each independent structure.

4.2.63 **Formwork (Clause 5.2)**

4.2.63.1 All exposed concrete corners shall be provided with 20mm x 20mm chamfers.

4.2.64 **Water Reticulation**

The scope of work covers for the civil works which include the:

- Provision and installation of a water reticulation system.
- Provision and installation of isolation valves.
- Connection into the existing water main reticulation, including provision and installation of isolation valves on the existing water main
- Provision for interim inspections and testing to final inspection and testing for acceptance.
- And any work arising out of or incidental to the above or required of the Contractor for the proper completion of the works in accordance with the true meaning and intent of the contract document.

4.2.64.1 Supporting Specifications

In so far as they can be applied, and where they are not inconsistent with the terms of this Specification, the latest amendment of the relevant parts of SANS 1200 shall be regarded as being embodied in this Specification. The following list of standards and specifications, not necessarily comprehensive, are referred to in this part of the Specification:

SANS	
SANS 1200 DB	Earthworks (Pipe trenches)

SANS 1200 LB	Bedding (Pipes)
SANS 1200 L	Medium Pressure Pipelines
SANS 62	Steel Pipes – Part 1 and 2
SANS 966-1	Components of pressure pipe systems – part 1
SANS 1476	Fabricated flanged steel pipework
SANS 664	Cast Iron Gate valves for waterworks
SANS 32	Internal and/or external protective coatings for steel tubes
SANS 10129	Plastics tape wrapping of steel pipes
SANS 1117	Plastic wrappings for the protection of steel pipes
SANS 1123	Pipe flanges
SANS 226	Water taps (Metallic bodies)
SANS 1128	Fire fighting equipment part1 : Components of underground and above ground hydrant systems
SANS 1200 LD	Sewers
SANS 10214	The design, fabrication and inspection of articles for hot-dip galvanising
SANS 1700	Fasteners
SANS 121	Hot dip galvanising coating on fabricated iron and steel articles-Specifications and test methods

4.2.64.2 HDPE Pipes and Fittings:

4.2.64.2.1 The HDPE pipe shall be of 110mm diameter conforming to SANS 4427 PE 80.

4.2.64.3 Corrosion Protection

4.2.64.3.1 All exposed (i.e. not buried) valves, pipes and specials shall be prepared and protected as follows:

- The surface shall be prepared by abrasive blasting to SIS Sa 2.5.
- A twin pack ethyl base inorganic zinc silicate primer shall be applied within 24 hours of the abrasive blasting, to a minimum dry film thickness of 75 microns.
- A polymide cured high build epoxy undercoat shall be applied to a minimum of 60 microns dry film thickness.
- A twin pack polyurethane enamel-finishing coat shall be applied to a minimum of 35 microns dry film thickness.
- Step 3 and 4 shall be carried out after erection; any damage to the primed surface shall be touched up with the zinc rich primer. The above shall be read in conjunction with the paint manufacturers specifications for that paint.

4.2.64.3.2 For all buried steel and cast-iron fittings clause 3.9.1 and clause 3.9.6 of SANS 1200 L shall apply. All buried steel pipes shall be protected against corrosion in accordance to SANS 10129 by treatment with a compatible primer, packed with a bitumen- or tar-based mastic and wrapped with an approved plastic tape to the requirements of SANS 1117.

4.2.64.4 Valves

4.2.64.4.1 All valves shall be 110mm diameter Class 16, double-flanged cast iron gate valves, resilient sealed with non-rising spindle, conforming to SANS 664. Gate valves shall be flanged to SANS 1123 Table 15 and shall be fitted with valve caps per SANS 664. The direction of closing shall be anticlockwise and clearly indicated on the valve body.

4.2.64.4.2 Taps shall comply with SANS 226 and be suitable for working pressures of up to 12 Bar.

4.2.64.5 Flanges, Bolts and Nuts

4.2.64.5.1 Pipe flanges shall comply with SANS 1123 Table 15, drilled to suit mating flanges and shall be installed square to the axis of the pipeline. Reaming of bolt holes to oversize dimensions in order to make a particular piece fit will not be permitted. Flanges shall be hot dip galvanized to 100micron thickness, in compliance with SANS 10214.

4.2.64.5.2 Bolts, nuts and washers shall comply with ANSI B16.5 or the relevant sections of SANS 1700 as applicable, in sizes appropriate to the class of pipe or special and of grade 316 stainless steel. The length of the bolt shall be such that, after the bolt has been tightened, the end of the bolt projects a minimum of one thread above the nut and to a maximum of three full threads.

4.2.64.6 Suitable Plant

4.2.64.6.1 The contractor shall ensure that only plant suitable for working in the confined limits of the site of works and able to obtain the required specification of layer works is used.

4.2.64.7 On-site Storage

4.2.64.7.1 The Contractor shall be allocated a storage area on site and shall be responsible for all materials stored on site until such time that the water main has been tested and handed over to the main Contractor.

4.2.64.7.2 Pipes should be stored on level ground that is free from stones and sharp objects and should be so stacked (in a stack of cross formation) that the load on each pipe is uniform throughout its length.

4.2.64.7.3 Socketed pipes should be stacked that the sockets are at different ends in each alternate layer and protrude from the stack.

4.2.64.7.4 The height of the stack should not exceed 1m, and pipes of different diameters and class should not be stacked together. Protective packing should not be removed until immediately before use.

4.2.64.8 Pipe-Laying Personnel

4.2.64.8.1 The laying of pipes and ancillary fittings shall be performed only by a qualified person who is registered by the local authority as an artisan in the plumbing, pipefitting or drain-laying trades, or who is qualified by reason of having attended a course on pipelaying of the Civil Engineering Industry Training Board.

4.2.64.9 Preparation of Trench Bottom

4.2.64.9.1 All trench bottoms shall be prepared in accordance with SANS 1200 DB clause 5.5.

4.2.64.10 Cutting Of Pipes

4.2.64.10.1 A fine-toothed hacksaw with mitre attachment set at 90º should be used to cut pipes to the required length. Each cut end should be square, and the outer edge evenly chamfered by means of a rasp or file or specifically designed chamfering tool. The chamfer must not extend further than half the wall thickness. Cut ends must be free from swarf, burrs, channels, and loose material.

4.2.64.10.2 When the length of the pipe to be cut is determined, allowances must be made for the length of any socket attached to the pipe and for a movement of at least 6mm in any rubber ring type socket into which the pipe is to be inserted.

4.2.64.11 Pipe Laying and Jointing

4.2.64.11.1 Pipes that have been exposed for several hours to direct sunlight and have become hot should not be laid until they have cooled to a temperature of approximately 25ºC.

4.2.64.11.2 Rubber ring jointing may be carried out in the trench. The pipeline should be laid directly on to the prepared bedding in the trench, and bricks or other hard bodies must not be placed under the pipeline for either temporary or permanent support. Rubber rings used must be those supplied by the pipe or fitting manufacturer. All spigots must be checked to ensure that they are free from burrs, and spigots, sockets and rings must be cleaned with a dry cloth. The pipe end must be chamfered to an angle of approximately 15º and the depth of entry must be marked on the spigot. This mark must be so positioned as to allow a 6mm clearance between the spigot and the bottom of the socket. A thin film of a recommended lubricant, by the manufacturer, should be applied to each rubber ring and each spigot.

4.2.64.12 Pipe-Jointing to Existing Main

4.2.64.12.1 Where HDPE pipe systems are to be connected to cast-iron pipes, cast iron flange adapters manufactured specifically for the purpose must be used.

4.2.64.13 Depths and Cover

4.2.64.13.1 The minimum cover above pipes shall be 900mm where possible, with encasing as indicated on the drawings to lengths with insufficient cover. At road crossings the minimum cover shall be 1200mm. The depth shall be gradually increased as specified in SANS 1200 L clause 5.1.4.2

4.2.64.14 Connection to Existing Water Main

4.2.64.14.1 The proposed 110mm diameter HDPE water main shall be connected to the existing main water supply main at the position as indicated on the drawings.

4.2.64.14.2 Where required, the existing pipe shall be cut to provide sufficient space for the proposed fittings. Any damage to the existing mains or any existing specials shall be repaired to the Contractors' account if caused by negligence on the Contractors' part

4.2.64.15 Tolerances

4.2.64.15.1 Tolerances shall be determined on the basis as stated in the relevant clauses of the applicable sections of SANS 1200, relevant drawings and manufacturers' specification as applicable. The Contractor shall ensure that tolerances are complied with.

4.2.64.16 Testing

4.2.64.16.1 The test pressure shall be 16 Bar for all water pipes installed under this Contract.

4.3 Structural Engineering Works - Concrete, Formwork and Reinforcement

4.3.1 **Scope of Works**

4.3.1.1 This part of the scope covers the construction of the structural engineering works to be carried out by the Contractor but is not limited to the following:

4.3.1.1.1 New concrete foundations for new full hight brick walls i.e Gun Safe Room, Storeroom and Entrance Ramps as detailed in drawings.

4.3.1.1.2 Provision for new reinforced concrete roof slab over the Gun Safe Room and entrance ramp as detail in drawings.

4.3.1.1.3 Provision for all isolation and movement joints as noted on the detail drawings.

4.3.1.1.4 Provision for new surface beds as noted on detail drawings i.e New Storeroom.

4.3.1.2 All concrete and structural steelwork shall be in accordance with Transnet's requirements for the design and construction of the infrastructure. The following Specifications and Codes of Practices shall be read in conjunction with all the other Specifications listed in this document.

4.3.2 **Specifications and Standards**

Standard	**Description**
S420	Transnet specification for concrete work
EEAM-Q-003	General - Specification for Steel Wire
EEAM-Q-006	Structural steel work
EEAM-Q-008	Corrosion Protection
EEAM-Q-009	Quality Management
EEAM-Q-010	Specification for Reinforced Concrete and Structural
EEAM-Q-013	Punch List Specification
EEAM-Q-016	General Requirements and Conditions

4.3.3 **Surveying and Setting Out**

4.3.3.1 Engineering surveys and setting out will be in accordance with SANS 1200.

4.3.3.2 Construction tolerance will be stated on the construction drawings or within the specifications referenced within the NEC works information.

4.3.4 Levels

4.3.4.1 The project datum is mean sea level (MSL).

4.3.5 Co-ordinates

4.3.5.1 Co-ordinates are based on the World Geodetic System (WGS 84). The value of the Local Co-ordinate (LO) system is dependent on the longitude.

4.3.6 Servitude

4.3.6.1 New infrastructure shall remain within the existing Transnet servitude and not encroach on land owned by others unless agreed with Transnet and addressed in the Environmental Impact Assessment.

4.3.7 **Structural - Concrete, Formwork and Reinforcement**

4.3.7.1 This section covers the construction of all new reinforced concrete and associated concrete works requirements for the proposed repair of the existing structure, as directed by the Engineer in the detail drawings.

4.3.7.2 Particular Specifications

4.3.7.2.1 All in situ concrete work (mass and reinforced) shall comply with SANS Specification 1200G (“8 Measurement and Payment” is not applicable) supplemented by the clauses in this section. Where SANS Specification 1200G and the clauses in this section are in conflict the clauses in this section shall take precedence.

4.3.7.2.2 In addition, the "Model Preambles for Trades" as recommended and published by the Association of South African Quantity Surveyors, 1999 Edition, shall be read in conjunction with and shall apply to all items in the Bill of Quantities not covered by the 'SANS Standardised Specifications' SANS 1200 Series.

4.3.7.2.3 Where the term “plain concrete” appears in SANS Specification 1200G it shall be read as “mass concrete.”

4.3.7.3 Cement

4.3.7.3.1 Common cements, complying with SANS 50197-1 shall be used for all concrete work. On no account shall masonry cements be used for concrete work, even if the strength designations are the same as for common cements.

4.3.7.3.2 The Supervisor for test purposes may require samples of cement from any one, or from every consignment. Cement in any consignment from which a sample may have been taken for testing shall not be used until it has been approved. Allowance must be made for possible delay in that tests may take 10 days to carry out.

4.3.7.3.3 Bags of cement shall be stacked in a waterproof, solidly constructed shed with a central door and a floor rendered damp-proof with a tarpaulin. The bags of cement shall be closely stacked (but not against walls) to reduce air circulation in such a manner that the cement is used in the order in which it was received, i.e. first in first out.

4.3.7.4 Alkali reactive concrete

4.3.7.4.1 Alkali Reactive Aggregates shall not be used in this project. The equivalent Na2O content of the concrete shall not exceed 2, 0 kg/m3 where % Na2O equivalent = % Na2O + (0,658 x %K2O).

4.3.7.5 Aggregates

4.3.7.5.1 Fine and coarse aggregate shall comply with the relevant clauses of SANS 1083.

4.3.7.5.2 No aggregate may be used until it has been approved. Samples having a mass of 25kg (16.5 litre) of the proposed aggregate to be used may be required by the Supervisor for test purposes. Samples having a mass of 25kg shall be forwarded every 3 months during concreting work and if the source of supply is changed. Allowance must be made for possible delay in that the tests may take 14 days to carry out.

4.3.7.6 Admixtures

4.3.7.6.1 Admixtures containing chlorides will not be permitted in reinforced concrete.

4.3.7.7 Cover blocks

4.3.7.7.1 Cover blocks used to ensure the cover to reinforcement shall be made of cement mortar.

4.3.7.7.2 Cover blocks shall be dense and have a minimum 28 day crushing strength of 30 Mpa and shall be cured in water for at least 14 days before being used.

4.3.7.7.3 Cover/spacer blocks made of plastic will not be permitted.

4.3.7.8 Concrete quality

4.3.7.8.1 Prior to the start of any concrete work on site, the Contractor shall submit a quality assurance plan which will ensure compliance with specification and provide acceptable documentary evidence that all specified operations have been carried out satisfactorily.

4.3.7.8.2 Where the minimum dimension to be placed during a single pour is larger than 600mm, and the cement content of the reinforced concrete exceeds the following:

- Cement Types I and II/ * S : 400 kg/m3
- Cement Types II/B-V and II/B-W : 450 kg/m3

4.3.7.8.3 The Project Manager may require that measures be instituted to reduce heat development in the concrete.

4.3.7.9 Unreinforced Concrete

- Class A Concrete
- Filling to Cavity of hollow walls

4.3.7.10 Unreinforced concrete cast against excavated surfaces Class A Concrete

- 15Mpa/19mm
- Surface blinding under footings and bases

4.3.7.11 Reinforced concrete

- 30 MPa/19mm Concrete
- Bases
- Foundation beams

4.3.7.12 Surface beds cast in panels on waterproofing

- Walls in foundations (Provisional).
- Columns in foundations (Provisional).

4.3.7.13 Batching

4.3.7.13.1 No batching on Site will be allowed.

4.3.7.14 Concrete placing

4.3.7.14.1 The size, shape and depth of any excavation shall be approved by the Project Manager before concrete is placed.

4.3.7.14.2 Unless otherwise permitted by the Project Manager, no concrete shall be placed until the fixed reinforcement has been accepted by him and confirmed in writing by way of a release certificate.

4.3.7.15 Construction joints

4.3.7.15.1 Unless otherwise shown on the drawings, the exact position of horizontal construction joints shall be marked on the formwork by means of grout checks in order to obtain truly horizontal joints.

4.3.7.15.2 Stub columns, stub walls and stays on footings shall be cast integrally with the footing and not afterwards, even where another class of concrete is being used.

4.3.7.15.3 Joint lines shall be so arranged that they coincide with features of the finished work.

4.3.7.15.4 Where new concrete is to be cast against a hardened concrete surface, neat cement slurry mixed to a creamy consistency shall be brushed onto the cleaned concrete surface.

4.3.7.15.5 Contraction joints shall be smooth and shall have one coat of limewash or PVA applied to the older surface prior to casting the fresher concrete.

4.3.7.16 Slip Joints between Concrete and Brickwork

4.3.7.16.1 Slip joints shall be provided between brickwork and concrete slabs and beams by levelling up and towelling smooth the bearing surfaces of brickwork with 3:1 cement mortar and covering the bearings before the concrete is cast, with two layers of one side smooth tempered hardboard, with the smooth sides in contact.

4.3.7.16.2 The ends and sides of beams and edges of concrete slabs shall be separated from the brickwork with 13mm thick bitumen impregnated soft board or expanded polyethylene strips placed vertically against the brickwork before the concrete is cast.

4.3.7.16.3 Similar slip joints shall be provided between brickwork and concrete lintels cast In situ, but without soft board or expanded polyethylene strips at ends.

4.3.7.17 Movement Joints

4.3.7.17.1 All movement joints are to be filled in with approved bitumen impregnated soft board or expanded polyethylene strip unless otherwise specified or detailed on drawings. Descriptions (prices) of movement joints shall be deemed to include formwork.

4.3.7.18 Grouting

4.3.7.18.1 25 MPa non-shrink grout:

4.3.7.18.2 Bedding approximately 25mm thick under base plate including chamfered edges all round.

4.3.7.19 Curing compound

4.3.7.19.1 An approved trafficable, resin-based, white pigmented, membrane forming for slopes flatter than 1:1.

4.3.7.19.2 An approved clear, aesthetically acceptable, membrane forming for all other concrete surfaces, including beam and slab soffits.

4.3.7.19.3 The curing compound shall comply with specification ASTM C309, except that the maximum permissible water loss in the test shall be 0, 40 kg/m2.

4.3.7.19.4 Alternatively, the curing compound shall be acceptable if the treated concrete retains 90% or more of its mixing water when subject to the test set out in BS 8110 Part 1 – Chapter 6.6.

4.3.7.20 Curing compound application

4.3.7.20.1 The total application rate of the curing compound shall be the greater of the supplier’s specification or 0,90 l/m2. On textured concrete surfaces, the total application rate shall be 0,90 l/m2.

4.3.7.20.2 In cases of concrete surfaces with run-off problems, it may be necessary to apply more than one coat of membrane forming curing compound to obtain the specified total or cumulative application rate.

4.3.7.20.3 Curing in accordance with SANS 1200 G shall commence on all concrete surfaces as soon as it is practical in the opinion of the NEC supervisor.

4.3.7.20.4 On unformed surfaces the curing compound shall be applied after finishing and as soon as the free water on the surface has disappeared and no water sheen is visible, but no so late that the liquid curing compound will be absorbed into the concrete.

4.3.7.20.5 On formed surfaces, the exposed concrete shall be wet with water immediately after the forms are removed and kept moist until the curing compound is applied.

4.3.7.20.6 Application of the curing compound shall begin once the concrete has reached a uniformly damp appearance with no free water on the surface.

4.3.7.20.7 Application of the compound may be done by hand or power spray.

4.3.7.20.8 The compound shall be applied at a uniform rate with two applications at right angles to each other to ensure complete coverage.

4.3.7.20.9 Pigmented compounds, without a thixotropic agent, shall be adequately stirred to assure even distribution of the pigment during application.

4.3.7.20.10 Unless otherwise directed by the Project Manager, the initial 24 hour curing of concrete surfaces not covered by formwork shall be carried out by ponding, covering with constantly wetted sand or mats, or continuous spraying in accordance with SANS 1200 G when the following climatic conditions occur:

- Wind velocity greater than 5 m/s, and/or
- Ambient temperature is above 25 °C, and/or
- The relative humidity is below 60 %

4.3.7.20.11 If plastic shrinkage occurs, the concrete, while still plastic, shall be re-vibrated, floated and re-coated with curing compound as if no curing has previously taken place.

4.3.7.21 Curing period

4.3.4.1 The curing period for concrete containing only CEM 1 shall be 7 days.

4.3.4.2 The curing period for concrete containing CEM 1 plus cement extenders (MGBS, FA) shall be 10 days.

4.3.4.3 The curing period will start on completion of the concrete pour and for formed surfaces shall included the time for which forms are still in place after the pour.

4.3.7.22 Concrete records

4.3.7.22.1 The Contractor shall maintain the following daily records for every part of the concrete structure and shall make these available at all times during the progress of the work for inspection by the Project Manager:

- The date and time during which concrete was placed
- Identification of the part of the structure in which the concrete was placed
- The mixed proportions and specified strength
- The type and brand of cement

- The slump of the concrete
- The identifying marks of test cubes made
- Curing procedure applied to concrete placed
- The times when shuttering was stripped and props removed
- The date of despatch of the cubes to the testing laboratory
- The test results
- The records shall be delivered to the Project Manager each week except in the case of sub-standard concrete, when the Project Manager shall be informed immediately.

4.3.7.23 Tolerances

4.3.7.23.1 Deviations shall be within the limits listed in SANS 1200 G for degree of accuracy II unless otherwise specified.

4.3.7.24 Testing and monitoring

4.3.7.24.1 Frequency of sampling and testing shall be as specified in SANS 1200 G.

4.3.5 Cost of tests

4.3.5.1 The costs of making, storing and testing of concrete test cubes as required under clause 7 'Tests' of SANS 1200 G shall include the cost of providing cube moulds necessary for the purpose, for testing costs and for submitting reports on the tests to the Project Manager. The testing shall be undertaken by an independent firm or institution nominated by the Contractor to the approval of the Project Manager (Test cubes are measured separately)

4.3.5.2 If the quantity of concrete from which samples were taken exceeds 40 m3, it shall be subject to the testing of a minimum of 3 sets of samples per day from each grade of concrete placed in each independent structure.

4.3.5.3 If the quantity of concrete from which samples were taken is less than 40 m3, it shall be subject to the testing of a minimum of 2 sets of samples per day from each grade of concrete placed in each independent structure.

4.3.5.4 If the Contractor disputes the results of the tests on concrete cubes, the concrete represented by the cubes will be considered acceptable if the Contractor, at his own cost, proves to the satisfaction of the Project Manager that the estimated actual strength of cores taken from the structure, determined in accordance with SANS Standard Method SM 856, is not less than the specified strength.

4.3.5.5 If the strength of the concrete fails to meet the acceptance criteria stipulated, the Project Manager may in his sole discretion and in addition to the options listed in SANS 1200 G:

- accept the concrete subject to approved remedial measures being undertaken by the Contractor; or
- permit the concrete to remain subject to the payment of a penalty

4.3.5.6 The penalty referred to will be determined as follows:

- Penalty = V x R x F

Where,

V = Volume (in the opinion of the *Project Manager*) of concrete of unsatisfactory strength represented by the test result.

R = Relevant scheduled rate

$$F = 1 - \sqrt{\frac{Average\ strength\ of\ unsatisfactory\ concrete}{Specified\ strength\ +\ 6\ MPa}}$$

Where the relevant scheduled rate (R) includes the cost of formwork or

$$F = 1 - \frac{Average\ strength\ of\ unsatisfactory\ concrete}{Specified\ strength\ +\ 6\ MPa}$$

Where the relevant scheduled rate (R) excludes the cost of formwork or where no formwork was involved.

4.3.6 Formwork

4.3.6.1 Descriptions of formwork shall be deemed to include use and waste only (except where described as left in or permanent), for fitting together in the required forms, wedging, plumbing and fixing to true angles and surfaces as necessary to ensure easy release during stripping and for reconditioning as necessary before re-use.

4.3.6.2 Rough formwork to sides (degree of accuracy ii):

- Strip footings.
- Bases.
- Walls in foundations.
- Outer face of walls flushes with perimeter of concrete structure.
- Rectangular columns in foundations.
- Edges not exceeding 300mm high
- Rough Formwork to Circular Columns

4.3.6.3 Smooth formwork to sides (degree of accuracy ii)

- Inner face of shaft walls.
- Edges not exceeding 300mm high

4.3.6.4 Movement joints:

- Expansion joints with soft board between vertical concrete surfaces.
- 12mm Joints not exceeding 300mm high.

4.3.6.5 Saw cut joints:

- 3.2 x 50mm and 6.4 x 20mm saw cut joints in two operations in top of concrete.
- Seal Sikaflex-11FC on backing chord to manufacturer’s specification
- Horizontal toggle construction joints through concrete including thick cement slurry to one face.
- Surface beds not exceeding 300mmm thick.

4.3.6.6 Forming key to concrete for plaster, mosaic tiles and other finishes

4.3.6.7 Where rough formwork has been used, surfaces of concrete to receive plaster, mosaic tiles and other finishes, shall, immediately after the formwork has been removed, be well wetted and wire

brushed whilst the concrete is still green and then shushed over with 2:1 cement grout to form a key for the finish, all to the approval of the Supervisor. The shushing is to be allowed to set hard before the finish is applied.

4.3.6.8 Where smooth formwork is used, surfaces of the concrete to receive plaster, mosaic tiles and other finishes shall be hacked, on the distinct understanding that hacking of concrete shall be at no extra cost to the employer.

4.3.6.9 Surfaces of concrete receiving plaster or other finishes shall not be plastered or finished until the Supervisor has signified his opinion in writing that the surfaces are suitable to receive plaster or other finishes.

4.3.6.10 Sleeve Pieces and Ties

4.3.6.10.1 Where it is necessary to leave plugs or holes in beams, slabs or any other reinforced concrete, all such plugs or holes must be situated in positions approved by the Supervisor before concreting. Where it is necessary to carry pipes, bolts, wires or any other fittings through reinforced concrete members, approved pipe sleeves must be provided and placed in position before concreting.

4.3.6.10.2 Where waste, ventilation water, heating or other pipes under 100mm diameter pass through concrete slabs and beams, galvanised mild steel sleeve pieces or diameters shown or required shall be cast into such concrete slabs and beams.

4.3.6.10.3 Chases shall be formed in edges of slabs or slots shall be formed in the slabs, or sizes required, where two or more pipes pass through together.

4.3.6.10.4 All necessary bolts, plugs, brackets, cramps, etc. shall be cast into the concrete as the work proceeds.

4.3.6.10.5 Where brickwork abuts against concrete, the brickwork is to be tied to the concrete with galvanized hoop-iron ties 1.6m thick by 32mm wide and approximately 600mm long to every third course of brickwork with one end of each tie cast approximately 150mm deep into the concrete. Where such fixing is impossible, i.e. where steel formwork is used, the ties are to be gun-nailed against concrete with steel nails to less than 38mm long.

4.3.6.11 Bagged Finish to Concrete

4.3.6.11.1 Concrete surfaces to receive bagged finish shall be prepared by removing sharp projections and making good defects with 3:1 cement mortar. Finish by rubbing over the whole area with wet rough sacking and cement grout to obtain an even surface.

4.3.6.12 Power Floated Finish

4.3.6.12.1 Power floated finish to floors etc. means that surfaces shall be floated c\mechanically to a smooth and even finish before the concrete has set. Small areas inaccessible to the machine are to be floated by hand. Under no circumstances is cement mortar to be added while floating the concrete.

4.3.6.13 “No Fines” Concrete

4.3.6.13.1 “No-fines” concrete, for grading flat concrete roofs and the like to falls, shall be in the proportion of 12 parts 19 iron cubical stone to 1 part cement mixed with 20 litres water per bag of cement and be laid to falls of not less than 15mm per linear metre for mastic asphalt and not less than

20mm per linear metre for sheet roof covering. For heavy load applications special mix designs may be required.

4.3.6.14 Fillets against up stands:

4.3.6.14.1 Form triangular fillets, size 100 x 100mm, in corners with walls, kerbs, etc. neatly mitred at angles, stopped where necessary and finished smooth ready to receive waterproofing.

4.3.6.15 To raised floor, bases, etc:

4.3.6.15.1 No-fines" concrete for raised floors, bases, etc. shall be in the proportions specified. Finished smooth with 3:1 sand/ cement screed to receive waterproofing.

4.4 Electrical works

4.4.1 **Scope of Work**

The *works*, entitled New CCTV Facility which consists of the construction of new electrical lighting, installation of electrical power reticulation, construction of wire-ways for telephone and data.

4.4.2 **Standard of work, Equipment & Materials**

4.4.2.1 The electrical installation shall conform to the requirements of the latest edition and amendments of SANS 10142-1 Code of Practice for the Wiring of Premises and any additional requirements thereto, described in this specification.

4.4.2.2 Where the local supply authority requirements differ from those specified herein, the Project Manager shall be approached for a decision.

4.4.2.3 All equipment and material used shall be of high quality and the work shall be of a high standard of workmanship carried out by qualified staff under proper supervision by experienced and competent officers.

4.4.2.4 All equipment and material shall comply with the relevant National or International standard specification. Where equipment does not comply, it shall be submitted to the Project Manager for approval.

4.4.3 **Service conditions**

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

4.4.3.1 Ambient/Environment Conditions:

All equipment offered shall be rated for continuous operation under the following conditions:

Altitude	0 to 1800m Above Sea Level
Ambient temperature	-5°C to +40°C (daily average +35°C).
Relative humidity	As high as 96%.
Lightning conditions	Severe, with a maximum lightning ground flash density of 11 flashes per km² per annum.
Atmosphere	Salt laden and corrosive industrial chemical and dust laden nature. Frequent heavy rains driven by winds reaching speeds of 100 Km/h and above.

4.4.3.2 Electrical conditions:

The system of supply will be three phase, 4 wire, 50 Hz alternating current with earthed neutral at a nominal voltage of 400 / 230V. The voltage may vary within the range of 95% to 105% of the nominal and all equipment installed shall be suitably rated

4.4.3.3 Lightning conditions:

All lightning protection equipment offered shall be rated to withstand the following conditions:

Current	The peak lightning current and its rate of rise shall be regarded as severe when i_{max} = 200kA.
Voltage	The highest cloud potential shall be assumed to be more than 100MV, where: Q = CV, where Q is assumed at 100C and C to be 10^{-7} F.

4.4.4 **Normative References**

The following publications and specifications (latest edition) shall apply:

4.4.4.1 Codes of Practices

SANS 10313	Code of Practice for Protection of Buildings against Lightning
SANS 10064	Code of Practice for the Preparation of Steel Surfaces for Coating
SANS 10086	Installation and Maintenance of Electrical Equipment used in Explosive Atmospheres
SANS 10108	The Classification of Hazardous Locations and the Selection of Electrical Apparatus for use in such locations
SANS 10114-1 SANS 10114-2	Interior Lighting
SANS10142-1	Code of Practice for the Wiring of Premises
SANS 10199	The design and Installation of Earth Electrodes

4.4.4.2 Technical Specifications

SANS 152	Low Voltage Air Break Switches, Connectors, Switch Disconnectors, Fuse Combination Units.
SANS 156	Moulded Case Circuit Breakers.
SANS 160	Electric room Heaters
SABS 163	Wall and Appliance Switches.
SANS 164-2	Plugs and Switch Socket Outlets for Household and similar purposes
SABS 165	Lamp holders

SANS 172	Low Voltage Fuses
SANS 181	Thermostats for Electric Storage Heaters
SABS 314	Flameproof Enclosures for Electrical Apparatus
SABS 743	Low Voltage Isolating Transformers
SANS 767	Earth Leakage Protection Units.
SABS 763	Hot Dip Zinc (galvanised) Coatings
SABS 784	Metal Enclosed Busbar Trunking Systems
SABS 890	Ballasts for Fluorescent Lamps:
SANS 908	Meter Cabinets
SABS 950	Non-metallic Conduit and Fittings.
SANS 1091	National Colour Standards for Paints.
SANS 1012	Electric Light Dimmers
SANS 1041	Tubular Fluorescent Lamps
SABS 1065	Metal Conduits and Fittings for Electrical Wiring.
SABS 1085	Wall Outlet Boxes.
SANS 1119	Interior Luminaries for Fluorescent Lamps.
SABS 1180	Electrical Distribution Boards
SABS 1197	Metallic Wire ways for installation in floors
SANS 1507	Electric Cables with Extruded Solid Dielectric Installation for Fixed Installations
SANS 1274	Coatings Applied by the Powder-coating Process.
SANS 1278	Interior Luminaires for Low Pressure Sodium Vapour and High Intensity: Discharge Lamps
SANS1279	Floodlight Luminaires
SABS IEC 439	Low Voltage Switchgear
SABS IEC 309	Plugs, Socket Outlets and Couplers for Industrial Purposes
SABS IEC 742	Isolating Transformers and Safety Isolating Transformers

4.4.4.3 Transnet Projects Specifications

TPD: 001 – ELP SPEC : Technical specification for the supply and installation of electrical lighting and power in buildings other than dwelling houses.

TPD: 002 – DB SPEC : Technical specification for the design and manufacturing of low voltage distribution boards.

TPD: 003 – CABLE SPEC : Technical specification for the installation of medium and low voltage cables.

TPD: 004 – EARTHING SPEC : Technical specification for earthing and the protection of buildings and structures against lightning.

4.4.5 The building

4.4.5.1 Supply, installation and commissioning of electrical lighting and power including wire ways distribution boards and all terminations, luminaires, power points and power supply to building subsystems such as air conditioning, ventilation equipment, fire detection etc.

4.4.5.2 Supply and installation of wire ways for data and communications cables

4.4.5.3 Supply and installation of LV Supply Cables

4.4.5.4 Design, supply and installation of Lightning protection and earthing of the building structures and distribution boards.

4.4.5.5 The scope covers the supply, installation, commissioning, handing over and preparation of as-built drawings in AutoCAD latest format in proper working order, the distribution boards shall be designed and constructed according to the specification no. TPD-002 - DBSPEC; “detailed specification for the design and manufacturing of low voltage distribution boards”.

4.4.5.6 All distribution boards shall be supplied with 30% spare ways for future expansion.

4.4.6 Lighting Installation

4.4.6.1 The Contractor shall supply and install luminaries in the positions as shown on drawings supplied.

4.4.6.2 The power supply to luminaries shall be installed in 25/20mm uPVC conduit as shown on drawings supplied.

4.4.6.3 All wire-ways and cable terminations for lighting circuits shall be fully waterproof.

4.4.6.4 All PVC conduits, couplers, male adaptors, boxes and PVC adhesives shall be SABS approved.

4.4.6.5 All luminaries to be surface mounted to the underside of the slab using suitable fixing accessories.

4.4.6.6 All luminaries in the offices are to be recessed mounted within the suspended ceiling using suitable fixing accessories. All recess luminaries to be supplied with a 3m cord and 5A socket outlet for power and 2 pin socket outlets for data communication.

4.4.7 Switched Socket Outlets

4.4.7.1 The Contractor shall supply and install switched socket outlet as shown on drawings supplied.

4.4.7.2 The power supply to the socket outlet shall be installed in 25/20mm uPVC conduits recessed into the wall or slabs.

4.4.7.3 The conduit droppers and the socket outlet boxes shall be cast into concrete and built into brick walls. All conduit terminations to socket outlet boxes shall be done using a PVC male adaptor and a suitable PVC washer.

4.4.7.4 All PVC conduits, couplers, male adaptors, boxes and PVC adhesives shall be SABS approved.

4.4.7.5 All socket outlets shall be installed according to SANS 10142-1 and specification No. TPD: 001-EL&PSPEC; Technical specification for the supply and installation of electrical lighting and power in buildings other than dwelling houses.

4.4.8 Sleeve pipes, Draw Boxes and Wireways

4.4.8.1 The main sleeve pipes shall be installed at least 500mm below ground level outside the building structures and at least 300mm below ground inside the building structures. Slow bends shall be used where the sleeve pipes enter the buildings or change direction.

4.4.9 Design, Supply and Installation of Earthing and Lightning Protection

4.4.9.1 The Contractor shall design, supply and install earthing and lightning protection equipment to the building in accordance with specification No. TPD: 004-EARTHINGSPEC; “Transnet Projects Specification for lightning protection and earthing” This component of work shall be undertaken by a specialist earthing contractor. The installation of lightning protection system shall comprise of the following components:

4.4.10 Roof Conductors

4.4.10.1 The Contractor shall supply and install a minimum 10mm diameter round aluminium conductors.

4.4.10.1 The roof conductors shall be secured to the concrete structure by means of aluminium clips which shall be bolted onto the roof parapet using 40mm x 3mm stainless steel or brass anchor fasteners.

4.4.11 Down Conductors

4.4.11.1 The Contractor shall supply and install a minimum 10mm diameter round aluminium down conductors.

4.4.11.2 The down conductors shall be installed in rainwater down pipes or in 25mm conduits provided for down conductors.

4.4.12 Test Joints

4.4.12.1 The Contractor shall supply and install Bolted test joints for the purpose of testing the earth electrode resistance.

4.4.12.2 The test joints shall be a bolt and nut of M25 minimum size.

4.4.12.3 The bolt and nuts assembly of the test joint shall be constructed from stainless steel and shall be cast into the concrete wall at 300mm above ground.

4.4.13 Earth Electrodes

4.4.13.1 Earth electrodes and couples shall be manufactured from copper in accordance to SABS 1063.

4.4.13.2 The earth continuity conductor coupled to the earth electrode and the test joint shall be insulated copper stranded conductor, with a minimum cross-sectional area not less than 50mm2. The earth continuity conductor shall be installed in a

4.4.13.3 Earth electrodes shall be installed not less than 500mm away from building foundations and at a depth of not less than 500mm below finished ground level.

4.4.13.4 The earth electrode resistance shall not be more than 15 ohms.

4.4.14 Compliance Certificate

4.4.14.1 The tenderer is required to test the installation in the presence of the Employer and issue compliance certificates for lightning protection systems (SANS 10313) for all work done to the satisfaction of the Employer.

4.4.14.2 The tenderer shall be registered and listed with South African Bureau of Standards and the listing number shall be included in the above-mentioned compliance certificate.

4.4.15 Distribution Board Earthing

4.4.15.1 The Contractor shall design, supply and install earthing for all distribution boards

4.4.16 Removal of existing Electrical Equipment

4.4.16.1 The Contractor shall remove and make safe all existing electrical lighting, switched socket outlets, isolators, power skirting and associated wiring as indicated on drawings supplied.

4.4.10.1 All electrical removed shall be handed over to the TPT electrical stores.

4.4.17 Additions and Alterations to Distribution Boards A and B

4.4.17.1 The Contractor shall supply and install circuit breakers and DIN rail if required as indicated on drawings supplied.

4.4.18 Single Phase/ Three Phase Switch Disconnectors

4.4.18.1 The contractor shall supply and install single phase and three phase switch-disconnectors as shown on drawings supplied.

4.4.18.2 All switch disconnectors circuits shall be supplied by cables or wires with the exact cross-sectional area as depicted on drawings supplied.

4.4.18.3 uPVC conduits recessed into the wall or slabs.

4.4.18.4 All switch disconnectors shall be installed according to SANS 10142-1 and specification number: TPD: 001 - ELPSPEC; Specification for electrical installations buildings other than dwelling houses.

4.4.19 Light Switches

4.4.19.1 The contractor shall supply and install light switches as shown on drawings supplied.

4.4.19.2 The light switches shall be installed at a height of no less than 1500mm above the finished floor level and 100mm away from the door.

4.4.20 **Sleeve Pipes, Draw Boxes and Wireways**

4.4.20.1 The main sleeve pipes shall be installed at least 500mm below ground level outside the building structures and at least 300mm below ground inside the building structures. Slow bends shall be used where the sleeve pipes enter the buildings or change direction.

4.4.21 **Guarantee**

4.4.21.1 All equipment offered shall be guaranteed against faulty workmanship or defects for a period of 12 months.

4.5 MECHANICAL WORKS

4.5.1 The Mechanical Works to be undertaken by the Contractor comprise two components. Firstly, the Contractor is responsible for the supply, installation, testing, commissioning, and handover of a complete HVAC system, potable water system including hot water system, and fire protection system, together with all associated components and subsystems. These are to be delivered in accordance with the mechanical engineering design to ensure a comfortable and compliant security control room for Transnet Port Terminals.

4.5.2 The mechanical scope of works also includes the design, supply, installation, testing, commissioning, certification and handover of a gaseous fire extinguishing system for the server room in the Security control building.

4.5.3 HVAC Systems

4.5.3.1 Supply, Manufacture, Delivering, Installation, Testing, Commissioning, Certification (COC) and Handover of all HVAC systems and all its associated components, supports, mountings, fasteners, brackets to form a complete operational system and function as per its intended design. Apart from the applicable statutory codes of compliance which needs to be met in designs and installations, the Contractor shall in the event where there exists no prescribed way of certain processes for the design and installation always comply with best engineering practice and best industry practice throughout the entire process from start to finish of the project.

4.5.3.2 Shop detailing of all HVAC drawings to provide manufacturing drawings of all components which shall be submitted to the Employer Agent for approval before manufacturing.

4.5.3.3 Detail design of all filter boxes, fresh air intakes to host all the components neatly spaced and fitted as specified on the drawing.

4.5.3.4 Removal and dismantling of all existing HVAC system components currently installed in the building and disposal thereof at a compliant off-site facility.

4.5.3.5 Drafting of all HVAC As-built drawings after final completion of installation works and provide in PDF and AutoCAD formats.

4.5.3.6 Produce an operational manual which must provide a comprehensive explanation of the functioning of the entire HVAC system and must include operational manuals, drawings or diagrams of all HVAC components, datasheets and data books of all HVAC components and systems.

4.5.3.7 Produce maintenance manuals for the complete HVAC system taking all HVAC components into account with a maintenance checklist, spare parts list and periodic inspection schedule on which components need to be inspected and/or serviced and replaced when.

4.5.3.8 Provide Testing and Commissioning Checklists and Reports of all HVAC components and systems where applicable.

4.5.3.9 Provide Training to 5 End-User Client personnel on the operation and maintenance of the HVAC systems.

4.5.3.10 Handover of all HVAC system documentation listed throughout this document as part of the handover pack in 3 hard copy files which must also be submitted in electronic PDF format to the Employer Agent via reputable and recognised electronic data transfer mechanisms such as Microsoft One Drive.

4.5.3.11 All HVAC work shall be executed by a Mechanical HVAC Installer/technician which must have a minimum qualification of a National Certificate: Air-conditioning, Refrigeration, and Ventilation (NQF Level 2-4) and be registered with QCTO or MERSETA and have at least 5 years of HVAC System installation experience and be registered with the SAQCC Gas (South African Qualification and Certifications Committee for Gas and be registered and the department of Labour. The HVAC installer must be registered as Refrigeration Gas Practitioner.

4.5.3.12 Refer to HVAC drawings for further instructions.

4.5.4 Potable water systems

4.5.4.1 Supply, installation, testing, commissioning, certification (COC) and handover of all potable cold and hot water systems and all its associated components in accordance with the relevant statutory SANS codes as listed in the works information document.

4.5.4.2 Connecting onto existing mains water supply line via suitable means of pipe connections and all associated components.

4.5.4.3 Shop detailing of hot water geyser structural support system and piping setup in accordance with the relevant SANS code which shall be submitted to the Employer Agent for approval before installation.

4.5.4.4 Drafting of all potable water as-built drawings after final completion of installation works and provide in PDF and native AutoCAD formats.

4.5.4.5 Provide the relevant plumbing and electrical COC's (certificates of compliance) for the installation of the geyser system and all plumbing works installed in accordance with the relevant statutory codes.

4.5.4.6 All equipment and installations shall comply in all respects with the requirements of the Occupations Health and safety Act No. 85 of 1993.

4.5.4.7 All plumbing works shall be executed by a licensed plumber who is registered with the PIRB (Plumbing Industry Registration Board).

4.5.4.8 All electrical works shall be executed by a registered master installation electrician

4.5.4.9 Refer to potable water drawings for further instructions.

4.5.5 Fire protection system

A fire protection system shall be provided in the Security control room building and the scope of work in this regard shall entail the following as per the design drawings:

4.5.5.1 Supply, installation, testing, commissioning, certification (COC) and handover of a fire water protection system which includes two fire hose reels fixtures, fire extinguishers, fire and emergency escape signage together with all associated components to mount the fire protection fixtures at the relevant positions.

4.5.5.2 Removal and off-site disposal at a compliant facility of all existing fire protection fixtures.

4.5.5.3 The fire water system shall include all its associated piping, valves, gauges, meters and components to have a functioning fire protection system.

4.5.5.4 Connection of the fire water service pipe and meter to the closest water mains pipe along with all its associated pipe components to ensure a functional working fire water connection.

4.5.5.5 All fire extinguishers shall be supplied with a timber backing board with the mounting hook neatly mounted against the wall at the indicated position.

4.5.5.6 Supply, installation, testing commissioning, certification (COC) and handover of the fire detection and alarm system in compliance with all the codes stipulated as per the design drawing.

4.5.5.7 All fire protection fixtures and signage shall be mounted at the relevant heights in accordance to statutory code listed in this document.

4.5.5.8 Supply and installation of all fire and emergency escape signage in compliance with the relevant SANS code as listed in the works information.

4.5.5.9 Produce fire as-built drawings at completion of the installation

4.5.5.10 Produce, supply and install fire emergency escape diagrams of adequate size in an aluminum frame subject to Employer Agent's approval.

4.5.5.11 Refer to fire protection drawings for instructions.

4.5.6 Fire detection and suppression system

4.5.5.12 A gaseous fire extinguishing system (hereafter referred to as "the system") designed and installed by the contractor, shall be provided in the Server room in the Security control room building and shall adhere to the following:

- Design, supply, installation, testing, commissioning, certification (COC) and handover of a gaseous fire-extinguishing system for the server room in accordance with SANS 14520 and all its relevant parts and other referenced codes.
- The system shall be based FK-5-1-12.
- The system designer shall have the following qualification:
    - Higher occupational certificate: Gaseous Fire Suppression System
    - Designer recognized by SAQA

4.5.5.13 The installer shall be registered as a SAQCC Fire installer and shall be responsible for the design, supply, installation, testing, commissioning, certification and handover of the gaseous fire extinguishing system. The installation of the fire suppression system shall be conducted by a SAQCC certified installer and SAQCC certified pipe fitter.

4.5.5.14 The fire gas suppression system shall be commissioned by a SAQCC certified commissioner in line with the relevant applicable SANS codes.

4.5.5.15 As-built drawings shall be produced at the completion of the installation

4.5.5.16 Certification shall be issued for the completed installation as per the requirements of SANS 14520 and contain all information stipulated in this code.

4.5.5.17 Supply and installation of all relevant signage associated with the system.

4.5.5.18 The system shall be suitably interlocked with the HVAC system in the room to ensure efficient and effective suppression in the event of fire.

4.5.5.19 Produce an operational manual which must provide a comprehensive explanation of the functioning of the entire gaseous fire-extinguishing system and must include operational manuals, drawings or diagrams and datasheets of all system components.

4.5.5.20 Produce maintenance manuals for the complete gaseous fire-extinguishing system taking all system components into account with a maintenance checklist, spare parts list and periodic inspection schedule on which components need to be inspected and/or serviced and replaced when.

4.5.5.21 Provide Testing and Commissioning Checklists and Reports of all system components and systems where applicable.

4.5.5.22 Provide Training to 5 End-User Client personnel on the operation and maintenance of the gaseous fire-extinguishing system.

4.5.5.23 Handover of all gaseous fire-extinguishing system documentation listed throughout this document as part of the handover pack in 3 hard copy files which must also be submitted in electronic PDF format

to the Employer Agent via reputable and recognised electronic data transfer mechanisms such as Microsoft One Drive.

4.5.7 Quality of Workmanship

4.5.7.1 All workmanship shall be of the highest professional standard, consistent with current best practice in the mechanical building services industry.

4.5.7.2 All work shall be executed by competent tradespersons and supervised by suitably qualified personnel.

4.5.7.3 All work shall be performed in accordance with the latest editions of the relevant codes as specified in this document and on the drawings.

4.5.8 Compliance and Tolerances

4.5.8.1 All installation work shall comply with the approved design drawings, specification and method statements.

4.5.8.2 Tolerances shall conform to those specified in relevant standards or as approved by the Engineer/Project Manager.

4.5.8.3 Any deviations and non-conformances shall be reported immediately and shall not be concealed until inspected and approved.

4.5.9 Materials and Equipment

4.5.8.4 Only new, undamaged, and approved materials, plant and equipment shall be used.

4.5.8.5 All materials shall be handles, stored, and installed in a manner that prevents damage, corrosion, or contamination.

4.5.8.6 Where alternatives or substitutions are proposed, these must receive prior written approval from the Engineer.

4.5.10 Workmanship Checks

4.5.10.1 The Contractor shall maintain a system of quality control inspections to verify compliance at each stage of installation (e.g. ductwork fabrication, pipe alignment, valve orientation, insulation thickness, bracket spacing, etc.)

4.5.10.2 All concealed services shall be inspected and approved before being covered up.

4.5.10.3 Records of inspections, test certificates, and commissioning reports shall form part of the quality documentation submitted upon completion.

4.5.11 Finishing and Presentation

4.5.7.1 All visible pipework, ductwork and equipment shall be neatly installed, aligned, and supported.

4.5.7.2 Surfaces shall be cleaned and finished free of burrs, sharp edges, wels spatter, or paint overspray.

4.5.12 Testing and Commissioning

4.5.12.1 Systems shall be pressure-tested, flushed, balanced, and commissioned to demonstrate full compliance with performance requirements.

4.5.12.2 Test results shall be documented and verified prior to handover.

4.5.13 Rectification of Defects

4.5.13.1 Any defective or substandard workmanship shall be rectified or replaced by the Contractor at no additional cost.

4.5.13.2 Rectification work shall be carried out promptly and after completion reported to the Engineer for inspection and acceptance.

4.5.14 **Governing Codes, Standards and Specifications**

4.5.14.1 The latest versions of the following governing codes and standards shall be complied with during the design and installation of the mechanical engineering systems.

CODES / STANDARD	**DESCRIPTION**
SANS 1128	Firefighting equipment Part 1: Components of underground and above-ground hydrant systems
SANS 10105	The use and control of fire-fighting equipment Part 1: Portable and wheeled (mobile) fire extinguishers
SANS 460	Plain-ended solid drawn copper tubes for potable water
SANS 543	Fire hose reels (with semi-rigid hose)
SANS 1475	The production of reconditioned fire-fighting equipment Part 1: Portable and wheeled (mobile) rechargeable fire extinguishers
SANS 10400	All applicable parts of the application of the National Building Regulation
SANS 10400-O	The application of the National Building Regulations Part T: Fire protection
SANS 10400-T	The application of the National Building Regulations Part T: Fire protection
SANS 10400-W	The application of the National Building Regulations Part W: Fire installation
SANS 14520	Gaseous fire-extinguishing systems-Physical properties and system design and all the relevant associated parts.
SANS 1186	Symbolic safety signs Part 1: Standard signs and general requirements
SANS 10139	Code of practice for design, installation, commissioning and maintenance of fire detection and alarm systems in non-domestic premises
SANS 10252-1	Water supply and drainage for buildings Part 1: Water supply installations for buildings
SANS 1238	Air-conditioning ductwork

SANS 10173	The installation, testing and balancing of air-conditioning ductwork
OHS Act 85 of 1993	Occupational Health and Safety Act 85 of 1993
Pressure Equipment Regulation-OHS Act	Pressure Equipment Regulations (PER) under the OHS Act apply to pressure vessels, cylinders and pressure piping used by gas systems — designers must ensure PER compliance
Local Municipal Bylaws	City of UMhlathuze Local Bylaws

4.5.10.1 The following specifications shall also be complied with:

EEAM CODES	**DESCRIPTION**
EEAM-Q-006	Structural steel Work
EEAM-Q-008	Corrosion Protection
EEAM-Q-009	Quality Management

5 List Of Drawings

5.1 Drawings issued by the *Employer*

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

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

Drawing number	Revision	Title
ARCHITECTURAL		
000182R-182-A-DE-0001-01	02	Security control room for Transnet Port Terminals Richards Bay, Ceiling& Carport Details
000182R-182-A-DE-0002-01	02	Security control room for TPT Rbay, Entrance, Desk & Kitchen
000182R-182-A-LA-0001-01	02	Security control room for TPT Rbay, Site, Demolition, Floor
000182R-182-A-SC-0001-01	02	Security control room for TPT Rbay, Door Schedule
000182R-182-A-SC-0002-01	02	Security control room for TPT Rbay, Window & Partition Schedule
000182R-182-A-SC-0003-01	02	Security control room for TPT Rbay, Sanware & Finishes Schedule
000182R-182-A-SC-0004-01	02	Security control room for TPT Rbay, Ironmongery schedule
CIVIL		
000182R-182-C-DE-0001-01	0B	Security control room for Transnet Port Terminals Richards Bay, Details
000182R-182-C-DE-0002-01	0A	Security control room for Transnet Port Terminals Richards Bay, Low Fence Details
000182R-182-C-LA-0001-01	0B	Security control room for TPT Rbay, Plan Layout
000182R-182-C-LA-0002-01	0B	Security control room for TPT Rbay, Plan Layout-Services
STRUCTURAL		
000182R-182-S-LA-0001-01	0A	Foundation, surface slab, roof slab layout, sections and details
ELECTRICAL		
000182R-182-E-LA-0001-01	0B	Security control room for TPT Rbay, Proposed EL&P Layout
000182R-182-E-LA-0002-01	0B	Security control room for TPT Rbay, Proposed Distribution
000182R-182-E-LA-0003-01	0B	Security control room for TPT Rbay, Proposed Electrical Site
000182R-182-E-LA-0004-01	0B	Security control room for TPT Rbay, Proposed Lighting

MECH		
000182R-182-M-LA-0001-01	0A	Security control room for Transnet Port Terminals Richards Bay, HVAC LAYOUT
000182R-182-M-LA-0002-01	0A	Security control room for TPT Rbay, Water Reticulation Layout
000182R-182-M-LA-0003-01	0A	Security control room for TPT Rbay, Fire Protection Layout
000182R-182-M-LA-0004-01	0A	Security control room for TPT Rbay, Fire and Evacuation Layout

SECTION 2

6 Management and start up

6.1 Management meetings

6.1.1 It is the Employer's specific intention that the Parties and their agents use the techniques of partnering to manage the contract by holding meetings designed to pro-actively and jointly manage the administration of the contract with the objective of minimising the adverse effects of risks and surprises for both parties.

6.1.2 Depending on the size and complexities of the Works, it is probably beneficial for the Employer to hold a weekly risk register meeting (Clause 16.2). This could be used to discuss safety, environmental, compensation events, subcontracting, overall co-ordination, and other matters of a general nature. Separate meetings for specialist activities such as programming, engineering, and design management, may also be warranted.

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

Title and purpose	**Approximate time & interval**	**Location**	**Attendance by:**
Risk Reduction and compensation events	As and when required	On site / Virtual	Project Manager, Supervisor, Contractor, and appropriate key persons
Overall contract progress and feedback	Every two weeks	On site / Virtual	Employer, Project Manager, Supervisor, Contractor, and appropriate key persons
Technical Meetings	Weekly	On site / Virtual	Project Manager, Supervisor, Contractor, and appropriate key persons
Planning Meetings	Weekly	On site / Virtual	Employer, Project Manager, Supervisor, Contractor, and appropriate key persons

6.1.1 Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature, and the progress

of the works. Records of these meetings are to be submitted to the Project Manager by the person convening the meeting within five days of the meeting.

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

6.2 Documentation Control

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

6.2.2 TPT's Project Document Controller will take the responsibility for the management of all technical and non-technical documentation throughout the life cycle of the Project. All documentation produced for and on behalf of the project will be registered with document control and its management thereof.

6.2.3 This will include the registration, classification, managing, scanning, tracking, filing, storing, distribution and filing of all hardcopy and electronic documentation generated for and on behalf of the project.

6.2.4 All documentation and data created for the Project shall be numbered and named according to the TPT Codification Procedure. Such numbering is only available from the Project's Document Control Group.

6.2.5 All contract correspondence is issued through document control. All communication to submitted electronically and is to be always addressed to the Project Manager and Transnet Port Terminals Doc Control mailbox email: RBayDocControl@transnet.net.

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

6.2.7 Should any change be made to documentation or data, which has already been submitted to the Project, then new or revised documentation or data shall be issued to Doc Control RBayDocControl@transnet.net to replace the out-dated information.

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

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

6.2.10 The Contractor is to ensure that the latest versions of the required application software and a suitable 'IT' Infrastructure are in place to support the electronic transmission of documentation. E.g. One drive should be used for document submission that exceed the email space requirement.

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

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

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

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

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

6.3 Safety risk management

6.3.1 The Contractor must comply with the requirements of the Project Site Health and Safety Specification and OHS Act No. 85 of 1993 and its applicable Regulations.

6.3.2 The Contractor is solely responsible for carrying out the work under the Contract having the highest regard for the health and safety of its employees, Transnet's employees and persons at or in the vicinity of the Site, the works, temporary work, materials, the property of third parties and any purpose relating to the Contractor carrying out its obligations under this Contract.

6.3.3 The Contractor must initiate and maintain safety precautions and programs to conform to all applicable Health and Safety laws or other requirements, including requirements of any applicable government instrumentality and client corporate, business unit and site requirements. The Contractor must, at its own cost, erect and maintain safeguards for the protection of workers and the public. The Contractor must manage all foreseeable hazards created by performance of the work. The Contractor must:

6.3.3.1 Provide all things and take all measures necessary for maintaining proper personal hygiene, ensuring safety of persons and property, and protecting the environment at or near the Site.

6.3.3.2 Avoid unnecessary interference with the passage of people and property at or near the Site.

6.3.3.3 Prevent nuisance and excessive noises and unreasonable disturbances in performing the Services.

6.3.3.4 Be responsible for the adequacy, stability, and safety of all its site operations, of all its methods of design, construction and work and be responsible for all the work, irrespective of any acceptance, recommendation, or consent by TPT, its Contractors, employees, agents and invitees, or any Government Body.

6.3.4 The Contractor must comply and is responsible for ensuring that all its Subcontractors comply with the relevant legislation(s) and statutory regulations for health and safety, the Transnet Health and Safety requirements included in the Contract and other document pertaining to health & safety contained in the Programme Health & Safety Management System and include standards, policies, procedures, guidelines, and safe work instructions.

6.4 Contractor's Health and Safety Management

6.4.1 The Contractor must prepare, implement, and maintain a project-specific Health and Safety Management Plan. The plan must be based on the requirements set out in the Project Site Health and Safety specification which will be provided by TPT Health and Safety, as well as all applicable legislation. It must cover all activities that will be carried out on the project site(s), from mobilisation and set-up through to rehabilitation and decommissioning.

6.4.2 The plan must demonstrate the Contractor's commitment to health and safety and must, as a minimum, include the following:

6.4.2.1 A copy of the Contractor's Health and Safety Policy; in terms of the OHS Act section 7.

6.4.2.2 Procedures concerning Hazard Identification and Risk Assessment, including both Baseline and Task-Based Risk Assessments.

6.4.2.3 All applicable legislation concerning work performed from an elevated position must be always complied with. Fall prevention or fall protection measures must be in place whenever the potential exists for a person to fall 2 metres or more. For the working at heights requirements, the Contractor shall refer to the Health and Safety Guideline Specification, HAS-SP-0001.

6.4.2.4 Arrangements concerning the identification of applicable Legal and Other Requirements, measures to ensure compliance with these requirements, and measures to ensure that this information is accessible to relevant personnel.

6.4.2.5 Details concerning Health and Safety Objectives – a process must be in place for setting objectives (and developing associated action plans) to drive continual improvement.

6.4.2.6 Details concerning Resources, Accountabilities and Responsibilities – this includes the assignment of specific health and safety responsibilities to individuals in accordance with legal or project requirements, including the appointment of a Project Manager, Health and Safety Officers, Supervisors, Health and Safety Representatives, and First Aiders.

6.4.2.7 Details concerning Competence, Training and Awareness – a system must be in place to ensure that each employee is suitably trained and competent, and procedures must be in place for identifying training needs and providing the necessary training.

6.4.2.8 Communication, Participation and Consultation arrangements concerning health and safety, including Toolbox Talks, Daily Safe Task Instructions, project health and safety meetings, and notice boards.

6.4.2.9 Documentation and Document Control – project-specific documentation required for the effective management of health and safety on the project must be developed and maintained, and processes must be in place for the control of these documents.

6.4.2.10 Processes and procedures for maintaining Operational Control, including rules and requirements (typically contained in Safe Work Procedures) for effectively managing health and safety risks, particularly critical risks associated with working at heights, confined spaces, mobile equipment, and light vehicles, lifting operations, hazardous chemical substances, etc.

6.4.2.11 Emergency Preparedness and Response procedures.

6.4.2.12 Management of Change – a process must be in place to ensure that health and safety risks are considered before changes are implemented.

6.4.2.13 Sub-Contractor Alignment procedures – a process must be in place for the assessment of Subcontractors and suppliers regarding health and safety requirements and performance (before any contract or purchase order is awarded)

6.4.2.14 Measuring and Monitoring plans, including a plan for the measuring and monitoring of employee exposure to hazardous substances or agents (e.g. noise, dust, etc.) to determine the effectiveness of control measures.

6.4.2.15 Incident Reporting and Investigation procedures describing the protocols to be followed regarding incident reporting, recording, investigation, and analysis.

6.4.2.16 Non-conformance and Action Management procedures concerning the management of corrective actions.

6.4.2.17 Performance Assessment and Auditing procedures concerning health and safety performance reporting, monthly internal audits to assess compliance with the project health and safety requirements, and daily site health and safety inspections; and

6.4.2.18 Details concerning the Management Review process followed to assess the effectiveness of health and safety management efforts.

6.4.2.19 The Contractor shall comply with OH&S Act – Section 8, 9, 13 and 16 and the Construction Regulations 2014.

6.4.2.20 The Contractor must nominate and appoint a responsible person on site to whom the Project Manager may refer in connection with the works. Persons are nominated for all shifts worked or whilst any activity relating to the Contract is being performed on site and must have the authority to bind the Contractor with respect to the Contract. (OH&S Act - 16 Section (2)).

6.4.2.21 The Contractor must ensure that the performance of all specified works is supervised throughout by enough qualified and competent appointed representatives of the Contractor, who have experience in the type of work specified. (OH&S Act – Construction Reg. 8 (1) and 8 (2.)

6.4.2.22 Note: No work may commence and or continue without the approval of the submitted SHE File Supervisory Appointees present on site. The Contractor’s Site Supervisor must be equipped with a mobile telephone with message bank and/or pager or an equivalent communication device so that communication throughout the Contract can be always maintained.

6.4.2.23 The Contractor’s Site Supervisor must provide a list of names and contact telephone numbers of all Contractors and Subcontractor’s contact persons on Site. This list is updated as a new Contractor or Subcontractor employee commences on Site.

6.4.2.24 The Contractor’s Site Supervisor must keep a record of all employees, including date of induction, relevant skills, and licenses, and be able to produce this list at the request of the Supervisor.

6.4.2.25 The Contractor's Site Supervisor must complete manning sheets describing the day's activities, labour numbers and classifications and issue these to the Supervisor prior to 9.00 am daily.

6.4.2.26 The Project Manager's Site Safety Representative is notified of any new starter with evidence of induction and site-specific induction prior to commencement of work.

6.4.3 Health and Safety Officer

6.4.3.1 The Contractor must appoint a full-time Health and Safety Officer for the duration of the contract. The Health and Safety Officer must be on site when work commences at the start of the day and must remain on site until all activities for that day (including the activities of sub-Contractors) have been completed. A Health and Safety Officer must be present during all shifts, so if work is carried out over more than one shift per day, the Contractor must make provision for an additional Health and Safety Officer. Each Contractor Health and Safety Officer shall be responsible for:

6.4.3.1.1 Reviewing all applicable legal and project health and safety requirements and providing guidance to Contractor and Subcontractor personnel (particularly the Contractor's Project Manager) to help always ensure compliance.

6.4.3.1.2 Assisting with the implementation of effective hazard identification and risk management processes for all work to be carried out by the Contractor.

6.4.3.1.3 Participating in the Baseline Risk Assessment for the Contractor's scope of work (prior to site establishment) and ensuring that identified control measures are implemented.

6.4.3.1.4 Participating in all Task-Based Risk Assessments conducted for the work to be carried out by the Contractor and ensuring that identified control measures are implemented.

6.4.3.1.5 Conducting Contractor health and safety induction training for all Contractor and Subcontractor personnel.

6.4.3.1.6 Compiling and maintaining all health and safety related documents and records required of the Contractor.

6.4.3.1.7 Communicating relevant health and safety information to Contractor and Subcontractor personnel (e.g. incidents and lessons learnt, leading practices, hazards, risks, and control measures, etc.).

6.4.3.1.8 Carrying out Safety Observations and Coaching (one per day).

6.4.3.1.9 Evaluating the content of the Daily Safe Task Instructions (DSTI's) conducted by the Contractor's appointed Supervisors and attending at least one DSTI each day.

6.4.3.1.10 Attending monthly Contractor and Site Health and Safety Meetings.

6.4.3.1.11 Assisting with the implementation of the Contractor's Health and Safety Management Plan and associated Safe Work Procedures.

6.4.3.1.12 Carrying out Planned Task Observations on an ad hoc basis.

6.4.3.1.13 Assisting with the implementation, testing and maintenance of an effective Emergency Response Plan for all Contractor and sub-Contractor activities.

6.4.3.1.14 Responding to workplace incidents (as appropriate).

6.4.3.1.15 Participating in incident investigations.

6.4.3.1.16 Maintaining accurate health and safety statistics (for the Contractor and all Subcontractors), and compiling health and safety performance reports as required.

6.4.3.1.17 Auditing the health and safety management system and workplace activities of the Contractor and each Subcontractor monthly to assess compliance with the project health and safety requirements; and,

6.4.3.1.18 Tracking and reporting on the implementation of corrective actions (arising from incident investigations, audits, inspections, etc.).

6.4.3.2 The Contractor must ensure that the Health and Safety Officer is adequately equipped to enable him to perform his duties effectively. Each Health and Safety Officer must be provided with the following:

6.4.3.2.1 A computer with access to all necessary systems, including access to e-mail and the internet.

6.4.3.2.2 A mobile telephone on contract or with adequate pre-paid airtime; and

6.4.3.2.3 A vehicle where required or instructed by a nominated project management representative (depending on the size and location of the project site(s)).

6.4.3.3 A Health and Safety Officer must be computer literate, fluent in English, and must have the following minimum qualifications, training, and experience:

6.4.3.4 At least 3years' experience as a Health and Safety Officer in construction projects

6.4.3.5 Experience and appropriate training with regard to implementing and maintaining a health and safety management system compliant with national legislation or an international standard.

6.4.3.6 Experience and appropriate training regarding construction related hazard identification and risk management processes.

6.4.3.7 Competence, experience and relevant training regarding incident investigation procedures and causation analysis.

6.4.3.8 Health and safety auditing experience and training.

6.4.3.9 A valid First Aid certificate of competency.

6.4.3.10 Fire prevention and protection training; and

6.4.3.11 A valid Driving License (light motor vehicle).

6.4.3.12 Before placing a SHE Officer on the project site(s), the Contractor must forward a copy of the person's CV to the nominated project management representative or to TPT Health and Safety Manager and TPT Project Environmental Resource for review and acceptance. A proposed candidate may be rejected should he not meet the experience and/or qualification requirements, or due to poor work performance on previous projects.

6.4.4 Contractor's Safety Health, Environmental File (SHE file)

6.4.4.1 The SHE file must comply with requirement of the TIMS Health and Safety specification.

6.4.4.2 The Contractor must submit a hard copy of its SHE file with Health and safety management plan (HSMP), policies and procedures/ SOP'S, Medical records of the team, Task base risk assessments, Legal appointment letters and organogram, Site office layout and other mandatory document stipulated by the Occupational Health and Safety Act to the Project Manager for acceptance prior to the commencement of any site work. The Contractor must ensure that his personnel strictly observe and comply with the procedures set out therein.

6.4.4.3 The Project Manager or the Project Manager's nominated Representative may from time-to-time request safety standard operating procedures applicable to the area of operations. The Contractor must forward to the Project Manager any updates or revisions to its HSMP, policies or standard operating procedures as soon as practicable following revision or update.

6.4.4.4 The Project Manager may require the Contractor from time to time to supplement its safety manual, policies, and procedures with guidelines and/or operating standards provided to the Contractor by the Project Manager. The Contractor must comply with such requests where the request is consistent with the requirements of the Contract. The Contractor must give prompt written notice to the Project Manager of any objection to the requested supplement, including the reasons for objection. The Project Manager's rights under this Clause are not intended, and must not be construed, to relieve the Contractor from any obligations to ensure compliance with all provisions of this Contract.

6.4.4.5 The Contractor and each of its Subcontractors must complete and submit Health and Safety statistics to the Project Manager or the Project Manager's nominated representative, or as amended by the Project Manager, before midday on the Friday of each week. The Contractor must submit monthly Health & Safety Statistics before midday on the last day of each month to the Project Manager's nominated representative.

6.4.4.6 The Contractor must submit to the Project Manager for acceptance a schedule of the specific Health and Safety records it intends to maintain for the Contract. As a minimum, such records are as specified by applicable legislation. Copies are provided to the Project Manager or the Project Manager's nominated Representative if requested.

6.4.4.7 The Contractor must implement a system to recognize, correct, and report unsafe acts/conditions (Unsafe Act/Condition Auditing) associated with all Site activities. All such observations must be recorded and delivered to the TPT Health and Safety Manager.

6.4.4.8 The Contractor and Subcontractor's workforce must, through their supervision, safety notice boards, toolbox meetings and daily pre-start meetings be kept aware of safety related matters.

6.4.4.9 The Contractor must hold documented Daily Safe Task Instructions with each work team before the start of each shift. Attendance records and brief topic notes is kept for auditing and record purposes.

6.4.4.10 The Contractor Site Manager and a Site Safety Representative must take part in weekly safety review meetings between the Contractor and the Project Manager or the Project Manager's nominated Representative.

6.4.4.11 The Contractor must attend all project safety meetings as outlined in the Project Safety Management Plan.

6.4.4.12 The Contractor complies with the requirements of the Site Safety Review Committee with respect to his own activities and others on the Site and Working Areas.

6.4.4.13 The Transnet Safety Officer and NEC Supervisor act on behalf of the Project Manager and may communicate directly with the Contractor and his key persons with respect to the Safety Management Plan:

6.4.4.14 Pre-employment medicals, including chest X-ray examinations, specific for the Contract will be required for all employees working on the Site regardless of duration spent on Site. Exit medicals, including chest X-ray examinations will be required at the end of the Contract. These medical examinations must be carried out by a registered Occupational Health Practitioner. The Contractor must ensure that budget provision for SHE requirements are in place.

6.5 Environmental Constraints and Management

6.5.1 All work is to be conducted in accordance with the principles of the National Environmental Management Act, 1998 (Act no 107 of 1998) but not limited to other applicable regulations as well acceptable environmental good practices. In addition, the Contractor is expected to comply with all applicable UMhlathuze Municipal bylaws.

6.5.2 The following documents, included in Annexure of the Works Information, provide the minimum acceptable standards that shall be adhered to:

6.5.2.1 Transnet Integrated Management System (TIMS) Policy Commitment Statement.

6.5.2.2 Contractor Environmental and Sustainability Specifications Guidelines (TRN-IMS-GRP-GDL-014.4). (CESSG)

6.5.2.3 Standard Operating Procedure for Transnet Construction Environmental Management (009-TCC-CLO-SUS-11386) (SOP: CEM)

6.5.2.4 Transnet Asbestos Management Procedure

6.5.3 The Contractor must comply with all the requirements of the SOP: CEM and CESSG as mentioned above. The above requirements shall be applicable to the main Contractor and its service providers.

6.5.4 The Contractor must sign the declaration of understanding as a commitment to abide with Transnet Environmental Governance Framework and Project Environmental Specification. Sufficient environmental budget must be allocated to meet all the project environmental requirements for the duration of the contract.

6.5.5 The Contractor shall perform the works and all construction activities within the Site and Working Areas having due regard to the environment and to environmental management practices as more particularly described within the SOP: CEM and CESSG.

6.5.6 The SOP: CEM defines how environmental management will be practiced on construction projects under Transnet's management and to ensure that that the environment is considered that negative impacts are avoided or minimised and positive impacts are enhanced. The SOP: CEM further describes the main roles and responsibilities of the project team with respect to Environmental Management. The CESSG describes the minimal requirements for environmental management to which the contractors must comply.

6.5.7 The Contractor must appoint a fulltime Environmental Officer (EO)/ Safety, Health and Environmental (SHE) Officer to monitor and manage compliance to Environmental Specification and all applicable environmental legislation. The EO/SHE officer should have relevant environmental qualifications and experience, and this must be approved by TPT before commencement of work on site. The Health & Safety Officer with NQF Level 6 qualification in Safety Management / NEBOSH / SAMTRAC, with at

least 5 years work experience in construction or building projects. The Environmental officer must have at least an NQF Level 6 qualification in Environmental Management, with a minimum of 5 years work experience in construction projects.

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

6.5.9 The overarching obligations of the Contractor under the CESSG before construction activities commence on the Site and/or Working Areas is to provide environmental method statements for all construction operations at the Site and/or Working Area by the Contractor to comply with the following:

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

6.5.11 The Contractor shall ensure that all salvageable items not required for re-use in the project.

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

6.5.13 The Contractor must appoint the waste removal Service Providers as per the TNPA list of waste removal Service Providers (included in the Annexures).

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

6.5.15 A copy of the SOP: CEM and CESSG shall be available on Site, and the Contractor shall ensure that all the personnel on Site (including Subcontractors and their staff) as well as suppliers are familiar with and understand the specifications.

6.5.16 Method statements need to be compiled by the Contractor throughout the Construction and Commissioning phase of the project. These Method Statements must be approved by the TPT Construction Manager and TPT Environmental Manager or Environmental Officer. Approval must be at least two weeks prior to the proposed commencement of the activity. Emergency construction activity method statements may also be required. The activities requiring method statements cannot commence if they have not been approved by the TPT Environmental Manager or Environmental Officer.

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

6.5.18 The Contractor shall be responsible for rehabilitating and or re-vegetating all areas to the satisfaction of the TPT Environmental Manager or Environmental Officer as detailed in the CESSG.

6.5.19 The Contractor must ensure that its Subcontractors comply with the Environmental Specification.

6.5.20 On Friday, 12 July 2024, GN. R.5042 of 2024 was published in Government Gazette No. 50930, in terms of which the Minister of Employment and Labour has, in terms of section 43 of the Occupational Health and Safety Act, 1993 made amendments to the Asbestos Abatement Regulations, 2020 ("the Regulations").

6.5.21 The notice amends regulation 24(f), by inserting an exception, to the provision that no person may use electrical power tools, such as angle grinders, or any other fast-moving equipment to cut, grind or drill asbestos-containing material; provided that slow-moving tools may only be used where the activity is part of asbestos-containing material removal for final disposal

6.6 Quality Assurance Requirements

6.6.1 The Contractor shall have, maintain, and demonstrate its use to the Project Manager (and/or the Supervisor to satisfy the requirements of The Works Information as appropriate) the documented Quality Management System to be used in the performance of The Works.

6.6.2 The Contractor's Quality Management System shall conform to International Standard ISO 9001, as a preferred system (or an equivalent standard acceptable to the Project Manager) and as a minimum to the requirements of specification EEAM-Q-009, General Quality requirements for Suppliers and contractors as contained in the Annexure to this Works Information.

6.6.3 The Contractor shall execute the works in accordance with the project specification "General Quality Requirements for Contractors and Suppliers" - QAL-STD-0001 included in Annexure 17 of the Works Information.

6.6.4 Below are some of the applicable Codes and Standards:

6.6.4.1 EEAM-Q-009 Quality Management Specification for Supplier/Construction

6.6.4.2 ISO 9001:2015 International Standard Series Quality Systems

6.6.4.3 ANSI/AWS D1.1 Structural Welding Code -Steel

6.6.4.4 SANS1200 Standardised Specifications for Civil engineering Construction

6.6.4.5 SANS 10160 General Procedures and Loadings (Design of Buildings)

6.6.4.6 SANS 10162 Structural Use of Steel

6.6.4.7 SANS 1200H Structural Steelwork

6.6.4.8 SANS 1200HC Corrosion Protection of Steelwork

6.6.4.9 SANS 1200HB Cladding and Sheeting

6.6.4.10 SANS 10100 Structural Use of Concrete

6.6.4.11 SANS 1200G Concrete (Structural)

6.6.4.12 SANS 1200D Earthworks

6.6.5 The Contractor submits his Quality Management System documents to the Project.

6.6.6 Manager as part of his programme under ECC Clause 31.2 to include details of:

6.6.6.1 Project Specific Quality Plan for the contract.

6.6.6.2 ISO 9001:2015 certification as a preferred Quality Management System.

6.6.6.3 Index of Quality procedures / Method statements to be used during the contract.

6.6.6.4 Quality Control Plan (QCP's) for each discipline (Civil & Structural, Mechanical and Electrical)

6.6.7 A signed Quality Policy based on International Organisation for Standardisation (ISO 9001:2015) that displays the five key policy requirements. The key policy requirements are:

6.6.7.1 Maintaining a Quality Management System meeting the requirements of ISO 9001:2015.

6.6.7.2 Continually improving the effectiveness of our Quality Management System.

6.6.7.3 Responding to our Clients' needs and expectations.

6.6.7.4 Providing the resources to achieve the quality objectives.

6.6.7.5 Enabling all our employees to meet quality requirements and striving to achieve good work first time, every time and on time

6.6.8 The Contractor's PQP includes or references to the quality plans of his Subcontractors and Suppliers.

6.6.9 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.

6.6.10 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.

6.6.11 The Project 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. Site Access will not be granted unless the PQP has been accepted by The Employer.

6.6.12 The Quality Control plans shall identify all inspection, test, and verification requirements to meet Contractual obligations, specifications, drawings, and related details including destructive, non-destructive testing, witness and hold points. The Contractor shall not commence fabrication or manufacture prior to review and acceptance of the applicable QCP's by The Employer.

6.6.13 The Index of Procedures means the Contractor's system for management of:

6.6.13.1 Documentation Control

6.6.13.2 Design Control

6.6.13.3 Procurement

The QCP identifies points in the fabrication, manufacturing and/or installation process that are selected for inspection. These points are denoted by the following inspection codes:

6.6.14 Hold Point (H): Inspection points in the manufacturing cycle, beyond which work shall not proceed without the specified activity, work or function being witnessed. Hold points require written notification to TRANSNET.

6.6.15 Witness Point (W): An inspection points in the manufacturing cycle that will be witnessed or verified. If TRANSNET confirms it is unable to attend after being provided with the written notification, then manufacture may proceed. Witness points require written notification to TRANSNET.

6.6.16 Review Point (R): A point at which products and quality records are verified and endorsed. Review points are not point that require notification to TRANSNET.

6.6.17 Surveillance (S): An inspection point in the manufacturing cycle during which any activity, work or function is observed. No formal notification is required. The Contractor maintains the status of testing and inspection by progressively having the QCPs signed off.

6.6.18 The Contractor shall provide material certificates for all materials supplied under this contract, in addition test certificates for all lifting and rigging equipment which is part of the gravity take up unit shall be provided. Certificates recording the balancing of the pulleys shall be provided.

6.7 Programming constraints

6.7.1 The Contractor's construction programme must be inclusive, but not limited to the following items:

6.7.1.1 Procurement and delivery of all long lead items necessary to Provide the works in line with the stipulations of the Employer's Works Information. Long lead items include but are not limited to; Plant, equipment, materials, and any other resources, as required to provide both temporary and permanent works.

6.7.1.2 Manufacturing and or Fabrication both on and off-site which may include but is not limited to; Plant, equipment, materials, and any other resources, as required to provide both temporary and permanent works.

6.7.1.3 Preparation and Approvals of Health & Safety, Environmental and Quality Documentation.

6.7.1.4 Approval of any applicable permits, permissions, and licenses, including inductions.

6.7.1.5 The Contractor's construction programme shall correspond with the Contractor's Method Statements, Quality Control Plans and Risk Assessments, as drafted in line with the Employer's stipulations.

6.7.1.6 The Contractor uses the latest version of MSP for his programme submissions, or similar approved software with the prior written consent of the Project Manager. If the Contractor will be using earlier or later versions of the software, the onus is on the Contractor to ensure that a conversion is done for the file to be compatible with MSP.

6.7.1.7 The Employer (including the agents of the Employer) operates on Site during dates or timings when the Contractor has completed certain elements of the works and/or during the contract period as stipulated in this Works Information.

6.7.1.8 Others operate on working area during dates or timings when the Contractor has completed certain elements of the works as stipulated in this Works Information

6.7.1.9 The Contractor's first programme submitted for acceptance shall be agreed during the pre-contract negotiation period, and no later than the period stipulated under Contract Data Part One (2 weeks after the Contract Date).

6.7.1.10 The Contractor complies with the Employer's high-level programme when he submits his first programme for acceptance.

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

6.7.1.12 The Contractor shows on his programme submitted for acceptance and all subsequently revised programmes, the critical path or paths and all necessary logic diagrams demonstrating sequence of operations.

6.7.1.13 The Contractor's programme shows duration of operations in working days as per the stipulated definition of the workdays and hours in the Employer's Works Information.

6.7.1.14 Each programme submitted by the Contractor to the Project Manager, is fully Cost and Resource Loaded (People, Equipment, Plant, Materials & Other Resources) except for the Contractor's tender programme submission.

6.7.1.15 The Contractor shows on each programme he submits to the Project Manager, the requirements as listed in the NEC 3, ECC, Clause 31.2.

6.7.1.16 The Contractor attends, participates in and makes a meaningful contribution to, planning initiation & set–up meetings held during the pre-contract negotiation period and no later than the period stipulated under Contract Data Part One (2 weeks after the Contract Date); to agree and set-up including but not limited to - the first schedule for acceptance; monitoring, control and reporting requirements; proposed templates and planning/scheduling procedures to be complied with for the duration of the project.

6.7.1.17 The Contractor shows on each revised programme he submits to the Project Manager a resource histogram showing planned progress versus actual, deviations from the Accepted Programme and any remedial actions proposed by the Contractor, including a spread sheet identifying instances of resource over-allocation and/or conflicts, accompanied by proposed resolutions.

6.7.1.18 The Contractor's programme shows the following levels:

6.7.1.19 Level 4 Project Schedule –detailed discipline/speciality level schedule decomposed to the appropriate levels of detail in order to accurately substantiate activity scope and activity duration estimates; developed and maintained by the Contractor relating to all operations identified on the programme representing the daily activities by each discipline, with activities and operations adequately decomposed in order to accurately represent the effort required to execute said activity/operation and support accurate duration estimates.

6.7.1.20 A narrative status report, which includes but is not limited to status and performance of operations on the Site and Working Areas; status and performance of operations outside the Working Areas,

manpower histograms, critical action items (top 10) and deviations from the Accepted Programme and action plan to rectify.

6.8 Reporting and Monitoring

6.8.1 The Contractor attends meetings as included but not limited to Section 2 Clause 5 of the Employer's Works Information.

6.8.2 The Contractor attends weekly planning meetings. Meeting agenda to include progress reporting as detailed under Section 2 Clause 5.10 of the Employer's Works Information, recovery/optimisation, contractual matters in line with NEC ECC core clauses 31, 32 and main option clause, Option B.

6.8.3 The Contractor submits programme narrative report to the Project Manager at fortnightly intervals in addition to the intervals for submission of revised programmes stated under Contract Data Part One. The Contractor also submits monthly programme narrative report to Project Manager.

6.8.4 The Contractor completes an assessment of all activities in progress and to completion to determine physical percentage complete, forecasted completion dates, deviations from the Accepted Programme and proposes remedial action to rectify deviations.

6.8.5 The Contractor shows on each revised programme he submits to the Project Manager a resource histogram showing planned progress versus actual, deviations from the accepted programme and any remedial actions proposed by the Contractor.

6.8.6 The Contractor submits the programme narrative report detailing the status and performance of operations on the Site and Working Areas, status, and performance of operations outside the Working Areas, man-power histograms, Plant and equipment histograms, and critical action items (top 10). Report shall indicate "progress this period" and "progress to date."

6.8.7 The Contractor's fortnightly project progress report (narrative report) includes but is not limited to:

6.8.7.1 Level 4 Project Schedule – showing two separate bars for each task i.e. the primary bar must reflect the current forecast dates and the secondary bar the latest Accepted Programme.

6.8.7.2 Progress Spreadsheet detailing actual progress achieved (target/planned quantity versus actual quantity) on current (critical) activities for the previous week, planned progress for the current week, deviations, and proposed recovery for each activity in question. A 1-week Look Ahead Spreadsheet in line with the aforementioned stipulations to be included. Priority to be given to identification of critical activities, progress, and any deviations from planned performance in this regard.

6.8.7.3 3-week Look Ahead Schedule showing two separate bars for each task i.e. the primary bar must reflect the current forecast dates and the secondary bar the latest Accepted Programme.

6.8.7.4 Dependencies/Deliverables matrix detailing interim approvals and/or any other inputs/requirements from Employer/Supervisor/Project Manager/Others or any other project Stakeholder in line with the activities identified in the 3-week Look Ahead Schedule.

6.8.7.5 The Contractor shall submit to the Project Manager, a bi-weekly report on progress of any off-site manufacturing activities undertaken during the previous half-month.

6.8.7.6 Based on the Accepted Programme/ latest programme submitted for acceptance the Contractor submits a cash flow forecast report that details the anticipated monthly cash flow, represented by the expected assessment of the amounts due, to the Project Manager. The cash flow forecast is to be extrapolated from the latest Accepted Programme through the mechanism of the cost loaded schedule or other similar methodologies with the prior approval of the Project Manager.

6.8.7.7 Monthly, the Contractor completes an assessment of all activities in progress and to completion and accordingly revises and submits the updated programme for acceptance and cash flow forecast report detailing any variances and proposes remedial actions to rectify deviations.

6.8.7.8 The Contractor's monthly programme narrative report is submitted a week before the last Friday of each month, or as required by the Project Manager. The report shall indicate "progress this period" and "progress to date" and shall include, but is not limited to, the following:

6.8.7.9 Summary of progress achieved during the reporting period.

6.8.7.9.1 Latest Accepted Programme.

6.8.7.9.2 Deviations from the current Accepted Programme and action plans to rectify.

6.8.7.9.3 Project milestones table – planned versus actual and forecast.

6.8.7.9.4 Status and performance of operations outside Working Areas.

6.8.7.9.5 Cash flow forecast report.

6.9 Contractor's management, supervision, and key people

6.9.1 The Contractor shall make an adequate, experienced, and stable project team available for the duration of the contract. The Contractor must exercise every effort to minimise the replacement of project team members to ensure optimum contract management continuity and efficiency.

6.9.2 No sharing of key personnel roles will be permitted in this project.

6.9.3 The Contractor employs full time, fully qualified and experienced key persons who have been delegated sufficient authority to manage the contract efficiently on-site during completion of the works including and not limited to:

6.9.3.1 The Project Manager must have a national diploma qualification in Built Environment, national diploma in Project Management and at least 5 years post qualification experience managing construction projects. The Project Manager should further provide evidence in working with the NEC suit of contracts and must have experience working in similar projects.

6.9.3.2 SHE Officer must have a minimum and completed SAMTRAC/NEBOSH or MSRM (Modern SHEQ Risk Management Qualification course) in safety management, registered with SACPCMP as CHSO (Construction Health and Safety Officer) and a minimum of 5 years' experience as a SHE Officer within the civil/ structural and/ or construction projects. Proof of environmental training must be attached to the C.V. and experience in environmental management to be included in the C.V.

6.9.3.3 The Contractor shall appoint qualified personnel to play a role of a Construction Manager or construction supervisor on site. The personnel must have a minimum qualification of a Diploma in Built Environment and at least 5 years of experience in building or construction projects.

6.9.3.4 The Contractor shall appoint a Project Manager, who has a minimum qualification of a National Diploma in built environment or Project Management with at least 8 years' experience in managing projects.

6.9.3.5 The Contractor provides an Organogram of all his key people (both as required by the Employer and as independently stated by the Contractor under Contract Data Part Two) and how such key people communicate with the Project Manager and the Supervisor and their delegates.

6.10 Contract change management.

6.10.1 For ease of communication standard templates shall be used for contract change management. The Contractor forwards all correspondence with respect to contract change management, i.e. Early Warnings and notifications of Compensation Events, on the standard templates provided.

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

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

6.10.3.1 Records of design employee's location of work or professional engineers engaged by the Contractor.

6.10.3.2 Records of people and Equipment within the working areas

6.10.3.3 Records of Equipment used, and people employed outside the Working Areas

6.10.3.4 Records of quotations, invoices and pay slips.